

## SKG-IKOB

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## European Technical Assessment

**ETA-16/0094**  
**Of 22/03/2022**

### General part

Technical Assessment Body issuing the European Technical Assessment:

SKG-IKOB Certificatie BV

Trade name of the construction product

Product family to which the  
construction product belongs

Manufacturer

Manufacturing plants

This European Technical Assessment  
contains

This European Technical Assessment is  
issued in accordance with regulation  
(EU) No 305/2011, on the basis of  
This ETA replaces

**Firesafe FT Graphite / Glava FT Graphite fugemasse**

**Firesafe FT Paste**

**Firesafe FT Acrylic / Glava Akryl fugemasse /**

**Bevegoline Brandfog Akryl**

**Fire Stopping and Sealing Product:**

**Penetration Seals**

**Firesafe AS**

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A003

145 pages including 2 Annex which form an integral part of  
this assessment.

EAD 350454-00-1104, edition September 2017

ETA 16-0094, version 7, issued on 08-06-2020

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## Specific parts

### 1 Technical description of the product

Firesafe FT Acrylic, Firesafe FT Graphite and Firesafe FT Paste are used to form a penetration seal around metallic pipes, plastic pipes and electrical cables to reinstate the fire resistance performance of wall and floor constructions, where they have been provided with apertures for the penetration of services.

| Product                                                                         | Description                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Firesafe FT Acrylic<br>(aka Glava Akryl fugemasse or Bevegoline Brandfog Akryl) | Is supplied in liquid form contained within 310 ml cartridges. The sealant is gunned into the aperture in the separating element/elements and around the service or services, to a specified depth utilizing mineral fibre insulation backing material.        |
| Firesafe FT Graphite<br>(aka Glava FT Graphite Fugemasse)                       | Is supplied in liquid form contained within 310 ml cartridges. The sealant is gunned into the aperture in the separating element/elements and around the service or services, to a specified depth utilizing mineral fibre insulation backing material.        |
| Firesafe FT Paste                                                               | Is supplied in paste form contained within 5 kgs pails. The paste is applied with a spatula into the aperture in the separating element/elements and around the service or services, to a specified depth utilizing mineral fibre insulation backing material. |

The applicant has submitted a written declaration that the product and/or constituents of the product contains no substances which have been classified as dangerous according to Directive 67/548/EEC and Regulation (EC) No. 1272/2008 and listed in the 'indicative list on dangerous substances' of the EGDS – taking into account the installation conditions of the construction product and the release scenarios resulting from there.

In addition to the specific clauses relating to dangerous substances contained in this European Technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

## **2 Specification of the intended uses in accordance with the applicable Assessment Document (hereinafter EAD)**

### **2.1 Intended use**

The intended use of Firesafe FT Acrylic, Firesafe FT Graphite and Firesafe FT Paste are to reinstate the fire resistance performance of flexible wall and rigid wall and floor constructions, where they are penetrated by services.

The specific elements of construction that the Firesafe FT Acrylic, Firesafe FT Graphite and Firesafe FT Paste may be used to provide a penetration seal in, are as follows:

Flexible walls: The wall must have a minimum thickness of 75 mm and comprise steel studs lined on both faces with minimum 2 layers of 12.5 mm thick boards; in compliance with EN 1363-1.

Rigid walls: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m<sup>3</sup> or 100 mm 5 layered CLT wall.

Rigid floors: The floor must have a minimum thickness of 150 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m<sup>3</sup> or 140 mm 5 layered CLT floor.

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period. Detailed information and data are given in Annex A.

Environmental conditions are type Z<sub>2</sub>: intended for uses in internal conditions with humidity lower than 85 % RH excluding temperatures below 0°C, without exposure to rain or UV.

### **2.2 Working life**

The assumed working life of Firesafe FT Acrylic, Firesafe FT Graphite and Firesafe FT Paste are for the intended use 10 years, provided that the assembled product is subject to appropriate installation, use and maintenance. The indication of 10 years cannot be interpreted as a guarantee given by Firesafe, but should only be regarded as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

### 3. Performance of the product and references to the methods used for its assessment

The assessment of fitness for use has been made in accordance with EAD 350454-00-1104.

| Firesafe FT Graphite                           |                                                          |                             |
|------------------------------------------------|----------------------------------------------------------|-----------------------------|
| No                                             | Essential Characteristic                                 | Product performances        |
| <b>BWR 2 Safety in case of fire</b>            |                                                          |                             |
| 1                                              | Reaction to fire                                         | Class F                     |
| 2                                              | Resistance to fire                                       | See annex A                 |
| <b>BWR 3 Hygiene, health and environment</b>   |                                                          |                             |
| 3                                              | Air permeability                                         | No performance assessed     |
| 4                                              | Water permeability                                       | No performance assessed     |
| 5                                              | Content, emission and/or release of dangerous substances | Declaration of manufacturer |
| <b>BWR 4 Safety and accessibility in use</b>   |                                                          |                             |
| 6                                              | Mechanical resistance and stability                      | No performance assessed     |
| 7                                              | Resistance to movement                                   | No performance assessed     |
| 8                                              | Adhesion                                                 | No performance assessed     |
| 9                                              | Durability                                               | Z <sub>2</sub>              |
| <b>BWR 5 Protection against noise</b>          |                                                          |                             |
| 10                                             | Airborne sound insulation                                | See annex B                 |
| <b>BWR 6 Energy economy and heat retention</b> |                                                          |                             |
| 11                                             | Thermal properties                                       | No performance assessed     |
| 12                                             | Water vapour permeability                                | No performance assessed     |

| Firesafe FT Acrylic                            |                                                          |                             |
|------------------------------------------------|----------------------------------------------------------|-----------------------------|
| No                                             | Essential Characteristic                                 | Product performances        |
| <b>BWR 2 Safety in case of fire</b>            |                                                          |                             |
| 1                                              | Reaction to fire                                         | Class F                     |
| 2                                              | Resistance to fire                                       | See annex A                 |
| <b>BWR 3 Hygiene, health and environment</b>   |                                                          |                             |
| 3                                              | Air permeability                                         | No performance assessed     |
| 4                                              | Water permeability                                       | No performance assessed     |
| 5                                              | Content, emission and/or release of dangerous substances | Declaration of manufacturer |
| <b>BWR 4 Safety and accessibility in use</b>   |                                                          |                             |
| 6                                              | Mechanical resistance and stability                      | No performance assessed     |
| 7                                              | Resistance to movement                                   | No performance assessed     |
| 8                                              | Adhesion                                                 | No performance assessed     |
| 9                                              | Durability                                               | Z <sub>2</sub>              |
| <b>BWR 5 Protection against noise</b>          |                                                          |                             |
| 10                                             | Airborne sound insulation                                | See annex B                 |
| <b>BWR 6 Energy economy and heat retention</b> |                                                          |                             |
| 11                                             | Thermal properties                                       | No performance assessed     |
| 12                                             | Water vapour permeability                                | No performance assessed     |

| Firesafe FT Paste                                  |                                     |                                |
|----------------------------------------------------|-------------------------------------|--------------------------------|
| Basic requirement for construction work            | Characteristic                      | Assessments of characteristics |
| <b>BWR1 Mechanical resistance and stability</b>    |                                     |                                |
| -                                                  | none                                | Not relevant                   |
| <b>BWR 2 Safety in case of fire</b>                |                                     |                                |
| EN 13501-1                                         | Reaction to fire                    | Class F                        |
| EN 13501-2                                         | Resistance to fire                  | Annex A                        |
| <b>BWR 3 Hygiene, health and environment</b>       |                                     |                                |
| EN 1026:2000                                       | Air permeability                    | No performance assessed        |
| ETAG 026-3, Annex C                                | Water permeability                  | No performance assessed        |
| Declaration of manufacturer                        | Release of dangerous substances     | Declaration of manufacturer    |
| <b>BWR 4 Safety in use</b>                         |                                     |                                |
| EOTA TR 001:2003                                   | Mechanical resistance and stability | No performance assessed        |
| EOTA TR 001:2003                                   | Resistance to movement              | No performance assessed        |
| EOTA TR 001:2003                                   | Adhesion                            | No performance assessed        |
| <b>BWR 5 Protection against noise</b>              |                                     |                                |
| EN10140-2/ EN ISO 717-1                            | Airborne sound insulation           | Annex B                        |
| <b>BWR 6 Energy economy and heat retention</b>     |                                     |                                |
| EN 12664, EN 12667 or EN 12939                     | Thermal properties                  | No performance assessed        |
| EN ISO 12572, EN 12056                             | Water vapour permeability           | No performance assessed        |
| <b>General aspects relating to fitness for use</b> |                                     |                                |
| ETAG 026-2, Annex B, B.6.2                         | Durability and serviceability       | Z <sub>2</sub>                 |

#### 4 **Assessment and verification of consistency of performance (hereinafter AVCP) system applied, with reference to its legal base**

According to the decision 1999/454/EC – Commission Decision of date 22nd June 1999 on the procedure for attesting the conformity of construction products pursuant to Article 20(2) of Council Directive 89/106/EEC as regards fire stopping, fire sealing and fire protective products, published in the Official Journal of the European Union (OJEU) L178/52 of 14/07/1999, see <http://eur-lex.europa.eu/JOIndex.do>) of the European Commission<sup>1</sup>, as amended, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table(s) applies (apply).

| Product(s)                              | Intended use(s)                                                      | Level(s) or class(es) | System(s) |
|-----------------------------------------|----------------------------------------------------------------------|-----------------------|-----------|
| Fire stopping and fire sealing products | For fire compartmentation and/or fire protection or fire performance | Any                   | 1         |

## 5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

### Tasks of the manufacturer

#### *Factory production control*

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall ensure that the product is in conformity with this European Technical Assessment. The manufacturer may only use initial / raw / constituent materials stated in the technical documentation of this European Technical Assessment.

The factory production control shall be in accordance with the Control Plan of 13/11/2018 relating to the European technical assessment ETA 14/0094 issued on 22/03/2022 which is part of the technical documentation of this European technical approval. The "Control Plan" is laid down in the context of the factory production control system operated by the manufacturer and deposited at SKG-IKOB. The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.

### Other tasks of the manufacturer

#### *Additional information*

The manufacturer shall provide a technical data sheet and an installation instruction with the following minimum information:

#### (a) Technical data sheet:

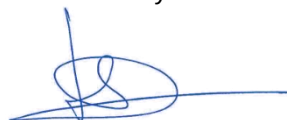
- Field of application:
- Building elements for which the penetration seal is suitable, type and properties of the building elements like minimum thickness, density, and - in case of lightweight constructions – the construction requirements.
- Limits in size, minimum thickness etc. of the penetration seal
- Construction of the penetration seal including the necessary components and additional products (e.g. backfilling material) with clear indication whether they are generic or specific.
- Services which the penetration seal is suitable, type and properties of the services like material, diameter, thickness etc. in case of pipes including insulation materials; necessary/allowed supports/fixings (e.g. cable trays)

#### (b) Installation instruction:

- Steps to be followed
- Procedure in case of retrofitting
- Stipulations on maintenance, repair and replacement

Issued in Geldermalsen, the Netherlands on 22/03/2022

The original English version is signed on behalf of SKG-IKOB  
by



ir. H.A.J. van Dartel  
Certification Manager

# Firesafe Field of Application

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## ANNEX A

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## ANNEX B

### acoustical performances

[sound insulation: penetrations + joints + blank seals](#)

## How-to-read

charts Field of Application Firesafe fire rated building products

### certification

Use FoA charts as guideline to quickly identify suitable Firesafe products within classification.

**Always apply acc. details as stated per principle detail; click [EI performance](#) in chart.**

### supporting construction

- 1** product has been tested in + certified for constructive element, default type:  
flexible wall  $\geq 100\text{mm}$ ; metal or timber studs, plaster board type A + wall insulation  
**1-n100** flexible wall  $\geq 100\text{mm}$ ; metal or timber studs, plaster board type F, **no** wall insulation  
**1-n75** flexible wall  $\geq 75\text{mm}$ ; metal or timber studs, plaster board type F, **no** wall insulation  
**2** rigid wall  $\geq 100\text{mm}$ : blockwork/concrete/masonry, density  $\geq 600 \text{ kg/m}^3$   
**3** rigid wall  $\geq 150\text{mm}$ : blockwork/concrete/masonry, density  $\geq 600 \text{ kg/m}^3$   
**4** flexible ceiling  $\geq 150\text{mm}$ : metal studs, plaster board type F  
**5** rigid floor  $\geq 150\text{mm}$ : (aerated) concrete, density  $\geq 600 \text{ kg/m}^3$   
**6** CLT wall  $\geq 100\text{mm}$   
**7** CLT floor  $\geq 140\text{mm}$

#### Note

Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

tested in construction type **1**

also applicable in constructive element type **2+3** if wall thickness +  $\text{m}^3$  weight are either equal or increased

tested in construction type **2**

also application in constructive element type **3** if wall thickness +  $\text{m}^3$  weight are either equal or increased

tested in FT Board

also applicable in GPG fireseal

**"you may always upgrade, but never downsize"**

### pipe penetrations

type of **plastic**

all plastic pipe types acc. [EN norms](#)

type of **metal**

all copper or steel or pipes; also suitable for material with lower thermal conductivity + melting point at least equal to tested material

EI

fire resistance in minutes (integrity + insulation)

U/U + U/C + C/U + C/C

pipe end uncapped U / capped C at resp. exposed + unexposed side

pipe insulation

- all synthetic rubber min.  $60 \text{ kg/m}^3$  eg Armaflex
- all glass wool or rock wool min.  $75 \text{ kg/m}^3$  eg Climpipe or U Protect Pipe Section Alu2
- all polyolefin foam min.  $28 \text{ kg/m}^3$  eg Uponor
- all PIR min.  $33 \text{ kg/m}^3$

LS

local sustained = partly insulated pipe; **total** insulation length in mm through constructive element (symmetrically)

LI

local interrupted = partly insulated pipe; insulation length in mm **on either side** of constructive element

CS

continued sustained = fully insulated pipe

CI

continued interrupted = fully insulated pipe, yet interrupted in constructive element

max. opening

see principle detail, plus:

- allowed oversize opening  $\leq 15\text{mm}$  with FIRE COLLAR + Fire Wrap; if larger, use FT Board:  
walls: max.  $600 \times 1200 \text{ mm} + 25\%$ , floors: max.  $1000 \times 1200 \text{ mm}$  up to  $600 \times 5000 \text{ mm}$
- allowed '**oversized**' collar  $\leq 15\text{mm}$ , eg use  $\varnothing 90$  collar for  $\varnothing 80$  pipe

#### Note

Support pipes; support distance: see principle detail.

Fasten glass wool or rock wool individually (not wrapped!) with steel wire; see principle detail.

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## How-to-read

charts Field of Application Firesafe fire rated building products

### certification

Use FoA charts as guideline to quickly identify suitable Firesafe products within classification.

**Always apply acc. details as stated per principle detail; click [EI performance](#) in chart.**

### cable penetrations

type of **service**

all steel (galvanised) cable trays + ladders, non-perforated + perforated

all steel (galvanised) mesh wire cable trays

EI

fire resistance in minutes (integrity + insulation)

### minimum working spaces

| configuration                     |       | horizontal | vertical |
|-----------------------------------|-------|------------|----------|
| Min. distances from opening edges | LARGE | 35mm       | 30 mm    |
|                                   | MIXED | 30 mm      | 0 mm     |
| Min. distances between services   | LARGE | 5mm        | 100 mm   |
|                                   | MIXED | 20 mm      | 20 mm    |

### cable groups

|                              |                     |
|------------------------------|---------------------|
| group 1 - small sheathed     | max. Ø 21mm         |
| group 2 - medium sheathed    | max. Ø 50mm         |
| group 3 - large sheathed     | max. Ø 80mm         |
| group 4 - data + fibre optic | max. Ø 100mm bundle |
| group 5 - non-sheathed       | max. Ø 23mm         |
| conduit, steel or plastic    | max. Ø 16mm         |

### max. opening

see principle detail

### Note

Support cable services; support distance: see principle detail.

### blank seals

EI

gaps + openings **without any service penetrations**

fire resistance in minutes (integrity + insulation)

[up to EI 120](#) for application in walls + floors

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## FoA plastic pipes

Firesafe fire rated building products are applicable for:

**PE**  
polyethylene

**aluPE-X**  
heating + water supply  
aka PEX-AL-PEX,  
Al-Composite or Multilayer

**PE-Xa**  
high pressure + temperature  
cross-linked PE

**PP**  
polypropylene

**PP-R**  
high pressure + temperature

**PP-MD**  
low noise

**PVC**  
polyvinyl chloride

### PE-LD + PE-HD

dØ up to 250 mm  
s1 3,2 up to 22,7 mm

pipes within range (dØ+s1) acc.

EN 1519-1  
EN 12666-1  
EN 12201-2  
EN ISO 15494  
DIN 8074  
DIN 8075  
DIN 19535-10

eg Wavin TS  
Agru PE 100  
Agru PE 100-RC

### aluPE-X

dØ up to 75 mm  
s1 2,0 up to 7,5 mm

pipes within range (dØ+s1) acc.

EN 1519-1  
EN 12201-2  
EN 12666-1  
EN ISO 15494  
DIN 8074  
DIN 8075  
DIN 19535-10

eg Uponor MLC  
TECEflex  
Geberit Mepla  
Kekelit Kelox KM 110  
Rehau Rautitan stabil  
Henco Alupex  
Begetube Alpex

### PE-Xa

dØ up to 32 (54) mm  
s1 2,2 up to 4,4 mm

pipes within range (dØ+s1) acc.

EN 1519-1  
EN 12201-2  
EN 12666-1  
EN 15875  
EN ISO 15494  
ISO 21003  
DIN 8074  
DIN 8075  
DIN 19535-10

eg Uponor Aqua  
Geberit Mepla  
Kekelit Kelox KM 110  
Rehau Rautitan flex  
Rehau Rautitan stabil

### PP

dØ up to 250 mm  
s1 2,7 up to 22,7 mm

pipes within range (dØ+s1) acc.

EN 1451-1  
EN ISO 15494  
EN ISO 15874  
DIN 8077  
DIN 8078

eg Dyka PP  
Agru PP-H

### PP-R

dØ up to 110 mm  
s1 3,7 up to 15,1 mm

pipes within range (dØ+s1) acc.

EN 1451-1  
EN ISO 15494  
EN ISO 15874  
ISO 21003  
DIN 8077  
DIN 8078

eg Aquatherm Blue  
Aquatherm Green  
Aquatechnik PP-R  
Akatherm PP-R  
Wavin Pilsa

### PP-MD

dØ up to 160 mm  
s1 1,8 up to 5,4 mm

pipes within range (dØ+s1) acc.

EN 1451-1  
EN ISO 15494  
EN ISO 15874  
DIN 8077  
DIN 8078

eg Uponor Decibel  
Geberit Silent-PP  
Pipelife Master 3  
Rehau Raupiano Plus  
Poloplast Polo-Kal NG / 3S  
Wavin SiTech / AS  
Valsir Silere / Triplus

### PP-MX

dØ up to 160 mm  
s1 2,7 up to 5,7 mm

pipes within range (dØ+s1) acc.

EN 1451-1  
EN ISO 15494  
EN ISO 15874  
DIN 8077  
DIN 8078

eg Geberit Silent-Pro

### PVC + PVC-C + PVC-U

dØ up to 400 mm  
s1 2,7 up to 22,7 mm

pipes within range (dØ+s1) acc.

EN 1329-1  
EN 1453-1  
EN 1452  
EN 1566-1  
EN ISO 15493  
ISO 15877  
DIN 8061  
DIN 8062  
DIN 19531-10

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| PE + PP + PVC classification ≤ Ø250 mm                                                                                           |                                                              |                 |
|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-----------------|
| Fire performances are valid for <b>range of dØ</b> pipe diameter + <b>s1</b> pipe thickness within the same pipe material:       |                                                              |                 |
| PE + PP + PVC acc. <a href="#">EN norms</a><br>dØ up to 250 mm<br>s1 up to 22,7 mm<br>pipe brands eg Pipelife, Agru, Dyka, Wavin |                                                              |                 |
| dØ                                                                                                                               | s1                                                           | pipe insulation |
| up to Ø110                                                                                                                       | 2,7 up to 10,0                                               | non-insulated   |
|                                                                                                                                  | PE 3,4 up to 10,0<br>PP 2,7 up to 6,3<br>PVC 2,7 up to 10,0  |                 |
|                                                                                                                                  |                                                              |                 |
|                                                                                                                                  |                                                              |                 |
| Ø125                                                                                                                             | 3,1 up to 11,7                                               | non-insulated   |
|                                                                                                                                  | PE 3,9 up to 11,7<br>PP 3,1 up to 7,1<br>PVC 3,1 up to 11,7  |                 |
| Ø140 - Ø160                                                                                                                      | 4,0 up to 14,6                                               | non-insulated   |
|                                                                                                                                  | PE 4,9 up to 14,6<br>PP 4,0 up to 14,6<br>PVC 4,0 up to 14,6 |                 |
| Ø200                                                                                                                             | 4,9 up to 18,2                                               | non-insulated   |
|                                                                                                                                  | PE 6,2 up to 18,2<br>PP 4,9 up to 18,2<br>PVC 4,9 up to 18,2 |                 |
| Ø250                                                                                                                             | 6,2 up to 22,7                                               | non-insulated   |
|                                                                                                                                  | PE 9,6 up to 22,7<br>PP 6,2 up to 22,7<br>PVC 6,2 up to 22,7 |                 |
| Firesafe FoA d22-1 - page 5                                                                                                      |                                                              |                 |

| suitable Firesafe products within classification: *                                                                                                   |                                                                          |                                                                                                                                                                  |                                                                                                                                                           |                                                                                                                 |                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| FT Graphite<br>DoP CPR-16/0094                                                                                                                        |                                                                          | FIRE COLLAR<br>DoP CPR-15/0339                                                                                                                                   |                                                                                                                                                           | Fire Wrap<br>DoP CPR-15/0339                                                                                    |                                                                                                 |
| walls                                                                                                                                                 | floors                                                                   | walls                                                                                                                                                            | floors                                                                                                                                                    | walls                                                                                                           | floors                                                                                          |
| <a href="#">EI 90 in wall 1+2+3</a><br><a href="#">EI 90 in wall 1-n100</a><br><a href="#">EI 30 in wall 1-n75</a><br><a href="#">EI 90 in wall 6</a> | <a href="#">EI 90 in floor 5</a><br><br><a href="#">EI 90 in floor 7</a> | <a href="#">EI 60 in wall 1+2+3</a><br><a href="#">EI 60 in wall 1-n100</a><br><a href="#">EI 30 in wall 1-n75</a><br>also on FT Board:<br>screwed on or cast-in | <a href="#">EI120 in ceiling 4</a><br><a href="#">EI 120 in floor 5</a><br><a href="#">EI 90 in floor 7</a><br>also on FT Board:<br>screwed on or cast-in | <a href="#">EI 120 in wall 1+2+3</a><br>2 layer                                                                 | <a href="#">EI 180 in floor 5</a><br>2 layer<br><br><a href="#">EI 90 in floor 7</a><br>2 layer |
|                                                                                                                                                       |                                                                          | <a href="#">EI 60 in wall 1+2+3</a><br><a href="#">EI 60 in wall 1-n100</a><br>collar Ø125                                                                       |                                                                                                                                                           | <a href="#">EI 60 in wall 1+2+3</a><br>2 layer                                                                  | <a href="#">EI 180 in floor 5</a><br>3 layer                                                    |
|                                                                                                                                                       |                                                                          | <a href="#">EI 60 in wall 1+2+3</a><br><a href="#">EI 60 in wall 1-n100</a><br>collar Ø140 or Ø160                                                               | <a href="#">EI 90 in floor 5</a><br>collar Ø140 or Ø160                                                                                                   |                                                                                                                 | <a href="#">EI 180 in floor 5</a><br>3 layer                                                    |
|                                                                                                                                                       |                                                                          | <a href="#">EI 60 in wall 1+2+3</a><br><a href="#">EI 60 in wall 1-n100</a><br>collar Ø200                                                                       |                                                                                                                                                           |                                                                                                                 |                                                                                                 |
|                                                                                                                                                       |                                                                          | <a href="#">EI 60 in wall 1+2+3</a><br>also in FT Board<br>collar Ø250                                                                                           |                                                                                                                                                           |                                                                                                                 |                                                                                                 |
|                                                                                                                                                       |                                                                          | non-standard configurations eg angled, bundled or XL:<br>up to Ø400mm with FIRE COLLAR                                                                           |                                                                                                                                                           |                                                                                                                 |                                                                                                 |
| joint details: min. W x D, default:<br>walls: 10 x 25 mm, apply on 2 sides<br>floors: 15 x 25 mm, apply on 2 sides                                    |                                                                          | default:<br>walls: apply on 2 sides<br>floors: apply on 1 side<br>always apply smoke seal FT Acrylic on 2 sides                                                  |                                                                                                                                                           | default:<br>walls: apply on 2 sides<br>floors: apply on 1 side<br>always apply smoke seal FT Acrylic on 2 sides |                                                                                                 |

|                                                                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| supporting construction                                                                                                                                                                                                                                                                                                                                                                                  |
| Constructive element must be classified acc. EN 13501-2 for the required fire resistance period:<br><br>1: flexible wall ≥100mm, insulated<br><b>1-n100: flexible wall ≥100mm, non-insulated</b><br><b>1-n75: flexible wall ≥75mm, non-insulated</b><br>2: rigid wall ≥100mm<br>3: rigid wall ≥150mm<br>4: flexible ceiling ≥150mm<br>5: rigid floor ≥150mm<br>6: CLT wall ≥100mm<br>7: CLT floor ≥140mm |
| Max. opening in constructive element: see principle detail. Use FT Board if opening is larger; see how-to-read.                                                                                                                                                                                                                                                                                          |
| Penetration services must be <b>supported</b> ;<br>support distance walls max. 500mm<br>support distance floors max. 400mm                                                                                                                                                                                                                                                                               |
| * Alternatively, use FT Acrylic or FT Paste for pipes ≤ Ø50mm; see individual results.                                                                                                                                                                                                                                                                                                                   |

NOTE:  
CONDUITS: see  
PLASTIC CABLE CONDUITS

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[plastic cable conduits](#)  
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[how-to-read](#)  
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## Notes:

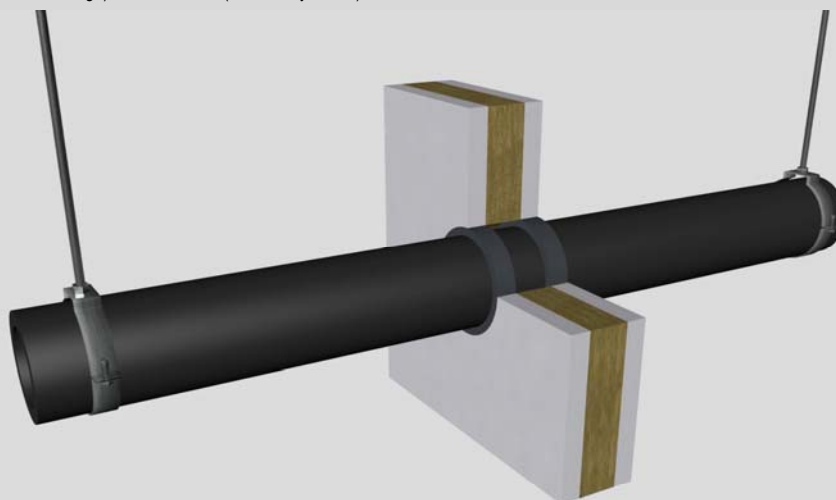
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45° (default for range) or 15° and 30° (individually tested)

## principle detail

## Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
0229



## PE + PP + PVC pipes

### FT Graphite

| service type <sup>1)</sup> |         |                      | pipe insulation                     |  | EI                                                                                  | constructive element <sup>2)</sup>      |       | Firesafe joint seal |         | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|----------------------|-------------------------------------|--|-------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------------|---------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m³ eg Armaflex           |  |  |                                         |       | width               | depth   | 1 or 2 sides | required | in construction | configuration |                                                         |
| max.                       |         |                      |                                     |  |                                                                                     |                                         |       |                     |         |              |          |                 |               |                                                         |
| Ø110                       | PE      | 3,4 up to 10,0       |                                     |  | EI 90                                                                               | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm | 25 mm               | 2 sides |              |          | 130 mm          | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            | PVC     | 2,7 up to 10,0       | <a href="#">non-insulated walls</a> |  | EI 90                                                                               | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm | 25 mm               | 2 sides |              |          | 130 mm          | U/C + C/C     |                                                         |
|                            | PP      | 2,7 up to 6,3        | <a href="#">non-insulated walls</a> |  | EI 30                                                                               | <a href="#">flexible walls ≥ 75 mm</a>  | 10 mm | 25 mm               | 2 sides |              |          | 130 mm          | U/C + C/C     |                                                         |
|                            |         |                      |                                     |  | EI 90                                                                               | <a href="#">CLT walls ≥ 100 mm</a>      | 10 mm | 25 mm               | 2 sides |              |          | 130 mm          | U/C + C/C     |                                                         |
|                            |         |                      |                                     |  | EI 90                                                                               | <a href="#">rigid floors ≥ 150 mm</a>   | 15 mm | 25 mm               | 2 sides |              |          | 140 mm          | U/C + C/C     |                                                         |
|                            |         |                      |                                     |  | EI 90                                                                               | <a href="#">CLT floors ≥ 140 mm</a>     | 15 mm | 25 mm               | 2 sides |              |          | 140 mm          | U/C + C/C     |                                                         |
| Ø90                        | PE      | 3,5 up to 8,2        |                                     |  | EI 120                                                                              | rigid walls ≥ 100 mm<br>in FR mortar    | 10 mm | 25 mm               | 2 sides |              |          | 200 x 1000 mm   | U/C + C/C     |                                                         |
|                            | PVC     | 3,0 up to 8,2        |                                     |  |                                                                                     |                                         |       |                     |         |              |          |                 |               |                                                         |
|                            | PP      | 3,0 up to 8,2        |                                     |  |                                                                                     |                                         |       |                     |         |              |          |                 |               |                                                         |

### individual test results

|      |     |           |                              |                    |                       |                         |                         |       |         |         |   |        |           |                                                                                                             |
|------|-----|-----------|------------------------------|--------------------|-----------------------|-------------------------|-------------------------|-------|---------|---------|---|--------|-----------|-------------------------------------------------------------------------------------------------------------|
| Ø110 | PE  | 4,2       |                              |                    | EI 120                | flexible walls ≥ 100 mm | 50 mm                   | 25 mm | 2 sides |         |   | 210 mm | U/C + C/C | default:<br>perpendicular +<br>all angles<br>between 90°<br>and 45° or<br>tested with max.<br>15°/30° angle |
|      | PE  | 4,2       |                              | synth. rubber 13mm | 700 LS + LI + CS + CI | EI 60                   | flexible walls ≥ 100 mm | 10 mm | 25 mm   | 2 sides |   | 156 mm | U/C + C/C |                                                                                                             |
|      | PVC | 3,2       | max. 15° angle <sup>3)</sup> |                    |                       | EI 90                   | flexible walls ≥ 100 mm | 10 mm | 25 mm   | 2 sides |   | 130 mm | U/C + C/C |                                                                                                             |
|      | PE  | 1,0       | PE bundle Ø16                |                    |                       | EI 120                  | flexible walls ≥ 100 mm | 10 mm | 25 mm   | 2 sides | * | 130 mm | U/C + C/C |                                                                                                             |
|      | PE  | 4,2       | max. 30° angle <sup>4)</sup> |                    |                       | EI 90                   | rigid walls ≥ 100 mm    | 10 mm | 25 mm   | 2 sides |   | 130 mm | U/C + C/C |                                                                                                             |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                    |                       | EI 90                   | CLT walls ≥ 100 mm      | 15 mm | 25 mm   | 2 sides | * | 140 mm |           |                                                                                                             |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                    |                       | EI 90                   | CLT floors ≥ 140 mm     | 15 mm | 25 mm   | 2 sides | * | 140 mm |           |                                                                                                             |
| Ø125 | PE  | max. 11,4 |                              |                    |                       | EI 60                   | flexible walls ≥ 100 mm | 10 mm | 25 mm   | 2 sides |   | 145 mm | U/C + C/C |                                                                                                             |

\* and smoke seal between conduits on 2 sides

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

<sup>3)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 15°

<sup>4)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 30°

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45° (default for range) or 15° and 30° (individually tested)

## principle detail

## Firesafe

tested property

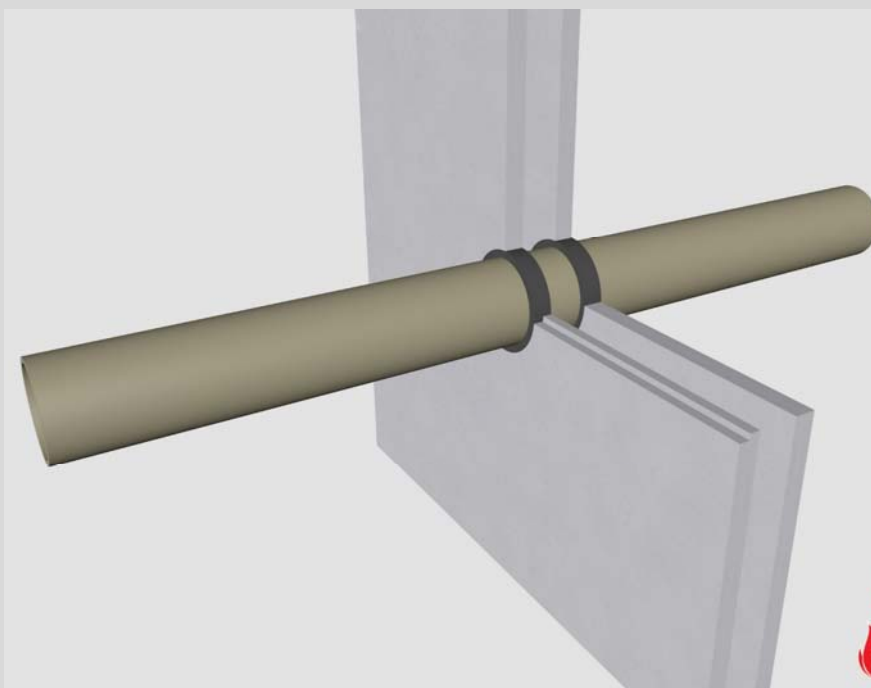
fire resistance

test method

EN 1366-3

service no.

30-23



## PE + PP + PVC pipes

### FT Graphite

| service type <sup>1)</sup> |         |                      | pipe insulation                       | EI     | constructive element <sup>2)</sup> | Firesafe joint seal |         | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|----------------------|---------------------------------------|--------|------------------------------------|---------------------|---------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m <sup>3</sup> eg Armaflex |        |                                    | width               | depth   | 1 or 2 sides | required | in construction | configuration |                                                         |
| max.<br>Ø110               | PE      | 3,4 up to 10,0       |                                       | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      |          | 130 mm          | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            | PVC     | 2,7 up to 10,0       | non-insulated walls                   | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      |          | 130 mm          | U/C + C/C     |                                                         |
|                            | PP      | 2,7 up to 6,3        | non-insulated walls                   | EI 30  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides      |          | 130 mm          | U/C + C/C     |                                                         |
|                            |         |                      |                                       | EI 90  | CLT walls ≥ 100 mm                 | 10 mm               | 25 mm   | 2 sides      |          | 130 mm          | U/C + C/C     |                                                         |
|                            |         |                      |                                       | EI 90  | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides      |          | 140 mm          | U/C + C/C     |                                                         |
| Ø90                        |         |                      |                                       | EI 90  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm   | 2 sides      |          | 140 mm          | U/C + C/C     |                                                         |
|                            | PE      | 3,5 up to 8,2        |                                       |        | rigid walls ≥ 100 mm               |                     |         |              |          |                 |               |                                                         |
|                            | PVC     | 3,0 up to 8,2        |                                       | EI 120 | in FR mortar                       | 10 mm               | 25 mm   | 2 sides      |          | 200 x 1000 mm   | U/C + C/C     |                                                         |
|                            | PP      | 3,0 up to 8,2        |                                       |        |                                    |                     |         |              |          |                 |               |                                                         |

### individual test results

|      |     |           |                              |                                          |        |                         |       |       |         |        |           |                                                                                                             |     |
|------|-----|-----------|------------------------------|------------------------------------------|--------|-------------------------|-------|-------|---------|--------|-----------|-------------------------------------------------------------------------------------------------------------|-----|
| Ø110 | PE  | 4,2       |                              |                                          | EI 120 | flexible walls ≥ 100 mm | 50 mm | 25 mm | 2 sides | 210 mm | U/C + C/C | default:<br>perpendicular +<br>all angles<br>between 90°<br>and 45° or<br>tested with max.<br>15°/30° angle |     |
|      | PE  | 4,2       |                              | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | 156 mm | U/C + C/C |                                                                                                             |     |
|      | PVC | 3,2       | max. 15° angle <sup>3)</sup> |                                          | EI 90  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | 130 mm | U/C + C/C |                                                                                                             |     |
|      | PE  | 1,0       | PE bundle Ø16                |                                          | EI 120 | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | *      | 130 mm    |                                                                                                             |     |
|      | PE  | 4,2       | max. 30° angle <sup>4)</sup> |                                          | EI 90  | rigid walls ≥ 100 mm    | 10 mm | 25 mm | 2 sides | 130 mm | U/C + C/C |                                                                                                             |     |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                                          | EI 90  | CLT walls ≥ 100 mm      | 15 mm | 25 mm | 2 sides | *      | 140 mm    |                                                                                                             | C/C |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                                          | EI 90  | CLT floors ≥ 140 mm     | 15 mm | 25 mm | 2 sides | *      | 140 mm    |                                                                                                             | C/C |
| Ø125 | PE  | max. 11,4 |                              |                                          | EI 60  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | 145 mm | U/C + C/C |                                                                                                             |     |

steel support

\* and smoke seal between conduits on 2 sides

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

<sup>3)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 15°

<sup>4)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 30°

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45° (default for range) or 15° and 30° (individually tested)

## principle detail

## Firesafe

tested property

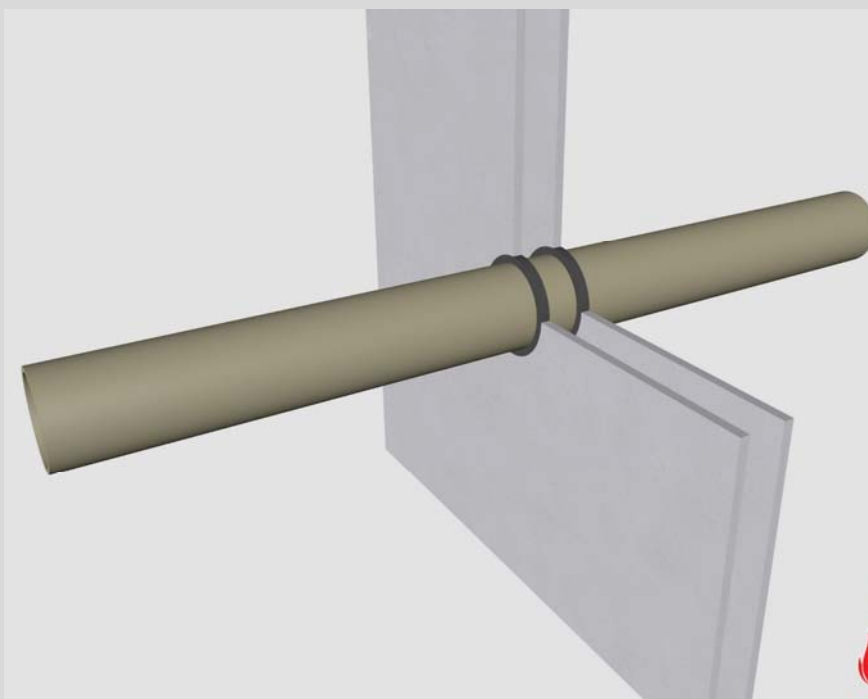
fire resistance

test method

EN 1366-3

service no.

31-68



## PE + PP + PVC pipes

### FT Graphite

| service type <sup>1)</sup> |         |                      | pipe insulation           |  |  EI | constructive element <sup>2)</sup>      |       | Firesafe joint seal |          | application     | backing       | max. opening | pipe end                                                | max. angle |
|----------------------------|---------|----------------------|---------------------------|--|----------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------------|----------|-----------------|---------------|--------------|---------------------------------------------------------|------------|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m³ eg Armaflex |  |                                                                                        | width                                   | depth | 1 or 2 sides        | required | in construction | configuration |              |                                                         |            |
| max.                       |         |                      |                           |  |                                                                                        |                                         |       |                     |          |                 |               |              |                                                         |            |
| Ø110                       | PE      | 3.4 up to 10.0       |                           |  | EI 90                                                                                  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm | 25 mm               | 2 sides  |                 | 130 mm        | U/C + C/C    | perpendicular +<br>all angles<br>between 90°<br>and 45° |            |
|                            | PVC     | 2.7 up to 10.0       | non-insulated walls       |  | EI 90                                                                                  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm | 25 mm               | 2 sides  |                 | 130 mm        | U/C + C/C    |                                                         |            |
|                            | PP      | 2.7 up to 6.3        | non-insulated walls       |  | EI 30                                                                                  | <a href="#">flexible walls ≥ 75 mm</a>  | 10 mm | 12.5 mm             | 2 sides  |                 | 130 mm        | U/C + C/C    |                                                         |            |
|                            |         |                      |                           |  | EI 90                                                                                  | <a href="#">CLT walls ≥ 100 mm</a>      | 10 mm | 25 mm               | 2 sides  |                 | 130 mm        | U/C + C/C    |                                                         |            |
|                            |         |                      |                           |  | EI 90                                                                                  | <a href="#">rigid floors ≥ 150 mm</a>   | 15 mm | 25 mm               | 2 sides  |                 | 140 mm        | U/C + C/C    |                                                         |            |
|                            |         |                      |                           |  | EI 90                                                                                  | <a href="#">CLT floors ≥ 140 mm</a>     | 15 mm | 25 mm               | 2 sides  |                 | 140 mm        | U/C + C/C    |                                                         |            |
| Ø90                        | PE      | 3.5 up to 8.2        |                           |  | EI 120                                                                                 | rigid walls ≥ 100 mm                    | 10 mm | 25 mm               | 2 sides  |                 | 200 x 1000 mm | U/C + C/C    |                                                         |            |
|                            | PVC     | 3.0 up to 8.2        |                           |  |                                                                                        | in FR mortar                            |       |                     |          |                 |               |              |                                                         |            |
|                            | PP      | 3.0 up to 8.2        |                           |  |                                                                                        |                                         |       |                     |          |                 |               |              |                                                         |            |

### individual test results

|      |     |           |                              |                    |                       |                         |                         |       |         |         |        |           |                                                                                                          |
|------|-----|-----------|------------------------------|--------------------|-----------------------|-------------------------|-------------------------|-------|---------|---------|--------|-----------|----------------------------------------------------------------------------------------------------------|
| Ø110 | PE  | 4,2       |                              |                    | EI 120                | flexible walls ≥ 100 mm | 50 mm                   | 25 mm | 2 sides |         | 210 mm | U/C + C/C | default:<br>perpendicular +<br>all angles between 90°<br>and 45° or<br>tested with max.<br>15°/30° angle |
|      | PE  | 4,2       |                              | synth. rubber 13mm | 700 LS + LI + CS + CI | EI 60                   | flexible walls ≥ 100 mm | 10 mm | 25 mm   | 2 sides | 156 mm | U/C + C/C |                                                                                                          |
|      | PVC | 3,2       | max. 15° angle <sup>3)</sup> |                    | EI 90                 | flexible walls ≥ 100 mm | 10 mm                   | 25 mm | 2 sides |         | 130 mm | U/C + C/C |                                                                                                          |
|      | PE  | 1,0       | PE bundle Ø16                |                    | EI 120                | flexible walls ≥ 100 mm | 10 mm                   | 25 mm | 2 sides | *       | 130 mm |           |                                                                                                          |
|      | PE  | 4,2       | max. 30° angle <sup>4)</sup> |                    | EI 90                 | rigid walls ≥ 100 mm    | 10 mm                   | 25 mm | 2 sides |         | 130 mm | U/C + C/C |                                                                                                          |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                    | EI 90                 | CLT walls ≥ 100 mm      | 15 mm                   | 25 mm | 2 sides | *       | 140 mm | C/C       |                                                                                                          |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                    | EI 90                 | CLT floors ≥ 140 mm     | 15 mm                   | 25 mm | 2 sides | *       | 140 mm | C/C       |                                                                                                          |
| Ø125 | PE  | max. 11,4 |                              |                    | EI 60                 | flexible walls ≥ 100 mm | 10 mm                   | 25 mm | 2 sides |         | 145 mm | U/C + C/C |                                                                                                          |

\* and smoke seal between conduits on 2 sides

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

<sup>3)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 15°

<sup>4)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 30°

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45° (default for range) or 15° and 30° (individually tested)

## principle detail

## Firesafe

tested property

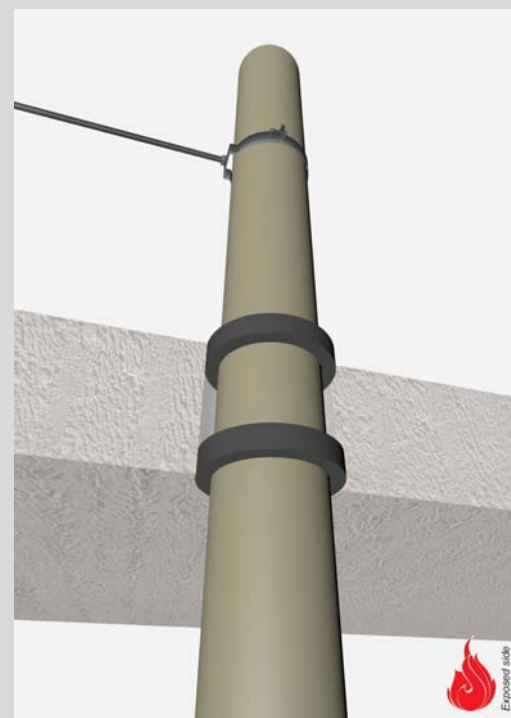
fire resistance

test method

EN 1366-3

service no.

0195



## PE + PP + PVC pipes

### FT Graphite

| service type <sup>1)</sup> |         |                      | pipe insulation                       |  | EI     | constructive element <sup>2)</sup>   |  | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|----------------------|---------------------------------------|--|--------|--------------------------------------|--|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m <sup>3</sup> eg Armaflex |  |        |                                      |  | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| Ø110                       | PE      | 3,4 up to 10,0       |                                       |  | EI 90  | flexible walls ≥ 100 mm              |  | 10 mm               | 25 mm | 2 sides      |          | 130 mm          | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            | PVC     | 2,7 up to 10,0       | non-insulated walls                   |  | EI 90  | flexible walls ≥ 100 mm              |  | 10 mm               | 25 mm | 2 sides      |          | 130 mm          | U/C + C/C     |                                                         |
|                            | PP      | 2,7 up to 6,3        | non-insulated walls                   |  | EI 30  | flexible walls ≥ 75 mm               |  | 10 mm               | 25 mm | 2 sides      |          | 130 mm          | U/C + C/C     |                                                         |
|                            |         |                      |                                       |  | EI 90  | CLT walls ≥ 100 mm                   |  | 10 mm               | 25 mm | 2 sides      |          | 130 mm          | U/C + C/C     |                                                         |
|                            |         |                      |                                       |  | EI 90  | rigid floors ≥ 150 mm                |  | 15 mm               | 25 mm | 2 sides      |          | 140 mm          | U/C + C/C     |                                                         |
|                            |         |                      |                                       |  | EI 90  | CLT floors ≥ 140 mm                  |  | 15 mm               | 25 mm | 2 sides      |          | 140 mm          | U/C + C/C     |                                                         |
| Ø90                        | PE      | 3,5 up to 8,2        |                                       |  | EI 120 | rigid walls ≥ 100 mm<br>in FR mortar |  | 10 mm               | 25 mm | 2 sides      |          | 200 x 1000 mm   | U/C + C/C     |                                                         |
|                            | PVC     | 3,0 up to 8,2        |                                       |  |        |                                      |  |                     |       |              |          |                 |               |                                                         |
|                            | PP      | 3,0 up to 8,2        |                                       |  |        |                                      |  |                     |       |              |          |                 |               |                                                         |

### individual test results

|      |     |           |                              |                    |        |                         |       |       |         |   |  |        |           |                                                                                                             |
|------|-----|-----------|------------------------------|--------------------|--------|-------------------------|-------|-------|---------|---|--|--------|-----------|-------------------------------------------------------------------------------------------------------------|
| Ø110 | PE  | 4,2       |                              |                    | EI 120 | flexible walls ≥ 100 mm | 50 mm | 25 mm | 2 sides |   |  | 210 mm | U/C + C/C | default:<br>perpendicular +<br>all angles<br>between 90°<br>and 45° or<br>tested with max.<br>15°/30° angle |
|      | PE  | 4,2       |                              | synth. rubber 13mm | EI 60  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides |   |  | 156 mm | U/C + C/C |                                                                                                             |
|      | PVC | 3,2       | max. 15° angle <sup>3)</sup> |                    | EI 90  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides |   |  | 130 mm | U/C + C/C |                                                                                                             |
|      | PE  | 1,0       | PE bundle Ø16                |                    | EI 120 | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | * |  | 130 mm | U/C + C/C |                                                                                                             |
|      | PE  | 4,2       | max. 30° angle <sup>4)</sup> |                    | EI 90  | rigid walls ≥ 100 mm    | 10 mm | 25 mm | 2 sides |   |  | 130 mm | U/C + C/C |                                                                                                             |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                    | EI 90  | CLT walls ≥ 100 mm      | 15 mm | 25 mm | 2 sides | * |  | 140 mm |           |                                                                                                             |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                    | EI 90  | CLT floors ≥ 140 mm     | 15 mm | 25 mm | 2 sides | * |  | 140 mm |           |                                                                                                             |
| Ø125 | PE  | max. 11,4 |                              |                    | EI 60  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides |   |  | 145 mm | U/C + C/C |                                                                                                             |

\* and smoke seal between conduits on 2 sides

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

<sup>3)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 15°

<sup>4)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 30°

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45° (default for range) or 15° and 30° (individually tested)

## principle detail

## Firesafe

tested property

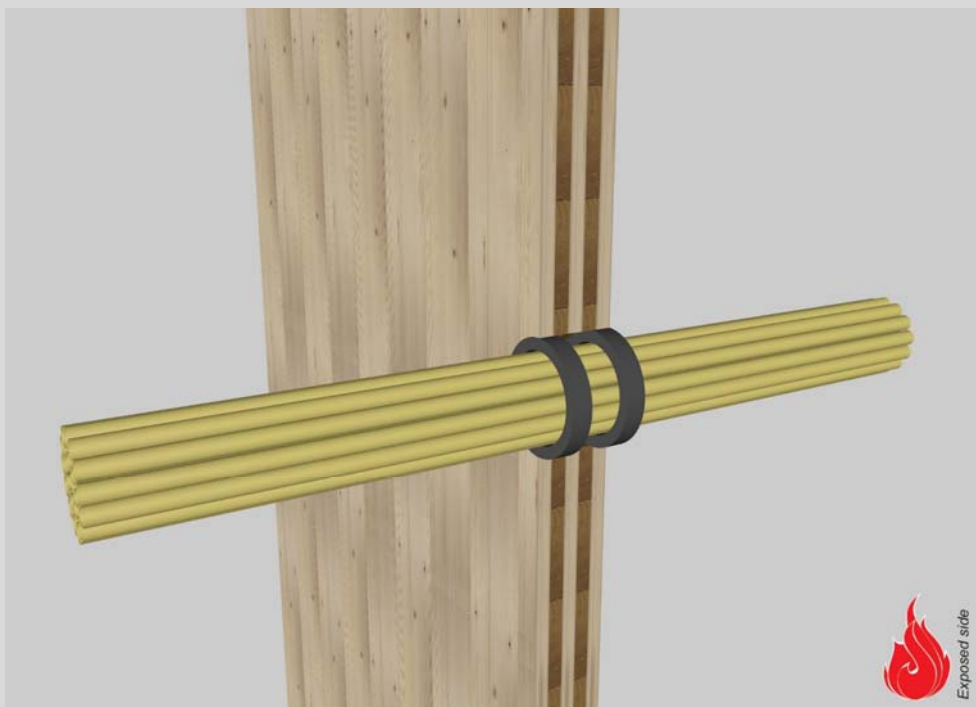
fire resistance

test method

EN 1366-3

service no.

27-18



## PE + PP + PVC pipes

### FT Graphite

| service type <sup>1)</sup> |         |                      | pipe insulation                     |  | EI     | constructive element <sup>2)</sup>      | Firesafe joint seal |       | application | backing | max. opening  | pipe end  | max. angle                                              |
|----------------------------|---------|----------------------|-------------------------------------|--|--------|-----------------------------------------|---------------------|-------|-------------|---------|---------------|-----------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m³ eg Armaflex           |  |        |                                         | width               | depth |             |         |               |           |                                                         |
| max.                       |         |                      |                                     |  |        |                                         |                     |       |             |         |               |           |                                                         |
| Ø110                       | PE      | 3,4 up to 10,0       |                                     |  | EI 90  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm               | 25 mm | 2 sides     |         | 130 mm        | U/C + C/C | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            | PVC     | 2,7 up to 10,0       | <a href="#">non-insulated walls</a> |  | EI 90  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm               | 25 mm | 2 sides     |         | 130 mm        | U/C + C/C |                                                         |
|                            | PP      | 2,7 up to 6,3        | <a href="#">non-insulated walls</a> |  | EI 30  | <a href="#">flexible walls ≥ 75 mm</a>  | 10 mm               | 25 mm | 2 sides     |         | 130 mm        | U/C + C/C |                                                         |
|                            |         |                      |                                     |  | EI 90  | <a href="#">CLT walls ≥ 100 mm</a>      | 10 mm               | 25 mm | 2 sides     |         | 130 mm        | U/C + C/C |                                                         |
|                            |         |                      |                                     |  | EI 90  | <a href="#">rigid floors ≥ 150 mm</a>   | 15 mm               | 25 mm | 2 sides     |         | 140 mm        | U/C + C/C |                                                         |
|                            |         |                      |                                     |  | EI 90  | <a href="#">CLT floors ≥ 140 mm</a>     | 15 mm               | 25 mm | 2 sides     |         | 140 mm        | U/C + C/C |                                                         |
| Ø90                        | PE      | 3,5 up to 8,2        |                                     |  | EI 120 | rigid walls ≥ 100 mm<br>in FR mortar    | 10 mm               | 25 mm | 2 sides     |         | 200 x 1000 mm | U/C + C/C |                                                         |
|                            | PVC     | 3,0 up to 8,2        |                                     |  |        |                                         |                     |       |             |         |               |           |                                                         |
|                            | PP      | 3,0 up to 8,2        |                                     |  |        |                                         |                     |       |             |         |               |           |                                                         |

### individual test results

|      |     |           |                              |                    |        |                         |       |       |         |   |        |           |                                                                                                             |
|------|-----|-----------|------------------------------|--------------------|--------|-------------------------|-------|-------|---------|---|--------|-----------|-------------------------------------------------------------------------------------------------------------|
| Ø110 | PE  | 4,2       |                              |                    | EI 120 | flexible walls ≥ 100 mm | 50 mm | 25 mm | 2 sides |   | 210 mm | U/C + C/C | default:<br>perpendicular +<br>all angles<br>between 90°<br>and 45° or<br>tested with max.<br>15°/30° angle |
|      | PE  | 4,2       |                              | synth. rubber 13mm | EI 60  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides |   | 156 mm | U/C + C/C |                                                                                                             |
|      | PVC | 3,2       | max. 15° angle <sup>3)</sup> |                    | EI 90  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides |   | 130 mm | U/C + C/C |                                                                                                             |
|      | PE  | 1,0       | PE bundle Ø16                |                    | EI 120 | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | * | 130 mm |           |                                                                                                             |
|      | PE  | 4,2       | max. 30° angle <sup>4)</sup> |                    | EI 90  | rigid walls ≥ 100 mm    | 10 mm | 25 mm | 2 sides |   | 130 mm | U/C + C/C |                                                                                                             |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                    | EI 90  | CLT walls ≥ 100 mm      | 15 mm | 25 mm | 2 sides | * | 140 mm | C/C       |                                                                                                             |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                    | EI 90  | CLT floors ≥ 140 mm     | 15 mm | 25 mm | 2 sides | * | 140 mm | C/C       |                                                                                                             |
| Ø125 | PE  | max. 11,4 |                              |                    | EI 60  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides |   | 145 mm | U/C + C/C |                                                                                                             |

\* and smoke seal between conduits on 2 sides

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

<sup>3)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 15°

<sup>4)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 30°

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45° (default for range) or 15° and 30° (individually tested)

## principle detail

## Firesafe

tested property

fire resistance

test method

EN 1366-3

service no.

27-31



## PE + PP + PVC pipes

### FT Graphite

| service type <sup>1)</sup> |         |                      | pipe insulation           |  | EI     | constructive element <sup>2)</sup>      | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|----------------------|---------------------------|--|--------|-----------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m³ eg Armaflex |  |        |                                         | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| max.                       |         |                      |                           |  |        |                                         |                     |       |              |          |                 |               |                                                         |
| Ø110                       | PE      | 3,4 up to 10,0       |                           |  | EI 90  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm               | 25 mm | 2 sides      |          | 130 mm          | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            | PVC     | 2,7 up to 10,0       | non-insulated walls       |  | EI 90  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm               | 25 mm | 2 sides      |          | 130 mm          | U/C + C/C     |                                                         |
|                            | PP      | 2,7 up to 6,3        | non-insulated walls       |  | EI 30  | <a href="#">flexible walls ≥ 75 mm</a>  | 10 mm               | 25 mm | 2 sides      |          | 130 mm          | U/C + C/C     |                                                         |
|                            |         |                      |                           |  | EI 90  | <a href="#">CLT walls ≥ 100 mm</a>      | 10 mm               | 25 mm | 2 sides      |          | 130 mm          | U/C + C/C     |                                                         |
|                            |         |                      |                           |  | EI 90  | <a href="#">rigid floors ≥ 150 mm</a>   | 15 mm               | 25 mm | 2 sides      |          | 140 mm          | U/C + C/C     |                                                         |
|                            |         |                      |                           |  | EI 90  | <a href="#">CLT floors ≥ 140 mm</a>     | 15 mm               | 25 mm | 2 sides      |          | 140 mm          | U/C + C/C     |                                                         |
| Ø90                        | PE      | 3,5 up to 8,2        |                           |  | EI 120 | rigid walls ≥ 100 mm<br>in FR mortar    | 10 mm               | 25 mm | 2 sides      |          | 200 x 1000 mm   | U/C + C/C     |                                                         |
|                            | PVC     | 3,0 up to 8,2        |                           |  |        |                                         |                     |       |              |          |                 |               |                                                         |
|                            | PP      | 3,0 up to 8,2        |                           |  |        |                                         |                     |       |              |          |                 |               |                                                         |

### individual test results

|      |     |           |                              |                                          |        |                         |       |       |         |   |        |           |                                                                                           |
|------|-----|-----------|------------------------------|------------------------------------------|--------|-------------------------|-------|-------|---------|---|--------|-----------|-------------------------------------------------------------------------------------------|
| Ø110 | PE  | 4,2       |                              |                                          | EI 120 | flexible walls ≥ 100 mm | 50 mm | 25 mm | 2 sides |   | 210 mm | U/C + C/C | default: perpendicular + all angles between 90° and 45° or tested with max. 15°/30° angle |
|      | PE  | 4,2       |                              | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides |   | 156 mm | U/C + C/C |                                                                                           |
|      | PVC | 3,2       | max. 15° angle <sup>3)</sup> |                                          | EI 90  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides |   | 130 mm | U/C + C/C |                                                                                           |
|      | PE  | 1,0       | PE bundle Ø16                |                                          | EI 120 | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | * | 130 mm |           |                                                                                           |
|      | PE  | 4,2       | max. 30° angle <sup>4)</sup> |                                          | EI 90  | rigid walls ≥ 100 mm    | 10 mm | 25 mm | 2 sides |   | 130 mm | U/C + C/C |                                                                                           |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                                          | EI 90  | CLT walls ≥ 100 mm      | 15 mm | 25 mm | 2 sides | * | 140 mm | C/C       |                                                                                           |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                                          | EI 90  | CLT floors ≥ 140 mm     | 15 mm | 25 mm | 2 sides | * | 140 mm | C/C       |                                                                                           |
| Ø125 | PE  | max. 11,4 |                              |                                          | EI 60  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides |   | 145 mm | U/C + C/C |                                                                                           |

\* and smoke seal between conduits on 2 sides

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

<sup>3)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 15°

<sup>4)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 30°

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45° (default for range) or 15° and 30° (individually tested)

## principle detail

## Firesafe

tested property

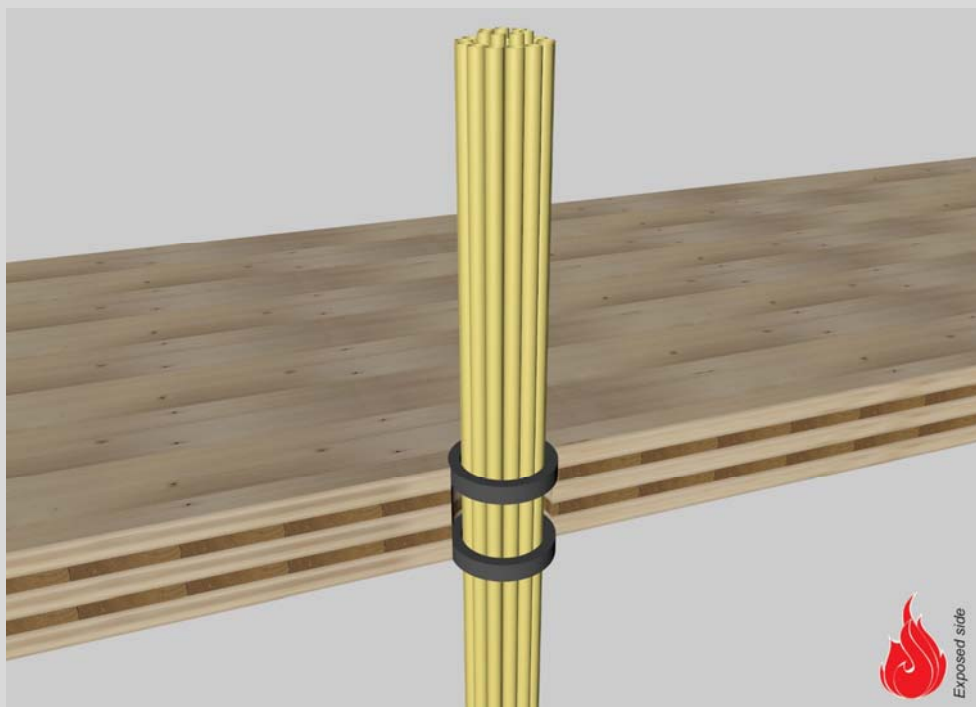
fire resistance

test method

EN 1366-3

service no.

28-38



## PE + PP + PVC pipes

### FT Graphite

| service type <sup>1)</sup> |         |                      | pipe insulation                     |  | EI     | constructive element <sup>2)</sup>      | Firesafe joint seal |       | application | backing required | max. opening in construction | pipe end configuration | max. angle                                              |
|----------------------------|---------|----------------------|-------------------------------------|--|--------|-----------------------------------------|---------------------|-------|-------------|------------------|------------------------------|------------------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m³ eg Armaflex           |  |        |                                         | width               | depth |             |                  |                              |                        |                                                         |
| max.                       |         |                      |                                     |  |        |                                         |                     |       |             |                  |                              |                        |                                                         |
| Ø110                       | PE      | 3,4 up to 10,0       |                                     |  | EI 90  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm               | 25 mm | 2 sides     |                  | 130 mm                       | U/C + C/C              | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            | PVC     | 2,7 up to 10,0       | <a href="#">non-insulated walls</a> |  | EI 90  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm               | 25 mm | 2 sides     |                  | 130 mm                       | U/C + C/C              |                                                         |
|                            | PP      | 2,7 up to 6,3        | <a href="#">non-insulated walls</a> |  | EI 30  | <a href="#">flexible walls ≥ 75 mm</a>  | 10 mm               | 25 mm | 2 sides     |                  | 130 mm                       | U/C + C/C              |                                                         |
|                            |         |                      |                                     |  | EI 90  | <a href="#">CLT walls ≥ 100 mm</a>      | 10 mm               | 25 mm | 2 sides     |                  | 130 mm                       | U/C + C/C              |                                                         |
|                            |         |                      |                                     |  | EI 90  | <a href="#">rigid floors ≥ 150 mm</a>   | 15 mm               | 25 mm | 2 sides     |                  | 140 mm                       | U/C + C/C              |                                                         |
|                            |         |                      |                                     |  | EI 90  | <a href="#">CLT floors ≥ 140 mm</a>     | 15 mm               | 25 mm | 2 sides     |                  | 140 mm                       | U/C + C/C              |                                                         |
| Ø90                        | PE      | 3,5 up to 8,2        |                                     |  | EI 120 | rigid walls ≥ 100 mm<br>in FR mortar    | 10 mm               | 25 mm | 2 sides     |                  | 200 x 1000 mm                | U/C + C/C              |                                                         |
|                            | PVC     | 3,0 up to 8,2        |                                     |  |        |                                         |                     |       |             |                  |                              |                        |                                                         |
|                            | PP      | 3,0 up to 8,2        |                                     |  |        |                                         |                     |       |             |                  |                              |                        |                                                         |

### individual test results

|      |     |           |                              |                    |        |                         |       |       |         |   |        |           |                                                                                           |
|------|-----|-----------|------------------------------|--------------------|--------|-------------------------|-------|-------|---------|---|--------|-----------|-------------------------------------------------------------------------------------------|
| Ø110 | PE  | 4,2       |                              |                    | EI 120 | flexible walls ≥ 100 mm | 50 mm | 25 mm | 2 sides |   | 210 mm | U/C + C/C | default: perpendicular + all angles between 90° and 45° or tested with max. 15°/30° angle |
|      | PE  | 4,2       |                              | synth. rubber 13mm | EI 60  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides |   | 156 mm | U/C + C/C |                                                                                           |
|      | PVC | 3,2       | max. 15° angle <sup>3)</sup> |                    | EI 90  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides |   | 130 mm | U/C + C/C |                                                                                           |
|      | PE  | 1,0       | PE bundle Ø16                |                    | EI 120 | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | * | 130 mm | U/C + C/C |                                                                                           |
|      | PE  | 4,2       | max. 30° angle <sup>4)</sup> |                    | EI 90  | rigid walls ≥ 100 mm    | 10 mm | 25 mm | 2 sides |   | 130 mm | U/C + C/C |                                                                                           |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                    | EI 90  | CLT walls ≥ 100 mm      | 15 mm | 25 mm | 2 sides | * | 140 mm | C/C       |                                                                                           |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                    | EI 90  | CLT floors ≥ 140 mm     | 15 mm | 25 mm | 2 sides | * | 140 mm | C/C       |                                                                                           |
| Ø125 | PE  | max. 11,4 |                              |                    | EI 60  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides |   | 145 mm | U/C + C/C |                                                                                           |

\* and smoke seal between conduits on 2 sides

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

<sup>3)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 15°

<sup>4)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 30°

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45° (default for range) or 15° and 30° (individually tested)

## principle detail

## Firesafe

tested property

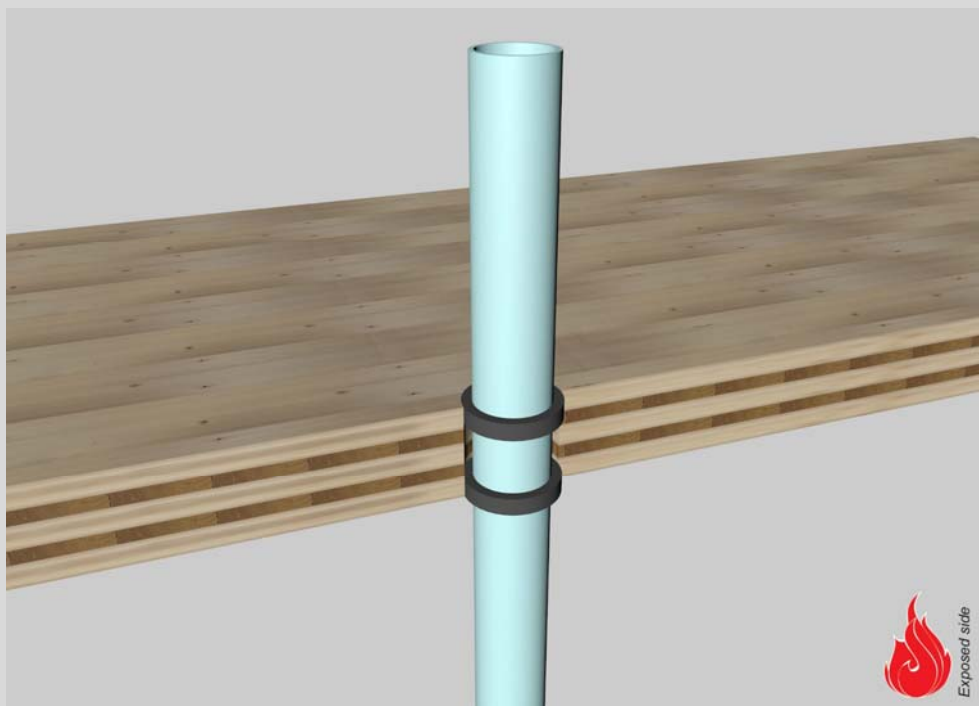
fire resistance

test method

EN 1366-3

service no.

28-51



## PE + PP + PVC pipes

### FT Graphite

| service type <sup>1)</sup> |         |                      | pipe insulation           |  |  EI | constructive element <sup>2)</sup> |                                         | Firesafe joint seal |              | application |                 | backing       |               | max. opening                                            |  | pipe end |  | max. angle |  |  |
|----------------------------|---------|----------------------|---------------------------|--|----------------------------------------------------------------------------------------|------------------------------------|-----------------------------------------|---------------------|--------------|-------------|-----------------|---------------|---------------|---------------------------------------------------------|--|----------|--|------------|--|--|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m³ eg Armaflex |  |                                                                                        |                                    | width                                   | depth               | 1 or 2 sides | required    | in construction |               | configuration |                                                         |  |          |  |            |  |  |
| max.                       |         |                      |                           |  |                                                                                        |                                    |                                         |                     |              |             |                 |               |               |                                                         |  |          |  |            |  |  |
| Ø110                       | PE      | 3,4 up to 10,0       |                           |  |                                                                                        | EI 90                              | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm               | 25 mm        | 2 sides     |                 | 130 mm        | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |  |          |  |            |  |  |
|                            | PVC     | 2,7 up to 10,0       | non-insulated walls       |  |                                                                                        | EI 90                              | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm               | 25 mm        | 2 sides     |                 | 130 mm        | U/C + C/C     |                                                         |  |          |  |            |  |  |
|                            | PP      | 2,7 up to 6,3        | non-insulated walls       |  |                                                                                        | EI 30                              | <a href="#">flexible walls ≥ 75 mm</a>  | 10 mm               | 25 mm        | 2 sides     |                 | 130 mm        | U/C + C/C     |                                                         |  |          |  |            |  |  |
|                            |         |                      |                           |  |                                                                                        | EI 90                              | <a href="#">CLT walls ≥ 100 mm</a>      | 10 mm               | 25 mm        | 2 sides     |                 | 130 mm        | U/C + C/C     |                                                         |  |          |  |            |  |  |
|                            |         |                      |                           |  |                                                                                        | EI 90                              | <a href="#">rigid floors ≥ 150 mm</a>   | 15 mm               | 25 mm        | 2 sides     |                 | 140 mm        | U/C + C/C     |                                                         |  |          |  |            |  |  |
|                            |         |                      |                           |  |                                                                                        | EI 90                              | <a href="#">CLT floors ≥ 140 mm</a>     | 15 mm               | 25 mm        | 2 sides     |                 | 140 mm        | U/C + C/C     |                                                         |  |          |  |            |  |  |
| Ø90                        | PE      | 3,5 up to 8,2        |                           |  |                                                                                        | EI 120                             | rigid walls ≥ 100 mm<br>in FR mortar    | 10 mm               | 25 mm        | 2 sides     |                 | 200 x 1000 mm | U/C + C/C     |                                                         |  |          |  |            |  |  |
|                            | PVC     | 3,0 up to 8,2        |                           |  |                                                                                        |                                    |                                         |                     |              |             |                 |               |               |                                                         |  |          |  |            |  |  |
|                            | PP      | 3,0 up to 8,2        |                           |  |                                                                                        |                                    |                                         |                     |              |             |                 |               |               |                                                         |  |          |  |            |  |  |

### individual test results

|      |     |           |                              |                    |        |                         |       |       |         |   |        |           |                                                                                           |
|------|-----|-----------|------------------------------|--------------------|--------|-------------------------|-------|-------|---------|---|--------|-----------|-------------------------------------------------------------------------------------------|
| Ø110 | PE  | 4,2       |                              |                    | EI 120 | flexible walls ≥ 100 mm | 50 mm | 25 mm | 2 sides |   | 210 mm | U/C + C/C | default: perpendicular + all angles between 90° and 45° or tested with max. 15°/30° angle |
|      | PE  | 4,2       |                              | synth. rubber 13mm | EI 60  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides |   | 156 mm | U/C + C/C |                                                                                           |
|      | PVC | 3,2       | max. 15° angle <sup>3)</sup> |                    | EI 90  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides |   | 130 mm | U/C + C/C |                                                                                           |
|      | PE  | 1,0       | PE bundle Ø16                |                    | EI 120 | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | * | 130 mm | U/C + C/C |                                                                                           |
|      | PE  | 4,2       | max. 30° angle <sup>4)</sup> |                    | EI 90  | rigid walls ≥ 100 mm    | 10 mm | 25 mm | 2 sides |   | 130 mm | U/C + C/C |                                                                                           |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                    | EI 90  | CLT walls ≥ 100 mm      | 15 mm | 25 mm | 2 sides | * | 140 mm | C/C       |                                                                                           |
|      | PVC | 1,0       | PVC bundle Ø16 + Ø20         |                    | EI 90  | CLT floors ≥ 140 mm     | 15 mm | 25 mm | 2 sides | * | 140 mm | C/C       |                                                                                           |
| Ø125 | PE  | max. 11,4 |                              |                    | EI 60  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides |   | 145 mm | U/C + C/C |                                                                                           |

\* and smoke seal between conduits on 2 sides

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

<sup>3)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 15°

<sup>4)</sup> Max. angle: perpendicular + all angles between 90° and 45° + 0° to max. 30°

| field of application                                                                                                                                                                                                                                                 |                                 | fire resistance - EI classification acc. <a href="#">EN 13501-2</a> / <a href="#">EN 1366-3</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                                                     |                                                   | Firesafe                                                                                 |                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| plastic pipe penetrations                                                                                                                                                                                                                                            |                                 | certification - EAD 350454-00-1104                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                                                                                                                                                     |                                                   |                                                                                          |                                                                  |
| PP-R classification ≤ Ø125 mm                                                                                                                                                                                                                                        |                                 | suitable Firesafe products within classification:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                     |                                                   |                                                                                          |                                                                  |
| Fire performances are valid for <b>range</b> of dØ pipe diameter + s1 pipe thickness within the same pipe material:<br><b>PP-R acc. <a href="#">EN norms</a></b><br>dØ 40 up to 125 mm<br>s1 3.7 up to 17,1 mm<br>pipe brands eg Aquatherm, Aquatechnik, Wavin Pilsa |                                 | FT Graphite<br>DoP CPR-16/0094                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  | FIRE COLLAR<br>DoP CPR-15/0339                                                                                                                      |                                                   | Fire Wrap<br>DoP CPR-15/0339                                                             |                                                                  |
| dØ                                                                                                                                                                                                                                                                   | s1                              | pipe insulation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | walls                                                                                                                                               | floors                                            | walls                                                                                    | floors                                                           |
| Ø40                                                                                                                                                                                                                                                                  | 3,7 up to 5,5                   | non-insulated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | <a href="#">EI 120 in wall 1+2</a>                                                                                                                  | results max.                                      | results max.                                                                             | results max.                                                     |
|                                                                                                                                                                                                                                                                      |                                 | + pipe insulation<br>+ polythylene rubber, min. 25 kg/m³<br>25 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | <a href="#">EI 240 in wall 3</a>                                                                                                                    | <a href="#">EI 240 in floor 5</a>                 | <a href="#">EI 120 in wall 1+2</a><br><a href="#">EI 240 in wall 3</a><br>collar Ø40     | <a href="#">EI 240 in floor 5</a><br>collar Ø40                  |
|                                                                                                                                                                                                                                                                      |                                 | individual result:<br><a href="#">EI 60 in wall 1-n100</a><br>in FT Board                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                                                                                                                     |                                                   |                                                                                          |                                                                  |
| Ø50                                                                                                                                                                                                                                                                  | 4,6                             | non-insulated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | individual result:<br><a href="#">EI 60 in wall 1-n75</a>                                                                                           |                                                   |                                                                                          |                                                                  |
| Ø63                                                                                                                                                                                                                                                                  | 5,8 up to 8,6                   | non-insulated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | results max.<br><a href="#">EI 120 in wall 1+2</a><br><a href="#">EI 240 in wall 3</a>                                                              | results max.<br><a href="#">EI 240 in floor 5</a> | <a href="#">EI 90 in wall 1+2</a><br><a href="#">EI 120 in wall 3</a><br>collar Ø63      | results max.<br><a href="#">EI 120 in floor 5</a><br>collar Ø63  |
| Ø75                                                                                                                                                                                                                                                                  | 6,8 up to 10,3<br>s1 up to 10,3 | non-insulated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | results max.<br><a href="#">EI 120 in wall 1+2</a><br><a href="#">EI 240 in wall 3</a><br>individual result:<br><a href="#">EI 60 in wall 1-n75</a> | results max.<br><a href="#">EI 240 in floor 5</a> | <a href="#">EI 90 in wall 1+2</a><br><a href="#">EI 120 in wall 3</a><br>collar Ø75      | <a href="#">EI 120 in floor 5</a><br>collar Ø75                  |
| Ø90                                                                                                                                                                                                                                                                  | 8,2                             | + pipe insulation<br>+ polythylene rubber, min. 25 kg/m³<br>25 mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | individual result:<br><a href="#">EI 60 in wall 1-n100</a>                                                                                          |                                                   |                                                                                          |                                                                  |
| Ø110                                                                                                                                                                                                                                                                 | 10,0 up to 15,1                 | non-insulated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  | results max.<br><a href="#">EI 120 in wall 1+2+3</a>                                                                                                | results max.<br><a href="#">EI 180 in floor 5</a> | <a href="#">EI 60 in wall 1+2+3</a><br>collar Ø110                                       | results max.<br><a href="#">EI 120 in floor 5</a><br>collar Ø110 |
| Ø125                                                                                                                                                                                                                                                                 | 11,4 up to 17,1                 | non-insulated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |                                                                                                                                                     |                                                   | results max.<br><a href="#">EI 180 in floor 5</a><br>collar Ø125                         | <a href="#">EI 240 in floor 5</a><br><br>3 layer                 |
|                                                                                                                                                                                                                                                                      |                                 | joint details: min. W x D, default:<br>walls: 10 x 40 mm, apply on 2 sides<br>floors: 15 x 40mm, apply on 2 sides                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  | default:<br>walls: apply on 2 sides<br>floors: apply on 1 side<br>always apply smoke seal FT Acrylic on 2 sides                                     |                                                   | default:<br><br>floors: apply on 1 side<br>always apply smoke seal FT Acrylic on 2 sides |                                                                  |
| Firesafe FoA d22-1 - page 6                                                                                                                                                                                                                                          |                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                                                     |                                                   |                                                                                          |                                                                  |
|                                                                                                                                                                                                                                                                      |                                 | supporting construction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |                                                                                                                                                     |                                                   |                                                                                          |                                                                  |
|                                                                                                                                                                                                                                                                      |                                 | Constructive element must be classified acc. EN 13501-2 for the required fire resistance period:<br><br>1: flexible wall ≥100mm, insulated<br>1-n100: flexible wall ≥100mm, non-insulated<br>1-n75: flexible wall ≥75mm, non-insulated<br>2: rigid wall ≥100mm<br>3: rigid wall ≥150mm<br>4: flexible ceiling ≥150mm<br>5: rigid floor ≥150mm<br>6: CLT wall ≥100mm<br>7: CLT floor ≥140mm<br><br>Max. opening in constructive element: see principle detail. Use FT Board if opening is larger; see how-to-read.<br><br>Penetration services must be supported;<br>support distance walls max. 500mm<br>support distance floors max. 400mm<br><br>Min. length pipe insulation LI / LS / CS / CI:<br>see principle detail.                                                                         |  |                                                                                                                                                     |                                                   |                                                                                          |                                                                  |
|                                                                                                                                                                                                                                                                      |                                 | <a href="#">► INDEX</a><br><a href="#">PE + PP + PVC</a><br><a href="#">plastic cable conduits</a><br><a href="#">PP-R</a><br><a href="#">PP-MD</a><br><a href="#">PP-MX</a><br><a href="#">aluPE-X</a><br><a href="#">PE-Xa</a><br><a href="#">copper</a><br><a href="#">steel</a><br><a href="#">steel conduits</a><br><a href="#">cast iron</a><br><a href="#">trays + ladders + wire mesh</a><br><a href="#">cables + bundles</a><br><a href="#">fire dampers</a><br><a href="#">air transfer grilles</a><br><a href="#">duct cladding</a><br><a href="#">linear joints</a><br><a href="#">socket boxes</a><br><a href="#">blank seals</a><br><br><a href="#">EN norms for plastic pipes</a><br><br><a href="#">how-to-read</a><br><a href="#">acoustical</a><br><a href="#">environmental</a> |  |                                                                                                                                                     |                                                   |                                                                                          |                                                                  |

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

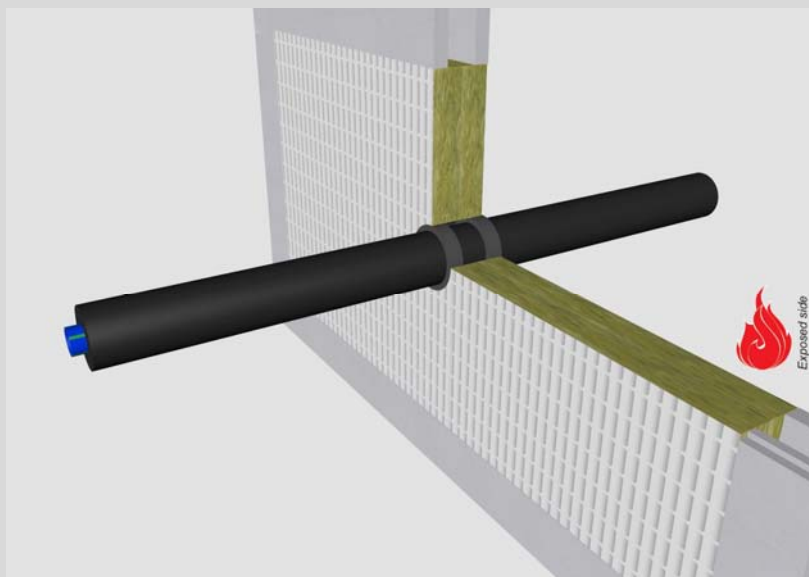
test method

service no.

fire resistance

EN 1366-3

30-59



## PP-R pipes

### FT Graphite

#### service type

dØ (mm) s1 (mm)

non-standard config.

#### pipe insulation

min. 25 kg/m³ eg Thermasmart



#### constructive element<sup>2)</sup>

#### Firesafe joint seal

width depth

#### application

1 or 2 sides

#### backing

required

#### max. opening

in construction

#### pipe end

configuration

#### max. angle

|      |           |  |  |               |                                         |       |       |         |   |        |           |                                                       |  |
|------|-----------|--|--|---------------|-----------------------------------------|-------|-------|---------|---|--------|-----------|-------------------------------------------------------|--|
| Ø40  | 3,7       |  |  | EI <b>120</b> | flexible walls ≥ 100 mm                 | 10 mm | 40 mm | 2 sides | - | 60 mm  | U/C + C/C | perpendicular<br>all angles<br>between 90°<br>and 45° |  |
|      | 3,7       |  |  | EI <b>240</b> | rigid walls ≥ 150 mm                    | 15 mm | 40 mm | 2 sides | - | 70 mm  | U/C + C/C |                                                       |  |
|      | max. 5,5  |  |  | EI <b>120</b> | flexible walls ≥ 100 mm                 | 10 mm | 40 mm | 2 sides | - | 60 mm  | U/C + C/C |                                                       |  |
|      | max. 5,5  |  |  | EI <b>240</b> | rigid walls ≥ 150 mm                    | 15 mm | 40 mm | 2 sides | - | 70 mm  | U/C + C/C |                                                       |  |
| Ø63  | 5,8       |  |  | EI <b>120</b> | flexible walls ≥ 100 mm                 | 10 mm | 40 mm | 2 sides | - | 83 mm  | U/C + C/C |                                                       |  |
|      | 5,8       |  |  | EI <b>240</b> | rigid walls ≥ 150 mm                    | 15 mm | 40 mm | 2 sides | - | 93 mm  | U/C + C/C |                                                       |  |
|      | max. 8,6  |  |  | EI <b>120</b> | flexible walls ≥ 100 mm                 | 10 mm | 40 mm | 2 sides | - | 83 mm  | U/C + C/C |                                                       |  |
|      | max. 8,6  |  |  | EI <b>180</b> | rigid walls ≥ 150 mm                    | 15 mm | 40 mm | 2 sides | - | 93 mm  | U/C + C/C |                                                       |  |
| Ø75  | 6,8       |  |  | EI <b>120</b> | flexible walls ≥ 100 mm                 | 10 mm | 40 mm | 2 sides | - | 95 mm  | U/C + C/C |                                                       |  |
|      | 6,8       |  |  | EI <b>240</b> | rigid walls ≥ 150 mm                    | 15 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |  |
|      | max. 10,3 |  |  | EI <b>120</b> | flexible walls ≥ 100 mm                 | 10 mm | 40 mm | 2 sides | - | 95 mm  | U/C + C/C |                                                       |  |
|      | max. 10,3 |  |  | EI <b>180</b> | rigid walls ≥ 150 mm                    | 15 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |  |
| max. |           |  |  |               |                                         |       |       |         |   |        |           |                                                       |  |
| Ø110 | 10,0      |  |  | EI <b>120</b> | flexible walls ≥ 100 mm                 | 10 mm | 40 mm | 2 sides | - | 130 mm | U/C + C/C |                                                       |  |
|      | 10,0      |  |  | EI <b>120</b> | rigid walls ≥ 150 mm                    | 10 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |  |
|      | max. 15,1 |  |  | EI <b>60</b>  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm | 40 mm | 2 sides | - | 130 mm | U/C + C/C |                                                       |  |
|      | max. 15,1 |  |  | EI <b>60</b>  | <a href="#">rigid walls ≥ 150 mm</a>    | 10 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |  |

#### individual test results

|     |     |                     |                         |         |       |                                         |      |         |         |   |               |           |                                                         |
|-----|-----|---------------------|-------------------------|---------|-------|-----------------------------------------|------|---------|---------|---|---------------|-----------|---------------------------------------------------------|
| Ø40 | 3,7 | non-insulated walls | polythylene rubber 25mm | CS + CI | EI 60 | <a href="#">flexible walls ≥ 100 mm</a> | 10mm | 100 mm  | 2 sides | - | 1200 x 600 mm | U/C + C/C | perpendicular +<br>all angles<br>between 90°<br>and 45° |
| Ø50 | 4,6 | non-insulated walls |                         |         | EI 60 | <a href="#">flexible walls ≥ 75 mm</a>  | 10mm | 12,5 mm | 2 sides | - | 70 mm         | U/C + C/C |                                                         |
| Ø75 | 6,8 | non-insulated walls |                         |         | EI 60 | <a href="#">flexible walls ≥ 75 mm</a>  | 10mm | 12,5 mm | 2 sides | - | 95 mm         | U/C + C/C |                                                         |
| Ø90 | 8,2 | non-insulated walls | polythylene rubber 25mm | CS + CI | EI 60 | flexible walls ≥ 100 mm                 | 10mm | 25 mm   | 2 sides | - | 160 mm        | U/C + C/C |                                                         |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

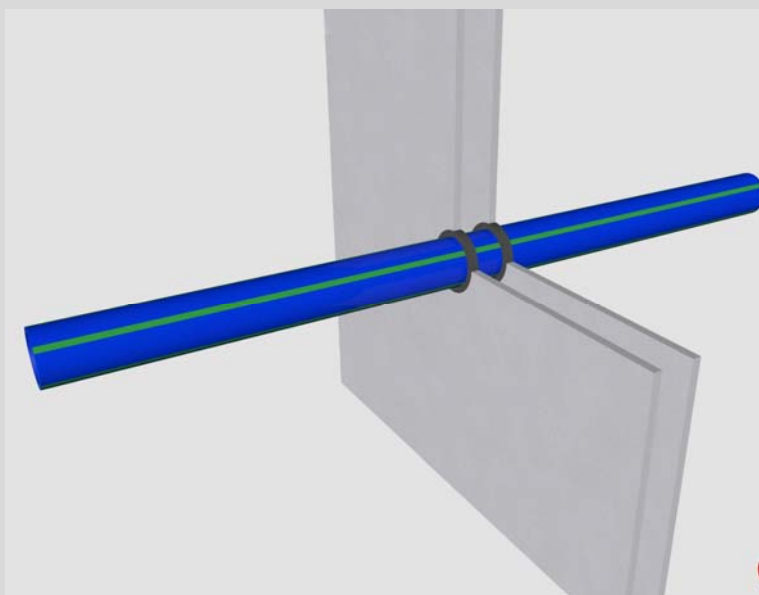
test method

service no.

fire resistance

EN 1366-3

31-74



## PP-R pipes

### FT Graphite

#### service type

dØ (mm) s1 (mm)

non-standard config.

#### pipe insulation

min. 25 kg/m³ eg ThermaSMART



EI

#### constructive element<sup>2)</sup>

#### Firesafe joint seal

width depth

#### application

1 or 2 sides

#### backing

required

#### max. opening

in construction

#### pipe end

configuration

#### max. angle

|      |           |  |  |               |                                         |       |       |         |   |        |           |                                                       |  |
|------|-----------|--|--|---------------|-----------------------------------------|-------|-------|---------|---|--------|-----------|-------------------------------------------------------|--|
| Ø40  | 3,7       |  |  | EI <b>120</b> | flexible walls ≥ 100 mm                 | 10 mm | 40 mm | 2 sides | - | 60 mm  | U/C + C/C | perpendicular<br>all angles<br>between 90°<br>and 45° |  |
|      | 3,7       |  |  | EI <b>240</b> | rigid walls ≥ 150 mm                    | 15 mm | 40 mm | 2 sides | - | 70 mm  | U/C + C/C |                                                       |  |
|      | max. 5,5  |  |  | EI <b>120</b> | flexible walls ≥ 100 mm                 | 10 mm | 40 mm | 2 sides | - | 60 mm  | U/C + C/C |                                                       |  |
|      | max. 5,5  |  |  | EI <b>240</b> | rigid walls ≥ 150 mm                    | 15 mm | 40 mm | 2 sides | - | 70 mm  | U/C + C/C |                                                       |  |
| Ø63  | 5,8       |  |  | EI <b>120</b> | flexible walls ≥ 100 mm                 | 10 mm | 40 mm | 2 sides | - | 83 mm  | U/C + C/C |                                                       |  |
|      | 5,8       |  |  | EI <b>240</b> | rigid walls ≥ 150 mm                    | 15 mm | 40 mm | 2 sides | - | 93 mm  | U/C + C/C |                                                       |  |
|      | max. 8,6  |  |  | EI <b>120</b> | flexible walls ≥ 100 mm                 | 10 mm | 40 mm | 2 sides | - | 83 mm  | U/C + C/C |                                                       |  |
|      | max. 8,6  |  |  | EI <b>180</b> | rigid walls ≥ 150 mm                    | 15 mm | 40 mm | 2 sides | - | 93 mm  | U/C + C/C |                                                       |  |
| Ø75  | 6,8       |  |  | EI <b>120</b> | flexible walls ≥ 100 mm                 | 10 mm | 40 mm | 2 sides | - | 95 mm  | U/C + C/C |                                                       |  |
|      | 6,8       |  |  | EI <b>240</b> | rigid walls ≥ 150 mm                    | 15 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |  |
|      | max. 10,3 |  |  | EI <b>120</b> | flexible walls ≥ 100 mm                 | 10 mm | 40 mm | 2 sides | - | 95 mm  | U/C + C/C |                                                       |  |
|      | max. 10,3 |  |  | EI <b>180</b> | rigid walls ≥ 150 mm                    | 15 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |  |
| max. |           |  |  |               |                                         |       |       |         |   |        |           |                                                       |  |
| Ø110 | 10,0      |  |  | EI <b>120</b> | flexible walls ≥ 100 mm                 | 10 mm | 40 mm | 2 sides | - | 130 mm | U/C + C/C |                                                       |  |
|      | 10,0      |  |  | EI <b>120</b> | rigid walls ≥ 150 mm                    | 10 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |  |
|      | max. 15,1 |  |  | EI <b>60</b>  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm | 40 mm | 2 sides | - | 130 mm | U/C + C/C |                                                       |  |
|      | max. 15,1 |  |  | EI <b>60</b>  | <a href="#">rigid walls ≥ 150 mm</a>    | 10 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |  |

#### individual test results

|     |     |                     |                         |         |       |                                         |      |         |         |   |               |           |                                                         |
|-----|-----|---------------------|-------------------------|---------|-------|-----------------------------------------|------|---------|---------|---|---------------|-----------|---------------------------------------------------------|
| Ø40 | 3,7 | non-insulated walls | polythylene rubber 25mm | CS + CI | EI 60 | <a href="#">flexible walls ≥ 100 mm</a> | 10mm | 100 mm  | 2 sides | - | 1200 x 600 mm | U/C + C/C | perpendicular +<br>all angles<br>between 90°<br>and 45° |
| Ø50 | 4,6 | non-insulated walls |                         |         | EI 60 | <a href="#">flexible walls ≥ 75 mm</a>  | 10mm | 12,5 mm | 2 sides | - | 70 mm         | U/C + C/C |                                                         |
| Ø75 | 6,8 | non-insulated walls |                         |         | EI 60 | <a href="#">flexible walls ≥ 75 mm</a>  | 10mm | 12,5 mm | 2 sides | - | 95 mm         | U/C + C/C |                                                         |
| Ø90 | 8,2 | non-insulated walls | polythylene rubber 25mm | CS + CI | EI 60 | flexible walls ≥ 100 mm                 | 10mm | 25 mm   | 2 sides | - | 160 mm        | U/C + C/C |                                                         |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

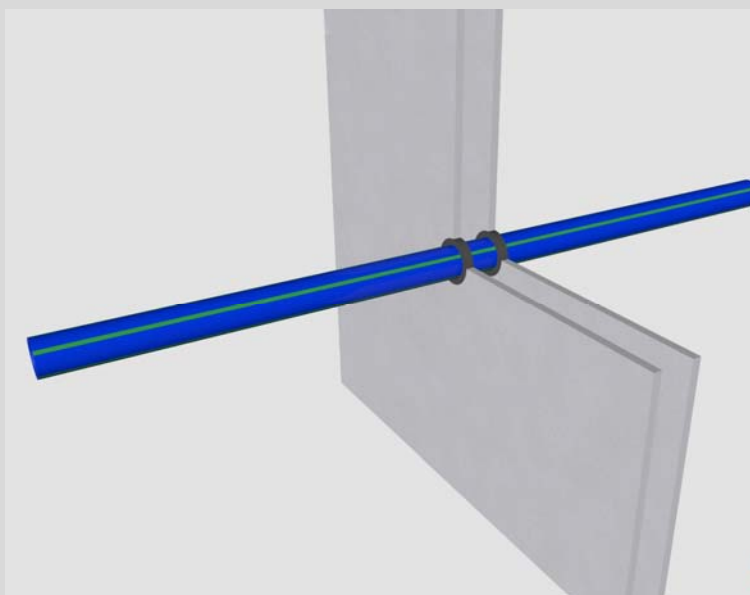
test method

service no.

fire resistance

EN 1366-3

31-43



## PP-R pipes

### FT Graphite

#### service type

dØ (mm) s1 (mm)

non-standard config.

#### pipe insulation

min. 25 kg/m³ eg ThermaSMART



#### EI

#### constructive element<sup>2)</sup>

#### Firesafe joint seal

width depth

#### application

1 or 2 sides

#### backing

required

#### max. opening

in construction

#### pipe end

configuration

#### max. angle

|      |           |  |  |        |                         |       |       |         |   |        |           |                                                       |
|------|-----------|--|--|--------|-------------------------|-------|-------|---------|---|--------|-----------|-------------------------------------------------------|
| Ø40  | 3,7       |  |  | EI 120 | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 60 mm  | U/C + C/C | perpendicular<br>all angles<br>between 90°<br>and 45° |
|      | 3,7       |  |  | EI 240 | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 70 mm  | U/C + C/C |                                                       |
|      | max. 5,5  |  |  | EI 120 | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 60 mm  | U/C + C/C |                                                       |
|      | max. 5,5  |  |  | EI 240 | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 70 mm  | U/C + C/C |                                                       |
| Ø63  | 5,8       |  |  | EI 120 | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 83 mm  | U/C + C/C |                                                       |
|      | 5,8       |  |  | EI 240 | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 93 mm  | U/C + C/C |                                                       |
|      | max. 8,6  |  |  | EI 120 | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 83 mm  | U/C + C/C |                                                       |
|      | max. 8,6  |  |  | EI 180 | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 93 mm  | U/C + C/C |                                                       |
| Ø75  | 6,8       |  |  | EI 120 | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 95 mm  | U/C + C/C |                                                       |
|      | 6,8       |  |  | EI 240 | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |
|      | max. 10,3 |  |  | EI 120 | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 95 mm  | U/C + C/C |                                                       |
|      | max. 10,3 |  |  | EI 180 | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |
| max. |           |  |  |        |                         |       |       |         |   |        |           |                                                       |
| Ø110 | 10,0      |  |  | EI 120 | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 130 mm | U/C + C/C |                                                       |
|      | 10,0      |  |  | EI 120 | rigid walls ≥ 150 mm    | 10 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |
|      | max. 15,1 |  |  | EI 60  | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 130 mm | U/C + C/C |                                                       |
|      | max. 15,1 |  |  | EI 60  | rigid walls ≥ 150 mm    | 10 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |

#### individual test results

|     |     |                     |                         |         |       |                                         |      |         |         |   |               |           |                                                         |
|-----|-----|---------------------|-------------------------|---------|-------|-----------------------------------------|------|---------|---------|---|---------------|-----------|---------------------------------------------------------|
| Ø40 | 3,7 | non-insulated walls | polythylene rubber 25mm | CS + CI | EI 60 | <a href="#">flexible walls ≥ 100 mm</a> | 10mm | 100 mm  | 2 sides | - | 1200 x 600 mm | U/C + C/C | perpendicular +<br>all angles<br>between 90°<br>and 45° |
| Ø50 | 4,6 | non-insulated walls |                         |         | EI 60 | <a href="#">flexible walls ≥ 75 mm</a>  | 10mm | 12,5 mm | 2 sides | - | 70 mm         | U/C + C/C |                                                         |
| Ø75 | 6,8 | non-insulated walls |                         |         | EI 60 | <a href="#">flexible walls ≥ 75 mm</a>  | 10mm | 12,5 mm | 2 sides | - | 95 mm         | U/C + C/C |                                                         |
| Ø90 | 8,2 | non-insulated walls | polythylene rubber 25mm | CS + CI | EI 60 | flexible walls ≥ 100 mm                 | 10mm | 25 mm   | 2 sides | - | 160 mm        | U/C + C/C |                                                         |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

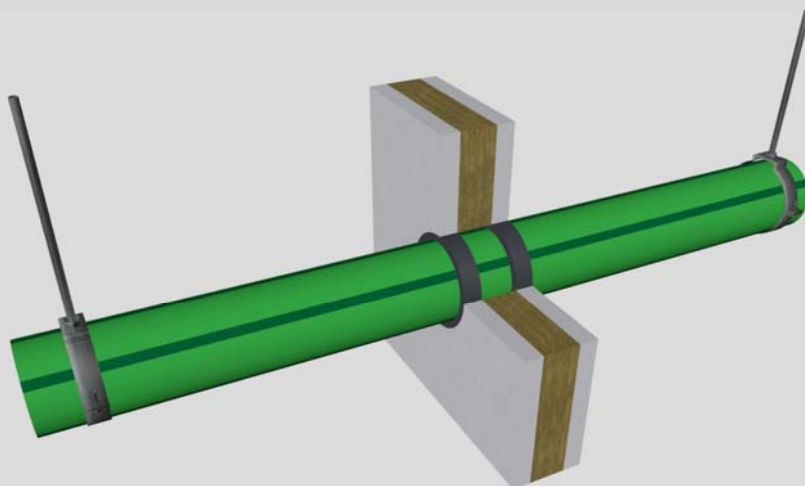
test method

service no.

fire resistance

EN 1366-3

15-28



## PP-R pipes

### FT Graphite

#### service type

dØ (mm) s1 (mm)

non-standard config.

#### pipe insulation

min. 25 kg/m³ eg ThermaSMART



#### constructive element<sup>2)</sup>

#### Firesafe joint seal

width depth

#### application

1 or 2 sides

#### backing

required

#### max. opening

in construction

#### pipe end

configuration

#### max. angle

|      |           |  |  |               |                         |       |       |         |   |        |           |                                                       |
|------|-----------|--|--|---------------|-------------------------|-------|-------|---------|---|--------|-----------|-------------------------------------------------------|
| Ø40  | 3,7       |  |  | EI <b>120</b> | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 60 mm  | U/C + C/C | perpendicular<br>all angles<br>between 90°<br>and 45° |
|      | 3,7       |  |  | EI <b>240</b> | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 70 mm  | U/C + C/C |                                                       |
|      | max. 5,5  |  |  | EI <b>120</b> | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 60 mm  | U/C + C/C |                                                       |
|      | max. 5,5  |  |  | EI <b>240</b> | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 70 mm  | U/C + C/C |                                                       |
| Ø63  | 5,8       |  |  | EI <b>120</b> | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 83 mm  | U/C + C/C |                                                       |
|      | 5,8       |  |  | EI <b>240</b> | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 93 mm  | U/C + C/C |                                                       |
|      | max. 8,6  |  |  | EI <b>120</b> | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 83 mm  | U/C + C/C |                                                       |
|      | max. 8,6  |  |  | EI <b>180</b> | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 93 mm  | U/C + C/C |                                                       |
| Ø75  | 6,8       |  |  | EI <b>120</b> | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 95 mm  | U/C + C/C |                                                       |
|      | 6,8       |  |  | EI <b>240</b> | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |
|      | max. 10,3 |  |  | EI <b>120</b> | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 95 mm  | U/C + C/C |                                                       |
|      | max. 10,3 |  |  | EI <b>180</b> | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |
| max. |           |  |  |               |                         |       |       |         |   |        |           |                                                       |
| Ø110 | 10,0      |  |  | EI <b>120</b> | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 130 mm | U/C + C/C |                                                       |
|      | 10,0      |  |  | EI <b>120</b> | rigid walls ≥ 150 mm    | 10 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |
|      | max. 15,1 |  |  | EI <b>60</b>  | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 130 mm | U/C + C/C |                                                       |
|      | max. 15,1 |  |  | EI <b>60</b>  | rigid walls ≥ 150 mm    | 10 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |

#### individual test results

| dØ (mm) | s1 (mm) | non-insulated walls | polyethylene rubber 25mm | CS + CI | EI 60 | flexible walls ≥ 100 mm | width | depth  | application | backing | max. opening  | pipe end  | max. angle                                              |
|---------|---------|---------------------|--------------------------|---------|-------|-------------------------|-------|--------|-------------|---------|---------------|-----------|---------------------------------------------------------|
| Ø40     | 3,7     | non-insulated walls |                          |         | EI 60 | flexible walls ≥ 100 mm | 10mm  | 100 mm | 2 sides     | -       | 1200 x 600 mm | U/C + C/C | perpendicular +<br>all angles<br>between 90°<br>and 45° |
| Ø50     | 4,6     | non-insulated walls |                          |         | EI 60 | flexible walls ≥ 75 mm  | 10mm  | 25 mm  | 2 sides     | -       | 70 mm         | U/C + C/C |                                                         |
| Ø75     | 6,8     | non-insulated walls |                          |         | EI 60 | flexible walls ≥ 75 mm  | 10mm  | 25 mm  | 2 sides     | -       | 95 mm         | U/C + C/C |                                                         |
| Ø90     | 8,2     | non-insulated walls | polyethylene rubber 25mm | CS + CI | EI 60 | flexible walls ≥ 100 mm | 10mm  | 25 mm  | 2 sides     | -       | 160 mm        | U/C + C/C |                                                         |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

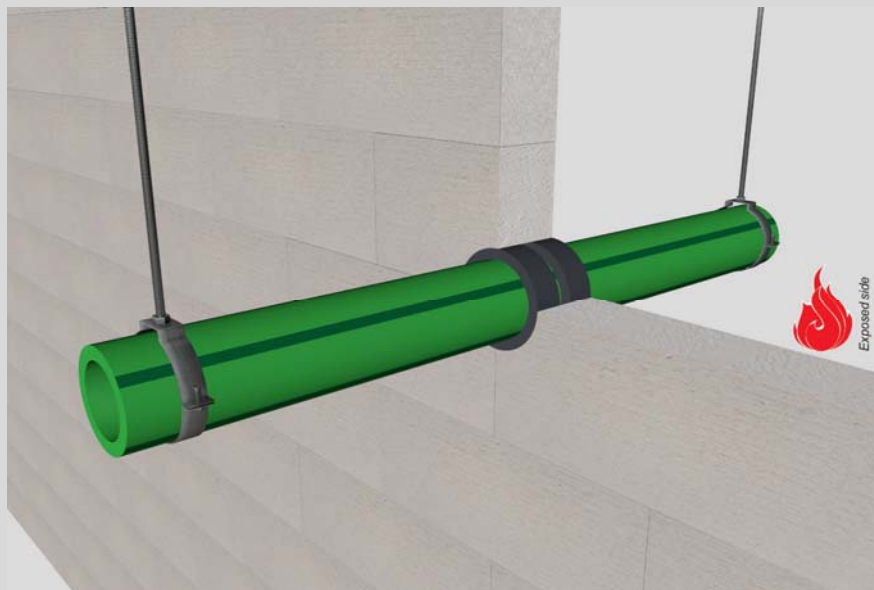
test method

service no.

fire resistance

EN 1366-3

15-28r



## PP-R pipes

### FT Graphite

#### service type

dØ (mm) s1 (mm)

non-standard config.

#### pipe insulation

min. 25 kg/m³ eg Thermasmat



EI

#### constructive element<sup>2)</sup>

#### Firesafe joint seal

width depth

#### application

1 or 2 sides

#### backing

required

#### max. opening

in construction

#### pipe end

configuration

#### max. angle

|      |           |  |  |               |                         |       |       |         |   |        |           |                                                       |
|------|-----------|--|--|---------------|-------------------------|-------|-------|---------|---|--------|-----------|-------------------------------------------------------|
| Ø40  | 3,7       |  |  | EI <b>120</b> | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 60 mm  | U/C + C/C | perpendicular<br>all angles<br>between 90°<br>and 45° |
|      | 3,7       |  |  | EI <b>240</b> | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 70 mm  | U/C + C/C |                                                       |
|      | max. 5,5  |  |  | EI <b>120</b> | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 60 mm  | U/C + C/C |                                                       |
|      | max. 5,5  |  |  | EI <b>240</b> | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 70 mm  | U/C + C/C |                                                       |
|      |           |  |  |               |                         |       |       |         |   |        |           |                                                       |
| Ø63  | 5,8       |  |  | EI <b>120</b> | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 83 mm  | U/C + C/C |                                                       |
|      | 5,8       |  |  | EI <b>240</b> | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 93 mm  | U/C + C/C |                                                       |
|      | max. 8,6  |  |  | EI <b>120</b> | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 83 mm  | U/C + C/C |                                                       |
|      | max. 8,6  |  |  | EI <b>180</b> | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 93 mm  | U/C + C/C |                                                       |
|      |           |  |  |               |                         |       |       |         |   |        |           |                                                       |
| Ø75  | 6,8       |  |  | EI <b>120</b> | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 95 mm  | U/C + C/C |                                                       |
|      | 6,8       |  |  | EI <b>240</b> | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |
|      | max. 10,3 |  |  | EI <b>120</b> | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 95 mm  | U/C + C/C |                                                       |
|      | max. 10,3 |  |  | EI <b>180</b> | rigid walls ≥ 150 mm    | 15 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |
|      |           |  |  |               |                         |       |       |         |   |        |           |                                                       |
| max. |           |  |  |               |                         |       |       |         |   |        |           |                                                       |
| Ø110 | 10,0      |  |  | EI <b>120</b> | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 130 mm | U/C + C/C |                                                       |
|      | 10,0      |  |  | EI <b>120</b> | rigid walls ≥ 150 mm    | 10 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |
|      | max. 15,1 |  |  | EI <b>60</b>  | flexible walls ≥ 100 mm | 10 mm | 40 mm | 2 sides | - | 130 mm | U/C + C/C |                                                       |
|      | max. 15,1 |  |  | EI <b>60</b>  | rigid walls ≥ 150 mm    | 10 mm | 40 mm | 2 sides | - | 105 mm | U/C + C/C |                                                       |

#### individual test results

| Ø40 | 3,7 | non-insulated walls | polythylene rubber 25mm | CS + CI | EI 60 | flexible walls ≥ 100 mm | 10mm | 100 mm  | 2 sides | - | 1200 x 600 mm | U/C + C/C | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|-----|-----|---------------------|-------------------------|---------|-------|-------------------------|------|---------|---------|---|---------------|-----------|---------------------------------------------------------|
| Ø50 | 4,6 | non-insulated walls |                         |         | EI 60 | flexible walls ≥ 75 mm  | 10mm | 12,5 mm | 2 sides | - | 70 mm         | U/C + C/C |                                                         |
| Ø75 | 6,8 | non-insulated walls |                         |         | EI 60 | flexible walls ≥ 75 mm  | 10mm | 12,5 mm | 2 sides | - | 95 mm         | U/C + C/C |                                                         |
| Ø90 | 8,2 | non-insulated walls | polythylene rubber 25mm | CS + CI | EI 60 | flexible walls ≥ 100 mm | 10mm | 25 mm   | 2 sides | - | 160 mm        | U/C + C/C |                                                         |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

**principle detail****Firesafe**

tested property

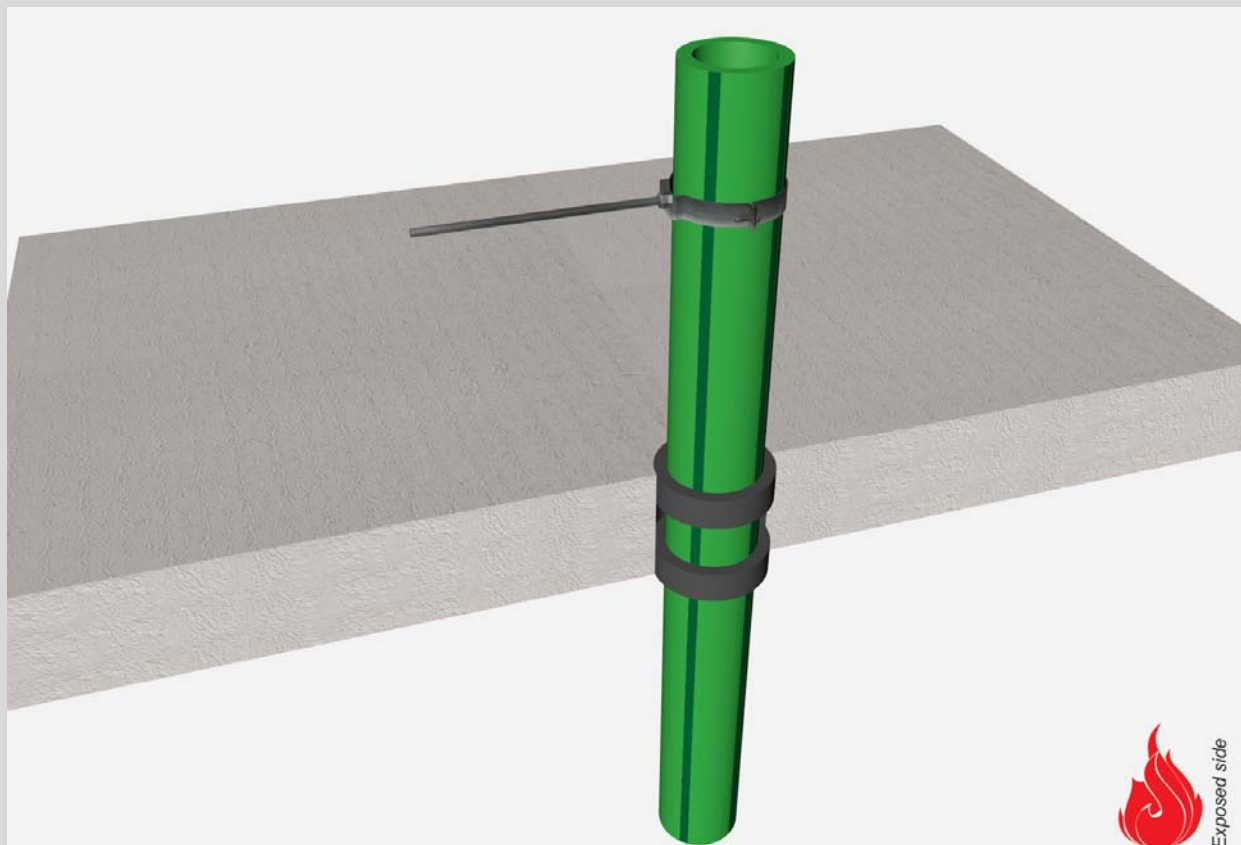
fire resistance

test method

EN 1366-3

service no.

17-1-6

**PP-R pipes****FT Graphite**

| service type |           | pipe insulation         |                       |  | EI                    | constructive element <sup>2)</sup> | Firesafe joint seal |         | application | backing      | max. opening | pipe end                                       | max. angle |
|--------------|-----------|-------------------------|-----------------------|-------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------|---------|-------------|--------------|--------------|------------------------------------------------|------------|
| dØ (mm)      | s1 (mm)   | min. 28 kg/m3 eg Uponor |                       |                                                                                     |                       |                                    | width               | depth   |             |              |              |                                                |            |
| Ø40          | min. 3,7  | -                       |                       | EI 240                                                                              | rigid floors ≥ 150 mm | 15 mm                              | 40 mm               | 2 sides | -           | 70 mm        | U/C + C/C    | perpendicular + all angles between 90° and 45° |            |
|              | max. 5,5  | -                       |                       | EI 240                                                                              | rigid floors ≥ 150 mm | 15 mm                              | 40 mm               | 2 sides | -           | 70 mm        | U/C + C/C    |                                                |            |
| Ø63          | min. 5,8  | -                       |                       | EI 240                                                                              | rigid floors ≥ 150 mm | 15 mm                              | 40 mm               | 2 sides | -           | 93 mm        | U/C + C/C    |                                                |            |
|              | max. 8,6  | -                       |                       | EI 180                                                                              | rigid floors ≥ 150 mm | 15 mm                              | 40 mm               | 2 sides | -           | 93 mm        | U/C + C/C    |                                                |            |
|              | 5,8       | polyolefin 25mm         | 750 LS + LI + CS + CI | EI 60                                                                               | rigid floors ≥ 150 mm | 15 mm                              | 40 mm               | 2 sides | -           | 600 x 800 mm | U/C + C/C    |                                                |            |
| Ø75          | min. 6,8  | -                       |                       | EI 240                                                                              | rigid floors ≥ 150 mm | 15 mm                              | 40 mm               | 2 sides | -           | 105 mm       | U/C + C/C    |                                                |            |
|              | max. 10,3 | -                       |                       | EI 180                                                                              | rigid floors ≥ 150 mm | 15 mm                              | 40 mm               | 2 sides | -           | 105 mm       | U/C + C/C    |                                                |            |
| max.         |           |                         |                       |                                                                                     |                       |                                    |                     |         |             |              |              |                                                |            |
| Ø110         | min. 10   | -                       |                       | EI 180                                                                              | rigid floors ≥ 150 mm | 15 mm                              | 40 mm               | 2 sides | -           | 140 mm       | U/C + C/C    |                                                |            |
|              | max. 15,1 | -                       |                       | EI 90                                                                               | rigid floors ≥ 150 mm | 15 mm                              | 40 mm               | 2 sides | -           | 140 mm       | U/C + C/C    |                                                |            |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>3)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

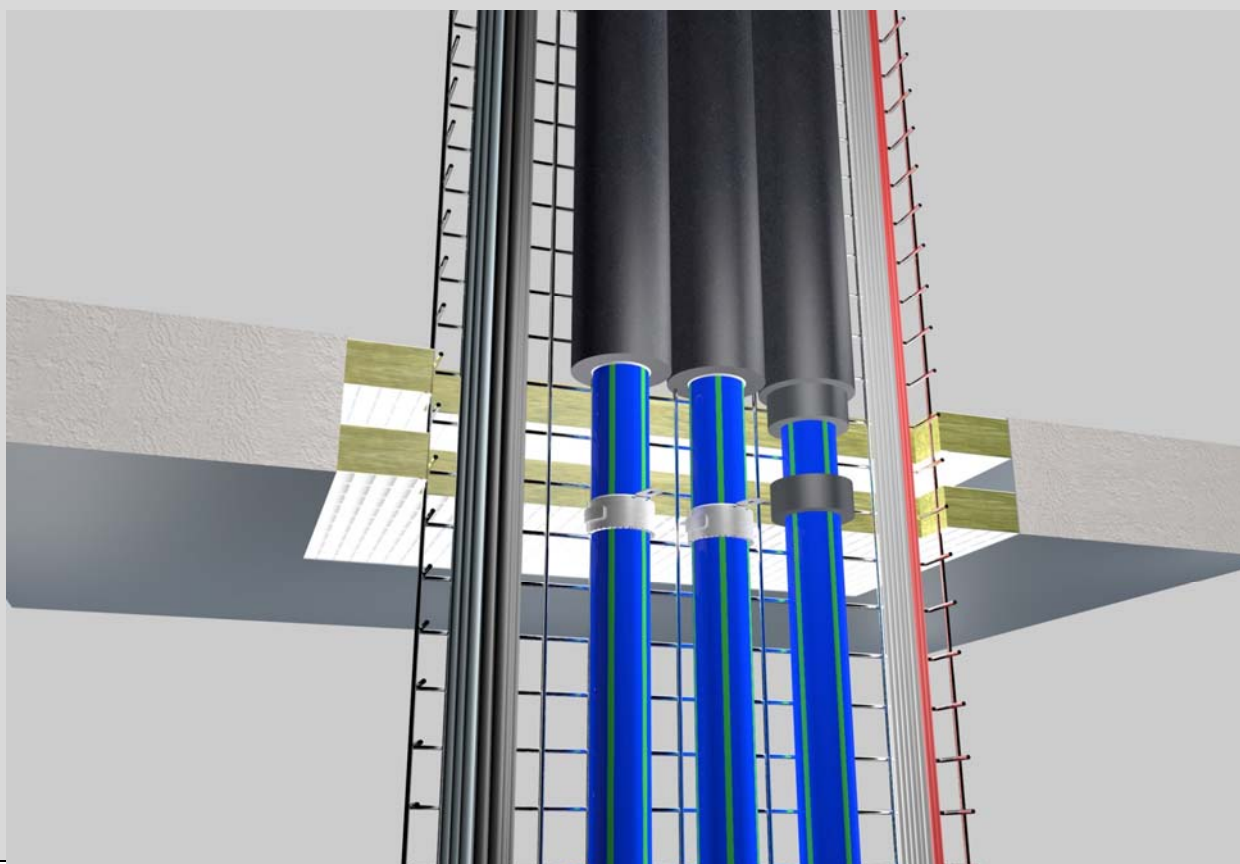
fire resistance

test method

EN 1366-3

service no.

17-6-6g



## PP-R pipes

### FT Graphite

| service type |           | pipe insulation         |                       |  | constructive element <sup>2)</sup> | Firesafe joint seal |       | application | backing | max. opening | pipe end configuration | max. angle                                     |
|--------------|-----------|-------------------------|-----------------------|-------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|-------------|---------|--------------|------------------------|------------------------------------------------|
| dØ (mm)      | s1 (mm)   | min. 28 kg/m3 eg Uponor |                       |                                                                                     |                                    | width               | depth |             |         |              |                        |                                                |
| Ø40          | min. 3,7  | -                       |                       | EI 240                                                                              | rigid floors ≥ 150 mm              | 15 mm               | 40 mm | 2 sides     | -       | 70 mm        | U/C + C/C              | perpendicular + all angles between 90° and 45° |
|              | max. 5,5  | -                       |                       | EI 240                                                                              | rigid floors ≥ 150 mm              | 15 mm               | 40 mm | 2 sides     | -       | 70 mm        | U/C + C/C              |                                                |
| Ø63          | min. 5,8  | -                       |                       | EI 240                                                                              | rigid floors ≥ 150 mm              | 15 mm               | 40 mm | 2 sides     | -       | 93 mm        | U/C + C/C              |                                                |
|              | max. 8,6  | -                       |                       | EI 180                                                                              | rigid floors ≥ 150 mm              | 15 mm               | 40 mm | 2 sides     | -       | 93 mm        | U/C + C/C              |                                                |
|              | 5,8       | polyolefin 25mm         | 750 LS + LI + CS + CI | EI 60                                                                               | rigid floors ≥ 150 mm              | 15 mm               | 40 mm | 2 sides     | -       | 600 x 800 mm | U/C + C/C              |                                                |
| Ø75          | min. 6,8  | -                       |                       | EI 240                                                                              | rigid floors ≥ 150 mm              | 15 mm               | 40 mm | 2 sides     | -       | 105 mm       | U/C + C/C              |                                                |
|              | max. 10,3 | -                       |                       | EI 180                                                                              | rigid floors ≥ 150 mm              | 15 mm               | 40 mm | 2 sides     | -       | 105 mm       | U/C + C/C              |                                                |
| max.         |           |                         |                       |                                                                                     |                                    |                     |       |             |         |              |                        |                                                |
| Ø110         | min. 10   | -                       |                       | EI 180                                                                              | rigid floors ≥ 150 mm              | 15 mm               | 40 mm | 2 sides     | -       | 140 mm       | U/C + C/C              |                                                |
|              | max. 15,1 | -                       |                       | EI 90                                                                               | rigid floors ≥ 150 mm              | 15 mm               | 40 mm | 2 sides     | -       | 140 mm       | U/C + C/C              |                                                |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>3)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

| field of application                                                                                                                                                                                                                                                                                    |     |                                    | fire resistance - EI classification acc. EN 13501-2 / EN 1366-3                                                                                                                                                                                                                                                                                                                            |                   |                                                                                                                 | Firesafe                         |                                                                                                                 |                              |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------|
| plastic pipe penetrations                                                                                                                                                                                                                                                                               |     |                                    | certification - EAD 350454-00-1104                                                                                                                                                                                                                                                                                                                                                         |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
| PP-MD classification ≤ Ø160 mm                                                                                                                                                                                                                                                                          |     |                                    | suitable Firesafe products within classification:                                                                                                                                                                                                                                                                                                                                          |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
| Fire performances are valid for range of dØ pipe diameter + s1 pipe thickness within the same pipe material:<br><b>PP-MD acc. EN norms</b><br>dØ 32 up to 160 mm<br>s1 1,8 up to 5,4 mm<br>pipe brands eg Uponor, Poloplast, Rehau, Geberit, Pipelife<br>acoustical damper brands eg Uponor Bottom Bend |     |                                    | FT Graphite<br>DoP CPR-16/0094                                                                                                                                                                                                                                                                                                                                                             |                   | FIRE COLLAR<br>DoP CPR-15/0339                                                                                  |                                  | Fire Wrap<br>DoP CPR-15/0339                                                                                    |                              |
| dØ                                                                                                                                                                                                                                                                                                      | s1  | configuration                      | walls                                                                                                                                                                                                                                                                                                                                                                                      | floors            | walls                                                                                                           | floors                           | walls                                                                                                           | floors                       |
| Ø32                                                                                                                                                                                                                                                                                                     | 1,8 | non-insulated                      | EI 120 in wall 1+2<br>EI 240 in wall 3                                                                                                                                                                                                                                                                                                                                                     | EI 240 in floor 5 | EI 120 in wall 1+2<br>EI 240 in wall 3<br>collar Ø40                                                            | EI 240 in floor 5<br>collar Ø40  | EI 120 in wall 1+2<br>EI 180 in wall 3<br>1 layer                                                               | EI 180 in floor 5<br>2 layer |
| Ø50                                                                                                                                                                                                                                                                                                     | 2,0 | non-insulated                      | EI 90 in wall 1+2<br>EI 180 in wall 3                                                                                                                                                                                                                                                                                                                                                      | EI 180 in floor 5 | EI 120 in wall 1+2<br>EI 180 in wall 3<br>collar Ø50                                                            | EI 240 in floor 5<br>collar Ø50  | EI 120 in wall 1+2<br>EI 240 in wall 3<br>1 layer                                                               | EI 240 in floor 5<br>1 layer |
| Ø75                                                                                                                                                                                                                                                                                                     | 2,6 | non-insulated                      | EI 60 in wall 1+2<br>EI 240 in wall 3                                                                                                                                                                                                                                                                                                                                                      | EI 240 in floor 5 | EI 120 in wall 1+2<br>EI 240 in wall 3<br>collar Ø75                                                            | EI 240 in floor 5<br>collar Ø75  | EI 120 in wall 1+2<br>EI 240 in wall 3<br>1 layer                                                               | EI 240 in floor 5<br>1 layer |
| Ø110                                                                                                                                                                                                                                                                                                    | 3,8 | non-insulated                      | EI 60 in wall 1+2+3                                                                                                                                                                                                                                                                                                                                                                        | EI 60 in floor 5  | EI 120 in wall 1+2+3<br>collar Ø110                                                                             | EI 180 in floor 5<br>collar Ø110 | EI 120 in wall 1+2+3<br>2 layer                                                                                 | EI 240 in floor 5<br>2 layer |
|                                                                                                                                                                                                                                                                                                         |     | + pipe socket                      |                                                                                                                                                                                                                                                                                                                                                                                            |                   | EI 90 in floor 7<br>collar Ø160<br>in GPG or FT Board                                                           |                                  |                                                                                                                 | EI 90 in floor 7<br>2 layer  |
|                                                                                                                                                                                                                                                                                                         |     | + acoustical damper                |                                                                                                                                                                                                                                                                                                                                                                                            |                   | EI 60 in wall 1+2+3<br>collar Ø140                                                                              | EI 240 in floor 5<br>collar Ø140 | EI 90 in wall 1+2+3<br>3 layer                                                                                  |                              |
| Ø160                                                                                                                                                                                                                                                                                                    | 5,4 | non-insulated<br><br>+ pipe socket |                                                                                                                                                                                                                                                                                                                                                                                            |                   | EI 60 in wall 1+2+3<br>collar Ø160                                                                              | EI 180 in floor 5<br>collar Ø160 |                                                                                                                 | EI 240 in floor 5<br>3 layer |
|                                                                                                                                                                                                                                                                                                         |     |                                    | joint details: min. W x D, default:<br>walls: 10 x 25 mm, apply on 2 sides<br>floors: 15 x 25 mm, apply on 2 sides                                                                                                                                                                                                                                                                         |                   | default:<br>walls: apply on 2 sides<br>floors: apply on 1 side<br>always apply smoke seal FT Acrylic on 2 sides |                                  | default:<br>walls: apply on 2 sides<br>floors: apply on 1 side<br>always apply smoke seal FT Acrylic on 2 sides |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | supporting construction                                                                                                                                                                                                                                                                                                                                                                    |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | Constructive element must be classified acc. EN 13501-2 for the required fire resistance period:<br><br>1: flexible wall ≥100mm, insulated<br>1-n100: flexible wall ≥100mm, non-insulated<br>1-n75: flexible wall ≥75mm, non-insulated<br>2: rigid wall ≥100mm<br>3: rigid wall ≥150mm<br>4: flexible ceiling ≥150mm<br>5: rigid floor ≥150mm<br>6: CLT wall ≥100mm<br>7: CLT floor ≥140mm |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | Max. opening in constructive element: see principle detail. Use FT Board if opening is larger; see how-to-read.                                                                                                                                                                                                                                                                            |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | Penetration services must be supported;<br>support distance walls max. 500mm<br>support distance floors max. 400mm                                                                                                                                                                                                                                                                         |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | ► INDEX                                                                                                                                                                                                                                                                                                                                                                                    |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | PE + PP + PVC                                                                                                                                                                                                                                                                                                                                                                              |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | plastic cable conduits                                                                                                                                                                                                                                                                                                                                                                     |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | PP-R                                                                                                                                                                                                                                                                                                                                                                                       |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | PP-MD                                                                                                                                                                                                                                                                                                                                                                                      |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | PP-MX                                                                                                                                                                                                                                                                                                                                                                                      |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | aluPE-X                                                                                                                                                                                                                                                                                                                                                                                    |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | PE-Xa                                                                                                                                                                                                                                                                                                                                                                                      |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | copper                                                                                                                                                                                                                                                                                                                                                                                     |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | steel                                                                                                                                                                                                                                                                                                                                                                                      |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | steel conduits                                                                                                                                                                                                                                                                                                                                                                             |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | cast iron                                                                                                                                                                                                                                                                                                                                                                                  |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | trays + ladders + wire mesh                                                                                                                                                                                                                                                                                                                                                                |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | cables + bundles                                                                                                                                                                                                                                                                                                                                                                           |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | fire dampers                                                                                                                                                                                                                                                                                                                                                                               |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | air transfer grilles                                                                                                                                                                                                                                                                                                                                                                       |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | duct cladding                                                                                                                                                                                                                                                                                                                                                                              |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | linear joints                                                                                                                                                                                                                                                                                                                                                                              |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | socket boxes                                                                                                                                                                                                                                                                                                                                                                               |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | blank seals                                                                                                                                                                                                                                                                                                                                                                                |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | EN norms for plastic pipes                                                                                                                                                                                                                                                                                                                                                                 |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | how-to-read                                                                                                                                                                                                                                                                                                                                                                                |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | acoustical                                                                                                                                                                                                                                                                                                                                                                                 |                   |                                                                                                                 |                                  |                                                                                                                 |                              |
|                                                                                                                                                                                                                                                                                                         |     |                                    | environmental                                                                                                                                                                                                                                                                                                                                                                              |                   |                                                                                                                 |                                  |                                                                                                                 |                              |

Firesafe FoA d22-1 - page 7

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

**principle detail****Firesafe**

tested property

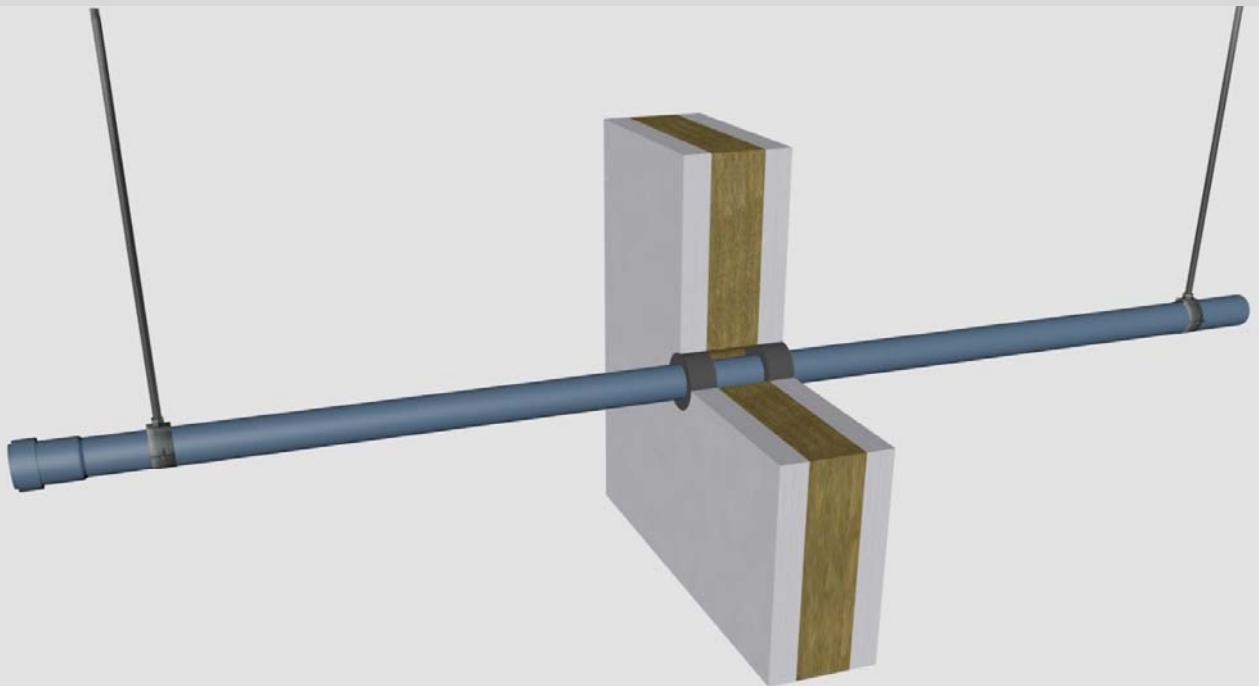
fire resistance

test method

EN 1366-3

service no.

19-60

**PP-MD pipes****FT Graphite**

| service type |         | pipe socket |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|--------------|---------|-------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)      | s1 (mm) |             |                                                                                        |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| Ø32          | 1,8     | -           | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 52 mm           | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|              |         | -           | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides      | -        | 62 mm           | U/C + C/C     |                                                         |
| Ø50          | 2,0     | -           | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 70 mm           | U/C + C/C     |                                                         |
|              |         | -           | EI <b>180</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides      | -        | 80 mm           | U/C + C/C     |                                                         |
| Ø75          | 2,6     | -           | EI <b>60</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | *        | 95 mm           | U/C + C/C     |                                                         |
|              |         | -           | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides      | -        | 105 mm          | U/C + C/C     |                                                         |
| max.         |         |             |                                                                                        |                                    |                     |       |              |          |                 |               |                                                         |
| Ø110         | 3.8     | -           | EI <b>60</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 130 mm          | U/C + C/C     |                                                         |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

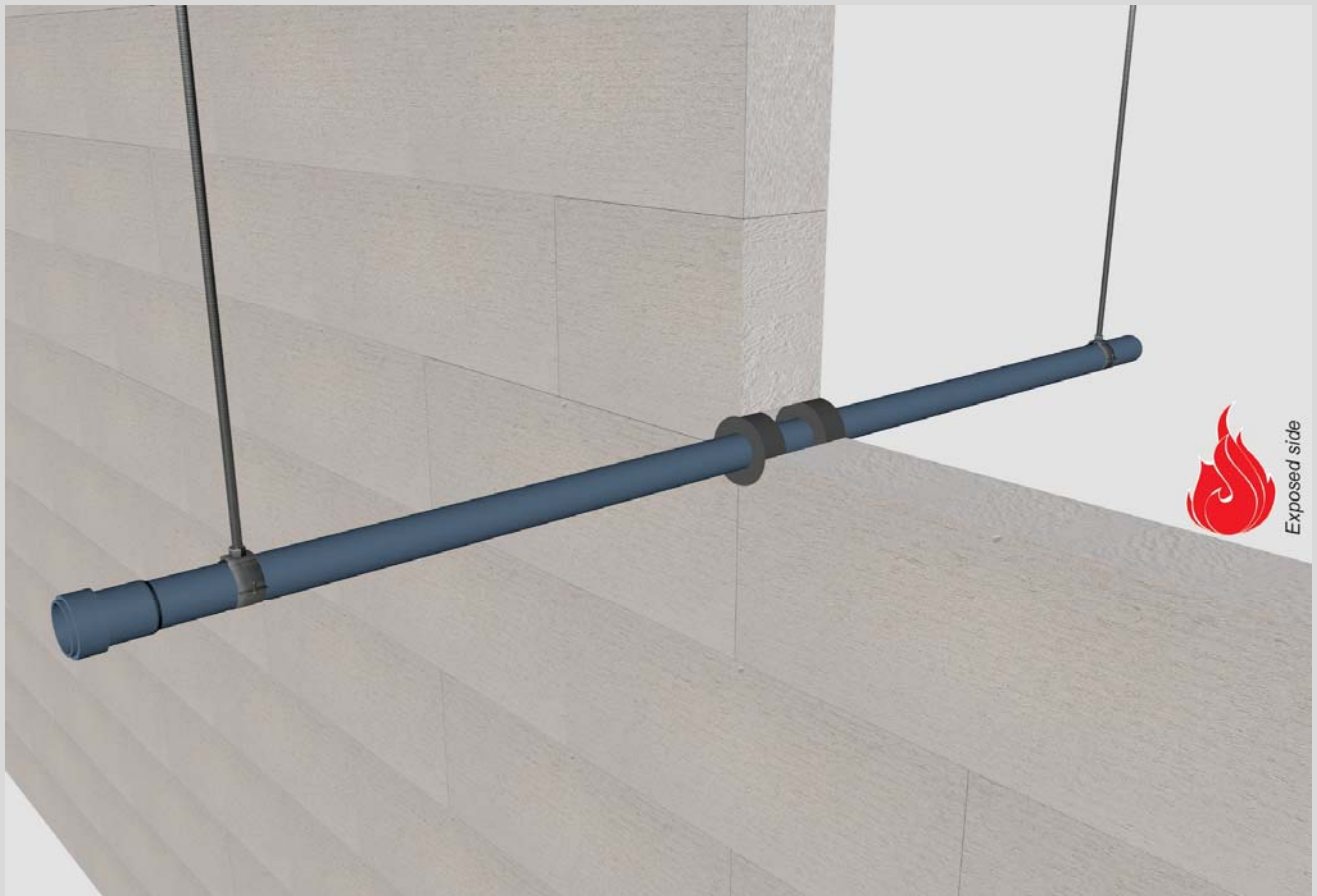
fire resistance

test method

EN 1366-3

service no.

19-60r



## PP-MD pipes

### FT Graphite

| service type |         | pipe socket |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|--------------|---------|-------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)      | s1 (mm) |             |                                                                                        |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| Ø32          | 1,8     | -           | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 52 mm           | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|              |         | -           | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides      | -        | 62 mm           | U/C + C/C     |                                                         |
| Ø50          | 2,0     | -           | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 70 mm           | U/C + C/C     |                                                         |
|              |         | -           | EI <b>180</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides      | -        | 80 mm           | U/C + C/C     |                                                         |
| Ø75          | 2,6     | -           | EI <b>60</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | *        | 95 mm           | U/C + C/C     |                                                         |
|              |         | -           | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides      | -        | 105 mm          | U/C + C/C     |                                                         |
| max.         |         |             |                                                                                        |                                    |                     |       |              |          |                 |               |                                                         |
| Ø110         | 3.8     | -           | EI <b>60</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 130 mm          | U/C + C/C     |                                                         |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

**principle detail****Firesafe****tested property**

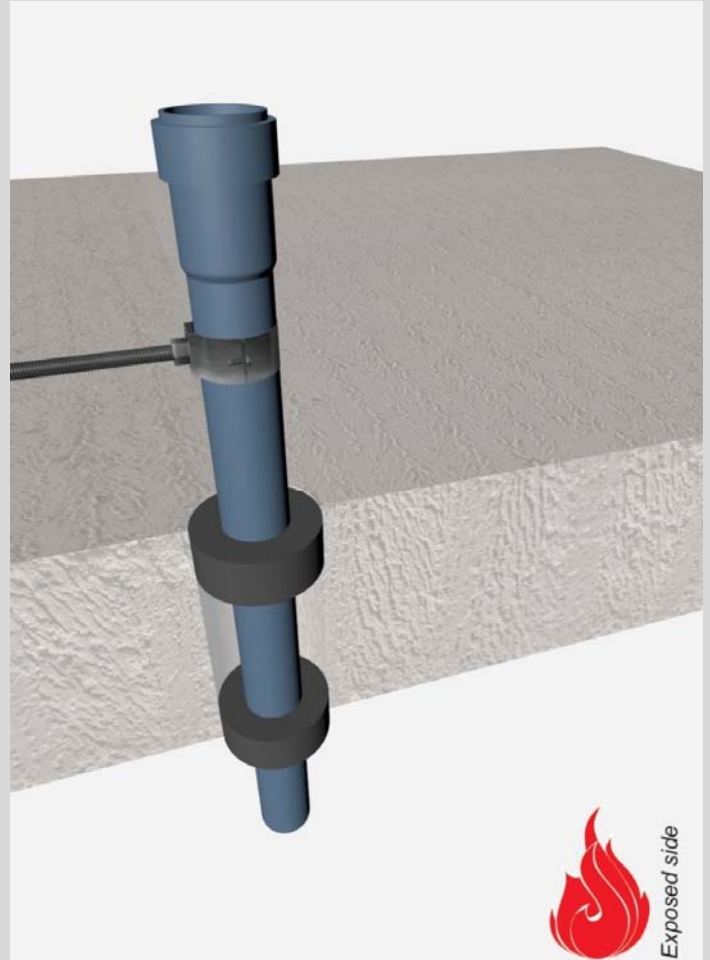
fire resistance

**test method**

EN 1366-3

**service no.**

22-17

**PP-MD pipes****FT Graphite**

| service type <sup>1)</sup> |         | pipe socket |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|-------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) |             |                                                                                        |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| Ø32                        | 1,8     | -           | EI <b>240</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides      | -        | 63 mm           | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |
| Ø50                        | 2,0     | -           | EI <b>180</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides      | -        | 80 mm           | U/C + C/C     |                                                         |
| Ø75                        | 2,6     | -           | EI <b>240</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides      | -        | 105 mm          | U/C + C/C     |                                                         |
| max.                       |         |             |                                                                                        |                                    |                     |       |              |          |                 |               |                                                         |
| Ø110                       | 3,8     | -           | EI <b>60</b>                                                                           | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides      | -        | 140 mm          | U/C + C/C     |                                                         |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

| field of application                                                                                                                                                                                                     |     |               | fire resistance - EI classification acc. <a href="#">EN 13501-2</a> / <a href="#">EN 1366-3</a>                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | Firesafe                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| plastic pipe penetrations                                                                                                                                                                                                |     |               | certification - EAD 350454-00-1104                                                                                 |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
| PP-MX classification ≤ Ø160 mm                                                                                                                                                                                           |     |               | suitable Firesafe products within classification:                                                                  |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
| Fire performances are valid for <b>range</b> of dØ pipe diameter + s1 pipe thickness within the same pipe material:<br><b>PP-MX acc. EN norms</b><br>dØ 50 up to 160 mm<br>s1 2.7 up to 5.7 mm<br>pipe brands eg Geberit |     |               | FT Graphite<br>DoP CPR-16/0094                                                                                     |                                   | FIRE COLLAR<br>DoP CPR-15/0339                                                                                  |                                                  | Fire Wrap<br>DoP CPR-15/0339                                                                                    |                                              | supporting construction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
| dØ                                                                                                                                                                                                                       | s1  | configuration | walls                                                                                                              | floors                            | walls                                                                                                           | floors                                           | walls                                                                                                           | floors                                       | <div>Constructive element must be classified acc. EN 13501-2 for the required fire resistance period:<br/><br/>1: flexible wall ≥100mm, insulated<br/><b>1-n100: flexible wall ≥100mm, non-insulated</b><br/>1-n75: flexible wall ≥75mm, <b>non-insulated</b><br/>2: rigid wall ≥100mm<br/>3: rigid wall ≥150mm<br/>4: flexible ceiling ≥150mm<br/>5: rigid floor ≥150mm<br/>6: CLT wall ≥100mm<br/>7: CLT floor ≥140mm<br/><br/>Max. opening in constructive element: see principle detail. Use FT Board if opening is larger; see how-to-read.<br/><br/>Penetration services must be <b>supported</b>,<br/>support distance walls max. 500mm<br/>support distance floors max. 400mm</div> |  |
| Ø50                                                                                                                                                                                                                      | 2.7 | non-insulated | <a href="#">EI 120 in wall 1+2</a><br><a href="#">EI 240 in wall 3</a>                                             | <a href="#">EI 240 in floor 5</a> | <a href="#">EI 90 in wall 1+2</a><br><a href="#">EI 240 in wall 3</a><br>collar Ø50                             | <a href="#">EI 240 in floor 5</a><br>collar Ø50  | <a href="#">EI 120 in wall 1+2</a><br><a href="#">EI 240 in wall 3</a><br>2 layer                               | <a href="#">EI 240 in floor 5</a><br>2 layer |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
|                                                                                                                                                                                                                          |     | + pipe socket | <a href="#">EI 120 in wall 1+2</a><br><a href="#">EI 240 in wall 3</a>                                             | <a href="#">EI 240 in floor 5</a> | <a href="#">EI 120 in wall 1+2</a><br><a href="#">EI 240 in wall 3</a><br>collar Ø63                            | <a href="#">EI 240 in floor 5</a><br>collar Ø63  | <a href="#">EI 120 in wall 1+2</a><br><a href="#">EI 240 in wall 3</a><br>2 layer                               | <a href="#">EI 240 in floor 5</a><br>2 layer |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
| Ø110                                                                                                                                                                                                                     | 4.2 | non-insulated | <a href="#">EI 90 in wall 1+2+3</a>                                                                                | <a href="#">EI 60 in floor 5</a>  | <a href="#">EI 90 in wall 1+2+3</a><br>collar Ø110                                                              | <a href="#">EI 240 in floor 5</a><br>collar Ø110 | <a href="#">EI 120 in wall 1+2+3</a><br>2 layer                                                                 | <a href="#">EI 180 in floor 5</a><br>2 layer |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
|                                                                                                                                                                                                                          |     | + pipe socket |                                                                                                                    | <a href="#">EI 240 in floor 5</a> | <a href="#">EI 90 in wall 1+2+3</a><br>collar Ø125                                                              | <a href="#">EI 240 in floor 5</a><br>collar Ø125 | <a href="#">EI 60 in wall 1+2+3</a><br>3 layer                                                                  | <a href="#">EI 60 in floor 5</a><br>3 layer  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
| Ø125                                                                                                                                                                                                                     | 4.7 | non-insulated |                                                                                                                    |                                   | <a href="#">EI 120 in wall 1+2+3</a><br>collar Ø125                                                             | <a href="#">EI 180 in floor 5</a><br>collar Ø125 | <a href="#">EI 120 in wall 1+2+3</a><br>3 layer                                                                 | <a href="#">EI 120 in floor 5</a><br>3 layer |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
|                                                                                                                                                                                                                          |     | + pipe socket |                                                                                                                    |                                   |                                                                                                                 | <a href="#">EI 180 in floor 5</a><br>collar Ø140 |                                                                                                                 | <a href="#">EI 240 in floor 5</a><br>3 layer |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
| Ø160                                                                                                                                                                                                                     | 5.7 | non-insulated |                                                                                                                    |                                   |                                                                                                                 | <a href="#">EI 120 in floor 5</a><br>collar Ø160 | <a href="#">EI 90 in wall 1+2+3</a><br>3 layer                                                                  | <a href="#">EI 240 in floor 5</a><br>3 layer |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
|                                                                                                                                                                                                                          |     | + pipe socket |                                                                                                                    |                                   | <a href="#">EI 120 in wall 1+2+3</a><br>collar Ø200                                                             | <a href="#">EI 180 in floor 5</a><br>collar Ø200 | <a href="#">EI 120 in wall 1+2+3</a><br>3 layer                                                                 | <a href="#">EI 240 in floor 5</a><br>3 layer |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
| Firesafe FoA d22-1 - page 8                                                                                                                                                                                              |     |               | joint details: min. W x D, default:<br>walls: 10 x 25 mm, apply on 2 sides<br>floors: 10 x 25 mm, apply on 2 sides |                                   | default:<br>walls: apply on 2 sides<br>floors: apply on 1 side<br>always apply smoke seal FT Acrylic on 2 sides |                                                  | default:<br>walls: apply on 2 sides<br>floors: apply on 1 side<br>always apply smoke seal FT Acrylic on 2 sides |                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">▶ INDEX</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">PE + PP + PVC</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">plastic cable conduits</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">PP-R</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">PP-MD</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">PP-MX</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">aluPE-X</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">PE-Xa</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">copper</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">steel</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">steel conduits</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">cast iron</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">trays + ladders + wire mesh</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">cables + bundles</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">fire dampers</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">air transfer grilles</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">duct cladding</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">linear joints</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">socket boxes</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">blank seals</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">EN norms for plastic pipes</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">how-to-read</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">acoustical</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |
|                                                                                                                                                                                                                          |     |               |                                                                                                                    |                                   |                                                                                                                 |                                                  |                                                                                                                 |                                              | <a href="#">environmental</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

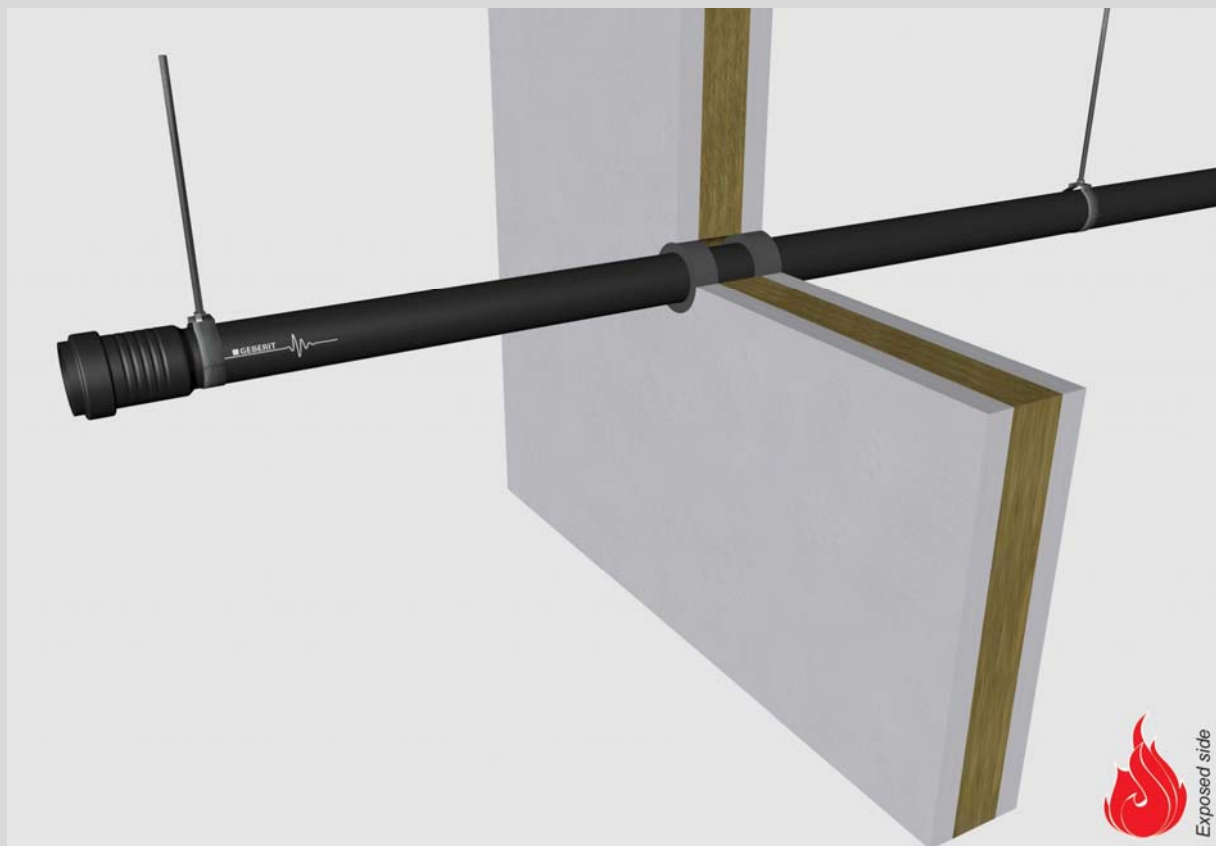
fire resistance

test method

EN 1366-3

service no.

23-15



## PP-MX pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe socket      | non-standard config.   |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|------------------|------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | exposed side     |                        |                                                                                        |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| Ø50                        | 2,7     | -                |                        | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 70 mm           | U/C           | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            |         | -                |                        | EI 240                                                                                 | rigid walls ≥ 150mm                | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           |                                                         |
|                            |         | socket on 1 side | socket flush with wall | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 76 mm           | U/C           |                                                         |
|                            |         | socket on 1 side | socket flush with wall | EI 240                                                                                 | rigid walls ≥ 150mm                | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           |                                                         |
| max.                       |         |                  |                        |                                                                                        |                                    |                     |       |              |          |                 |               |                                                         |
| Ø110                       | 4,2     | -                |                        | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 130 mm          | U/C           |                                                         |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

### Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

### principle detail

### Firesafe

tested property

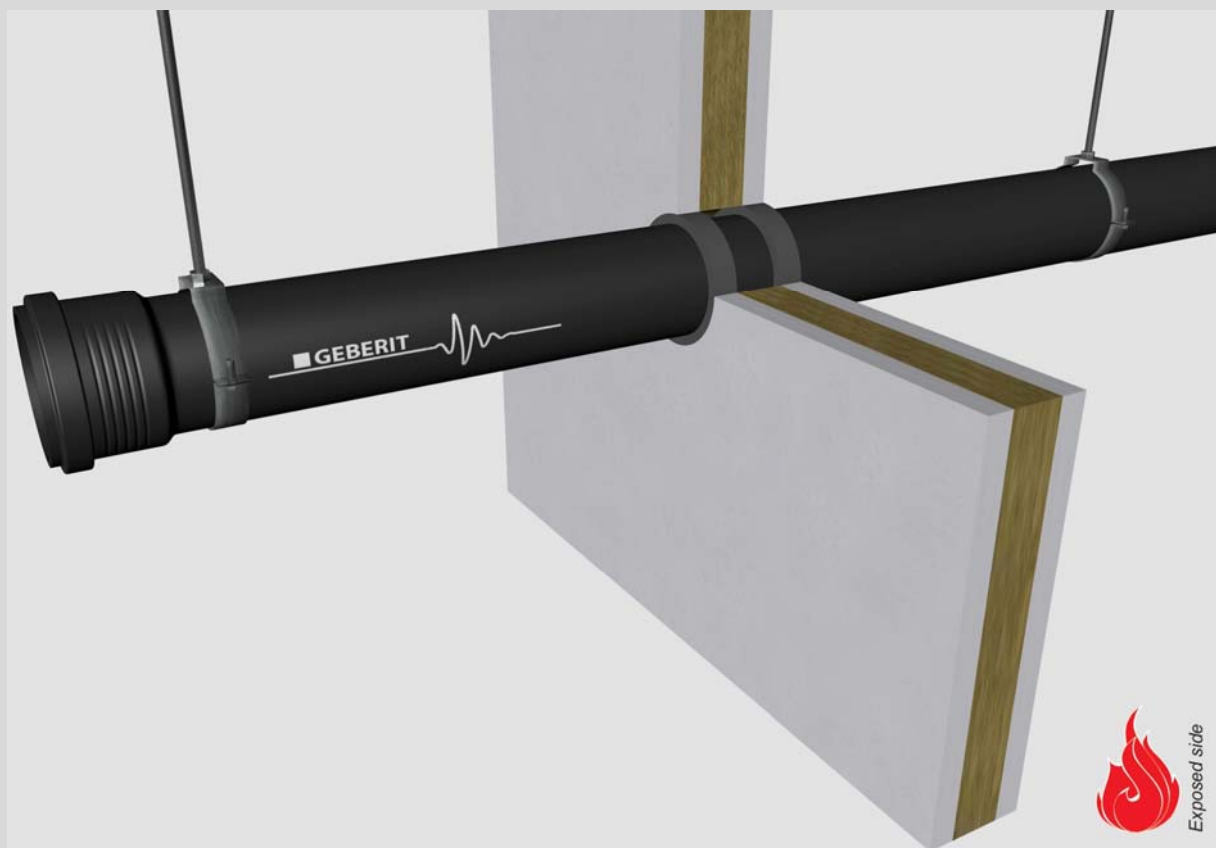
fire resistance

test method

EN 1366-3

service no.

23-33



## PP-MX pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe socket      | non-standard config.   |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|------------------|------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | exposed side     |                        |                                                                                        |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| Ø50                        | 2,7     | -                |                        | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 70 mm           | U/C           | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            |         | -                |                        | EI 240                                                                                 | rigid walls ≥ 150mm                | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           |                                                         |
|                            |         | socket on 1 side | socket flush with wall | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 76 mm           | U/C           |                                                         |
|                            |         | socket on 1 side | socket flush with wall | EI 240                                                                                 | rigid walls ≥ 150mm                | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           |                                                         |
| max.                       |         |                  |                        |                                                                                        |                                    |                     |       |              |          |                 |               |                                                         |
| Ø110                       | 4,2     | -                |                        | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 130 mm          | U/C           |                                                         |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

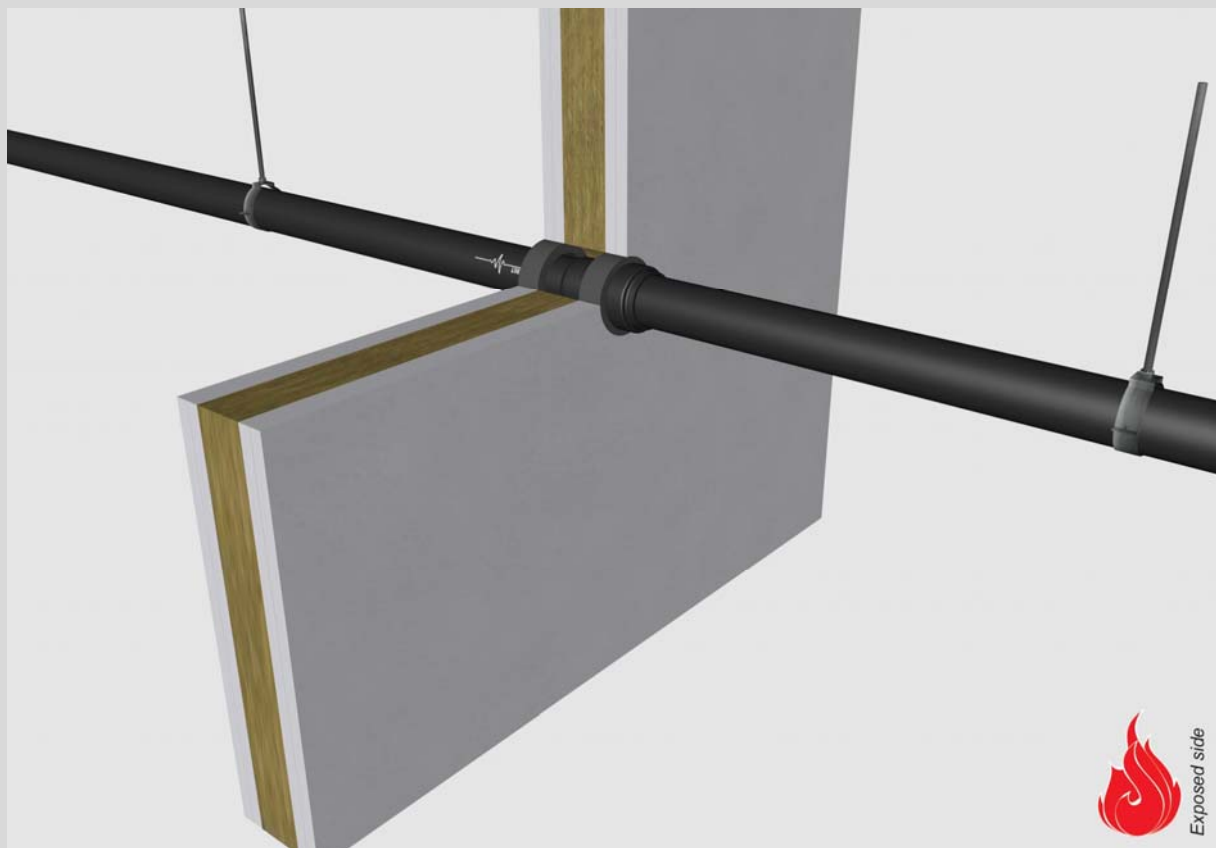
fire resistance

test method

EN 1366-3

service no.

23-24



## PP-MX pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe socket      | non-standard config.   |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|------------------|------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | exposed side     |                        |                                                                                        |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| Ø50                        | 2,7     | -                |                        | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 70 mm           | U/C           | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            |         | -                |                        | EI 240                                                                                 | rigid walls ≥ 150mm                | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           |                                                         |
|                            |         | socket on 1 side | socket flush with wall | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 76 mm           | U/C           |                                                         |
|                            |         | socket on 1 side | socket flush with wall | EI 240                                                                                 | rigid walls ≥ 150mm                | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           |                                                         |
| max.                       |         |                  |                        |                                                                                        |                                    |                     |       |              |          |                 |               |                                                         |
| Ø110                       | 4,2     | -                |                        | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 130 mm          | U/C           |                                                         |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

### Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

### principle detail

### Firesafe

tested property

fire resistance

test method

EN 1366-3

service no.

23-15r



## PP-MX pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe socket      | non-standard config.   |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|------------------|------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | exposed side     |                        |                                                                                        |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| Ø50                        | 2,7     | -                |                        | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 70 mm           | U/C           | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            |         | -                |                        | EI 240                                                                                 | rigid walls ≥ 150mm                | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           |                                                         |
|                            |         | socket on 1 side | socket flush with wall | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 76 mm           | U/C           |                                                         |
|                            |         | socket on 1 side | socket flush with wall | EI 240                                                                                 | rigid walls ≥ 150mm                | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           |                                                         |
| max.                       |         |                  |                        |                                                                                        |                                    |                     |       |              |          |                 |               |                                                         |
| Ø110                       | 4,2     | -                |                        | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 130 mm          | U/C           |                                                         |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

### Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

### principle detail

### Firesafe

tested property

fire resistance

test method

EN 1366-3

service no.

23-24r



## PP-MX pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe socket      | non-standard config.   |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|------------------|------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | exposed side     |                        |                                                                                        |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| Ø50                        | 2,7     | -                |                        | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 70 mm           | U/C           | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            |         | -                |                        | EI 240                                                                                 | rigid walls ≥ 150mm                | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           |                                                         |
|                            |         | socket on 1 side | socket flush with wall | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 76 mm           | U/C           |                                                         |
|                            |         | socket on 1 side | socket flush with wall | EI 240                                                                                 | rigid walls ≥ 150mm                | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           |                                                         |
| max.                       |         |                  |                        |                                                                                        |                                    |                     |       |              |          |                 |               |                                                         |
| Ø110                       | 4,2     | -                |                        | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 130 mm          | U/C           |                                                         |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

fire resistance

test method

EN 1366-3

service no.

24-49



## PP-MX pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe socket      | non-standard config.    |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|------------------|-------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | exposed side     |                         |                                                                                        |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| Ø50                        | 2,7     | -                |                         | EI 240                                                                                 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            |         | socket on 1 side | socket flush with floor | EI 240                                                                                 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           |                                                         |
| max.                       |         |                  |                         |                                                                                        |                                    |                     |       |              |          |                 |               |                                                         |
| Ø110                       | 4,2     | -                |                         | EI 60                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 132 mm          | U/C           |                                                         |
|                            |         | socket on 1 side | socket flush with floor | EI 240                                                                                 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 142 mm          | U/C           |                                                         |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

# Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

fire resistance

test method

EN 1366-3

service no.

24-52



## PP-MX pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe socket      | non-standard config.    | El  | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|------------------|-------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | exposed side     |                         |                                                                                        |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| Ø50                        | 2,7     | -                |                         | El 240                                                                                 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            |         | socket on 1 side | socket flush with floor | El 240                                                                                 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           |                                                         |
| max.                       |         |                  |                         |                                                                                        |                                    |                     |       |              |          |                 |               |                                                         |
| Ø110                       | 4,2     | -                |                         | El 60                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 132 mm          | U/C           |                                                         |
|                            |         | socket on 1 side | socket flush with floor | El 240                                                                                 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 142 mm          | U/C           |                                                         |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

#### Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

#### principle detail

#### Firesafe

tested property

fire resistance

test method

EN 1366-3

service no.

24-29



## PP-MX pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe socket      | non-standard config.    |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|------------------|-------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | exposed side     |                         |                                                                                        |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| Ø50                        | 2,7     | -                |                         | EI 240                                                                                 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            |         | socket on 1 side | socket flush with floor | EI 240                                                                                 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           |                                                         |
| max.                       |         |                  |                         |                                                                                        |                                    |                     |       |              |          |                 |               |                                                         |
| Ø110                       | 4,2     | -                |                         | EI 60                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 132 mm          | U/C           |                                                         |
|                            |         | socket on 1 side | socket flush with floor | EI 240                                                                                 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 142 mm          | U/C           |                                                         |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

**principle detail****Firesafe**

tested property

fire resistance

test method

EN 1366-3

service no.

24-27

**PP-MX pipes****FT Graphite**

| service type <sup>1)</sup> |         | pipe socket      | non-standard config.    | El  | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|------------------|-------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | exposed side     |                         |                                                                                        |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| Ø50                        | 2,7     | -                |                         | El 240                                                                                 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            |         | socket on 1 side | socket flush with floor | El 240                                                                                 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C           |                                                         |
| max.                       |         |                  |                         |                                                                                        |                                    |                     |       |              |          |                 |               |                                                         |
| Ø110                       | 4,2     | -                |                         | El 60                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 132 mm          | U/C           |                                                         |
|                            |         | socket on 1 side | socket flush with floor | El 240                                                                                 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 142 mm          | U/C           |                                                         |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

| field of application                                                                                                                                                                                                                                                                                                               |                                                        | fire resistance - EI classification acc. EN 13501-2 / EN 1366-3                                                                                                                                                                                                                                                                                                                        |                                                                 |                                                                                                                    |                                                     | Firesafe                                                                                                        |                                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| plastic pipe penetrations                                                                                                                                                                                                                                                                                                          |                                                        | certification - EAD 350454-00-1104                                                                                                                                                                                                                                                                                                                                                     |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
| aluPE-X (composite) classification ≤ Ø75 mm                                                                                                                                                                                                                                                                                        |                                                        | suitable Firesafe products within classification:                                                                                                                                                                                                                                                                                                                                      |                                                                 |                                                                                                                    |                                                     | ▶ INDEX                                                                                                         |                                                    |
| Fire performances are valid for range of dØ pipe diameter + s1 pipe thickness within the same pipe material:<br>aluPE-X (composite) acc. EN norms<br>dØ 16 up to 75 mm<br>s1 2.0 up to 7.5 mm<br>pipe brands eg Uponor, Rehau, Geberit, Henco<br>pipe insulation brands eg Cimpipe, Rockwool, Armatex, U Protect Pipe Section Alu2 |                                                        | FT Graphite<br>DoP CPR-16/0094                                                                                                                                                                                                                                                                                                                                                         |                                                                 | FT Acrylic or FT Paste<br>DoP CPR-16/0094                                                                          |                                                     | FIRE COLLAR<br>DoP CPR-15/0339                                                                                  |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | Fire Wrap<br>DoP CPR-15/0339                                                                                                                                                                                                                                                                                                                                                           |                                                                 |                                                                                                                    |                                                     | supporting construction                                                                                         |                                                    |
| dØ                                                                                                                                                                                                                                                                                                                                 | s1                                                     | pipe insulation                                                                                                                                                                                                                                                                                                                                                                        |                                                                 | walls                                                                                                              | floors                                              | walls                                                                                                           | floors                                             |
| up to Ø25                                                                                                                                                                                                                                                                                                                          | 2.0 up to 2.5                                          | non-insulated                                                                                                                                                                                                                                                                                                                                                                          |                                                                 | EI 120 in wall 1+2+3                                                                                               | EI 120 in wall 1+2+3                                |                                                                                                                 |                                                    |
| Ø16 up to Ø75<br>+ synth. rubber insulation                                                                                                                                                                                                                                                                                        | 2.0 up to 7.5                                          | + pipe insulation                                                                                                                                                                                                                                                                                                                                                                      |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    | + synth. rubber, min. 60 kg/m³<br>up to 13mm           | EI 60 in wall 1+2+3<br>EI 90 in wall 1-n100<br>EI 60 in wall 1-n75<br>also in FT Board                                                                                                                                                                                                                                                                                                 | individual results max.<br>EI 90 in floor 5<br>EI 90 in floor 7 | EI 120 in wall 3<br>EI 90 in wall 6                                                                                | EI 120 in floor 5<br>EI 90 in floor 7<br>10 x 25 mm | EI 90 in floor 7<br>collar Ø50 - Ø90                                                                            | EI 60 in wall 1+2+3<br>2 layer<br>also in FT Board |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | EI 120 in wall 2+3<br>in GPG                                                                                                                                                                                                                                                                                                                                                           |                                                                 | EI 60 in wall 2+3<br>in GPG                                                                                        |                                                     | EI 90 in floor 7<br>2 layer                                                                                     |                                                    |
| Ø16 up to Ø75<br>+ glass or rock wool (alu) insulation                                                                                                                                                                                                                                                                             | 2.0 up to 7.5                                          | + pipe insulation                                                                                                                                                                                                                                                                                                                                                                      |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    | + glass or rock wool (alu), min. 75 kg/m³<br>20 + 30mm | EI 120 in wall 1+2<br>EI 240 in wall 3                                                                                                                                                                                                                                                                                                                                                 | EI 240 in floor 5                                               |                                                                                                                    |                                                     | EI 120 in wall 1+2<br>EI 240 in wall 3<br>1 layer                                                               | EI 240 in floor 5<br>2 layer                       |
|                                                                                                                                                                                                                                                                                                                                    | 40mm                                                   | EI 120 in wall 1+2<br>EI 240 in wall 3                                                                                                                                                                                                                                                                                                                                                 | EI 240 in floor 5                                               |                                                                                                                    |                                                     | EI 120 in wall 1+2<br>EI 240 in wall 3<br>1 layer                                                               | EI 240 in floor 5<br>2 layer                       |
|                                                                                                                                                                                                                                                                                                                                    | 50mm                                                   | EI 120 in wall 1+2<br>EI 240 in wall 3                                                                                                                                                                                                                                                                                                                                                 | EI 240 in floor 5                                               |                                                                                                                    |                                                     | EI 120 in wall 1+2<br>EI 240 in wall 3<br>2 layer                                                               | EI 240 in floor 5<br>2 layer                       |
|                                                                                                                                                                                                                                                                                                                                    | 60mm                                                   | EI 120 in wall 1+2<br>EI 240 in wall 3                                                                                                                                                                                                                                                                                                                                                 | EI 240 in floor 5                                               |                                                                                                                    |                                                     | EI 120 in wall 1+2+3<br>3 layer                                                                                 | EI 120 in floor 5<br>3 layer                       |
|                                                                                                                                                                                                                                                                                                                                    | 80mm                                                   | EI 120 in wall 1+2<br>EI 240 in wall 3                                                                                                                                                                                                                                                                                                                                                 | EI 240 in floor 5                                               |                                                                                                                    |                                                     | EI 120 in wall 1+2+3<br>3 layer                                                                                 | EI 120 in floor 5<br>3 layer                       |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | joint details: min. W x D, default:<br>walls: 10 x 25 mm, apply on 2 sides<br>floors: 15 x 25 mm, apply on 2 sides                                                                                                                                                                                                                                                                     |                                                                 | joint details: min. W x D, default:<br>walls: 10 x 25 mm, apply on 2 sides<br>floors: 15 x 25 mm, apply on 2 sides |                                                     | floors: apply on 1 side<br>always apply smoke seal FT Acrylic on 2 sides                                        |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                 |                                                                                                                    |                                                     | default:<br>walls: apply on 2 sides<br>floors: apply on 1 side<br>always apply smoke seal FT Acrylic on 2 sides |                                                    |
| Firesafe FoA d22-1 - page 9                                                                                                                                                                                                                                                                                                        |                                                        |                                                                                                                                                                                                                                                                                                                                                                                        |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | Constructive element must be classified acc. EN 13501-2 for the required fire resistance period:<br>1: flexible wall ≥100mm, insulated<br>1-n100: flexible wall ≥100mm, non-insulated<br>1-n75: flexible wall ≥75mm, non-insulated<br>2: rigid wall ≥100mm<br>3: rigid wall ≥150mm<br>4: flexible ceiling ≥150mm<br>5: rigid floor ≥150mm<br>6: CLT wall ≥100mm<br>7: CLT floor ≥140mm |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | Max. opening in constructive element: see principle detail. Use FT Board if opening is larger; see how-to-read.                                                                                                                                                                                                                                                                        |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | Penetration services must be supported;<br>support distance walls max. 500mm<br>support distance floors max. 400mm                                                                                                                                                                                                                                                                     |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | Min. length pipe insulation LI / LS / CS / CI:<br>see principle detail.                                                                                                                                                                                                                                                                                                                |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | EN norms for plastic pipes                                                                                                                                                                                                                                                                                                                                                             |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | how-to-read                                                                                                                                                                                                                                                                                                                                                                            |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | acoustical                                                                                                                                                                                                                                                                                                                                                                             |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | environmental                                                                                                                                                                                                                                                                                                                                                                          |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | PE + PP + PVC                                                                                                                                                                                                                                                                                                                                                                          |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | plastic cable conduits                                                                                                                                                                                                                                                                                                                                                                 |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | PP-R                                                                                                                                                                                                                                                                                                                                                                                   |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | PP-MD                                                                                                                                                                                                                                                                                                                                                                                  |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | PP-MX                                                                                                                                                                                                                                                                                                                                                                                  |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | aluPE-X                                                                                                                                                                                                                                                                                                                                                                                |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | PE-Xa                                                                                                                                                                                                                                                                                                                                                                                  |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | copper                                                                                                                                                                                                                                                                                                                                                                                 |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | steel                                                                                                                                                                                                                                                                                                                                                                                  |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | steel conduits                                                                                                                                                                                                                                                                                                                                                                         |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | cast iron                                                                                                                                                                                                                                                                                                                                                                              |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | trays + ladders + wire mesh                                                                                                                                                                                                                                                                                                                                                            |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | cables + bundles                                                                                                                                                                                                                                                                                                                                                                       |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | fire dampers                                                                                                                                                                                                                                                                                                                                                                           |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | air transfer grilles                                                                                                                                                                                                                                                                                                                                                                   |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | duct cladding                                                                                                                                                                                                                                                                                                                                                                          |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | linear joints                                                                                                                                                                                                                                                                                                                                                                          |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | socket boxes                                                                                                                                                                                                                                                                                                                                                                           |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |
|                                                                                                                                                                                                                                                                                                                                    |                                                        | blank seals                                                                                                                                                                                                                                                                                                                                                                            |                                                                 |                                                                                                                    |                                                     |                                                                                                                 |                                                    |

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

**principle detail****Firesafe**

tested property

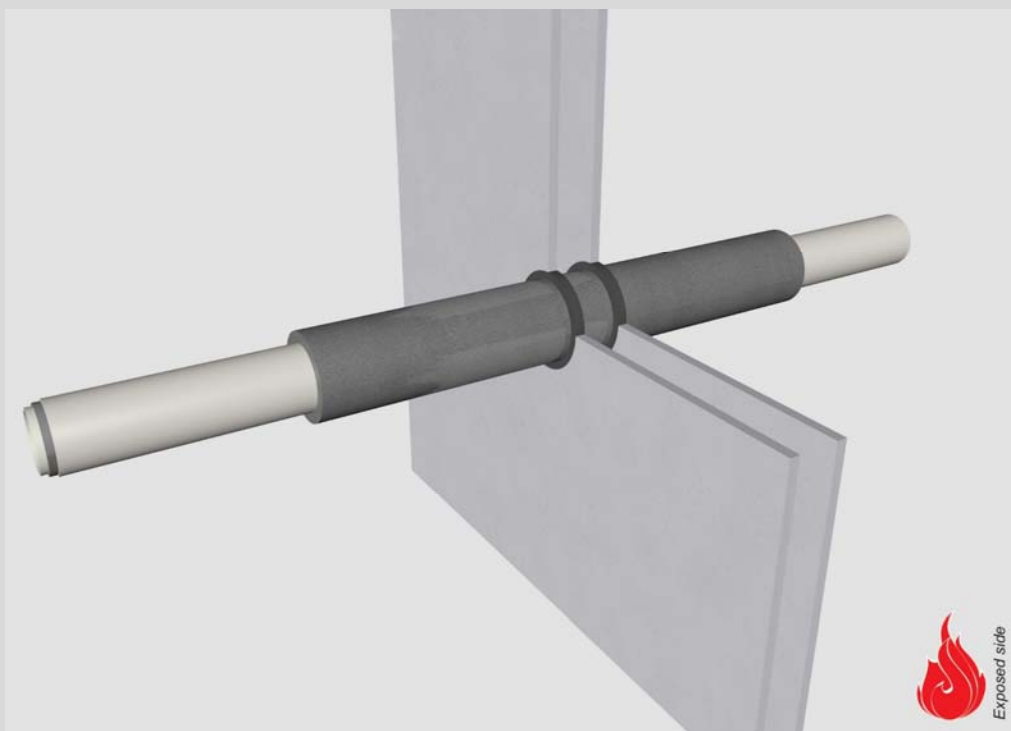
test method

service no.

fire resistance

EN 1366-3

31-35

**aluPE-X pipes****FT Graphite**

| service type <sup>1)</sup> |         |                      | pipe insulation                          |  | EI     | constructive element <sup>2)</sup> | Firesafe joint seal |         | application | backing required | max. opening in construction | pipe end configuration | max. angle                                     |  |
|----------------------------|---------|----------------------|------------------------------------------|--|--------|------------------------------------|---------------------|---------|-------------|------------------|------------------------------|------------------------|------------------------------------------------|--|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m³ eg Armaflex                |  |        |                                    | width               | depth   |             |                  |                              |                        |                                                |  |
| Ø16                        | 2,0     |                      | -                                        |  | EI 120 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -                | 36 mm                        | U/C + C/C              | perpendicular + all angles between 90° and 45° |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -                | 71 mm                        | U/C + C/C              |                                                |  |
|                            |         | non-insulated walls  | synth. rubber 10mm CS + CI               |  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -                | 58 mm                        | U/C + C/C              |                                                |  |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides     | -                | 62 mm                        | U/C + C/C              |                                                |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -                | 600x1200 mm + 25%            | U/C + C/C              |                                                |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 90  | rigid walls ≥ 150 mm               | 10 mm               | 25 mm   | 2 sides     | -                | 62 mm                        | U/C + C/C              |                                                |  |
| Ø25                        | 2,5     |                      | -                                        |  | EI 120 | flexible walls ≥ 100 mm            | 5 mm                | 25 mm   | 2 sides     | -                | 45 mm                        | U/C + C/C              |                                                |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -                | 71 mm                        | U/C + C/C              |                                                |  |
|                            |         | non-insulated walls  | synth. rubber 10mm CS + CI               |  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -                | 67 mm                        | U/C + C/C              |                                                |  |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides     | -                | 71 mm                        | U/C + C/C              |                                                |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -                | 600x1200 mm + 25%            | U/C + C/C              |                                                |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 90  | rigid walls ≥ 150 mm               | 10 mm               | 25 mm   | 2 sides     | -                | 71 mm                        | U/C + C/C              |                                                |  |
|                            |         |                      |                                          |  |        | rigid walls ≥ 100 mm               |                     |         |             |                  |                              |                        |                                                |  |
| Ø63                        | 6,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -                | 600x1200 mm                  | U/C + C/C              |                                                |  |
|                            |         | non-insulated walls  | synth. rubber 10mm CS + CI               |  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -                | 105 mm                       | U/C + C/C              |                                                |  |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides     | -                | 109 mm                       | U/C + C/C              |                                                |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -                | 600x1200 mm                  | U/C + C/C              |                                                |  |
|                            |         |                      |                                          |  |        | rigid walls ≥ 100 mm               |                     |         |             |                  |                              |                        |                                                |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120 | in FR mortar                       | 10 mm               | 25 mm   | 2 sides     | -                | 200x1000 mm                  | U/C + C/C              |                                                |  |
| max.                       |         |                      |                                          |  |        |                                    |                     |         |             |                  |                              |                        |                                                |  |
| Ø75                        | 7,5     |                      | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -                | 600x1200 mm                  | U/C + C/C              |                                                |  |
|                            |         | non-insulated walls  | synth. rubber 10mm CS + CI               |  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -                | 117 mm                       | U/C + C/C              |                                                |  |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides     | -                | 121 mm                       | U/C + C/C              |                                                |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -                | 600x1200 mm                  | U/C + C/C              |                                                |  |
|                            |         |                      |                                          |  |        | rigid walls ≥ 100 mm               |                     |         |             |                  |                              |                        |                                                |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120 | in FR mortar                       | 10 mm               | 25 mm   | 2 sides     | -                | 200x1000 mm                  | U/C + C/C              |                                                |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

# Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

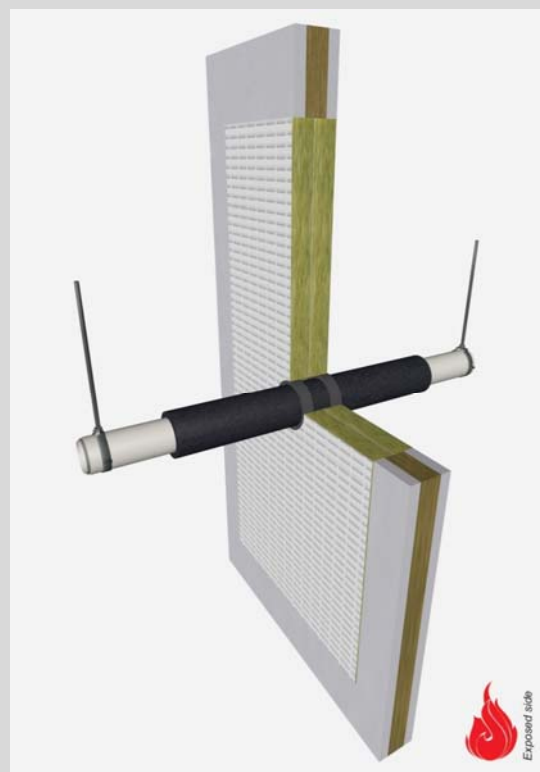
test method

service no.

fire resistance

EN 1366-3

0265



## aluPE-X pipes

| service type <sup>1)</sup> |         |                      | pipe insulation                          |        |  EI | constructive element <sup>2)</sup> |         | Firesafe joint seal |   | application       | backing required | max. opening in construction                   | pipe end configuration | max. angle |
|----------------------------|---------|----------------------|------------------------------------------|--------|----------------------------------------------------------------------------------------|------------------------------------|---------|---------------------|---|-------------------|------------------|------------------------------------------------|------------------------|------------|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m³ eg Armaflex                |        |                                                                                        |                                    | width   | depth               |   |                   |                  |                                                |                        |            |
| Ø16                        | 2,0     |                      | -                                        | EI 120 | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm   | 2 sides             | - | 36 mm             | U/C + C/C        | perpendicular + all angles between 90° and 45° |                        |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60  | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm   | 2 sides             | - | 71 mm             | U/C + C/C        |                                                |                        |            |
|                            |         | non-insulated walls  | synth. rubber 10mm CS + CI               | EI 90  | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm   | 2 sides             | - | 58 mm             | U/C + C/C        |                                                |                        |            |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60  | flexible walls ≥ 75 mm                                                                 | 10 mm                              | 12,5 mm | 2 sides             | - | 62 mm             | U/C + C/C        |                                                |                        |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60  | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm   | 2 sides             | - | 600x1200 mm + 25% | U/C + C/C        |                                                |                        |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 90  | rigid walls ≥ 150 mm                                                                   | 10 mm                              | 25 mm   | 2 sides             | - | 62 mm             | U/C + C/C        |                                                |                        |            |
| Ø25                        | 2,5     |                      | -                                        | EI 120 | flexible walls ≥ 100 mm                                                                | 5 mm                               | 25 mm   | 2 sides             | - | 45 mm             | U/C + C/C        |                                                |                        |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60  | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm   | 2 sides             | - | 71 mm             | U/C + C/C        |                                                |                        |            |
|                            |         | non-insulated walls  | synth. rubber 10mm CS + CI               | EI 90  | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm   | 2 sides             | - | 67 mm             | U/C + C/C        |                                                |                        |            |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60  | flexible walls ≥ 75 mm                                                                 | 10 mm                              | 12,5 mm | 2 sides             | - | 71 mm             | U/C + C/C        |                                                |                        |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60  | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm   | 2 sides             | - | 600x1200 mm + 25% | U/C + C/C        |                                                |                        |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 90  | rigid walls ≥ 150 mm                                                                   | 10 mm                              | 25 mm   | 2 sides             | - | 71 mm             | U/C + C/C        |                                                |                        |            |
|                            |         |                      |                                          |        | rigid walls ≥ 100 mm                                                                   |                                    |         |                     |   |                   |                  |                                                |                        |            |
| Ø63                        | 6,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60  | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm   | 2 sides             | - | 600x1200 mm       | U/C + C/C        |                                                |                        |            |
|                            |         | non-insulated walls  | synth. rubber 10mm CS + CI               | EI 90  | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm   | 2 sides             | - | 105 mm            | U/C + C/C        |                                                |                        |            |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60  | flexible walls ≥ 75 mm                                                                 | 10 mm                              | 12,5 mm | 2 sides             | - | 109 mm            | U/C + C/C        |                                                |                        |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60  | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm   | 2 sides             | - | 600x1200 mm       | U/C + C/C        |                                                |                        |            |
|                            |         |                      |                                          |        | rigid walls ≥ 100 mm                                                                   |                                    |         |                     |   |                   |                  |                                                |                        |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120 | in FR mortar                                                                           | 10 mm                              | 25 mm   | 2 sides             | - | 200x1000 mm       | U/C + C/C        |                                                |                        |            |
| max.                       |         |                      |                                          |        |                                                                                        |                                    |         |                     |   |                   |                  |                                                |                        |            |
| Ø75                        | 7,5     |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60  | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm   | 2 sides             | - | 600x1200 mm       | U/C + C/C        |                                                |                        |            |
|                            |         | non-insulated walls  | synth. rubber 10mm CS + CI               | EI 90  | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm   | 2 sides             | - | 117 mm            | U/C + C/C        |                                                |                        |            |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60  | flexible walls ≥ 75 mm                                                                 | 10 mm                              | 12,5 mm | 2 sides             | - | 121 mm            | U/C + C/C        |                                                |                        |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60  | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm   | 2 sides             | - | 600x1200 mm       | U/C + C/C        |                                                |                        |            |
|                            |         |                      |                                          |        | rigid walls ≥ 100 mm                                                                   |                                    |         |                     |   |                   |                  |                                                |                        |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120 | in FR mortar                                                                           | 10 mm                              | 25 mm   | 2 sides             | - | 200x1000 mm       | U/C + C/C        |                                                |                        |            |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

# Notes:

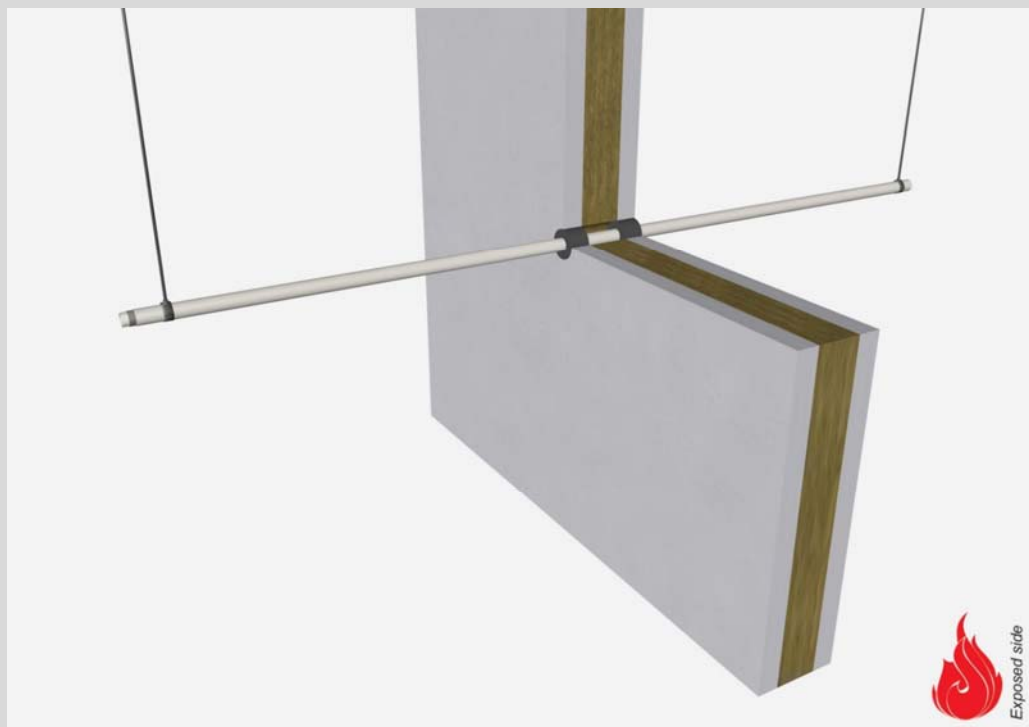
- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

# principle detail

# Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
0085



## aluPE-X pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe insulation                          |  EI | constructive element <sup>2)</sup> | Firesafe joint seal     |       | application  | backing  | max. opening    | pipe end          | max. angle                                              |           |
|----------------------------|---------|------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------|-------------------------|-------|--------------|----------|-----------------|-------------------|---------------------------------------------------------|-----------|
| dØ (mm)                    | s1 (mm) | min. 60 kg/m³ eg Armaflex                |                                                                                        |                                    | width                   | depth | 1 or 2 sides | required | in construction | configuration     |                                                         |           |
| Ø16                        | 2,0     | -                                        | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm                   | 25 mm | 2 sides      | -        | 36 mm           | U/C + C/C         | perpendicular +<br>all angles<br>between 90°<br>and 45° |           |
|                            |         |                                          | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 60                              | flexible walls ≥ 100 mm | 10 mm | 25 mm        | 2 sides  | -               | 71 mm             |                                                         | U/C + C/C |
|                            |         | non-insulated walls                      | synth. rubber 10mm CS + CI                                                             | EI 90                              | flexible walls ≥ 100 mm | 10 mm | 25 mm        | 2 sides  | -               | 58 mm             |                                                         | U/C + C/C |
|                            |         | non-insulated walls                      | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 60                              | flexible walls ≥ 75 mm  | 10 mm | 12,5 mm      | 2 sides  | -               | 62 mm             |                                                         | U/C + C/C |
|                            |         |                                          | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 60                              | flexible walls ≥ 100 mm | 10 mm | 25 mm        | 2 sides  | -               | 600x1200 mm + 25% |                                                         | U/C + C/C |
|                            |         |                                          | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 90                              | rigid walls ≥ 150 mm    | 10 mm | 25 mm        | 2 sides  | -               | 62 mm             |                                                         | U/C + C/C |
| Ø25                        | 2,5     | -                                        | EI 120                                                                                 | flexible walls ≥ 100 mm            | 5 mm                    | 25 mm | 2 sides      | -        | 45 mm           | U/C + C/C         |                                                         |           |
|                            |         |                                          | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 60                              | flexible walls ≥ 100 mm | 10 mm | 25 mm        | 2 sides  | -               | 71 mm             |                                                         | U/C + C/C |
|                            |         | non-insulated walls                      | synth. rubber 10mm CS + CI                                                             | EI 90                              | flexible walls ≥ 100 mm | 10 mm | 25 mm        | 2 sides  | -               | 67 mm             |                                                         | U/C + C/C |
|                            |         | non-insulated walls                      | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 60                              | flexible walls ≥ 75 mm  | 10 mm | 12,5 mm      | 2 sides  | -               | 71 mm             |                                                         | U/C + C/C |
|                            |         |                                          | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 60                              | flexible walls ≥ 100 mm | 10 mm | 25 mm        | 2 sides  | -               | 600x1200 mm + 25% |                                                         | U/C + C/C |
|                            |         |                                          | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 90                              | rigid walls ≥ 150 mm    | 10 mm | 25 mm        | 2 sides  | -               | 71 mm             |                                                         | U/C + C/C |
|                            |         |                                          |                                                                                        |                                    | rigid walls ≥ 100 mm    |       |              |          |                 |                   |                                                         |           |
| Ø63                        | 6,0     |                                          | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 60                              | flexible walls ≥ 100 mm | 10 mm | 25 mm        | 2 sides  | -               | 600x1200 mm       |                                                         | U/C + C/C |
|                            |         | non-insulated walls                      | synth. rubber 10mm CS + CI                                                             | EI 90                              | flexible walls ≥ 100 mm | 10 mm | 25 mm        | 2 sides  | -               | 105 mm            |                                                         | U/C + C/C |
|                            |         | non-insulated walls                      | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 60                              | flexible walls ≥ 75 mm  | 10 mm | 12,5 mm      | 2 sides  | -               | 109 mm            |                                                         | U/C + C/C |
|                            |         |                                          | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 60                              | flexible walls ≥ 100 mm | 10 mm | 25 mm        | 2 sides  | -               | 600x1200 mm       |                                                         | U/C + C/C |
|                            |         |                                          |                                                                                        |                                    | rigid walls ≥ 100 mm    |       |              |          |                 |                   |                                                         |           |
|                            |         |                                          | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 120                             | in FR mortar            | 10 mm | 25 mm        | 2 sides  | -               | 200x1000 mm       |                                                         | U/C + C/C |
| max.                       |         |                                          |                                                                                        |                                    |                         |       |              |          |                 |                   |                                                         |           |
| Ø75                        | 7,5     |                                          | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 60                              | flexible walls ≥ 100 mm | 10 mm | 25 mm        | 2 sides  | -               | 600x1200 mm       |                                                         | U/C + C/C |
|                            |         | non-insulated walls                      | synth. rubber 10mm CS + CI                                                             | EI 90                              | flexible walls ≥ 100 mm | 10 mm | 25 mm        | 2 sides  | -               | 117 mm            |                                                         | U/C + C/C |
|                            |         | non-insulated walls                      | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 60                              | flexible walls ≥ 75 mm  | 10 mm | 12,5 mm      | 2 sides  | -               | 121 mm            |                                                         | U/C + C/C |
|                            |         |                                          | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 60                              | flexible walls ≥ 100 mm | 10 mm | 25 mm        | 2 sides  | -               | 600x1200 mm       |                                                         | U/C + C/C |
|                            |         |                                          |                                                                                        |                                    | rigid walls ≥ 100 mm    |       |              |          |                 |                   |                                                         |           |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                                 | in FR mortar                       | 10 mm                   | 25 mm | 2 sides      | -        | 200x1000 mm     | U/C + C/C         |                                                         |           |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

# Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

# principle detail

# Firesafe

## tested property

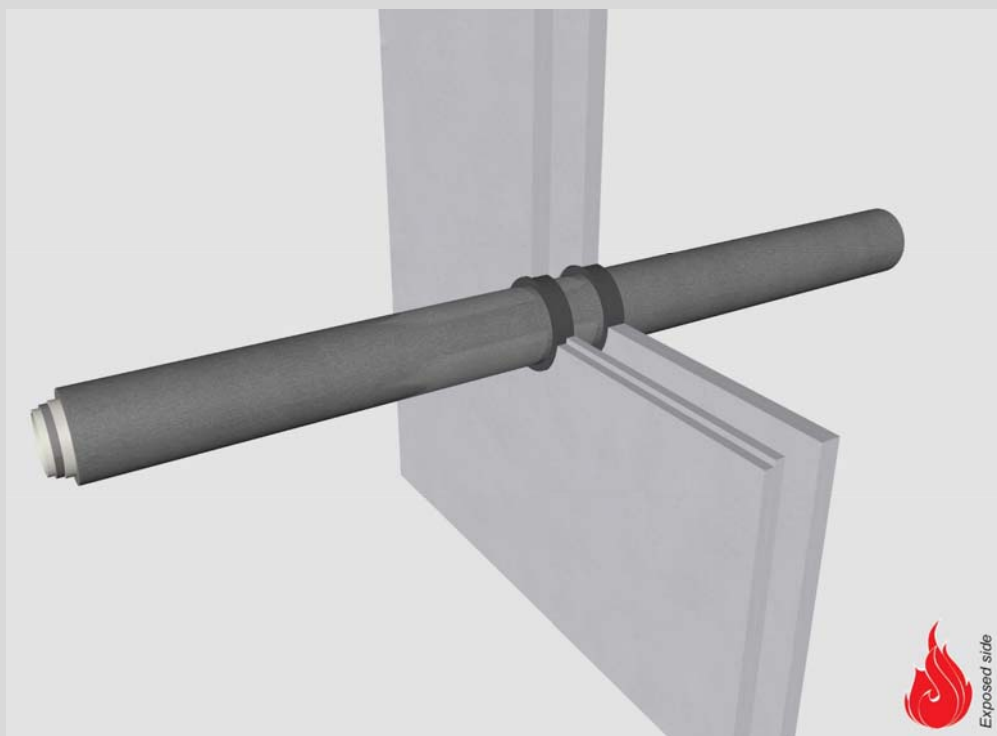
## test method

## service no.

## fire resistance

EN 1366-3

30-35



## aluPE-X pipes

| service type <sup>1)</sup> |         |                      | pipe insulation                          |                      |  EI | constructive element <sup>2)</sup>      |       | Firesafe joint seal |         | application | backing required  | max. opening in construction | pipe end configuration                         | max. angle |
|----------------------------|---------|----------------------|------------------------------------------|----------------------|----------------------------------------------------------------------------------------|-----------------------------------------|-------|---------------------|---------|-------------|-------------------|------------------------------|------------------------------------------------|------------|
| dØ (mm)                    | s1 (mm) | non-standard config. | min.                                     | 60 kg/m³ eg Armaflex |                                                                                        | width                                   | depth | 1 or 2 sides        |         |             |                   |                              |                                                |            |
| Ø16                        | 2,0     |                      | -                                        |                      | EI 120                                                                                 | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm | 25 mm               | 2 sides | -           | 36 mm             | U/C + C/C                    | perpendicular + all angles between 90° and 45° |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 60                                                                                  | flexible walls ≥ 100 mm                 | 10 mm | 25 mm               | 2 sides | -           | 71 mm             | U/C + C/C                    |                                                |            |
|                            |         | non-insulated walls  | synth. rubber 10mm CS + CI               |                      | EI 90                                                                                  | flexible walls ≥ 100 mm                 | 10 mm | 25 mm               | 2 sides | -           | 58 mm             | U/C + C/C                    |                                                |            |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 60                                                                                  | flexible walls ≥ 75 mm                  | 10 mm | 12,5 mm             | 2 sides | -           | 62 mm             | U/C + C/C                    |                                                |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 60                                                                                  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm | 25 mm               | 2 sides | -           | 600x1200 mm + 25% | U/C + C/C                    |                                                |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 90                                                                                  | rigid walls ≥ 150 mm                    | 10 mm | 25 mm               | 2 sides | -           | 62 mm             | U/C + C/C                    |                                                |            |
| Ø25                        | 2,5     |                      | -                                        |                      | EI 120                                                                                 | flexible walls ≥ 100 mm                 | 5 mm  | 25 mm               | 2 sides | -           | 45 mm             | U/C + C/C                    |                                                |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 60                                                                                  | flexible walls ≥ 100 mm                 | 10 mm | 25 mm               | 2 sides | -           | 71 mm             | U/C + C/C                    |                                                |            |
|                            |         | non-insulated walls  | synth. rubber 10mm CS + CI               |                      | EI 90                                                                                  | flexible walls ≥ 100 mm                 | 10 mm | 25 mm               | 2 sides | -           | 67 mm             | U/C + C/C                    |                                                |            |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 60                                                                                  | flexible walls ≥ 75 mm                  | 10 mm | 12,5 mm             | 2 sides | -           | 71 mm             | U/C + C/C                    |                                                |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 60                                                                                  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm | 25 mm               | 2 sides | -           | 600x1200 mm + 25% | U/C + C/C                    |                                                |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 90                                                                                  | rigid walls ≥ 150 mm                    | 10 mm | 25 mm               | 2 sides | -           | 71 mm             | U/C + C/C                    |                                                |            |
|                            |         |                      |                                          |                      |                                                                                        | rigid walls ≥ 100 mm                    |       |                     |         |             |                   |                              |                                                |            |
| Ø63                        | 6,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 60                                                                                  | flexible walls ≥ 100 mm                 | 10 mm | 25 mm               | 2 sides | -           | 600x1200 mm       | U/C + C/C                    |                                                |            |
|                            |         | non-insulated walls  | synth. rubber 10mm CS + CI               |                      | EI 90                                                                                  | flexible walls ≥ 100 mm                 | 10 mm | 25 mm               | 2 sides | -           | 105 mm            | U/C + C/C                    |                                                |            |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 60                                                                                  | flexible walls ≥ 75 mm                  | 10 mm | 12,5 mm             | 2 sides | -           | 109 mm            | U/C + C/C                    |                                                |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 60                                                                                  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm | 25 mm               | 2 sides | -           | 600x1200 mm       | U/C + C/C                    |                                                |            |
|                            |         |                      |                                          |                      |                                                                                        | rigid walls ≥ 100 mm                    |       |                     |         |             |                   |                              |                                                |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 120                                                                                 | in FR mortar                            | 10 mm | 25 mm               | 2 sides | -           | 200x1000 mm       | U/C + C/C                    |                                                |            |
| max.                       |         |                      |                                          |                      |                                                                                        |                                         |       |                     |         |             |                   |                              |                                                |            |
| Ø75                        | 7,5     |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 60                                                                                  | flexible walls ≥ 100 mm                 | 10 mm | 25 mm               | 2 sides | -           | 600x1200 mm       | U/C + C/C                    |                                                |            |
|                            |         | non-insulated walls  | synth. rubber 10mm CS + CI               |                      | EI 90                                                                                  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm | 25 mm               | 2 sides | -           | 117 mm            | U/C + C/C                    |                                                |            |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 60                                                                                  | <a href="#">flexible walls ≥ 75 mm</a>  | 10 mm | 12,5 mm             | 2 sides | -           | 121 mm            | U/C + C/C                    |                                                |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 60                                                                                  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm | 25 mm               | 2 sides | -           | 600x1200 mm       | U/C + C/C                    |                                                |            |
|                            |         |                      |                                          |                      |                                                                                        | rigid walls ≥ 100 mm                    |       |                     |         |             |                   |                              |                                                |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                      | EI 120                                                                                 | in FR mortar                            | 10 mm | 25 mm               | 2 sides | -           | 200x1000 mm       | U/C + C/C                    |                                                |            |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

### tested property

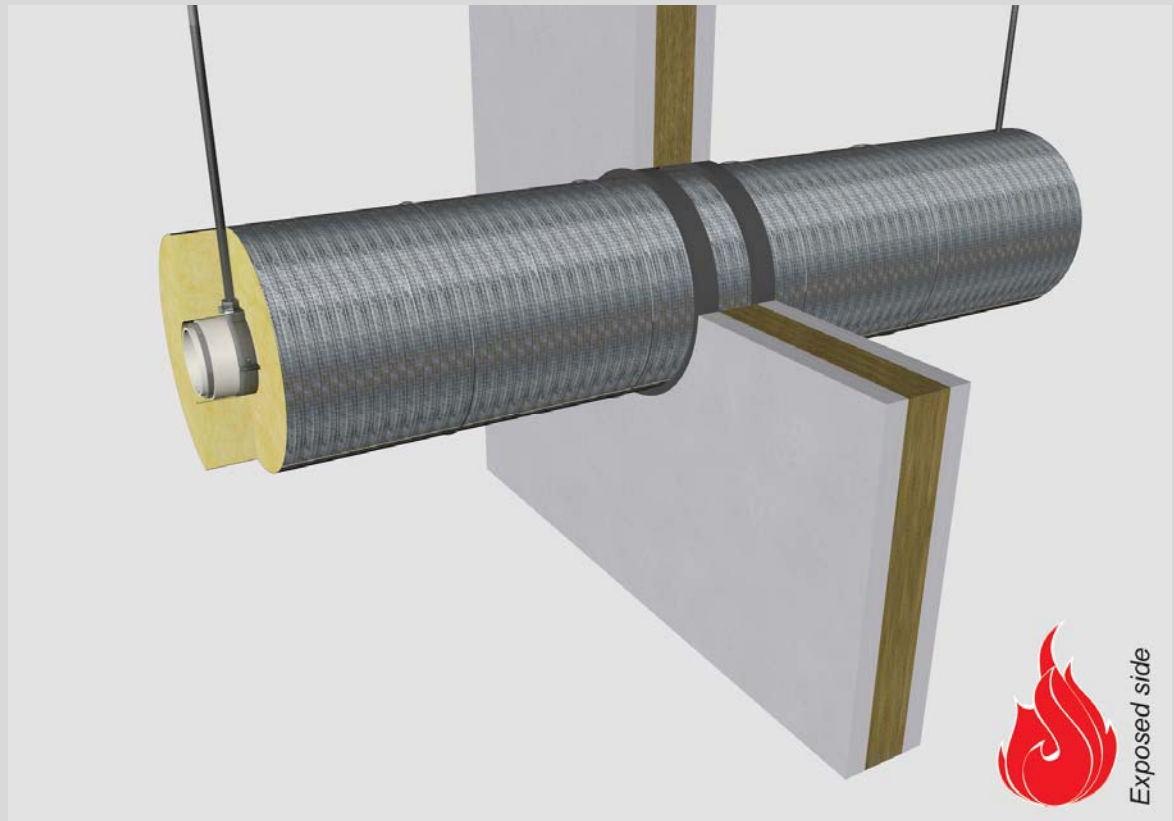
### test method

### service no.

### fire resistance

EN 1366-3

21-5



## aluPE-X pipes

| service type <sup>1)</sup> |         | pipe insulation <sup>2)</sup>                   |                                | EI     | constructive element <sup>3)</sup> | FT Graphite |       | application | backing | max. opening | pipe end configuration | max. angle                                     |
|----------------------------|---------|-------------------------------------------------|--------------------------------|--------|------------------------------------|-------------|-------|-------------|---------|--------------|------------------------|------------------------------------------------|
| dØ (mm)                    | s1 (mm) | min. 75 kg/m <sup>3</sup> eg Climpipe, Rockwool | or U Protect Pipe Section Alu2 |        |                                    | width       | depth |             |         |              |                        |                                                |
| Ø16                        | 2,0     | glass / rock wool 20mm                          | 1200 CS + CI                   | EI 120 | flexible walls ≥ 100 mm            | 10 mm       | 25 mm | 2 sides     | -       | 76 mm        | U/C + C/C              | perpendicular + all angles between 90° and 45° |
|                            |         |                                                 | 20mm 1200 CS + CI              | EI 240 | rigid walls ≥ 150 mm               | 15 mm       | 25 mm | 2 sides     | -       | 86 mm        | U/C + C/C              |                                                |
|                            |         |                                                 | 30mm 1200 CS + CI              | EI 120 | flexible walls ≥ 100 mm            | 10 mm       | 25 mm | 2 sides     | -       | 96 mm        | U/C + C/C              |                                                |
|                            |         |                                                 | 30mm 1200 CS + CI              | EI 240 | rigid walls ≥ 150 mm               | 15 mm       | 25 mm | 2 sides     | -       | 106 mm       | U/C + C/C              |                                                |
|                            |         |                                                 | 40mm 1200 CS + CI              | EI 120 | flexible walls ≥ 100 mm            | 10 mm       | 25 mm | 2 sides     | -       | 116 mm       | U/C + C/C              |                                                |
|                            |         |                                                 | 40mm 1200 CS + CI              | EI 240 | rigid walls ≥ 150 mm               | 15 mm       | 25 mm | 2 sides     | -       | 126 mm       | U/C + C/C              |                                                |
|                            |         |                                                 | 50mm 1200 CS + CI              | EI 120 | flexible walls ≥ 100 mm            | 10 mm       | 25 mm | 2 sides     | -       | 136 mm       | U/C + C/C              |                                                |
|                            |         |                                                 | 50mm 1200 CS + CI              | EI 240 | rigid walls ≥ 150 mm               | 15 mm       | 25 mm | 2 sides     | -       | 146 mm       | U/C + C/C              |                                                |
| max.                       | 7,5     | glass / rock wool 20mm                          | 1200 CS + CI                   | EI 120 | flexible walls ≥ 100 mm            | 10 mm       | 25 mm | 2 sides     | -       | 135 mm       | U/C + C/C              |                                                |
|                            |         |                                                 | 20 mm 1200 CS + CI             | EI 240 | rigid walls ≥ 150 mm               | 15 mm       | 25 mm | 2 sides     | -       | 145 mm       | U/C + C/C              |                                                |
|                            |         |                                                 | 30mm 1200 CS + CI              | EI 120 | flexible walls ≥ 100 mm            | 10 mm       | 25 mm | 2 sides     | -       | 155 mm       | U/C + C/C              |                                                |
|                            |         |                                                 | 30mm 1200 CS + CI              | EI 240 | rigid walls ≥ 150 mm               | 15 mm       | 25 mm | 2 sides     | -       | 165 mm       | U/C + C/C              |                                                |
|                            |         |                                                 | 40mm 1200 CS + CI              | EI 120 | flexible walls ≥ 100 mm            | 10 mm       | 25 mm | 2 sides     | -       | 175 mm       | U/C + C/C              |                                                |
|                            |         |                                                 | 40mm 1200 CS + CI              | EI 240 | rigid walls ≥ 150 mm               | 15 mm       | 25 mm | 2 sides     | -       | 185 mm       | U/C + C/C              |                                                |
|                            |         |                                                 | 50mm 1200 CS + CI              | EI 120 | flexible walls ≥ 100 mm            | 10 mm       | 25 mm | 2 sides     | -       | 195 mm       | U/C + C/C              |                                                |
|                            |         |                                                 | 50mm 1200 CS + CI              | EI 240 | rigid walls ≥ 150 mm               | 15 mm       | 25 mm | 2 sides     | -       | 205 mm       | U/C + C/C              |                                                |
|                            |         |                                                 | 60mm 1200 CS + CI              | EI 120 | flexible walls ≥ 100 mm            | 10 mm       | 25 mm | 2 sides     | -       | 215 mm       | U/C + C/C              |                                                |
|                            |         |                                                 | 60mm 1200 CS + CI              | EI 240 | rigid walls ≥ 150 mm               | 15 mm       | 25 mm | 2 sides     | -       | 225 mm       | U/C + C/C              |                                                |
|                            |         |                                                 | 80mm 1200 CS + CI              | EI 120 | flexible walls ≥ 100 mm            | 10 mm       | 25 mm | 2 sides     | -       | 255 mm       | U/C + C/C              |                                                |
|                            |         |                                                 | 80mm 1200 CS + CI              | EI 240 | rigid walls ≥ 150 mm               | 15 mm       | 25 mm | 2 sides     | -       | 265 mm       | U/C + C/C              |                                                |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Pipe insulation must be fastened individually (not wrapped!) with steel wire; at max. 50mm + 300mm from constructive element.

<sup>3)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

### tested property

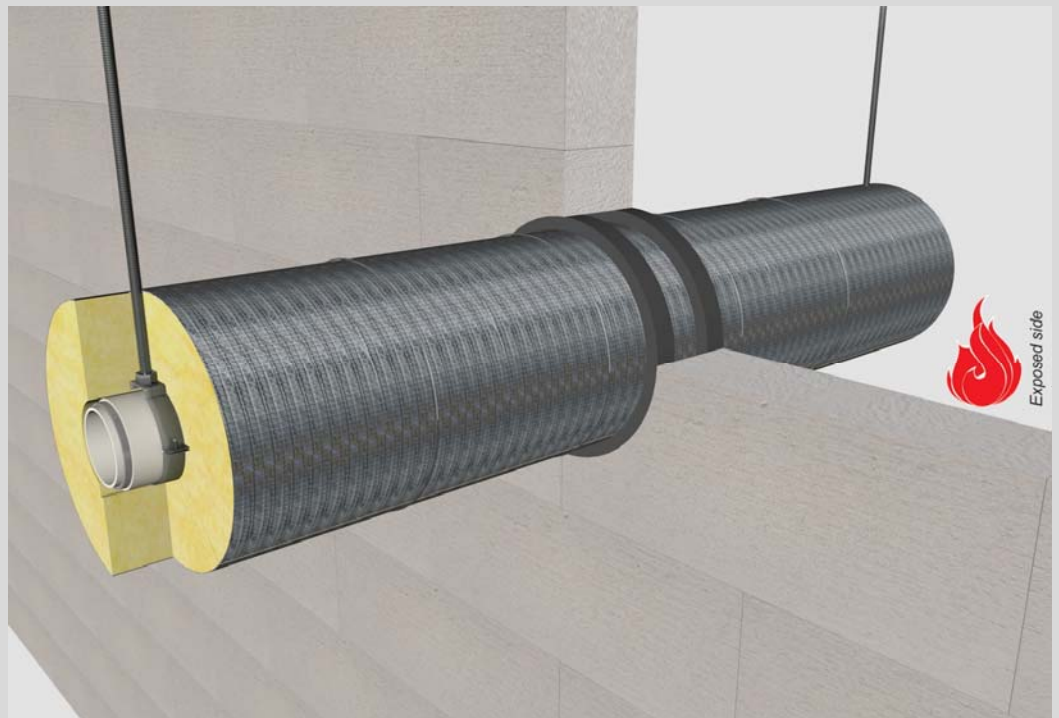
### test method

### service no.

### fire resistance

EN 1366-3

21-5r



## aluPE-X pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe insulation <sup>2)</sup>                                                     |                    |  EI | constructive element <sup>3)</sup> | Firesafe joint seal |       | application | backing | max. opening | pipe end  | max. angle                                              |
|----------------------------|---------|-----------------------------------------------------------------------------------|--------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|-------------|---------|--------------|-----------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | min. 75 kg/m <sup>3</sup> eg Climpipe, Rockwool<br>or U Protect Pipe Section Alu2 |                    |                                                                                        |                                    | width               | depth |             |         |              |           |                                                         |
| Ø16                        | 2,0     | glass / rock wool 20mm                                                            | 1200 CS + CI       | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 76 mm        | U/C + C/C | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            |         |                                                                                   | 20mm 1200 CS + CI  | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 86 mm        | U/C + C/C |                                                         |
|                            |         | 30mm                                                                              | 1200 CS + CI       | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 96 mm        | U/C + C/C |                                                         |
|                            |         |                                                                                   | 30mm 1200 CS + CI  | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 106 mm       | U/C + C/C |                                                         |
|                            |         | 40mm                                                                              | 1200 CS + CI       | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 116 mm       | U/C + C/C |                                                         |
|                            |         |                                                                                   | 40mm 1200 CS + CI  | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 126 mm       | U/C + C/C |                                                         |
|                            |         | 50mm                                                                              | 1200 CS + CI       | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 136 mm       | U/C + C/C |                                                         |
|                            |         |                                                                                   | 50mm 1200 CS + CI  | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 146 mm       | U/C + C/C |                                                         |
|                            |         | 60mm                                                                              | 1200 CS + CI       | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 156 mm       | U/C + C/C |                                                         |
|                            |         |                                                                                   | 60mm 1200 CS + CI  | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 166 mm       | U/C + C/C |                                                         |
|                            |         | 80mm                                                                              | 1200 CS + CI       | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 196 mm       | U/C + C/C |                                                         |
|                            |         |                                                                                   | 80mm 1200 CS + CI  | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 206 mm       | U/C + C/C |                                                         |
| max.                       |         |                                                                                   |                    |                                                                                        |                                    |                     |       |             |         |              |           |                                                         |
| Ø75                        | 7,5     | glass / rock wool 20mm                                                            | 1200 CS + CI       | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 135 mm       | U/C + C/C |                                                         |
|                            |         |                                                                                   | 20 mm 1200 CS + CI | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 145 mm       | U/C + C/C |                                                         |
|                            |         | 30mm                                                                              | 1200 CS + CI       | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 155 mm       | U/C + C/C |                                                         |
|                            |         |                                                                                   | 30mm 1200 CS + CI  | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 165 mm       | U/C + C/C |                                                         |
|                            |         | 40mm                                                                              | 1200 CS + CI       | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 175 mm       | U/C + C/C |                                                         |
|                            |         |                                                                                   | 40mm 1200 CS + CI  | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 185 mm       | U/C + C/C |                                                         |
|                            |         | 50mm                                                                              | 1200 CS + CI       | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 195 mm       | U/C + C/C |                                                         |
|                            |         |                                                                                   | 50mm 1200 CS + CI  | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 205 mm       | U/C + C/C |                                                         |
|                            |         | 60mm                                                                              | 1200 CS + CI       | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 215 mm       | U/C + C/C |                                                         |
|                            |         |                                                                                   | 60mm 1200 CS + CI  | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 225 mm       | U/C + C/C |                                                         |
|                            |         | 80mm                                                                              | 1200 CS + CI       | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 255 mm       | U/C + C/C |                                                         |
|                            |         |                                                                                   | 80mm 1200 CS + CI  | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 265 mm       | U/C + C/C |                                                         |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Pipe insulation must be fastened individually (not wrapped!) with steel wire: at max. 50mm + 300mm from constructive element.

<sup>3)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

### tested property

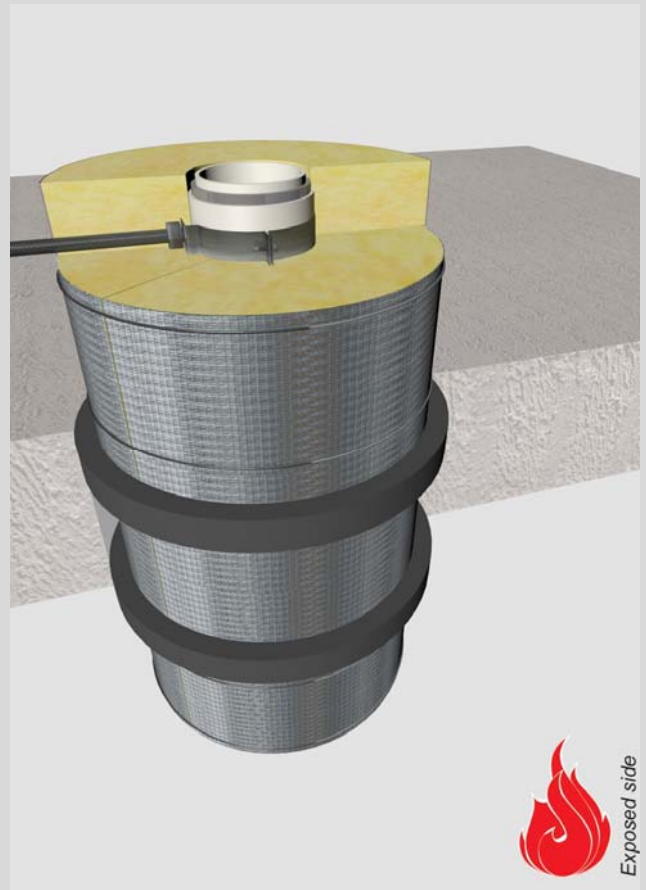
### test method

### service no.

### fire resistance

EN 1366-3

22-9



## aluPE-X pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe insulation <sup>2)</sup>                   |                                | EI     | constructive element <sup>3)</sup> | Firesafe joint seal |       | application | backing | max. opening | pipe end configuration | max. angle                                     |
|----------------------------|---------|-------------------------------------------------|--------------------------------|--------|------------------------------------|---------------------|-------|-------------|---------|--------------|------------------------|------------------------------------------------|
| dØ (mm)                    | s1 (mm) | min. 75 kg/m <sup>3</sup> eg Climpipe, Rockwool | or U Protect Pipe Section Alu2 |        |                                    | width               | depth |             |         |              |                        |                                                |
| Ø16                        | 2,0     | glass / rock wool 20mm                          | 1200 CS + CI                   | EI 240 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 86 mm        | U/C + C/C              | perpendicular + all angles between 90° and 45° |
|                            |         | 30mm                                            | 1200 CS + CI                   | EI 240 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 106 mm       | U/C + C/C              |                                                |
|                            |         | 40mm                                            | 1200 CS + CI                   | EI 240 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 126 mm       | U/C + C/C              |                                                |
|                            |         | 50mm                                            | 1200 CS + CI                   | EI 240 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 146 mm       | U/C + C/C              |                                                |
|                            |         | 60mm                                            | 1200 CS + CI                   | EI 240 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 166 mm       | U/C + C/C              |                                                |
|                            |         | 80mm                                            | 1200 CS + CI                   | EI 240 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 220 mm       | U/C + C/C              |                                                |
| <b>max.</b>                |         |                                                 |                                |        |                                    |                     |       |             |         |              |                        |                                                |
| Ø75                        | 7,5     | glass / rock wool 20mm                          | 1200 CS + CI                   | EI 240 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 150 mm       | U/C + C/C              |                                                |
|                            |         | 30mm                                            | 1200 CS + CI                   | EI 240 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 165 mm       | U/C + C/C              |                                                |
|                            |         | 40mm                                            | 1200 CS + CI                   | EI 240 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 185 mm       | U/C + C/C              |                                                |
|                            |         | 50mm                                            | 1200 CS + CI                   | EI 240 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 205 mm       | U/C + C/C              |                                                |
|                            |         | 60mm                                            | 1200 CS + CI                   | EI 240 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 225 mm       | U/C + C/C              |                                                |
|                            |         | 80mm                                            | 1200 CS + CI                   | EI 240 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 265 mm       | U/C + C/C              |                                                |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Pipe insulation must be fastened individually (not wrapped!) with steel wire: at max. 50mm + 300mm from constructive element.

<sup>3)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

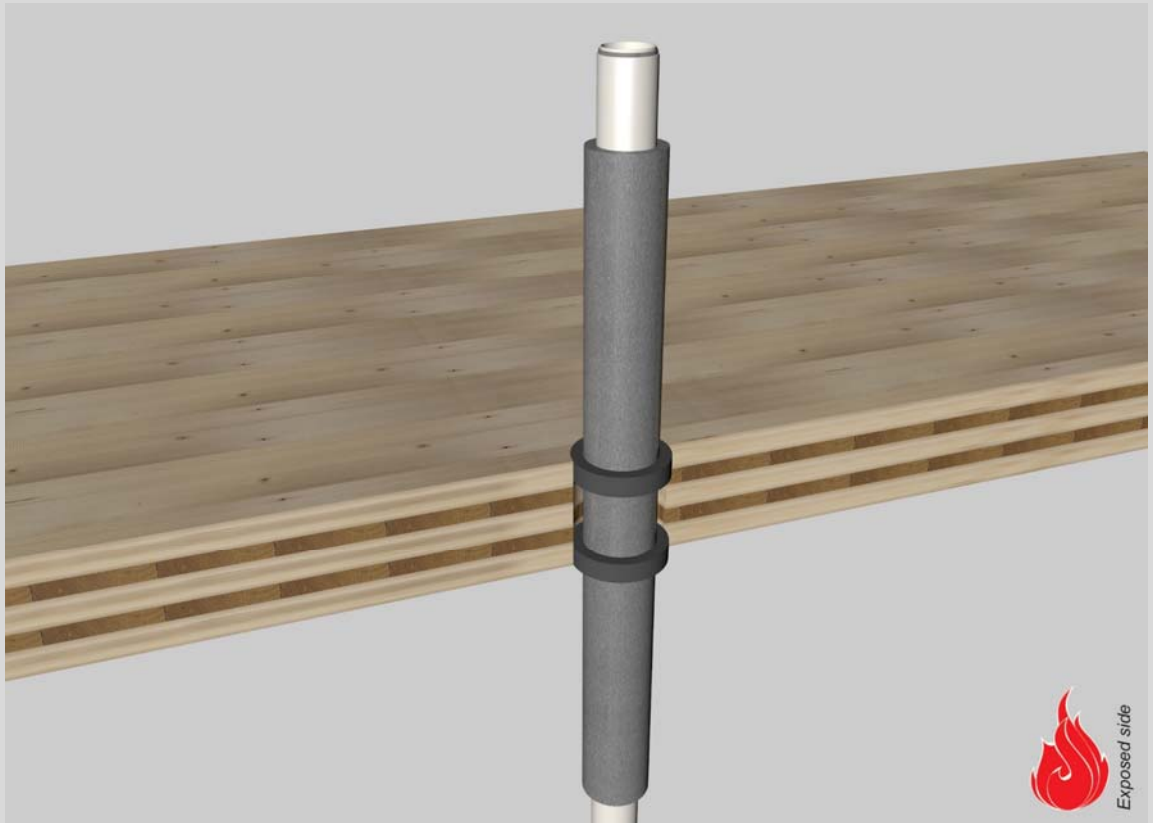
- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

tested property  
test method  
service no.

## Firesafe

fire resistance  
EN 1366-3  
28-48



## aluPE-X pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe insulation           |                       |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|---------------------------|-----------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | min. 60 kg/m³ eg Armaflex |                       |                                                                                        |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| Ø16                        | 2,00    | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 90                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 62 mm           | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            | 2,00    | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 60                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 600 x 5000 mm   | U/C + C/C     |                                                         |
|                            | 2,25    | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm | 2 sides      |          | 72 mm           | U/C + C/C     |                                                         |
| Ø25                        | 2,50    | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 90                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C + C/C     |                                                         |
|                            |         | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 60                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 600 x 5000 mm   | U/C + C/C     |                                                         |
|                            |         | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm | 2 sides      |          | 72 mm           | U/C + C/C     |                                                         |
| max.                       |         |                           |                       |                                                                                        |                                    |                     |       |              |          |                 |               |                                                         |
| Ø63                        | 4,50    | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm | 2 sides      | -        | 119 mm          | U/C + C/C     |                                                         |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

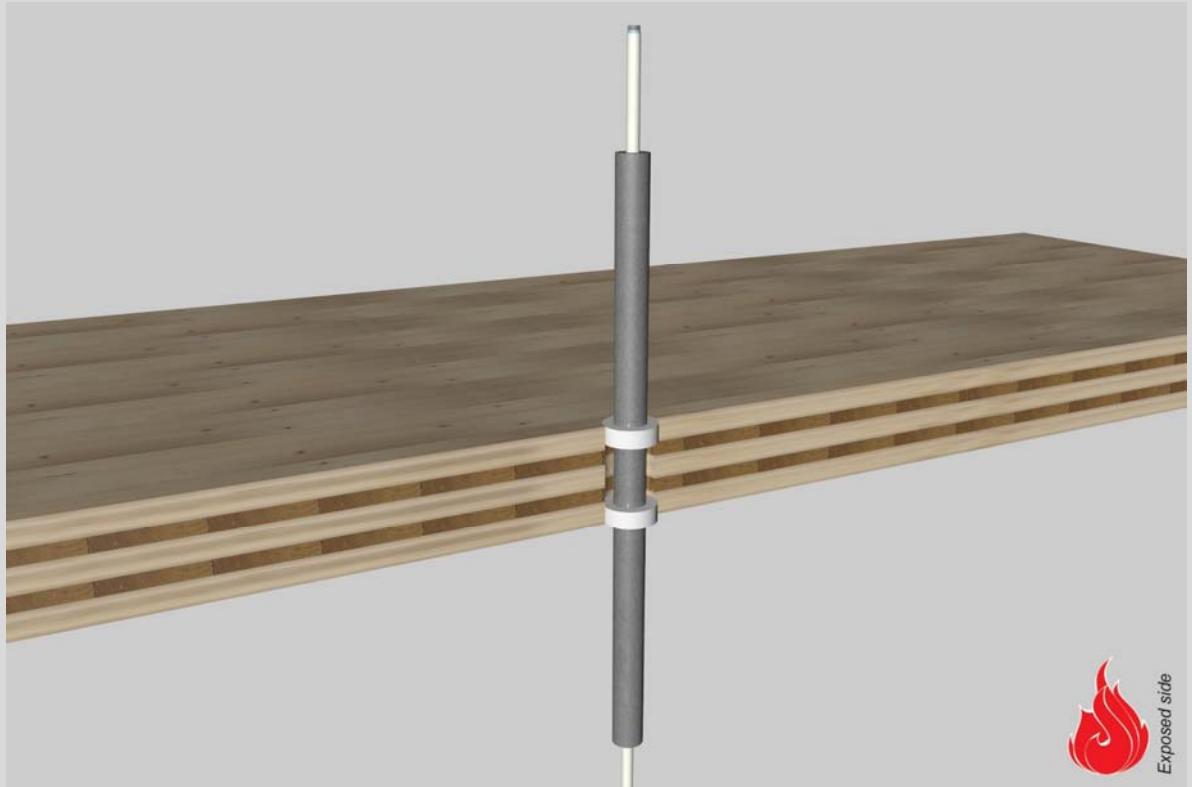
- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

**Firesafe**

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
**28-46**



## aluPE-X pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe insulation           |                       |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |
|----------------------------|---------|---------------------------|-----------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)                    | s1 (mm) | min. 60 kg/m³ eg Armaflex |                       |                                                                                        |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |
| Ø16                        | 2,00    | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 90                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 62 mm           | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|                            | 2,00    | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 60                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 600 x 5000 mm   | U/C + C/C     |                                                         |
|                            | 2,25    | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm | 2 sides      | -        | 72 mm           | U/C + C/C     |                                                         |
| Ø25                        | 2,50    | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 90                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C + C/C     |                                                         |
|                            |         | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 60                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 600 x 5000 mm   | U/C + C/C     |                                                         |
|                            |         | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm | 2 sides      | -        | 72 mm           | U/C + C/C     |                                                         |
| max.                       |         |                           |                       |                                                                                        |                                    |                     |       |              |          |                 |               |                                                         |
| Ø63                        | 4,50    | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm | 2 sides      | -        | 119 mm          | U/C + C/C     |                                                         |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

**principle detail**
**Firesafe**
**tested property**

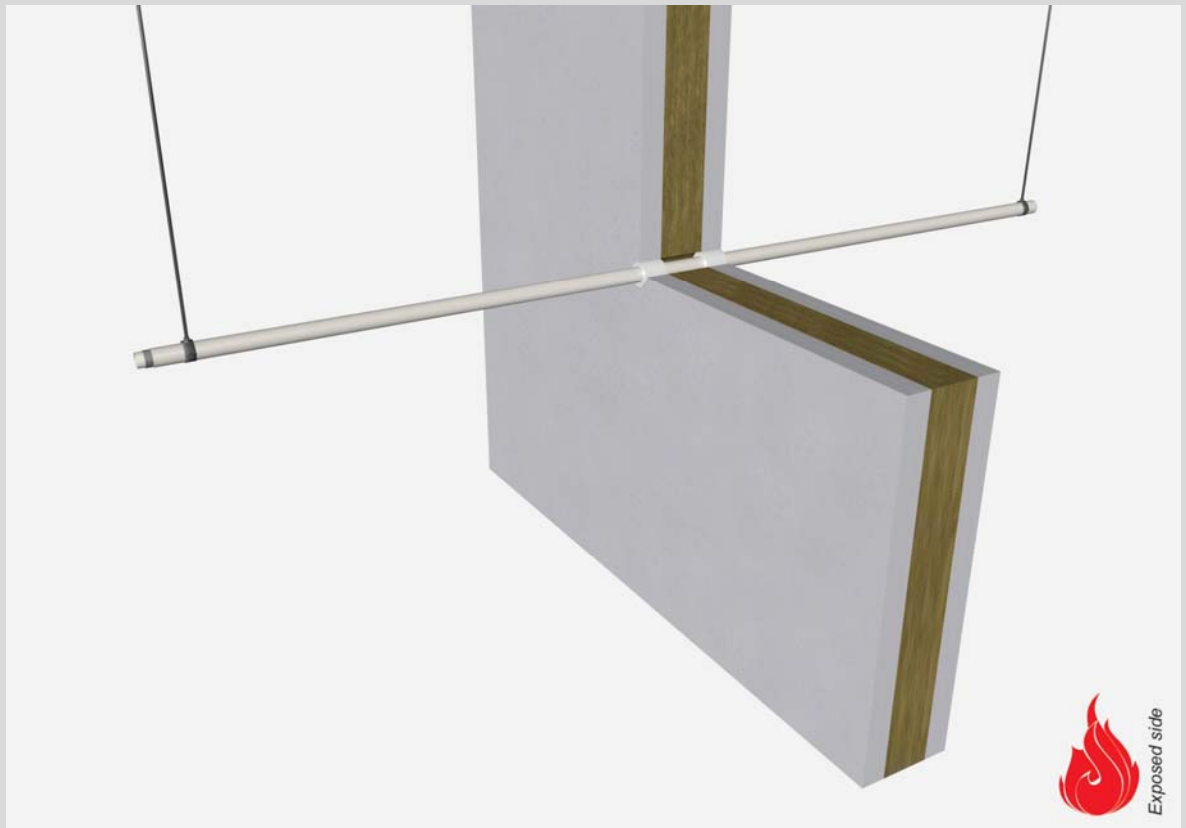
fire resistance

**test method**

EN 1366-3

**service no.**

0064



## aluPE-X pipes

**FT Acrylic**

| service type <sup>1)</sup> |         | pipe insulation                          |              | EI     | constructive element <sup>2)</sup>      | Firesafe joint seal |       | application  | backing   | max. opening    | pipe end      | max. angle                                              |  |
|----------------------------|---------|------------------------------------------|--------------|--------|-----------------------------------------|---------------------|-------|--------------|-----------|-----------------|---------------|---------------------------------------------------------|--|
| dØ (mm)                    | s1 (mm) | min. 60 kg/m <sup>3</sup> eg Armaflex    |              |        |                                         | width               | depth | 1 or 2 sides | required  | in construction | configuration |                                                         |  |
| up to                      |         |                                          |              |        |                                         |                     |       |              |           |                 |               |                                                         |  |
| Ø16                        | 2,0     | -                                        |              | EI 120 | <a href="#">flexible walls ≥ 100 mm</a> | 5 mm                | 25 mm | 2 sides      | -         | 26mm            | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |              | EI 120 | rigid walls ≥ 150 mm                    | 10 mm               | 25 mm | 2 sides      | -         | 62mm            | U/C + C/C     |                                                         |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |              | EI 120 | rigid floors ≥ 150 mm                   | 10 mm               | 25 mm | 2 sides      | -         | 62 mm           | U/C + C/C     |                                                         |  |
| Ø25                        | 2,5     | -                                        |              | EI 120 | flexible walls ≥ 100 mm                 | 10 mm               | 25 mm | 2 sides      | -         | 45 mm           | U/C + C/C     |                                                         |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |              | EI 120 | rigid walls ≥ 150 mm                    | 10 mm               | 25 mm | 2 sides      | -         | 71 mm           | U/C + C/C     |                                                         |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |              | EI 90  | <a href="#">CLT walls ≥ 100 mm</a>      | 10 mm               | 25 mm | 2 sides      | -         | 71 mm           | U/C + C/C     |                                                         |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |              | EI 90  | <a href="#">CLT floors ≥ 140 mm</a>     | 10 mm               | 25 mm | 2 sides      | -         | 71 mm           | U/C + C/C     |                                                         |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |              | EI 120 | rigid floors ≥ 150 mm                   | 10 mm               | 25 mm | 2 sides      | -         | 71 mm           | U/C + C/C     |                                                         |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |              |        | rigid walls ≥ 100 mm                    |                     |       |              |           |                 |               |                                                         |  |
|                            |         | EI 60                                    | in FR mortar | 10 mm  | 25 mm                                   | 2 sides             | -     | 200x1000 mm  | U/C + C/C |                 |               |                                                         |  |
| Ø63                        | 6.0     | synth. rubber 13mm 700 LS + LI + CS + CI |              | EI 120 | rigid walls ≥ 150 mm                    | 10 mm               | 25 mm | 2 sides      | -         | 109 mm          | U/C + C/C     |                                                         |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |              | EI 120 | rigid floors ≥ 150 mm                   | 10 mm               | 25 mm | 2 sides      | -         | 109 mm          | U/C + C/C     |                                                         |  |
|                            |         |                                          |              |        | rigid walls ≥ 100 mm                    |                     |       |              |           |                 |               |                                                         |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |              | EI 60  | in FR mortar                            | 10 mm               | 25 mm | 2 sides      | -         | 200x1000 mm     | U/C + C/C     |                                                         |  |
| max.                       |         |                                          |              |        |                                         |                     |       |              |           |                 |               |                                                         |  |
| Ø75                        | 7,5     | synth. rubber 13mm 700 LS + LI + CS + CI |              | EI 120 | <a href="#">rigid walls ≥ 150 mm</a>    | 10 mm               | 25 mm | 2 sides      | -         | 121 mm          | U/C + C/C     |                                                         |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |              | EI 120 | <a href="#">rigid floors ≥ 150 mm</a>   | 10 mm               | 25 mm | 2 sides      | -         | 121 mm          | U/C + C/C     |                                                         |  |
|                            |         |                                          |              |        | rigid walls ≥ 100 mm                    |                     |       |              |           |                 |               |                                                         |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |              | EI 60  | in FR mortar                            | 10 mm               | 25 mm | 2 sides      | -         | 200x1000 mm     | U/C + C/C     |                                                         |  |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

**principle detail**
**Firesafe**
**tested property**

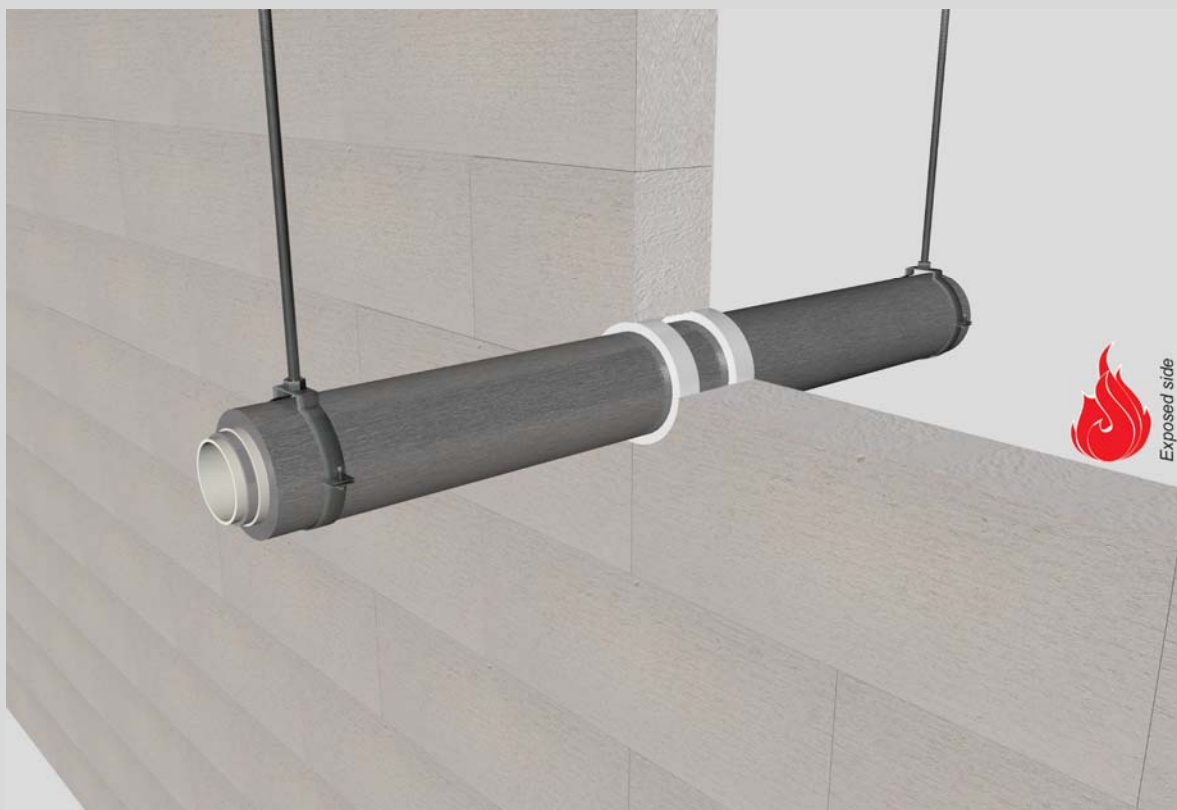
fire resistance

**test method**

EN 1366-3

**service no.**

8-5-9r



## aluPE-X pipes

**FT Acrylic**

| service type <sup>1)</sup> |         | pipe insulation                          |  |  | EI                                      | constructive element <sup>2)</sup> | Firesafe joint seal |         | application | backing<br>required | max. opening<br>in construction | pipe end<br>configuration                               | max. angle |  |
|----------------------------|---------|------------------------------------------|--|-------------------------------------------------------------------------------------|-----------------------------------------|------------------------------------|---------------------|---------|-------------|---------------------|---------------------------------|---------------------------------------------------------|------------|--|
| dØ (mm)                    | s1 (mm) | min. 60 kg/m <sup>3</sup> eg Armaflex    |  |                                                                                     |                                         |                                    | width               | depth   |             |                     |                                 |                                                         |            |  |
| up to                      |         |                                          |  |                                                                                     |                                         |                                    |                     |         |             |                     |                                 |                                                         |            |  |
| Ø16                        | 2,0     | -                                        |  | EI 120                                                                              | <a href="#">flexible walls ≥ 100 mm</a> | 5 mm                               | 25 mm               | 2 sides | -           | 26mm                | U/C + C/C                       | perpendicular +<br>all angles<br>between 90°<br>and 45° |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm                              | 25 mm               | 2 sides | -           | 62mm                | U/C + C/C                       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm                              | 25 mm               | 2 sides | -           | 62 mm               | U/C + C/C                       |                                                         |            |  |
| Ø25                        | 2,5     | -                                        |  | EI 120                                                                              | flexible walls ≥ 100 mm                 | 10 mm                              | 25 mm               | 2 sides | -           | 45 mm               | U/C + C/C                       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm                              | 25 mm               | 2 sides | -           | 71 mm               | U/C + C/C                       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 90                                                                               | <a href="#">CLT walls ≥ 100 mm</a>      | 10 mm                              | 25 mm               | 2 sides | -           | 71 mm               | U/C + C/C                       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 90                                                                               | <a href="#">CLT floors ≥ 140 mm</a>     | 10 mm                              | 25 mm               | 2 sides | -           | 71 mm               | U/C + C/C                       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm                              | 25 mm               | 2 sides | -           | 71 mm               | U/C + C/C                       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60                                                                               | rigid walls ≥ 100 mm<br>in FR mortar    | 10 mm                              | 25 mm               | 2 sides | -           | 200x1000 mm         | U/C + C/C                       |                                                         |            |  |
| Ø63                        | 6,0     | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm                              | 25 mm               | 2 sides | -           | 109 mm              | U/C + C/C                       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm                              | 25 mm               | 2 sides | -           | 109 mm              | U/C + C/C                       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  |                                                                                     | rigid walls ≥ 100 mm                    |                                    |                     |         |             |                     |                                 |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60                                                                               | in FR mortar                            | 10 mm                              | 25 mm               | 2 sides | -           | 200x1000 mm         | U/C + C/C                       |                                                         |            |  |
| max.                       |         |                                          |  |                                                                                     |                                         |                                    |                     |         |             |                     |                                 |                                                         |            |  |
| Ø75                        | 7,5     | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | <a href="#">rigid walls ≥ 150 mm</a>    | 10 mm                              | 25 mm               | 2 sides | -           | 121 mm              | U/C + C/C                       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | <a href="#">rigid floors ≥ 150 mm</a>   | 10 mm                              | 25 mm               | 2 sides | -           | 121 mm              | U/C + C/C                       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60                                                                               | in FR mortar                            | 10 mm                              | 25 mm               | 2 sides | -           | 200x1000 mm         | U/C + C/C                       |                                                         |            |  |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

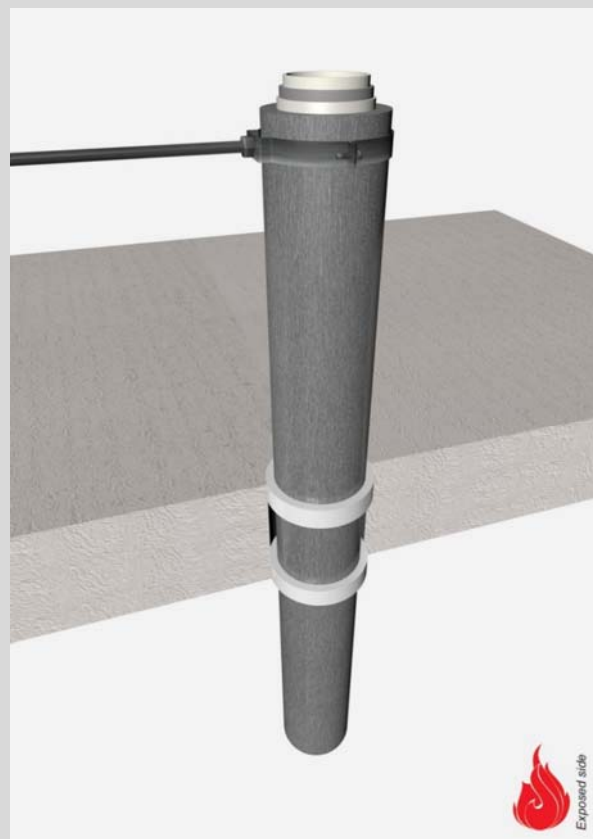
fire resistance

test method

EN 1366-3

service no.

8-5-9



## aluPE-X pipes

### FT Acrylic

| service type <sup>1)</sup> |         | pipe insulation                          |  |  | EI                                      | constructive element <sup>2)</sup> | Firesafe joint seal |         | application  | backing     | max. opening    | pipe end                                                | max. angle |  |
|----------------------------|---------|------------------------------------------|--|-------------------------------------------------------------------------------------|-----------------------------------------|------------------------------------|---------------------|---------|--------------|-------------|-----------------|---------------------------------------------------------|------------|--|
| dØ (mm)                    | s1 (mm) | min. 60 kg/m <sup>3</sup> eg Armaflex    |  |                                                                                     |                                         |                                    | width               | depth   | 1 or 2 sides | required    | in construction | configuration                                           |            |  |
| up to                      |         |                                          |  |                                                                                     |                                         |                                    |                     |         |              |             |                 |                                                         |            |  |
| Ø16                        | 2,0     | -                                        |  | EI 120                                                                              | <a href="#">flexible walls ≥ 100 mm</a> | 5 mm                               | 25 mm               | 2 sides | -            | 26mm        | U/C + C/C       | perpendicular +<br>all angles<br>between 90°<br>and 45° |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm                              | 25 mm               | 2 sides | -            | 62mm        | U/C + C/C       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm                              | 25 mm               | 2 sides | -            | 62 mm       | U/C + C/C       |                                                         |            |  |
| Ø25                        | 2,5     | -                                        |  | EI 120                                                                              | flexible walls ≥ 100 mm                 | 10 mm                              | 25 mm               | 2 sides | -            | 45 mm       | U/C + C/C       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm                              | 25 mm               | 2 sides | -            | 71 mm       | U/C + C/C       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 90                                                                               | <a href="#">CLT walls ≥ 100 mm</a>      | 10 mm                              | 25 mm               | 2 sides | -            | 71 mm       | U/C + C/C       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 90                                                                               | <a href="#">CLT floors ≥ 140 mm</a>     | 10 mm                              | 25 mm               | 2 sides | -            | 71 mm       | U/C + C/C       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm                              | 25 mm               | 2 sides | -            | 71 mm       | U/C + C/C       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60                                                                               | rigid walls ≥ 100 mm<br>in FR mortar    | 10 mm                              | 25 mm               | 2 sides | -            | 200x1000 mm | U/C + C/C       |                                                         |            |  |
| Ø63                        | 6,0     | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm                              | 25 mm               | 2 sides | -            | 109 mm      | U/C + C/C       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm                              | 25 mm               | 2 sides | -            | 109 mm      | U/C + C/C       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60                                                                               | rigid walls ≥ 100 mm<br>in FR mortar    | 10 mm                              | 25 mm               | 2 sides | -            | 200x1000 mm | U/C + C/C       |                                                         |            |  |
| max.                       |         |                                          |  |                                                                                     |                                         |                                    |                     |         |              |             |                 |                                                         |            |  |
| Ø75                        | 7,5     | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | <a href="#">rigid walls ≥ 150 mm</a>    | 10 mm                              | 25 mm               | 2 sides | -            | 121 mm      | U/C + C/C       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120                                                                              | <a href="#">rigid floors ≥ 150 mm</a>   | 10 mm                              | 25 mm               | 2 sides | -            | 121 mm      | U/C + C/C       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60                                                                               | rigid walls ≥ 100 mm<br>in FR mortar    | 10 mm                              | 25 mm               | 2 sides | -            | 200x1000 mm | U/C + C/C       |                                                         |            |  |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

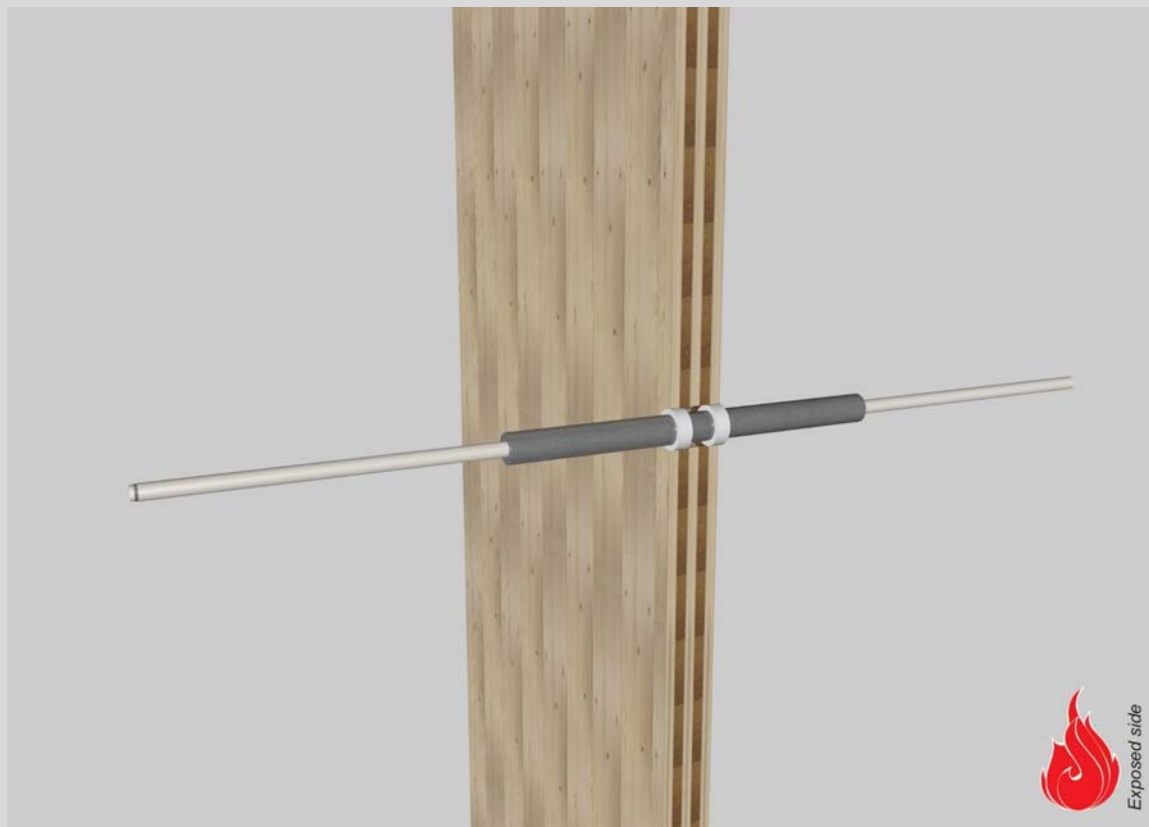
fire resistance

test method

EN 1366-3

service no.

27-6



## aluPE-X pipes

### FT Acrylic

| service type <sup>1)</sup> |         | pipe insulation                       |                       | EI     | constructive element <sup>2)</sup>      |  | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |  |
|----------------------------|---------|---------------------------------------|-----------------------|--------|-----------------------------------------|--|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|--|
| dØ (mm)                    | s1 (mm) | min. 60 kg/m <sup>3</sup> eg Armaflex |                       |        |                                         |  | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |  |
| up to                      |         |                                       |                       |        |                                         |  |                     |       |              |          |                 |               |                                                         |  |
| Ø16                        | 2,00    | -                                     |                       | EI 120 | <a href="#">flexible walls ≥ 100 mm</a> |  | 5 mm                | 25 mm | 2 sides      | -        | 26mm            | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |  |
|                            |         | synth. rubber 13mm                    | 700 LS + LI + CS + CI | EI 120 | rigid walls ≥ 150 mm                    |  | 10 mm               | 25 mm | 2 sides      | -        | 62mm            | U/C + C/C     |                                                         |  |
|                            |         | synth. rubber 13mm                    | 700 LS + LI + CS + CI | EI 120 | rigid floors ≥ 150 mm                   |  | 10 mm               | 25 mm | 2 sides      | -        | 62 mm           | U/C + C/C     |                                                         |  |
| Ø25                        | 2,50    | -                                     |                       | EI 120 | flexible walls ≥ 100 mm                 |  | 10 mm               | 25 mm | 2 sides      | -        | 45 mm           | U/C + C/C     |                                                         |  |
|                            | 2,50    | synth. rubber 13mm                    | 700 LS + LI + CS + CI | EI 120 | rigid walls ≥ 150 mm                    |  | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C + C/C     |                                                         |  |
|                            | 2,25    | synth. rubber 13mm                    | 700 LS + LI + CS + CI | EI 90  | <a href="#">CLT walls ≥ 100 mm</a>      |  | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C + C/C     |                                                         |  |
|                            | 3,00    | synth. rubber 13mm                    | 700 LS + LI + CS + CI | EI 90  | <a href="#">CLT floors ≥ 140 mm</a>     |  | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C + C/C     |                                                         |  |
|                            | 2,50    | synth. rubber 13mm                    | 700 LS + LI + CS + CI | EI 120 | rigid floors ≥ 150 mm                   |  | 10 mm               | 25 mm | 2 sides      | -        | 71 mm           | U/C + C/C     |                                                         |  |
|                            | 2,50    | synth. rubber 13mm                    | 700 LS + LI + CS + CI |        | rigid walls ≥ 100 mm                    |  |                     |       |              |          |                 |               |                                                         |  |
|                            |         | synth. rubber 13mm                    | 700 LS + LI + CS + CI | EI 60  | in FR mortar                            |  | 10 mm               | 25 mm | 2 sides      | -        | 200x1000 mm     | U/C + C/C     |                                                         |  |
| Ø63                        | 6,00    | synth. rubber 13mm                    | 700 LS + LI + CS + CI | EI 120 | rigid walls ≥ 150 mm                    |  | 10 mm               | 25 mm | 2 sides      | -        | 109 mm          | U/C + C/C     |                                                         |  |
|                            |         | synth. rubber 13mm                    | 700 LS + LI + CS + CI | EI 120 | rigid floors ≥ 150 mm                   |  | 10 mm               | 25 mm | 2 sides      | -        | 109 mm          | U/C + C/C     |                                                         |  |
|                            |         | synth. rubber 13mm                    | 700 LS + LI + CS + CI |        | rigid walls ≥ 100 mm                    |  |                     |       |              |          |                 |               |                                                         |  |
|                            |         | synth. rubber 13mm                    | 700 LS + LI + CS + CI | EI 60  | in FR mortar                            |  | 10 mm               | 25 mm | 2 sides      | -        | 200x1000 mm     | U/C + C/C     |                                                         |  |
| max.                       |         |                                       |                       |        |                                         |  |                     |       |              |          |                 |               |                                                         |  |
| Ø75                        | 7,50    | synth. rubber 13mm                    | 700 LS + LI + CS + CI | EI 120 | <a href="#">rigid walls ≥ 150 mm</a>    |  | 10 mm               | 25 mm | 2 sides      | -        | 121 mm          | U/C + C/C     |                                                         |  |
|                            |         | synth. rubber 13mm                    | 700 LS + LI + CS + CI | EI 120 | <a href="#">rigid floors ≥ 150 mm</a>   |  | 10 mm               | 25 mm | 2 sides      | -        | 121 mm          | U/C + C/C     |                                                         |  |
|                            |         | synth. rubber 13mm                    | 700 LS + LI + CS + CI | EI 60  | in FR mortar                            |  | 10 mm               | 25 mm | 2 sides      | -        | 200x1000 mm     | U/C + C/C     |                                                         |  |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

**principle detail**
**Firesafe**
**tested property**

fire resistance

**test method**

EN 1366-3

**service no.**

28-30



## aluPE-X pipes

**FT Acrylic**

| service type <sup>1)</sup> |         | pipe insulation                          |  | EI     | constructive element <sup>2)</sup>      |       | Firesafe joint seal |         | application  | backing     | max. opening    | pipe end                                                | max. angle |  |
|----------------------------|---------|------------------------------------------|--|--------|-----------------------------------------|-------|---------------------|---------|--------------|-------------|-----------------|---------------------------------------------------------|------------|--|
| dØ (mm)                    | s1 (mm) | min. 60 kg/m <sup>3</sup> eg Armaflex    |  |        |                                         |       | width               | depth   | 1 or 2 sides | required    | in construction | configuration                                           |            |  |
| up to                      |         |                                          |  |        |                                         |       |                     |         |              |             |                 |                                                         |            |  |
| Ø16                        | 2,00    | -                                        |  | EI 120 | <a href="#">flexible walls ≥ 100 mm</a> | 5 mm  | 25 mm               | 2 sides | -            | 26mm        | U/C + C/C       | perpendicular +<br>all angles<br>between 90°<br>and 45° |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120 | rigid walls ≥ 150 mm                    | 10 mm | 25 mm               | 2 sides | -            | 62mm        | U/C + C/C       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120 | rigid floors ≥ 150 mm                   | 10 mm | 25 mm               | 2 sides | -            | 62 mm       | U/C + C/C       |                                                         |            |  |
| Ø25                        | 2,50    | -                                        |  | EI 120 | flexible walls ≥ 100 mm                 | 10 mm | 25 mm               | 2 sides | -            | 45 mm       | U/C + C/C       |                                                         |            |  |
|                            | 2,50    | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120 | rigid walls ≥ 150 mm                    | 10 mm | 25 mm               | 2 sides | -            | 71 mm       | U/C + C/C       |                                                         |            |  |
|                            | 2,25    | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 90  | <a href="#">CLT walls ≥ 100 mm</a>      | 10 mm | 25 mm               | 2 sides | -            | 71 mm       | U/C + C/C       |                                                         |            |  |
|                            | 3,00    | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 90  | <a href="#">CLT floors ≥ 140 mm</a>     | 10 mm | 25 mm               | 2 sides | -            | 71 mm       | U/C + C/C       |                                                         |            |  |
|                            | 2,50    | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120 | rigid floors ≥ 150 mm                   | 10 mm | 25 mm               | 2 sides | -            | 71 mm       | U/C + C/C       |                                                         |            |  |
|                            | 2,50    | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60  | rigid walls ≥ 100 mm<br>in FR mortar    | 10 mm | 25 mm               | 2 sides | -            | 200x1000 mm | U/C + C/C       |                                                         |            |  |
| Ø63                        | 6,00    | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120 | rigid walls ≥ 150 mm                    | 10 mm | 25 mm               | 2 sides | -            | 109 mm      | U/C + C/C       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120 | rigid floors ≥ 150 mm                   | 10 mm | 25 mm               | 2 sides | -            | 109 mm      | U/C + C/C       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60  | rigid walls ≥ 100 mm<br>in FR mortar    | 10 mm | 25 mm               | 2 sides | -            | 200x1000 mm | U/C + C/C       |                                                         |            |  |
| max.                       |         |                                          |  |        |                                         |       |                     |         |              |             |                 |                                                         |            |  |
| Ø75                        | 7,50    | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120 | <a href="#">rigid walls ≥ 150 mm</a>    | 10 mm | 25 mm               | 2 sides | -            | 121 mm      | U/C + C/C       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 120 | <a href="#">rigid floors ≥ 150 mm</a>   | 10 mm | 25 mm               | 2 sides | -            | 121 mm      | U/C + C/C       |                                                         |            |  |
|                            |         | synth. rubber 13mm 700 LS + LI + CS + CI |  | EI 60  | rigid walls ≥ 100 mm<br>in FR mortar    | 10 mm | 25 mm               | 2 sides | -            | 200x1000 mm | U/C + C/C       |                                                         |            |  |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!



**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe  $d\varnothing + s1$**  (thickness) are allowed within range and same pipe material
- EI for flexible walls  $\geq 100\text{mm}$  is also applicable for **rigid walls**  $\geq 100\text{mm}$
- angle: perpendicular + all angles between  $90^\circ$  and  $45^\circ$
- 'eccentric to zero' position in opening is allowed

**principle detail****Firesafe****tested property**

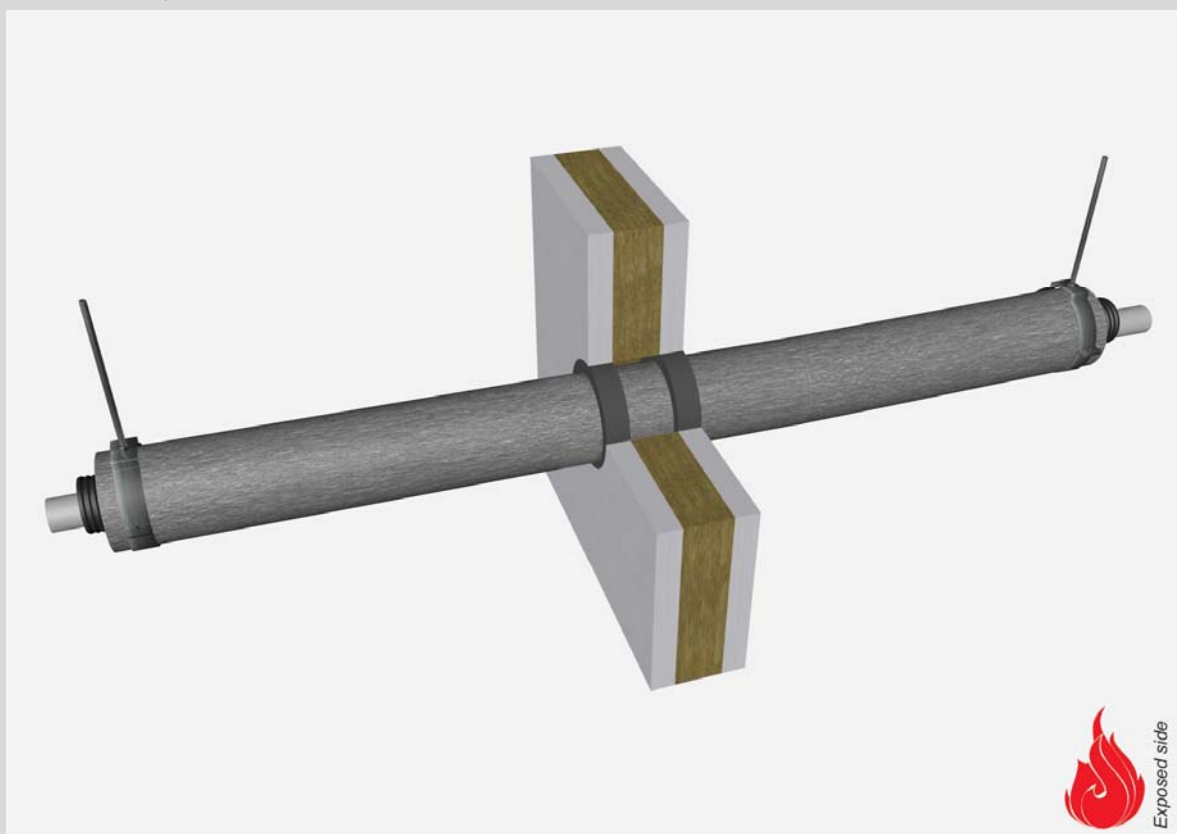
fire resistance

**test method**

EN 1366-3

**service no.**

15-49

**PE-Xa pipes****FT Graphite**

| service type |                 | pipe insulation                     |        |  | EI                      | constructive element <sup>2)</sup> | Firesafe joint seal |         | application   |               | backing<br>required | max. opening<br>in construction                         | pipe end<br>configuration |
|--------------|-----------------|-------------------------------------|--------|-------------------------------------------------------------------------------------|-------------------------|------------------------------------|---------------------|---------|---------------|---------------|---------------------|---------------------------------------------------------|---------------------------|
| dØ (mm)      | s1 (mm)         | min. 28 kg/m <sup>3</sup> eg Uponor |        |                                                                                     |                         |                                    | width               | depth   | 1 or 2 sides  |               |                     |                                                         |                           |
| Ø15/28       | 2,5             | -                                   |        | EI 90                                                                               | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -             | 48 mm         | U/C + C/C           | perpendicular +<br>all angles<br>between 90°<br>and 45° |                           |
|              |                 | -                                   |        | EI 240                                                                              | rigid walls ≥ 150 mm    | 15 mm                              | 25 mm               | 2 sides | -             | 58 mm         | U/C + C/C           |                                                         |                           |
|              | 2x bundled      | -                                   | EI 60  | shaft walls ≥ 75 mm                                                                 | 10 mm                   | 25 mm                              | 2 sides             | -       | 300 x 1200 mm | U/C + C/C     |                     |                                                         |                           |
|              | polyolefin 10mm | 1200 CS + CI                        | EI 120 | flexible walls ≥ 100 mm                                                             | 10 mm                   | 25 mm                              | 2 sides             | -       | 68 mm         | U/C + C/C     |                     |                                                         |                           |
|              | polyolefin 10mm | 1200 CS + CI                        | EI 240 | rigid walls ≥ 150 mm                                                                | 15 mm                   | 25 mm                              | 2 sides             | -       | 78 mm         | U/C + C/C     |                     |                                                         |                           |
|              | polyolefin 10mm | 1200 CS + CI                        | EI 60  | shaft walls ≥ 75 mm                                                                 | 10 mm                   | 25 mm                              | 2 sides             | -       | 300 x 1200 mm | U/C + C/C     |                     |                                                         |                           |
| Ø16/25       | 2,2             | -                                   |        | EI 120                                                                              | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -             | 45 mm         | U/C + C/C           |                                                         |                           |
|              |                 | -                                   |        | EI 240                                                                              | rigid walls ≥ 150 mm    | 15 mm                              | 25 mm               | 2 sides | -             | 55 mm         | U/C + C/C           |                                                         |                           |
|              | polyolefin 10mm | 1200 CS + CI                        | EI 120 | flexible walls ≥ 100 mm                                                             | 10 mm                   | 25 mm                              | 2 sides             | -       | 65 mm         | U/C + C/C     |                     |                                                         |                           |
|              | polyolefin 10mm | 1200 CS + CI                        | EI 240 | rigid walls ≥ 150 mm                                                                | 15 mm                   | 25 mm                              | 2 sides             | -       | 75 mm         | U/C + C/C     |                     |                                                         |                           |
| max.         |                 |                                     |        |                                                                                     |                         |                                    |                     |         |               |               |                     |                                                         |                           |
| Ø32/54       | 4,4             | -                                   |        | EI 120                                                                              | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -             | 74 mm         | U/C + C/C           |                                                         |                           |
|              |                 | -                                   |        | EI 240                                                                              | rigid walls ≥ 150 mm    | 15 mm                              | 25 mm               | 2 sides | -             | 84 mm         | U/C + C/C           |                                                         |                           |
|              |                 | -                                   |        | EI 60                                                                               | shaft walls ≥ 75 mm     | 10 mm                              | 25 mm               | 2 sides | -             | 300 x 1200 mm | U/C + C/C           |                                                         |                           |
|              | polyolefin 20mm | 1200 CS + CI                        | EI 90  | flexible walls ≥ 100 mm                                                             | 10 mm                   | 25 mm                              | 2 sides             | -       | 144 mm        | U/C + C/C     |                     |                                                         |                           |
|              | polyolefin 20mm | 1200 CS + CI                        | EI 120 | rigid walls ≥ 150 mm                                                                | 15 mm                   | 25 mm                              | 2 sides             | -       | 124 mm        | U/C + C/C     |                     |                                                         |                           |

on FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance  $\leq 500\text{mm}$ .

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls  $\geq 100\text{mm}$  is also applicable for rigid walls  $\geq 100\text{mm}$ !

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- other pipe  $d\varnothing + s1$  (thickness) are allowed within range and same pipe material
- EI for flexible walls  $\geq 100\text{mm}$  is also applicable for rigid walls  $\geq 100\text{mm}$
- angle: perpendicular + all angles between  $90^\circ$  and  $45^\circ$
- 'eccentric to zero' position in opening is allowed

## principle detail

## Firesafe

tested property

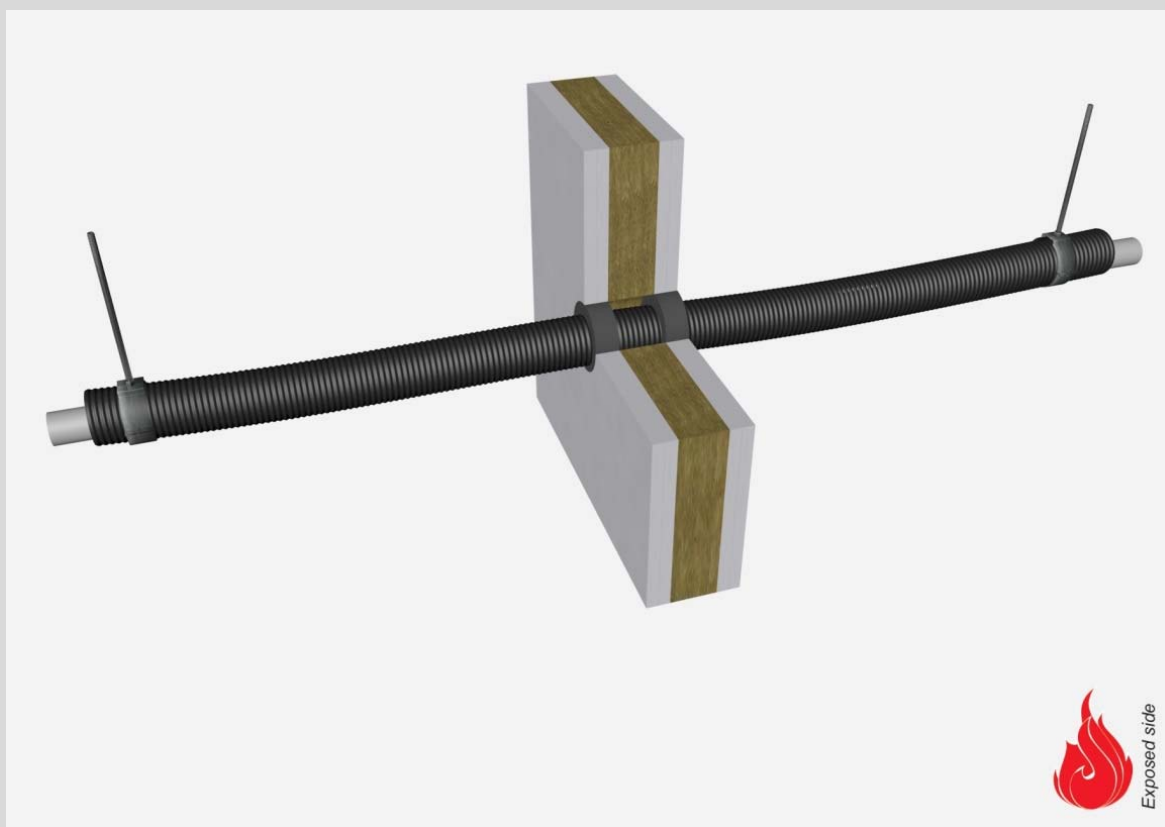
fire resistance

test method

EN 1366-3

service no.

15-39



## PE-Xa pipes

### FT Graphite

| service type |                 | pipe insulation                     |               |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |         | application  | backing       | max. opening    | pipe end      |                                                         |
|--------------|-----------------|-------------------------------------|---------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|---------|--------------|---------------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)      | s1 (mm)         | min. 28 kg/m <sup>3</sup> eg Uponor |               |                                                                                        |                                    | width               | depth   | 1 or 2 sides | required      | in construction | configuration |                                                         |
| Ø15/28       | 2,5             | -                                   |               | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -             | 48 mm           | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|              |                 | -                                   |               | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm   | 2 sides      | -             | 58 mm           | U/C + C/C     |                                                         |
|              | 2x bundled      | -                                   | EI <b>60</b>  | <div>shaft walls ≥ 75 mm</div>                                                         | 10 mm                              | 25 mm               | 2 sides | -            | 300 x 1200 mm | U/C + C/C       |               |                                                         |
|              | polyolefin 10mm | 1200 CS + CI                        | EI <b>120</b> | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm               | 2 sides | -            | 68 mm         | U/C + C/C       |               |                                                         |
|              | polyolefin 10mm | 1200 CS + CI                        | EI <b>240</b> | rigid walls ≥ 150 mm                                                                   | 15 mm                              | 25 mm               | 2 sides | -            | 78 mm         | U/C + C/C       |               |                                                         |
|              | polyolefin 10mm | 1200 CS + CI                        | EI <b>60</b>  | <div>shaft walls ≥ 75 mm</div>                                                         | 10 mm                              | 25 mm               | 2 sides | -            | 300 x 1200 mm | U/C + C/C       |               |                                                         |
|              |                 |                                     |               |                                                                                        |                                    |                     |         |              |               |                 |               |                                                         |
| Ø16/25       | 2,2             | -                                   |               | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -             | 45 mm           | U/C + C/C     |                                                         |
|              |                 | -                                   |               | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm   | 2 sides      | -             | 55 mm           | U/C + C/C     |                                                         |
|              | polyolefin 10mm | 1200 CS + CI                        | EI <b>120</b> | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm               | 2 sides | -            | 65 mm         | U/C + C/C       |               |                                                         |
|              | polyolefin 10mm | 1200 CS + CI                        | EI <b>240</b> | rigid walls ≥ 150 mm                                                                   | 15 mm                              | 25 mm               | 2 sides | -            | 75 mm         | U/C + C/C       |               |                                                         |
|              |                 |                                     |               |                                                                                        |                                    |                     |         |              |               |                 |               |                                                         |
| <b>max.</b>  |                 |                                     |               |                                                                                        |                                    |                     |         |              |               |                 |               |                                                         |
| Ø32/54       | 4,4             | -                                   |               | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -             | 74 mm           | U/C + C/C     |                                                         |
|              |                 | -                                   |               | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm   | 2 sides      | -             | 84 mm           | U/C + C/C     |                                                         |
|              |                 | -                                   |               | EI <b>60</b>                                                                           | <div>shaft walls ≥ 75 mm</div>     | 10 mm               | 25 mm   | 2 sides      | -             | 300 x 1200 mm   | U/C + C/C     |                                                         |
|              | polyolefin 20mm | 1200 CS + CI                        | EI <b>90</b>  | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm               | 2 sides | -            | 144 mm        | U/C + C/C       |               |                                                         |
|              | polyolefin 20mm | 1200 CS + CI                        | EI <b>120</b> | rigid walls ≥ 150 mm                                                                   | 15 mm                              | 25 mm               | 2 sides | -            | 124 mm        | U/C + C/C       |               |                                                         |

on FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance  $\leq 500\text{mm}$ .

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls  $\geq 100\text{mm}$  is also applicable for rigid walls  $\geq 100\text{mm}$ !

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°
- 'eccentric to zero' position in opening is allowed

## principle detail

## Firesafe

tested property

fire resistance

test method

EN 1366-3

service no.

15-39r



## PE-Xa pipes

### FT Graphite

| service type |                 | pipe insulation                     |               |  | EI                             | constructive element <sup>2)</sup> | Firesafe joint seal |         | application   |               | backing         | max. opening  | pipe end                                                |  |
|--------------|-----------------|-------------------------------------|---------------|-------------------------------------------------------------------------------------|--------------------------------|------------------------------------|---------------------|---------|---------------|---------------|-----------------|---------------|---------------------------------------------------------|--|
| dØ (mm)      | s1 (mm)         | min. 28 kg/m <sup>3</sup> eg Uponor |               |                                                                                     |                                |                                    | width               | depth   | 1 or 2 sides  | required      | in construction | configuration |                                                         |  |
| Ø15/28       | 2,5             | -                                   |               | EI <b>90</b>                                                                        |                                | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides       | -             | 48 mm           | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |  |
|              |                 | -                                   |               | EI <b>240</b>                                                                       |                                | rigid walls ≥ 150 mm               | 15 mm               | 25 mm   | 2 sides       | -             | 58 mm           | U/C + C/C     |                                                         |  |
|              |                 | 2x bundled                          | -             | EI <b>60</b>                                                                        | <div>shaft walls ≥ 75 mm</div> | 10 mm                              | 25 mm               | 2 sides | -             | 300 x 1200 mm | U/C + C/C       |               |                                                         |  |
|              | polyolefin 10mm | 1200 CS + CI                        | EI <b>120</b> |                                                                                     | flexible walls ≥ 100 mm        | 10 mm                              | 25 mm               | 2 sides | -             | 68 mm         | U/C + C/C       |               |                                                         |  |
|              | polyolefin 10mm | 1200 CS + CI                        | EI <b>240</b> |                                                                                     | rigid walls ≥ 150 mm           | 15 mm                              | 25 mm               | 2 sides | -             | 78 mm         | U/C + C/C       |               |                                                         |  |
|              | polyolefin 10mm | 1200 CS + CI                        | EI <b>60</b>  | <div>shaft walls ≥ 75 mm</div>                                                      | 10 mm                          | 25 mm                              | 2 sides             | -       | 300 x 1200 mm | U/C + C/C     |                 |               |                                                         |  |
|              |                 |                                     |               |                                                                                     |                                |                                    |                     |         |               |               |                 |               |                                                         |  |
| Ø16/25       | 2,2             | -                                   |               | EI <b>120</b>                                                                       |                                | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides       | -             | 45 mm           | U/C + C/C     |                                                         |  |
|              |                 | -                                   |               | EI <b>240</b>                                                                       |                                | rigid walls ≥ 150 mm               | 15 mm               | 25 mm   | 2 sides       | -             | 55 mm           | U/C + C/C     |                                                         |  |
|              | polyolefin 10mm | 1200 CS + CI                        | EI <b>120</b> |                                                                                     | flexible walls ≥ 100 mm        | 10 mm                              | 25 mm               | 2 sides | -             | 65 mm         | U/C + C/C       |               |                                                         |  |
|              | polyolefin 10mm | 1200 CS + CI                        | EI <b>240</b> |                                                                                     | rigid walls ≥ 150 mm           | 15 mm                              | 25 mm               | 2 sides | -             | 75 mm         | U/C + C/C       |               |                                                         |  |
|              |                 |                                     |               |                                                                                     |                                |                                    |                     |         |               |               |                 |               |                                                         |  |
| <b>max.</b>  |                 |                                     |               |                                                                                     |                                |                                    |                     |         |               |               |                 |               |                                                         |  |
| Ø32/54       | 4,4             | -                                   |               | EI <b>120</b>                                                                       |                                | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides       | -             | 74 mm           | U/C + C/C     |                                                         |  |
|              |                 | -                                   |               | EI <b>240</b>                                                                       |                                | rigid walls ≥ 150 mm               | 15 mm               | 25 mm   | 2 sides       | -             | 84 mm           | U/C + C/C     |                                                         |  |
|              |                 | -                                   |               | EI <b>60</b>                                                                        | <div>shaft walls ≥ 75 mm</div> | 10 mm                              | 25 mm               | 2 sides | -             | 300 x 1200 mm | U/C + C/C       |               |                                                         |  |
|              | polyolefin 20mm | 1200 CS + CI                        | EI <b>90</b>  |                                                                                     | flexible walls ≥ 100 mm        | 10 mm                              | 25 mm               | 2 sides | -             | 144 mm        | U/C + C/C       |               |                                                         |  |
|              | polyolefin 20mm | 1200 CS + CI                        | EI <b>120</b> |                                                                                     | rigid walls ≥ 150 mm           | 15 mm                              | 25 mm               | 2 sides | -             | 124 mm        | U/C + C/C       |               |                                                         |  |

on FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°
- 'eccentric to zero' position in opening is allowed

## principle detail

Firesafe

tested property

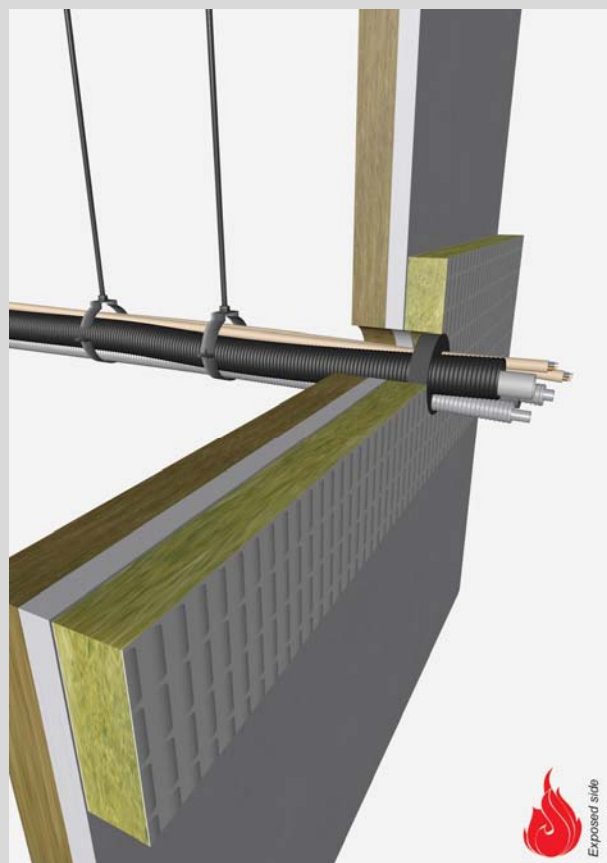
fire resistance

test method

EN 1366-3

service no.

16-6



## PE-Xa pipes

### FT Graphite

| service type |            | pipe insulation                     |                 | EI           | constructive element <sup>2)</sup> | Firesafe joint seal     |       | application  | backing  | max. opening    | pipe end                                                |           |
|--------------|------------|-------------------------------------|-----------------|--------------|------------------------------------|-------------------------|-------|--------------|----------|-----------------|---------------------------------------------------------|-----------|
| dØ (mm)      | s1 (mm)    | min. 28 kg/m <sup>3</sup> eg Uponor |                 |              |                                    | width                   | depth | 1 or 2 sides | required | in construction | configuration                                           |           |
| Ø15/28       | 2,5        | -                                   |                 | EI 90        | flexible walls ≥ 100 mm            | 10 mm                   | 25 mm | 2 sides      | -        | 48 mm           | U/C + C/C                                               |           |
|              |            | -                                   |                 | EI 240       | rigid walls ≥ 150 mm               | 15 mm                   | 25 mm | 2 sides      | -        | 58 mm           | U/C + C/C                                               |           |
|              | 2x bundled | -                                   |                 | EI 60        | shaft walls ≥ 75 mm                | 10 mm                   | 25 mm | 2 sides      | -        | 300 x 1200 mm   | U/C + C/C                                               |           |
|              |            | polyolefin 10mm                     | 1200 CS + CI    | EI 120       | flexible walls ≥ 100 mm            | 10 mm                   | 25 mm | 2 sides      | -        | 68 mm           | U/C + C/C                                               |           |
|              |            | polyolefin 10mm                     | 1200 CS + CI    | EI 240       | rigid walls ≥ 150 mm               | 15 mm                   | 25 mm | 2 sides      | -        | 78 mm           | U/C + C/C                                               |           |
|              |            | polyolefin 10mm                     | 1200 CS + CI    | EI 60        | shaft walls ≥ 75 mm                | 10 mm                   | 25 mm | 2 sides      | -        | 300 x 1200 mm   | U/C + C/C                                               |           |
|              |            |                                     |                 |              |                                    |                         |       |              |          |                 | perpendicular +<br>all angles<br>between 90°<br>and 45° |           |
| Ø16/25       | 2,2        | -                                   |                 | EI 120       | flexible walls ≥ 100 mm            | 10 mm                   | 25 mm | 2 sides      | -        | 45 mm           |                                                         | U/C + C/C |
|              |            | -                                   |                 | EI 240       | rigid walls ≥ 150 mm               | 15 mm                   | 25 mm | 2 sides      | -        | 55 mm           |                                                         | U/C + C/C |
|              |            | polyolefin 10mm                     | 1200 CS + CI    | EI 120       | flexible walls ≥ 100 mm            | 10 mm                   | 25 mm | 2 sides      | -        | 65 mm           |                                                         | U/C + C/C |
|              |            | polyolefin 10mm                     | 1200 CS + CI    | EI 240       | rigid walls ≥ 150 mm               | 15 mm                   | 25 mm | 2 sides      | -        | 75 mm           |                                                         | U/C + C/C |
|              |            |                                     |                 |              |                                    |                         |       |              |          |                 |                                                         |           |
| max.         |            |                                     |                 |              |                                    |                         |       |              |          |                 |                                                         |           |
| Ø32/54       | 4,4        | -                                   |                 | EI 120       | flexible walls ≥ 100 mm            | 10 mm                   | 25 mm | 2 sides      | -        | 74 mm           | U/C + C/C                                               |           |
|              |            | -                                   |                 | EI 240       | rigid walls ≥ 150 mm               | 15 mm                   | 25 mm | 2 sides      | -        | 84 mm           | U/C + C/C                                               |           |
|              |            | -                                   |                 | EI 60        | shaft walls ≥ 75 mm                | 10 mm                   | 25 mm | 2 sides      | -        | 300 x 1200 mm   | U/C + C/C                                               |           |
|              |            |                                     | polyolefin 20mm | 1200 CS + CI | EI 90                              | flexible walls ≥ 100 mm | 10 mm | 25 mm        | 2 sides  | -               | 144 mm                                                  | U/C + C/C |
|              |            |                                     | polyolefin 20mm | 1200 CS + CI | EI 120                             | rigid walls ≥ 150 mm    | 15 mm | 25 mm        | 2 sides  | -               | 124 mm                                                  | U/C + C/C |

perpendicular +  
all angles  
between 90°  
and 45°

on FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°
- 'eccentric to zero' position in opening is allowed

## principle detail

## Firesafe

tested property

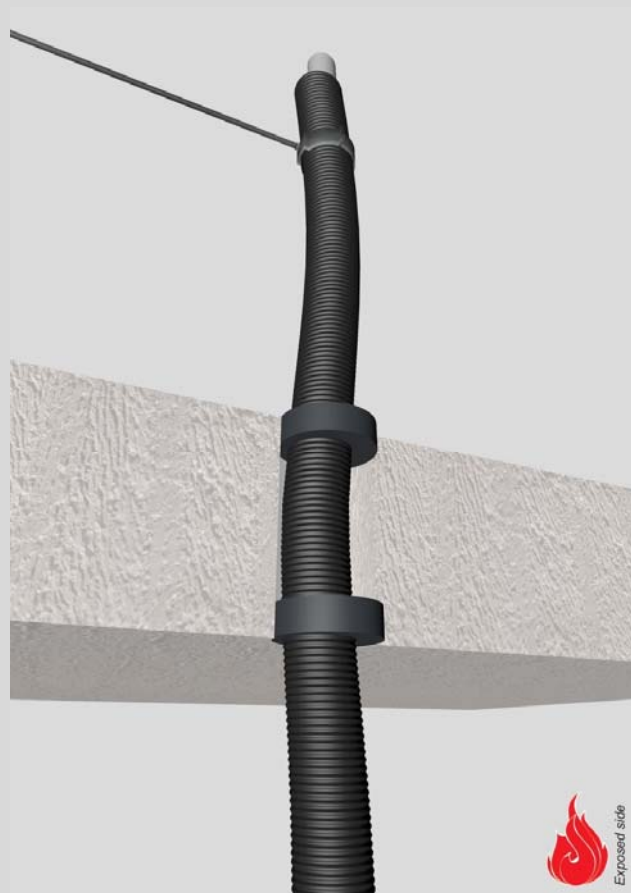
fire resistance

test method

EN 1366-3

service no.

17-3-3



## PE-Xa pipes

### FT Graphite

| service type |         | pipe insulation         |              |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application | backing required | max. opening in construction | pipe end configuration | max. angle                                     |
|--------------|---------|-------------------------|--------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|-------------|------------------|------------------------------|------------------------|------------------------------------------------|
| dØ (mm)      | s1 (mm) | min. 28 kg/m³ eg Uponor |              |                                                                                        |                                    | width               | depth |             |                  |                              |                        |                                                |
| Ø15/28       | 2,5     | -                       |              | EI <b>240</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 58 mm                        | U/C + C/C              | perpendicular + all angles between 90° and 45° |
|              |         | polyolefin 10mm         | 1200 CS + CI | EI <b>240</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 78 mm                        | U/C + C/C              |                                                |
|              |         |                         |              |                                                                                        |                                    |                     |       |             |                  |                              |                        |                                                |
| Ø16/25       | 2,2     | -                       |              | EI <b>240</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 55 mm                        | U/C + C/C              |                                                |
|              |         | polyolefin 10mm         | 1200 CS + CI | EI <b>240</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 75 mm                        | U/C + C/C              |                                                |
|              |         |                         |              |                                                                                        |                                    |                     |       |             |                  |                              |                        |                                                |
| max.         |         |                         |              |                                                                                        |                                    |                     |       |             |                  |                              |                        |                                                |
| Ø32/54       | 4,4     | -                       |              | EI <b>240</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 84 mm                        | U/C + C/C              |                                                |
|              |         | polyolefin 20mm         | 1200 CS + CI | EI <b>90</b>                                                                           | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 124 mm                       | U/C + C/C              |                                                |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°
- 'eccentric to zero' position in opening is allowed

**principle detail****Firesafe****tested property**

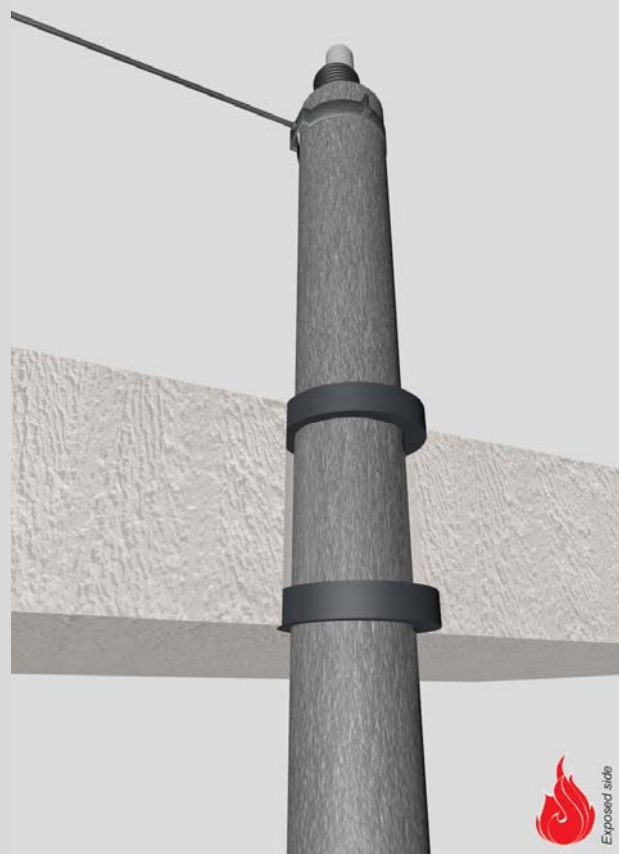
fire resistance

**test method**

EN 1366-3

**service no.**

17-3-6

**PE-Xa pipes****FT Graphite**

| service type |         | pipe insulation         |              |  | EI                    | constructive element <sup>2)</sup> | Firesafe joint seal |         | application | backing required | max. opening in construction | pipe end configuration                         | max. angle |
|--------------|---------|-------------------------|--------------|-------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------|---------|-------------|------------------|------------------------------|------------------------------------------------|------------|
| dØ (mm)      | s1 (mm) | min. 28 kg/m³ eg Uponor |              |                                                                                     |                       |                                    | width               | depth   |             |                  |                              |                                                |            |
| Ø15/28       | 2,5     | -                       |              | EI <b>240</b>                                                                       | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 58 mm            | U/C + C/C                    | perpendicular + all angles between 90° and 45° |            |
|              |         | polyolefin 10mm         | 1200 CS + CI | EI <b>240</b>                                                                       | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 78 mm            | U/C + C/C                    |                                                |            |
|              |         |                         |              |                                                                                     |                       |                                    |                     |         |             |                  |                              |                                                |            |
| Ø16/25       | 2,2     | -                       |              | EI <b>240</b>                                                                       | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 55 mm            | U/C + C/C                    |                                                |            |
|              |         | polyolefin 10mm         | 1200 CS + CI | EI <b>240</b>                                                                       | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 75 mm            | U/C + C/C                    |                                                |            |
|              |         |                         |              |                                                                                     |                       |                                    |                     |         |             |                  |                              |                                                |            |
| max.         |         |                         |              |                                                                                     |                       |                                    |                     |         |             |                  |                              |                                                |            |
| Ø32/54       | 4,4     | -                       |              | EI <b>240</b>                                                                       | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 84 mm            | U/C + C/C                    |                                                |            |
|              |         | polyolefin 20mm         | 1200 CS + CI | EI <b>90</b>                                                                        | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 124 mm           | U/C + C/C                    |                                                |            |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°
- 'eccentric to zero' position in opening is allowed

## principle detail

## Firesafe

tested property

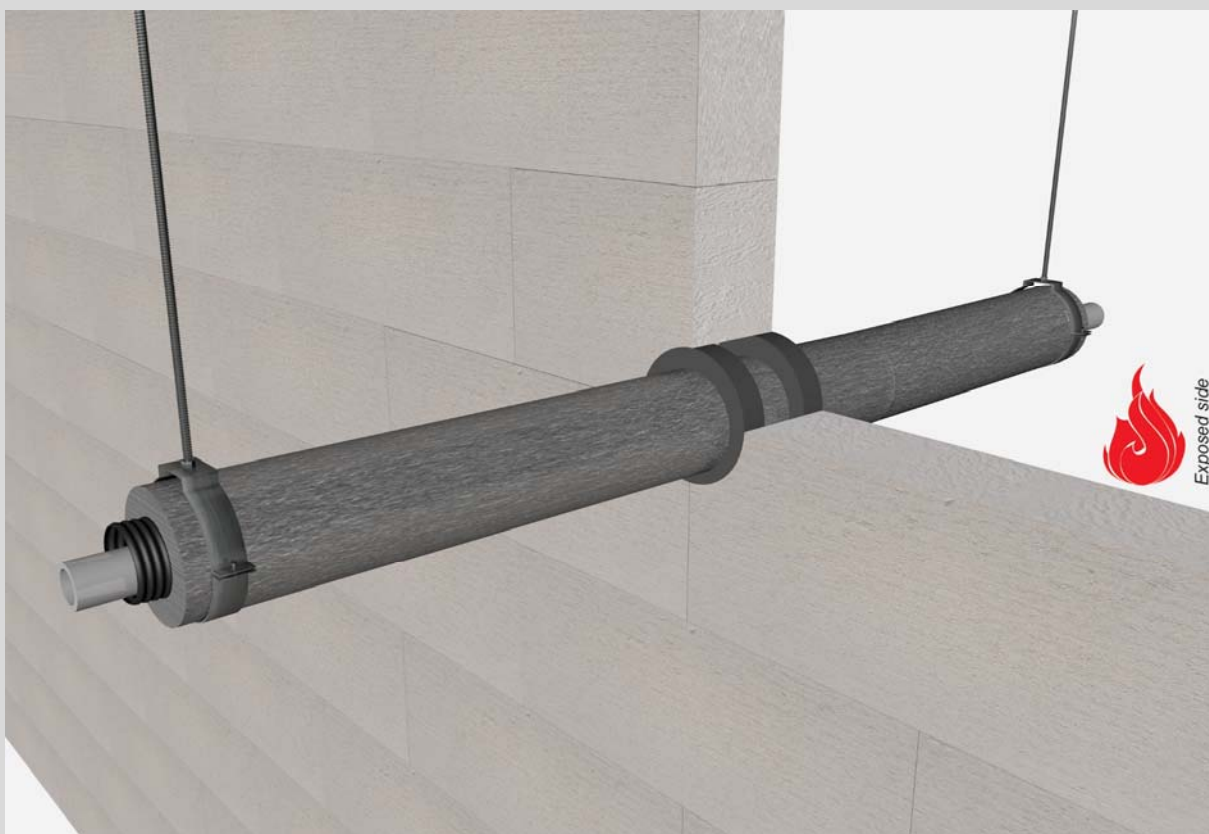
fire resistance

test method

EN 1366-3

service no.

15-49r



## PE-Xa pipes

### FT Graphite

| service type |                 | pipe insulation                     |               |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |         | application  | backing       | max. opening    | pipe end      |                                                         |
|--------------|-----------------|-------------------------------------|---------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|---------|--------------|---------------|-----------------|---------------|---------------------------------------------------------|
| dØ (mm)      | s1 (mm)         | min. 28 kg/m <sup>3</sup> eg Uponor |               |                                                                                        |                                    | width               | depth   | 1 or 2 sides | required      | in construction | configuration |                                                         |
| Ø15/28       | 2,5             | -                                   |               | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -             | 48 mm           | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|              |                 | -                                   |               | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm   | 2 sides      | -             | 58 mm           | U/C + C/C     |                                                         |
|              |                 | 2x bundled                          | -             | EI <b>60</b>                                                                           | <div>shaft walls ≥ 75 mm</div>     | 10 mm               | 25 mm   | 2 sides      | -             | 300 x 1200 mm   | U/C + C/C     |                                                         |
|              | polyolefin 10mm | 1200 CS + CI                        | EI <b>120</b> | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm               | 2 sides | -            | 68 mm         | U/C + C/C       |               |                                                         |
|              | polyolefin 10mm | 1200 CS + CI                        | EI <b>240</b> | rigid walls ≥ 150 mm                                                                   | 15 mm                              | 25 mm               | 2 sides | -            | 78 mm         | U/C + C/C       |               |                                                         |
|              | polyolefin 10mm | 1200 CS + CI                        | EI <b>60</b>  | <div>shaft walls ≥ 75 mm</div>                                                         | 10 mm                              | 25 mm               | 2 sides | -            | 300 x 1200 mm | U/C + C/C       |               |                                                         |
|              |                 |                                     |               |                                                                                        |                                    |                     |         |              |               |                 |               |                                                         |
| Ø16/25       | 2,2             | -                                   |               | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -             | 45 mm           | U/C + C/C     |                                                         |
|              |                 | -                                   |               | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm   | 2 sides      | -             | 55 mm           | U/C + C/C     |                                                         |
|              | polyolefin 10mm | 1200 CS + CI                        | EI <b>120</b> | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm               | 2 sides | -            | 65 mm         | U/C + C/C       |               |                                                         |
|              | polyolefin 10mm | 1200 CS + CI                        | EI <b>240</b> | rigid walls ≥ 150 mm                                                                   | 15 mm                              | 25 mm               | 2 sides | -            | 75 mm         | U/C + C/C       |               |                                                         |
|              |                 |                                     |               |                                                                                        |                                    |                     |         |              |               |                 |               |                                                         |
| <b>max.</b>  |                 |                                     |               |                                                                                        |                                    |                     |         |              |               |                 |               |                                                         |
| Ø32/54       | 4,4             | -                                   |               | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -             | 74 mm           | U/C + C/C     |                                                         |
|              |                 | -                                   |               | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm   | 2 sides      | -             | 84 mm           | U/C + C/C     |                                                         |
|              |                 | -                                   |               | EI <b>60</b>                                                                           | <div>shaft walls ≥ 75 mm</div>     | 10 mm               | 25 mm   | 2 sides      | -             | 300 x 1200 mm   | U/C + C/C     |                                                         |
|              | polyolefin 20mm | 1200 CS + CI                        | EI <b>90</b>  | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm               | 2 sides | -            | 144 mm        | U/C + C/C       |               |                                                         |
|              | polyolefin 20mm | 1200 CS + CI                        | EI <b>120</b> | rigid walls ≥ 150 mm                                                                   | 15 mm                              | 25 mm               | 2 sides | -            | 124 mm        | U/C + C/C       |               |                                                         |

on FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls  $\geq 100\text{mm}$  is also applicable for **rigid walls**  $\geq 100\text{mm}$
- angle: perpendicular + all angles between  $90^\circ$  and  $45^\circ$
- 'eccentric to zero' position in opening is allowed

**principle detail****Firesafe**

tested property

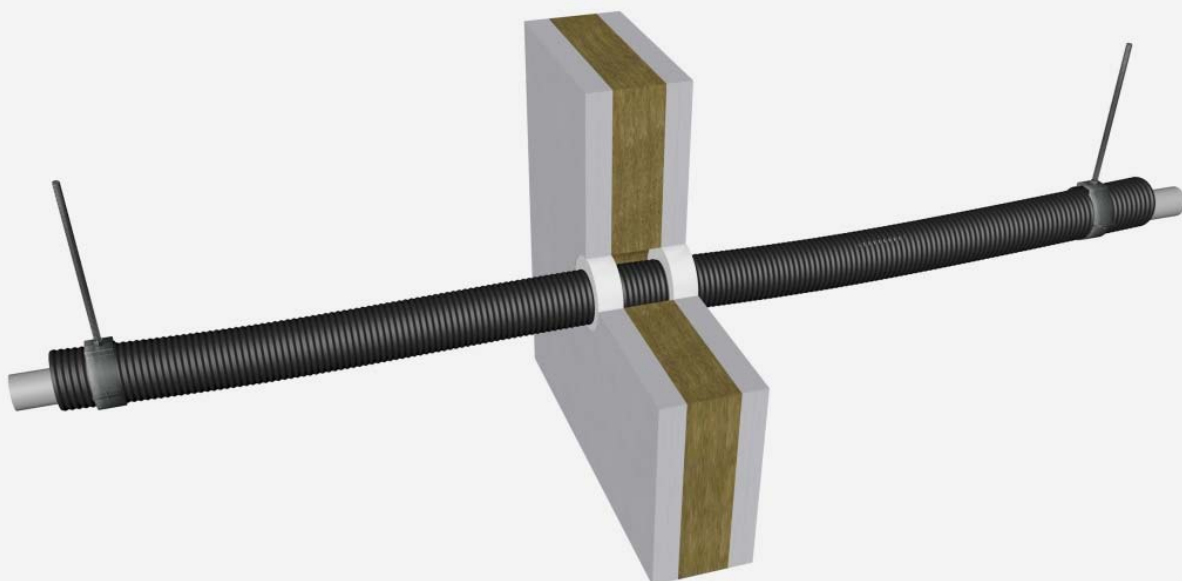
fire resistance

test method

EN 1366-3

service no.

15-40

**PE-Xa pipes****FT Acrylic**

| service type |         | pipe insulation |  |  | EI | constructive element <sup>2)</sup>      | Firesafe joint seal |       | application | backing | max. opening | pipe end  | max. angle                                              |              |
|--------------|---------|-----------------|--|-------------------------------------------------------------------------------------|----|-----------------------------------------|---------------------|-------|-------------|---------|--------------|-----------|---------------------------------------------------------|--------------|
| dØ (mm)      | s1 (mm) |                 |  |                                                                                     |    |                                         | width               | depth |             |         |              |           |                                                         | 1 or 2 sides |
| up to        |         |                 |  |                                                                                     |    |                                         |                     |       |             |         |              |           |                                                         |              |
| Ø15/28       | 2.5     | -               |  | EI <b>90</b>                                                                        |    | flexible walls ≥ 100 mm                 | 10 mm               | 25 mm | 2 sides     | -       | 48 mm        | U/C + C/C | perpendicular +<br>all angles<br>between 90°<br>and 45° |              |
|              |         | -               |  | EI <b>240</b>                                                                       |    | rigid walls ≥ 150 mm                    | 15 mm               | 25 mm | 2 sides     | -       | 58 mm        | U/C + C/C |                                                         |              |
|              |         | -               |  | EI <b>240</b>                                                                       |    | rigid floors ≥ 150 mm                   | 15 mm               | 25 mm | 2 sides     | -       | 58 mm        | U/C + C/C |                                                         |              |
|              |         |                 |  |                                                                                     |    |                                         |                     |       |             |         |              |           |                                                         |              |
| Ø16/25       | 2.2     | -               |  | EI <b>120</b>                                                                       |    | flexible walls ≥ 100 mm                 | 10 mm               | 25 mm | 2 sides     | -       | 45 mm        | U/C + C/C |                                                         |              |
|              |         | -               |  | EI <b>90</b>                                                                        |    | <a href="#">CLT walls ≥ 100 mm</a>      | 10 mm               | 25 mm | 2 sides     | -       | 45 mm        | U/C + C/C |                                                         |              |
|              |         | -               |  | EI <b>240</b>                                                                       |    | rigid walls ≥ 150 mm                    | 15 mm               | 25 mm | 2 sides     | -       | 55 mm        | U/C + C/C |                                                         |              |
|              |         | -               |  | EI <b>240</b>                                                                       |    | rigid floors ≥ 150 mm                   | 15 mm               | 25 mm | 2 sides     | -       | 55 mm        | U/C + C/C |                                                         |              |
|              |         | -               |  | EI <b>90</b>                                                                        |    | <a href="#">CLT floors ≥ 140 mm</a>     | 15 mm               | 25 mm | 2 sides     | -       | 55 mm        | U/C + C/C |                                                         |              |
|              |         |                 |  |                                                                                     |    |                                         |                     |       |             |         |              |           |                                                         |              |
| max.         |         |                 |  |                                                                                     |    |                                         |                     |       |             |         |              |           |                                                         |              |
| Ø32/54       | 4.4     | -               |  | EI <b>60</b>                                                                        |    | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm               | 25 mm | 2 sides     | -       | 74 mm        | U/C + C/C |                                                         |              |
|              |         | -               |  | EI <b>180</b>                                                                       |    | <a href="#">rigid walls ≥ 150 mm</a>    | 15 mm               | 25 mm | 2 sides     | -       | 84 mm        | U/C + C/C |                                                         |              |
|              |         | -               |  | EI <b>180</b>                                                                       |    | <a href="#">rigid floors ≥ 150 mm</a>   | 15 mm               | 25 mm | 2 sides     | -       | 84 mm        | U/C + C/C |                                                         |              |

<sup>1)</sup> Penetration services must be supported; support distance  $\leq 500\text{mm}$  (wall) or  $\leq 400\text{mm}$  (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls  $\geq 100\text{mm}$  is also applicable for rigid walls  $\geq 100\text{mm}$ !

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls  $\geq 100\text{mm}$  is also applicable for **rigid walls**  $\geq 100\text{mm}$
- angle: perpendicular + all angles between  $90^\circ$  and  $45^\circ$
- 'eccentric to zero' position in opening is allowed

## principle detail

## Firesafe

tested property

fire resistance

test method

EN 1366-3

service no.

15-40r



## PE-Xa pipes

### FT Acrylic

| service type |         | pipe insulation |  | EI            | constructive element <sup>2)</sup>      | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle |                                                         |
|--------------|---------|-----------------|--|---------------|-----------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|------------|---------------------------------------------------------|
| dØ (mm)      | s1 (mm) |                 |  |               |                                         | width               | depth | 1 or 2 sides | required | in construction | configuration |            |                                                         |
| up to        |         |                 |  |               |                                         |                     |       |              |          |                 |               |            | perpendicular +<br>all angles<br>between 90°<br>and 45° |
| Ø15/28       | 2,5     | -               |  | EI <b>90</b>  | flexible walls ≥ 100 mm                 | 10 mm               | 25 mm | 2 sides      | -        | 48 mm           | U/C + C/C     |            |                                                         |
|              |         | -               |  | EI <b>240</b> | rigid walls ≥ 150 mm                    | 15 mm               | 25 mm | 2 sides      | -        | 58 mm           | U/C + C/C     |            |                                                         |
|              |         | -               |  | EI <b>240</b> | rigid floors ≥ 150 mm                   | 15 mm               | 25 mm | 2 sides      | -        | 58 mm           | U/C + C/C     |            |                                                         |
|              |         |                 |  |               |                                         |                     |       |              |          |                 |               |            |                                                         |
| Ø16/25       | 2,2     | -               |  | EI <b>120</b> | flexible walls ≥ 100 mm                 | 10 mm               | 25 mm | 2 sides      | -        | 45 mm           | U/C + C/C     |            |                                                         |
|              |         | -               |  | EI <b>90</b>  | <a href="#">CLT walls ≥ 100 mm</a>      | 10 mm               | 25 mm | 2 sides      | -        | 45 mm           | U/C + C/C     |            |                                                         |
|              |         | -               |  | EI <b>240</b> | rigid walls ≥ 150 mm                    | 15 mm               | 25 mm | 2 sides      | -        | 55 mm           | U/C + C/C     |            |                                                         |
|              |         | -               |  | EI <b>240</b> | rigid floors ≥ 150 mm                   | 15 mm               | 25 mm | 2 sides      | -        | 55 mm           | U/C + C/C     |            |                                                         |
|              |         | -               |  | EI <b>90</b>  | <a href="#">CLT floors ≥ 140 mm</a>     | 15 mm               | 25 mm | 2 sides      | -        | 55 mm           | U/C + C/C     |            |                                                         |
|              |         |                 |  |               |                                         |                     |       |              |          |                 |               |            |                                                         |
| max.         |         |                 |  |               |                                         |                     |       |              |          |                 |               |            |                                                         |
| Ø32/54       | 4,4     | -               |  | EI <b>60</b>  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm               | 25 mm | 2 sides      | -        | 74 mm           | U/C + C/C     |            |                                                         |
|              |         | -               |  | EI <b>180</b> | <a href="#">rigid walls ≥ 150 mm</a>    | 15 mm               | 25 mm | 2 sides      | -        | 84 mm           | U/C + C/C     |            |                                                         |
|              |         | -               |  | EI <b>180</b> | <a href="#">rigid floors ≥ 150 mm</a>   | 15 mm               | 25 mm | 2 sides      | -        | 84 mm           | U/C + C/C     |            |                                                         |

<sup>1)</sup> Penetration services must be supported; support distance  $\leq 500\text{mm}$  (wall) or  $\leq 400\text{mm}$  (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls  $\geq 100\text{mm}$  is also applicable for rigid walls  $\geq 100\text{mm}$ !

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°
- 'eccentric to zero' position in opening is allowed

## principle detail

## Firesafe

tested property

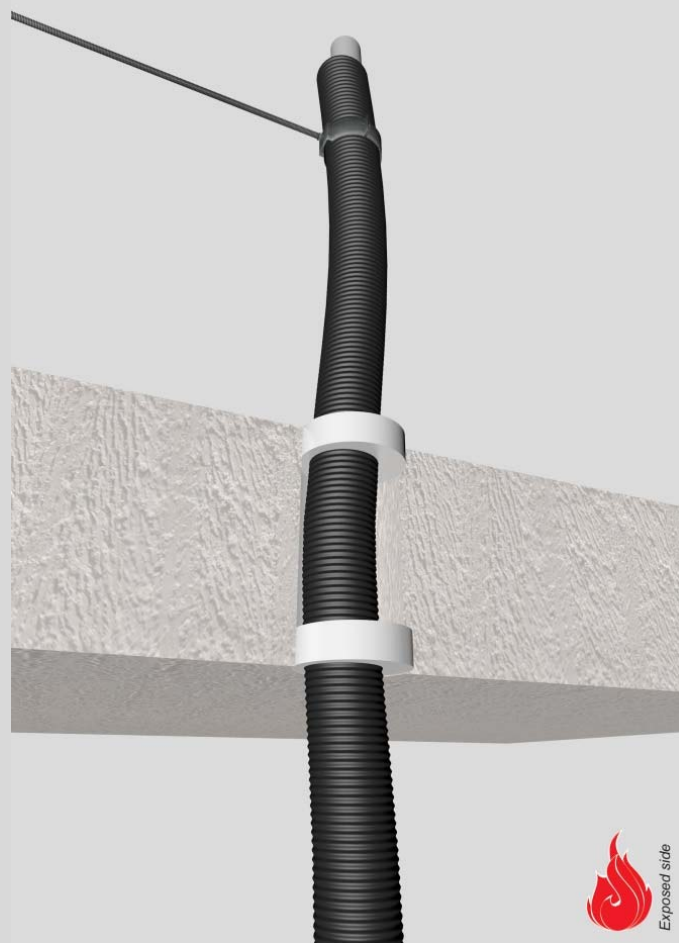
fire resistance

test method

EN 1366-3

service no.

17-3-9



## PE-Xa pipes

### FT Acrylic

| service type |         | pipe insulation | EI                                                                                  | constructive element <sup>2)</sup>      | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |  |
|--------------|---------|-----------------|-------------------------------------------------------------------------------------|-----------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|--|
| dØ (mm)      | s1 (mm) |                 |  |                                         | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |  |
| up to        |         |                 |                                                                                     |                                         |                     |       |              |          |                 |               |                                                         |  |
| Ø15/28       | 2,5     | -               | EI 90                                                                               | flexible walls ≥ 100 mm                 | 10 mm               | 25 mm | 2 sides      | -        | 48 mm           | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |  |
|              |         | -               | EI 240                                                                              | rigid walls ≥ 150 mm                    | 15 mm               | 25 mm | 2 sides      | -        | 58 mm           | U/C + C/C     |                                                         |  |
|              |         | -               | EI 240                                                                              | rigid floors ≥ 150 mm                   | 15 mm               | 25 mm | 2 sides      | -        | 58 mm           | U/C + C/C     |                                                         |  |
|              |         |                 |                                                                                     |                                         |                     |       |              |          |                 |               |                                                         |  |
| Ø16/25       | 2,2     | -               | EI 120                                                                              | flexible walls ≥ 100 mm                 | 10 mm               | 25 mm | 2 sides      | -        | 45 mm           | U/C + C/C     |                                                         |  |
|              |         | -               | EI 90                                                                               | <a href="#">CLT walls ≥ 100 mm</a>      | 10 mm               | 25 mm | 2 sides      | -        | 45 mm           | U/C + C/C     |                                                         |  |
|              |         | -               | EI 240                                                                              | rigid walls ≥ 150 mm                    | 15 mm               | 25 mm | 2 sides      | -        | 55 mm           | U/C + C/C     |                                                         |  |
|              |         | -               | EI 240                                                                              | rigid floors ≥ 150 mm                   | 15 mm               | 25 mm | 2 sides      | -        | 55 mm           | U/C + C/C     |                                                         |  |
|              |         | -               | EI 90                                                                               | <a href="#">CLT floors ≥ 140 mm</a>     | 15 mm               | 25 mm | 2 sides      | -        | 55 mm           | U/C + C/C     |                                                         |  |
|              |         |                 |                                                                                     |                                         |                     |       |              |          |                 |               |                                                         |  |
| max.         |         |                 |                                                                                     |                                         |                     |       |              |          |                 |               |                                                         |  |
| Ø32/54       | 4,4     | -               | EI 60                                                                               | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm               | 25 mm | 2 sides      | -        | 74 mm           | U/C + C/C     |                                                         |  |
|              |         | -               | EI 180                                                                              | <a href="#">rigid walls ≥ 150 mm</a>    | 15 mm               | 25 mm | 2 sides      | -        | 84 mm           | U/C + C/C     |                                                         |  |
|              |         | -               | EI 180                                                                              | <a href="#">rigid floors ≥ 150 mm</a>   | 15 mm               | 25 mm | 2 sides      | -        | 84 mm           | U/C + C/C     |                                                         |  |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls  $\geq 100\text{mm}$  is also applicable for **rigid walls**  $\geq 100\text{mm}$
- angle: perpendicular + all angles between  $90^\circ$  and  $45^\circ$
- 'eccentric to zero' position in opening is allowed

**principle detail****Firesafe**

tested property

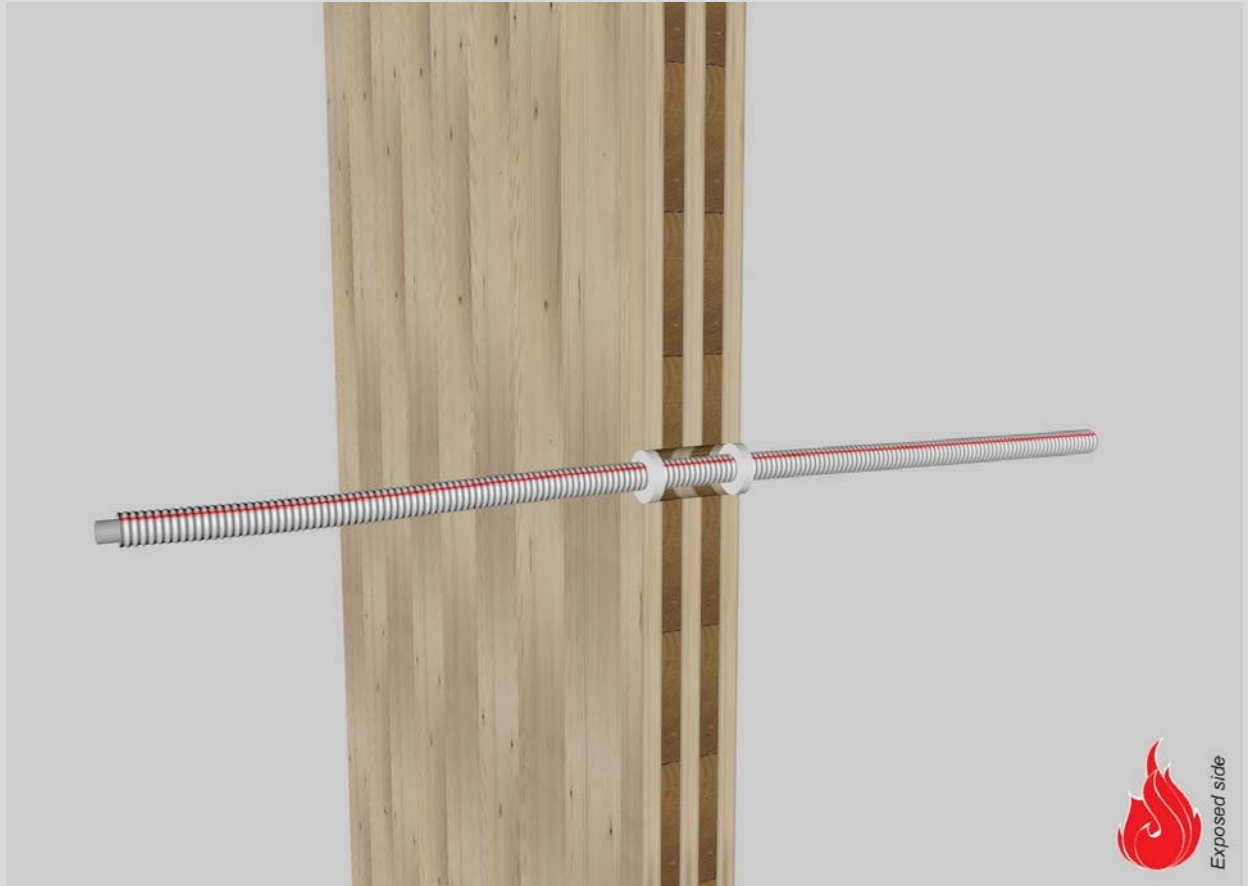
fire resistance

test method

EN 1366-3

service no.

27-5

**PE-Xa pipes****FT Acrylic**

| service type |         | pipe insulation | EI     | constructive element <sup>2)</sup>      | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end      | max. angle                                              |  |
|--------------|---------|-----------------|--------|-----------------------------------------|---------------------|-------|--------------|----------|-----------------|---------------|---------------------------------------------------------|--|
| dØ (mm)      | s1 (mm) |                 |        |                                         | width               | depth | 1 or 2 sides | required | in construction | configuration |                                                         |  |
| up to        |         |                 |        |                                         |                     |       |              |          |                 |               |                                                         |  |
| Ø15/28       | 2,5     | -               | EI 90  | flexible walls ≥ 100 mm                 | 10 mm               | 25 mm | 2 sides      | -        | 48 mm           | U/C + C/C     | perpendicular +<br>all angles<br>between 90°<br>and 45° |  |
|              |         | -               | EI 240 | rigid walls ≥ 150 mm                    | 15 mm               | 25 mm | 2 sides      | -        | 58 mm           | U/C + C/C     |                                                         |  |
|              |         | -               | EI 240 | rigid floors ≥ 150 mm                   | 15 mm               | 25 mm | 2 sides      | -        | 58 mm           | U/C + C/C     |                                                         |  |
|              |         |                 |        |                                         |                     |       |              |          |                 |               |                                                         |  |
| Ø16/25       | 2,2     | -               | EI 120 | flexible walls ≥ 100 mm                 | 10 mm               | 25 mm | 2 sides      | -        | 45 mm           | U/C + C/C     |                                                         |  |
|              |         | -               | EI 90  | <a href="#">CLT walls ≥ 100 mm</a>      | 10 mm               | 25 mm | 2 sides      | -        | 45 mm           | U/C + C/C     |                                                         |  |
|              |         | -               | EI 240 | rigid walls ≥ 150 mm                    | 15 mm               | 25 mm | 2 sides      | -        | 55 mm           | U/C + C/C     |                                                         |  |
|              |         | -               | EI 240 | rigid floors ≥ 150 mm                   | 15 mm               | 25 mm | 2 sides      | -        | 55 mm           | U/C + C/C     |                                                         |  |
|              |         | -               | EI 90  | <a href="#">CLT floors ≥ 140 mm</a>     | 15 mm               | 25 mm | 2 sides      | -        | 55 mm           | U/C + C/C     |                                                         |  |
| max.         |         |                 |        |                                         |                     |       |              |          |                 |               |                                                         |  |
| Ø32/54       | 4,4     | -               | EI 60  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm               | 25 mm | 2 sides      | -        | 74 mm           | U/C + C/C     |                                                         |  |
|              |         | -               | EI 180 | <a href="#">rigid walls ≥ 150 mm</a>    | 15 mm               | 25 mm | 2 sides      | -        | 84 mm           | U/C + C/C     |                                                         |  |
|              |         | -               | EI 180 | <a href="#">rigid floors ≥ 150 mm</a>   | 15 mm               | 25 mm | 2 sides      | -        | 84 mm           | U/C + C/C     |                                                         |  |

<sup>1)</sup> Penetration services must be supported; support distance  $\leq 500\text{mm}$  (wall) or  $\leq 400\text{mm}$  (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls  $\geq 100\text{mm}$  is also applicable for rigid walls  $\geq 100\text{mm}$ !

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls  $\geq 100\text{mm}$  is also applicable for **rigid walls**  $\geq 100\text{mm}$
- angle: perpendicular + all angles between 90° and 45°
- 'eccentric to zero' position in opening is allowed

**principle detail****Firesafe**

tested property

fire resistance

test method

EN 1366-3

service no.

28-31

**PE-Xa pipes****FT Acrylic**

| service type |         | pipe insulation |        | EI                                      | constructive element <sup>2)</sup> | Firesafe joint seal |         | application | backing | max. opening | pipe end                                                | max. angle |
|--------------|---------|-----------------|--------|-----------------------------------------|------------------------------------|---------------------|---------|-------------|---------|--------------|---------------------------------------------------------|------------|
| dØ (mm)      | s1 (mm) |                 |        |                                         |                                    | width               | depth   |             |         |              |                                                         |            |
| up to        |         |                 |        |                                         |                                    |                     |         |             |         |              |                                                         |            |
| Ø15/28       | 2,5     | -               | EI 90  | flexible walls ≥ 100 mm                 | 10 mm                              | 25 mm               | 2 sides | -           | 48 mm   | U/C + C/C    | perpendicular +<br>all angles<br>between 90°<br>and 45° |            |
|              |         | -               | EI 240 | rigid walls ≥ 150 mm                    | 15 mm                              | 25 mm               | 2 sides | -           | 58 mm   | U/C + C/C    |                                                         |            |
|              |         | -               | EI 240 | rigid floors ≥ 150 mm                   | 15 mm                              | 25 mm               | 2 sides | -           | 58 mm   | U/C + C/C    |                                                         |            |
|              |         |                 |        |                                         |                                    |                     |         |             |         |              |                                                         |            |
| Ø16/25       | 2,2     | -               | EI 120 | flexible walls ≥ 100 mm                 | 10 mm                              | 25 mm               | 2 sides | -           | 45 mm   | U/C + C/C    |                                                         |            |
|              |         | -               | EI 90  | <a href="#">CLT walls ≥ 100 mm</a>      | 10 mm                              | 25 mm               | 2 sides | -           | 45 mm   | U/C + C/C    |                                                         |            |
|              |         | -               | EI 240 | rigid walls ≥ 150 mm                    | 15 mm                              | 25 mm               | 2 sides | -           | 55 mm   | U/C + C/C    |                                                         |            |
|              |         | -               | EI 240 | rigid floors ≥ 150 mm                   | 15 mm                              | 25 mm               | 2 sides | -           | 55 mm   | U/C + C/C    |                                                         |            |
|              |         | -               | EI 90  | <a href="#">CLT floors ≥ 140 mm</a>     | 15 mm                              | 25 mm               | 2 sides | -           | 55 mm   | U/C + C/C    |                                                         |            |
|              |         |                 |        |                                         |                                    |                     |         |             |         |              |                                                         |            |
| max.         |         |                 |        |                                         |                                    |                     |         |             |         |              |                                                         |            |
| Ø32/54       | 4,4     | -               | EI 60  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm                              | 25 mm               | 2 sides | -           | 74 mm   | U/C + C/C    |                                                         |            |
|              |         | -               | EI 180 | <a href="#">rigid walls ≥ 150 mm</a>    | 15 mm                              | 25 mm               | 2 sides | -           | 84 mm   | U/C + C/C    |                                                         |            |
|              |         | -               | EI 180 | <a href="#">rigid floors ≥ 150 mm</a>   | 15 mm                              | 25 mm               | 2 sides | -           | 84 mm   | U/C + C/C    |                                                         |            |

<sup>1)</sup> Penetration services must be supported; support distance  $\leq 500\text{mm}$  (wall) or  $\leq 400\text{mm}$  (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls  $\geq 100\text{mm}$  is also applicable for rigid walls  $\geq 100\text{mm}$ !

| field of application                                                                                                                                                                                                                                             |                                                            |                 | fire resistance - EI classification acc. EN 13501-2 / EN 1366-3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                              |                                                                                                                    |                                              | Firesafe                                                                                                        |                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| metal pipe penetrations                                                                                                                                                                                                                                          |                                                            |                 | certification - EAD 350454-00-1104                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                              |                                                                                                                    |                                              |                                                                                                                 |                                             |
| COPPER classification ≤ Ø76 mm                                                                                                                                                                                                                                   |                                                            |                 | suitable Firesafe products within classification:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                              |                                                                                                                    |                                              |                                                                                                                 |                                             |
| Fire performances are valid for <b>range</b> of dØ pipe diameter + s1 pipe thickness within the same pipe material:<br><br>copper<br>dØ max. 76 mm<br>s1 max. 14,0 mm<br><br>pipe insulation brands eg Climpipe, Rockwool, Armaflex, U Protect Pipe Section Alu2 |                                                            |                 | FT Graphite<br>DoP CPR-16/0094                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                              | FT Acrylic or FT Paste<br>DoP CPR-16/0094                                                                          |                                              | Fire Wrap<br>DoP CPR-15/0339                                                                                    |                                             |
| dØ                                                                                                                                                                                                                                                               | s1                                                         | pipe insulation | walls                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | floors                                       | walls                                                                                                              | floors                                       | walls                                                                                                           | floors                                      |
| up to Ø28                                                                                                                                                                                                                                                        | 1,0 up to 1,2                                              | non-insulated   | individual results max.<br>EI 180 in wall                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | individual results max.<br>EI 180 in floor 5 | individual results max.<br>EI 120 in wall                                                                          | individual results max.<br>EI 120 in floor 5 |                                                                                                                 |                                             |
|                                                                                                                                                                                                                                                                  | up to Ø42<br>+ synth. rubber or rock wool (alu) insulation | 1,0 up to 14,0  | + pipe insulation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                              |                                                                                                                    |                                              |                                                                                                                 |                                             |
| + synth. rubber, min. 60 kg/m <sup>3</sup>                                                                                                                                                                                                                       |                                                            | 13mm            | EI 90 in wall 1+2+3<br>individual results max.<br>EI 60 in wall 1-n75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | individual results max.<br>EI 90 in floor 7  | individual results max.<br>EI 120 in wall 3                                                                        | individual results max.<br>EI 120 in floor 5 |                                                                                                                 | individual results max.<br>EI 90 in floor 7 |
|                                                                                                                                                                                                                                                                  |                                                            | 25mm            | EI 90 in wall 1+2+3<br>individual result:<br>EI 90 in wall 1-n100<br>individual results max.<br>EI 60 in wall 1-n75                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                              |                                                                                                                    |                                              |                                                                                                                 |                                             |
| + rock wool (alu), min. 90 kg/m <sup>3</sup>                                                                                                                                                                                                                     |                                                            | 25mm            | EI 60 in wall 1+2+3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                              | individual results max.<br>EI 90 in wall 1-n100<br>EI 60 in wall 1-n75<br>EI 120 in wall 3                         | individual results max.<br>EI 120 in floor 5 |                                                                                                                 |                                             |
|                                                                                                                                                                                                                                                                  |                                                            | 50mm            | EI 90 in wall 1+2+3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                              |                                                                                                                    |                                              |                                                                                                                 |                                             |
| up to Ø76<br>+ glass or rock wool (alu) insulation                                                                                                                                                                                                               |                                                            | 1,0 up to 2,1   | + pipe insulation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                              |                                                                                                                    |                                              |                                                                                                                 |                                             |
|                                                                                                                                                                                                                                                                  | + glass or rock wool (alu), min. 75 kg/m <sup>3</sup>      | 20 up to 30mm   | EI 90 in wall 1+2+3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | EI 90 in floor 5                             |                                                                                                                    |                                              | EI 90 in wall 1+2<br>EI 120 in wall 3<br>2 layer                                                                | EI 120 in floor 5<br>2 layer                |
|                                                                                                                                                                                                                                                                  |                                                            | 40mm            | EI 90 in wall 1+2+3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | EI 90 in floor 5                             |                                                                                                                    |                                              | EI 90 in wall 1+2<br>EI 120 in wall 3<br>1 layer                                                                | EI 120 in floor 5<br>2 layer                |
|                                                                                                                                                                                                                                                                  |                                                            | 50mm            | EI 90 in wall 1+2+3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | EI 90 in floor 5                             |                                                                                                                    |                                              | EI 90 in wall 1+2<br>EI 120 in wall 3<br>2 layer                                                                | EI 120 in floor 5<br>2 layer                |
|                                                                                                                                                                                                                                                                  |                                                            | 60mm            | EI 90 in wall 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | EI 90 in floor 5                             |                                                                                                                    |                                              | EI 60 in wall 1+2<br>EI 120 in wall 3<br>3 layer                                                                | EI 120 in floor 5<br>3 layer                |
|                                                                                                                                                                                                                                                                  |                                                            | 80mm            | EI 240 in wall 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | EI 240 in floor 5                            |                                                                                                                    |                                              | EI 60 in wall 1+2<br>EI 120 in wall 3<br>3 layer                                                                | EI 120 in floor 5<br>3 layer                |
|                                                                                                                                                                                                                                                                  |                                                            |                 | joint details: min. W x D, default:<br>walls: 10 x 25 mm, apply on 2 sides<br>floors: 15 x 25 mm, apply on 2 sides                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                              | joint details: min. W x D, default:<br>walls: 10 x 25 mm, apply on 2 sides<br>floors: 15 x 25 mm, apply on 2 sides |                                              | default:<br>walls: apply on 2 sides<br>floors: apply on 1 side<br>always apply smoke seal FT Acrylic on 2 sides |                                             |
| supporting construction                                                                                                                                                                                                                                          |                                                            |                 | Constructive element must be classified acc. EN 13501-2 for the required fire resistance period:<br>1: flexible wall ≥100mm, insulated<br>1-n100: flexible wall ≥100mm, non-insulated<br>1-n75: flexible wall ≥75mm, non-insulated<br>2: rigid wall ≥100mm<br>3: rigid wall ≥150mm<br>4: flexible ceiling ≥150mm<br>5: rigid floor ≥150mm<br>6: CLT wall ≥100mm<br>7: CLT floor ≥140mm<br><br>Max. opening in constructive element: see principle detail. Use FT Board if opening is larger; see how-to-read.<br><br>Penetration services must be supported;<br>support distance walls max. 500mm<br>support distance floors max. 400mm<br><br>Min. length pipe insulation LI / LS / CS / CI:<br>see principle detail.                                                                         |                                              |                                                                                                                    |                                              |                                                                                                                 |                                             |
|                                                                                                                                                                                                                                                                  |                                                            |                 | <a href="#">► INDEX</a><br><a href="#">PE + PP + PVC</a><br><a href="#">plastic cable conduits</a><br><a href="#">PP-R</a><br><a href="#">PP-MD</a><br><a href="#">PP-MX</a><br><a href="#">aluPE-X</a><br><a href="#">PE-Xa</a><br><a href="#">copper</a><br><a href="#">steel</a><br><a href="#">steel conduits</a><br><a href="#">cast iron</a><br><a href="#">trays + ladders + wire mesh</a><br><a href="#">cables + bundles</a><br><a href="#">fire dampers</a><br><a href="#">air transfer grilles</a><br><a href="#">duct cladding</a><br><a href="#">linear joints</a><br><a href="#">socket boxes</a><br><a href="#">blank seals</a><br><br><a href="#">EN norms for plastic pipes</a><br><a href="#">how-to-read</a><br><a href="#">acoustical</a><br><a href="#">environmental</a> |                                              |                                                                                                                    |                                              |                                                                                                                 |                                             |
| Firesafe FoA d22-1 - page 11                                                                                                                                                                                                                                     |                                                            |                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                              |                                                                                                                    |                                              |                                                                                                                 |                                             |

# Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

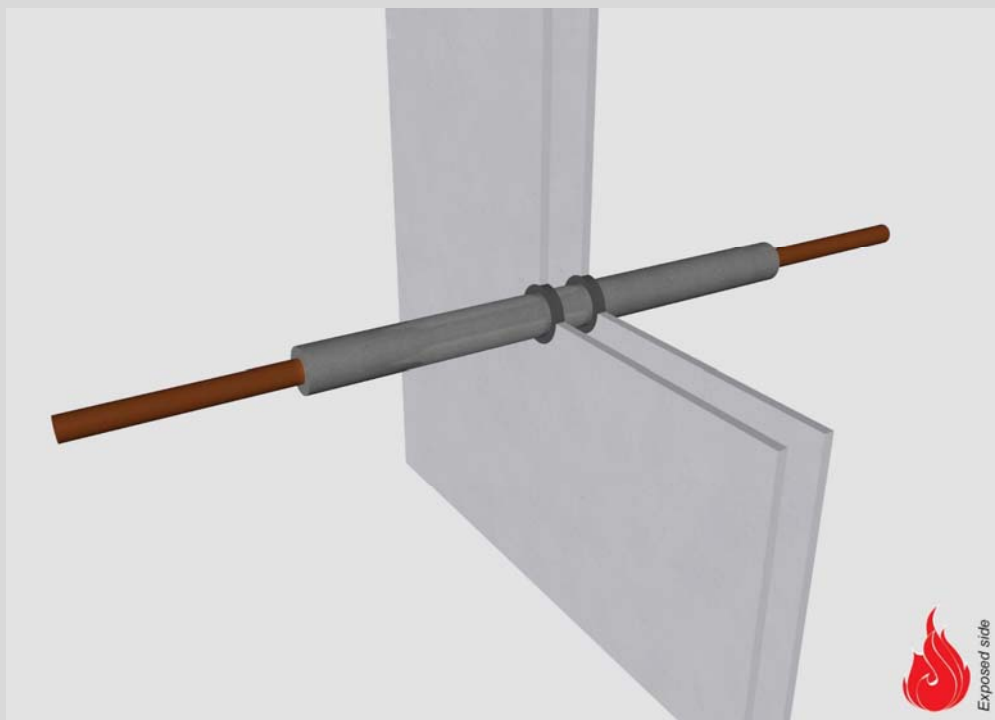
test method

service no.

fire resistance

EN 1366-3

31-20



## copper pipes

### FT Graphite

| service type <sup>1)</sup> |         |                      | pipe insulation                                                               |  |  | constructive element <sup>2)</sup> |       | Firesafe joint seal |          | application     |               | backing       |                 | max. opening |                                                | pipe end |  | max. angle |  |
|----------------------------|---------|----------------------|-------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------|------------------------------------|-------|---------------------|----------|-----------------|---------------|---------------|-----------------|--------------|------------------------------------------------|----------|--|------------|--|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m <sup>3</sup> eg Armalex<br>min. 90 kg/m <sup>3</sup> eg Rockwool |  |                                                                                     | width                              | depth | 1 or 2 sides        | required | in construction | configuration |               |                 |              |                                                |          |  |            |  |
| up to                      |         |                      |                                                                               |  |                                                                                     |                                    |       |                     |          |                 |               |               |                 |              |                                                |          |  |            |  |
| Ø12                        | 1,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 90                                                                               | CLT floors ≥ 140 mm                |       | 15 mm               | 25 mm    | 2 sides         | -             | 68 mm         | C/U + U/C + C/C |              | perpendicular + all angles between 90° and 45° |          |  |            |  |
| Ø15                        | 1,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 120                                                                              | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 61 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI                                      |  | EI 90                                                                               | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 85 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | rock wool 25 mm 700 LS + LI + CS + CI                                         |  | EI 90                                                                               | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 85 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | rock wool 50 mm 700 LS + LI + CS + CI                                         |  | EI 120                                                                              | flexible walls ≥ 100 mm            |       | 6 mm                | 25 mm    | 2 sides         | -             | 128 mm        | C/U + U/C + C/C |              |                                                |          |  |            |  |
| Ø22                        | 1,1     | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 60                                                                               | flexible walls ≥ 75 mm             |       | 10 mm               | 12,5 mm  | 2 sides         | -             | 68 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI                                      |  | EI 60                                                                               | flexible walls ≥ 75 mm             |       | 10 mm               | 12,5 mm  | 2 sides         | -             | 92 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 60                                                                               | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 600 x 1500 mm | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 90                                                                               | rigid floors ≥ 150 mm              |       | 10 mm               | 25 mm    | 2 sides         | -             | 68 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 60                                                                               | rigid floors ≥ 150 mm              |       | 10 mm               | 25 mm    | 2 sides         | -             | 600 x 5000 mm | C/U + U/C + C/C |              |                                                |          |  |            |  |
| Ø28                        | 1,2     | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 60                                                                               | flexible walls ≥ 75 mm             |       | 10 mm               | 12,5 mm  | 2 sides         | -             | 74 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI                                      |  | EI 60                                                                               | flexible walls ≥ 75 mm             |       | 10 mm               | 12,5 mm  | 2 sides         | -             | 98 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
| Ø35                        | 1,5     |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 90                                                                               | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 81 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI                                      |  | EI 90                                                                               | flexible walls ≥ 100 mm            |       | 6 mm                | 25 mm    | 2 sides         | -             | 98 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | rock wool 25 mm 700 LS + LI + CS + CI                                         |  | EI 60                                                                               | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 105 mm        | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | rock wool 50 mm 700 LS + LI + CS + CI                                         |  | EI 90                                                                               | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 155 mm        | C/U + U/C + C/C |              |                                                |          |  |            |  |
| max.                       |         |                      |                                                                               |  |                                                                                     |                                    |       |                     |          |                 |               |               |                 |              |                                                |          |  |            |  |
| Ø42                        | 1,5     | non-insulated walls  | synth. rubber 25mm CS + CI                                                    |  | EI 90                                                                               | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 112 mm        | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 30                                                                               | flexible walls ≥ 75 mm             |       | 10 mm               | 12,5 mm  | 2 sides         | -             | 88 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI                                      |  | EI 60                                                                               | flexible walls ≥ 75 mm             |       | 10 mm               | 12,5 mm  | 2 sides         | -             | 112 mm        | C/U + U/C + C/C |              |                                                |          |  |            |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

# Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

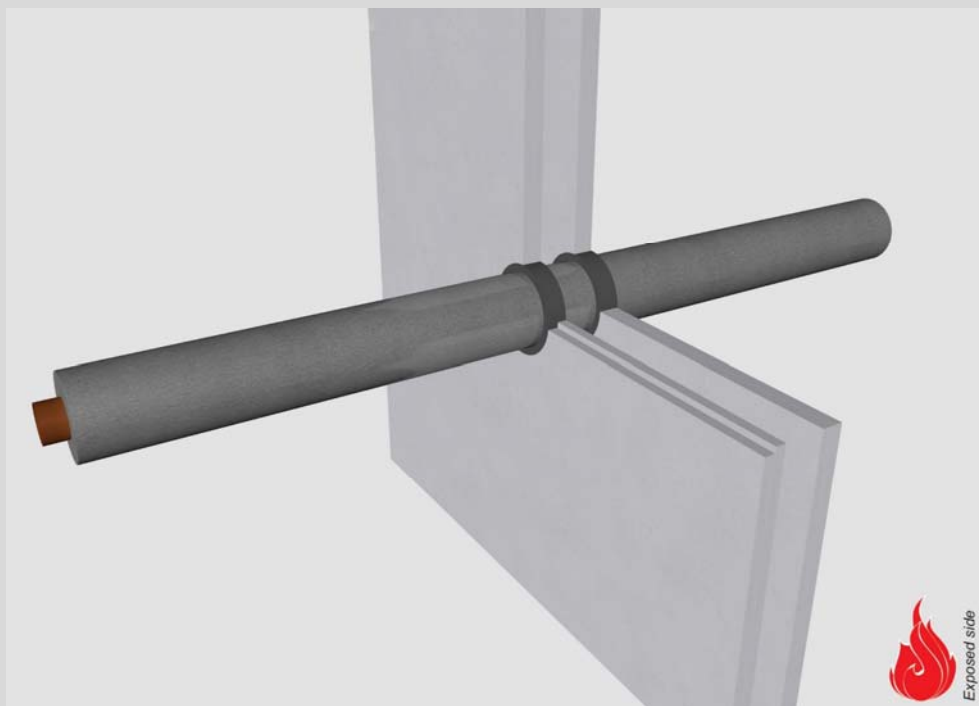
test method

service no.

fire resistance

EN 1366-3

30-28



## copper pipes

### FT Graphite

| service type <sup>1)</sup> |         |                      | pipe insulation                                                               |  |  EI | constructive element <sup>2)</sup> |       | Firesafe joint seal |          | application     |               | backing       |                 | max. opening |                                                | pipe end |  | max. angle |  |
|----------------------------|---------|----------------------|-------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------|------------------------------------|-------|---------------------|----------|-----------------|---------------|---------------|-----------------|--------------|------------------------------------------------|----------|--|------------|--|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m <sup>3</sup> eg Armalex<br>min. 90 kg/m <sup>3</sup> eg Rockwool |  |                                                                                        | width                              | depth | 1 or 2 sides        | required | in construction | configuration |               |                 |              |                                                |          |  |            |  |
| up to                      |         |                      |                                                                               |  |                                                                                        |                                    |       |                     |          |                 |               |               |                 |              |                                                |          |  |            |  |
| Ø12                        | 1,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 90                                                                                  | CLT floors ≥ 140 mm                |       | 15 mm               | 25 mm    | 2 sides         | -             | 68 mm         | C/U + U/C + C/C |              | perpendicular + all angles between 90° and 45° |          |  |            |  |
| Ø15                        | 1,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 120                                                                                 | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 61 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI                                      |  | EI 90                                                                                  | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 85 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | rock wool 25 mm 700 LS + LI + CS + CI                                         |  | EI 90                                                                                  | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 85 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | rock wool 50 mm 700 LS + LI + CS + CI                                         |  | EI 120                                                                                 | flexible walls ≥ 100 mm            |       | 6 mm                | 25 mm    | 2 sides         | -             | 128 mm        | C/U + U/C + C/C |              |                                                |          |  |            |  |
| Ø22                        | 1,1     | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 60                                                                                  | flexible walls ≥ 75 mm             |       | 10 mm               | 12,5 mm  | 2 sides         | -             | 68 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI                                      |  | EI 60                                                                                  | flexible walls ≥ 75 mm             |       | 10 mm               | 12,5 mm  | 2 sides         | -             | 92 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 60                                                                                  | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 600 x 1500 mm | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 90                                                                                  | rigid floors ≥ 150 mm              |       | 10 mm               | 25 mm    | 2 sides         | -             | 68 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 60                                                                                  | rigid floors ≥ 150 mm              |       | 10 mm               | 25 mm    | 2 sides         | -             | 600 x 5000 mm | C/U + U/C + C/C |              |                                                |          |  |            |  |
| Ø28                        | 1,2     | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 60                                                                                  | flexible walls ≥ 75 mm             |       | 10 mm               | 12,5 mm  | 2 sides         | -             | 74 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI                                      |  | EI 60                                                                                  | flexible walls ≥ 75 mm             |       | 10 mm               | 12,5 mm  | 2 sides         | -             | 98 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
| Ø35                        | 1,5     |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 90                                                                                  | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 81 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI                                      |  | EI 90                                                                                  | flexible walls ≥ 100 mm            |       | 6 mm                | 25 mm    | 2 sides         | -             | 98 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | rock wool 25 mm 700 LS + LI + CS + CI                                         |  | EI 60                                                                                  | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 105 mm        | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         |                      | rock wool 50 mm 700 LS + LI + CS + CI                                         |  | EI 90                                                                                  | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 155 mm        | C/U + U/C + C/C |              |                                                |          |  |            |  |
| max.                       |         |                      |                                                                               |  |                                                                                        |                                    |       |                     |          |                 |               |               |                 |              |                                                |          |  |            |  |
| Ø42                        | 1,5     | non-insulated walls  | synth. rubber 25mm CS + CI                                                    |  | EI 90                                                                                  | flexible walls ≥ 100 mm            |       | 10 mm               | 25 mm    | 2 sides         | -             | 112 mm        | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI                                      |  | EI 30                                                                                  | flexible walls ≥ 75 mm             |       | 10 mm               | 12,5 mm  | 2 sides         | -             | 88 mm         | C/U + U/C + C/C |              |                                                |          |  |            |  |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI                                      |  | EI 60                                                                                  | flexible walls ≥ 75 mm             |       | 10 mm               | 12,5 mm  | 2 sides         | -             | 112 mm        | C/U + U/C + C/C |              |                                                |          |  |            |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

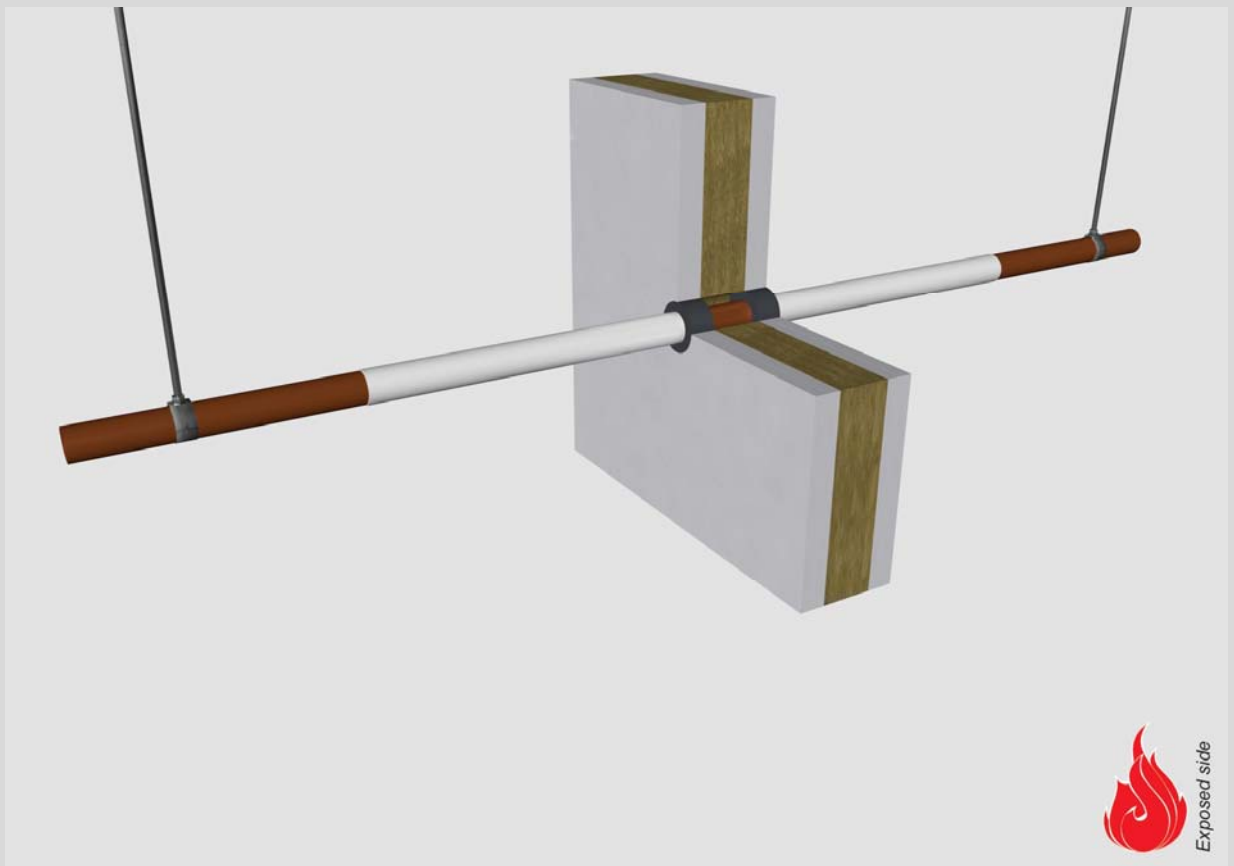
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

tested property  
test method  
service no.

## Firesafe

fire resistance  
EN 1366-3  
0298



## copper pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe insulation      | EI                                                                                  | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end        | max. angle                                     |
|----------------------------|---------|----------------------|-------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|-----------------|------------------------------------------------|
| dØ (mm)                    | s1 (mm) | FT Coating DFT 0,8mm |  |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration   |                                                |
| Ø8                         | 1,0     | FT Coating 200 LI    | EI <b>90</b>                                                                        | flexible walls ≥ 100 mm            | -                   |       | 2 sides      | -        | 8 mm            | C/U + U/C + C/C | perpendicular + all angles between 90° and 45° |
| Ø12                        | 1,0     | FT Coating 300 LI    | EI <b>90</b>                                                                        | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 32 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>120</b>                                                                       | rigid walls ≥ 150 mm               | 10 mm               | 25 mm | 2 sides      | -        | 32 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>120</b>                                                                       | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 32 mm           | C/U + U/C + C/C |                                                |
| Ø15                        | 1,0     | -                    | EI <b>60</b>                                                                        | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 35 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>120</b>                                                                       | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 35 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>120</b>                                                                       | rigid walls ≥ 150 mm               | 14 mm               | 25 mm | 2 sides      | -        | 44 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>120</b>                                                                       | rigid floors ≥ 150 mm              | 14 mm               | 25 mm | 2 sides      | -        | 44 mm           | C/U + U/C + C/C |                                                |
| Ø22                        | 1,1     | FT Coating 300 LI    | EI <b>60</b>                                                                        | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 42 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>120</b>                                                                       | rigid walls ≥ 150 mm               | 10 mm               | 25 mm | 2 sides      | -        | 44 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>120</b>                                                                       | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 44 mm           | C/U + U/C + C/C |                                                |
| max.                       |         |                      |                                                                                     |                                    |                     |       |              |          |                 |                 |                                                |
| Ø28                        | 1,2     | FT Coating 300 LI    | EI <b>60</b>                                                                        | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 48 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>90</b>                                                                        | rigid walls ≥ 150 mm               | 10 mm               | 25 mm | 2 sides      | -        | 50 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>90</b>                                                                        | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 50 mm           | C/U + U/C + C/C |                                                |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

# Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

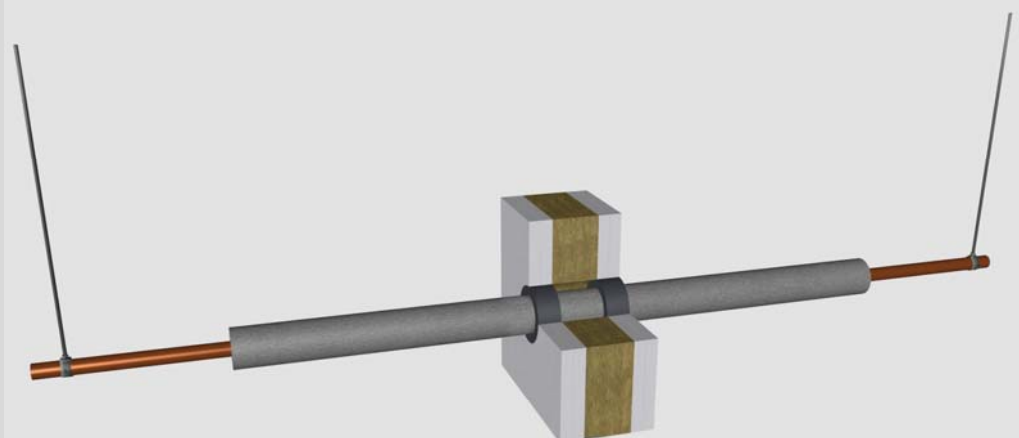
test method

service no.

fire resistance

EN 1366-3

0061



## copper pipes

| service type <sup>1)</sup> |         |                      | pipe insulation                          |                           |  | EI                      | constructive element <sup>2)</sup> | Firesafe joint seal |         | application | backing required | max. opening in construction | pipe end configuration                         | max. angle |
|----------------------------|---------|----------------------|------------------------------------------|---------------------------|-------------------------------------------------------------------------------------|-------------------------|------------------------------------|---------------------|---------|-------------|------------------|------------------------------|------------------------------------------------|------------|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m³ eg Armaflex                | min. 90 kg/m³ eg Rockwool |                                                                                     |                         |                                    | width               | depth   |             |                  |                              |                                                |            |
| up to                      |         |                      |                                          |                           |                                                                                     |                         |                                    |                     |         |             |                  |                              |                                                |            |
| Ø12                        | 1,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                           | EI 90                                                                               | CLT floors ≥ 140 mm     | 15 mm                              | 25 mm               | 2 sides | -           | 68 mm            | C/U + U/C + C/C              | perpendicular + all angles between 90° and 45° |            |
| Ø15                        | 1,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                           | EI 120                                                                              | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 61 mm            | C/U + U/C + C/C              |                                                |            |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI |                           | EI 90                                                                               | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 85 mm            | C/U + U/C + C/C              |                                                |            |
|                            |         |                      | rock wool 25 mm 700 LS + LI + CS + CI    |                           | EI 90                                                                               | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 85 mm            | C/U + U/C + C/C              |                                                |            |
|                            |         |                      | rock wool 50 mm 700 LS + LI + CS + CI    |                           | EI 120                                                                              | flexible walls ≥ 100 mm | 6 mm                               | 25 mm               | 2 sides | -           | 128 mm           | C/U + U/C + C/C              |                                                |            |
| Ø22                        | 1,1     | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI |                           | EI 60                                                                               | flexible walls ≥ 75 mm  | 10 mm                              | 25 mm               | 2 sides | -           | 68 mm            | C/U + U/C + C/C              |                                                |            |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI |                           | EI 60                                                                               | flexible walls ≥ 75 mm  | 10 mm                              | 25 mm               | 2 sides | -           | 92 mm            | C/U + U/C + C/C              |                                                |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                           | EI 60                                                                               | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 600 x 1500 mm    | C/U + U/C + C/C              |                                                |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                           | EI 90                                                                               | rigid floors ≥ 150 mm   | 10 mm                              | 25 mm               | 2 sides | -           | 68 mm            | C/U + U/C + C/C              |                                                |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                           | EI 60                                                                               | rigid floors ≥ 150 mm   | 10 mm                              | 25 mm               | 2 sides | -           | 600 x 5000 mm    | C/U + U/C + C/C              |                                                |            |
| Ø28                        | 1,2     | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI |                           | EI 60                                                                               | flexible walls ≥ 75 mm  | 10 mm                              | 25 mm               | 2 sides | -           | 74 mm            | C/U + U/C + C/C              |                                                |            |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI |                           | EI 60                                                                               | flexible walls ≥ 75 mm  | 10 mm                              | 25 mm               | 2 sides | -           | 98 mm            | C/U + U/C + C/C              |                                                |            |
| Ø35                        | 1,5     |                      | synth. rubber 13mm 700 LS + LI + CS + CI |                           | EI 90                                                                               | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 81 mm            | C/U + U/C + C/C              |                                                |            |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI |                           | EI 90                                                                               | flexible walls ≥ 100 mm | 6 mm                               | 25 mm               | 2 sides | -           | 98 mm            | C/U + U/C + C/C              |                                                |            |
|                            |         |                      | rock wool 25 mm 700 LS + LI + CS + CI    |                           | EI 60                                                                               | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 105 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         |                      | rock wool 50 mm 700 LS + LI + CS + CI    |                           | EI 90                                                                               | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 155 mm           | C/U + U/C + C/C              |                                                |            |
| max.                       |         |                      |                                          |                           |                                                                                     |                         |                                    |                     |         |             |                  |                              |                                                |            |
| Ø42                        | 1,5     | non-insulated walls  | synth. rubber 25mm CS + CI               |                           | EI 90                                                                               | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 112 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI |                           | EI 30                                                                               | flexible walls ≥ 75 mm  | 10 mm                              | 25 mm               | 2 sides | -           | 88 mm            | C/U + U/C + C/C              |                                                |            |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI |                           | EI 60                                                                               | flexible walls ≥ 75 mm  | 10 mm                              | 25 mm               | 2 sides | -           | 112 mm           | C/U + U/C + C/C              |                                                |            |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

# Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

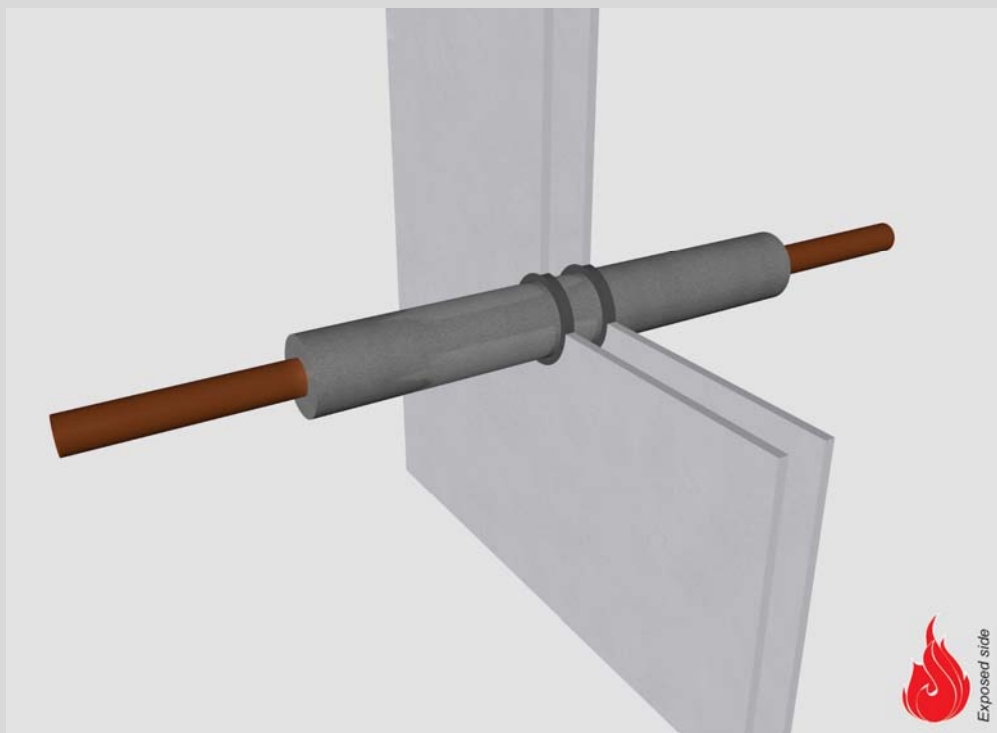
test method

service no.

fire resistance

EN 1366-3

31-23



## copper pipes

### FT Graphite

| service type <sup>1)</sup> |         |                      | pipe insulation                                                                |  | EI     | constructive element <sup>2)</sup> | Firesafe joint seal |         | application  |          | backing         |  | max. opening    |  | pipe end configuration                         |  | max. angle |  |  |
|----------------------------|---------|----------------------|--------------------------------------------------------------------------------|--|--------|------------------------------------|---------------------|---------|--------------|----------|-----------------|--|-----------------|--|------------------------------------------------|--|------------|--|--|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m <sup>3</sup> eg Amalexex<br>min. 90 kg/m <sup>3</sup> eg Rockwool |  |        |                                    | width               | depth   | 1 or 2 sides | required | in construction |  | configuration   |  |                                                |  |            |  |  |
| up to                      |         |                      |                                                                                |  |        |                                    |                     |         |              |          |                 |  |                 |  |                                                |  |            |  |  |
| Ø12                        | 1,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                       |  | EI 90  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm   | 2 sides      | -        | 68 mm           |  | C/U + U/C + C/C |  | perpendicular + all angles between 90° and 45° |  |            |  |  |
| Ø15                        | 1,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                       |  | EI 120 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 61 mm           |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI                                       |  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 85 mm           |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
|                            |         |                      | rock wool 25 mm 700 LS + LI + CS + CI                                          |  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 85 mm           |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
|                            |         |                      | rock wool 50 mm 700 LS + LI + CS + CI                                          |  | EI 120 | flexible walls ≥ 100 mm            | 6 mm                | 25 mm   | 2 sides      | -        | 128 mm          |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
| Ø22                        | 1,1     | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI                                       |  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides      | -        | 68 mm           |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI                                       |  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides      | -        | 92 mm           |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                       |  | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 600 x 1500 mm   |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                       |  | EI 90  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm   | 2 sides      | -        | 68 mm           |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                       |  | EI 60  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm   | 2 sides      | -        | 600 x 5000 mm   |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
| Ø28                        | 1,2     | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI                                       |  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides      | -        | 74 mm           |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI                                       |  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides      | -        | 98 mm           |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
| Ø35                        | 1,5     |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                       |  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 81 mm           |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI                                       |  | EI 90  | flexible walls ≥ 100 mm            | 6 mm                | 25 mm   | 2 sides      | -        | 98 mm           |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
|                            |         |                      | rock wool 25 mm 700 LS + LI + CS + CI                                          |  | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 105 mm          |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
|                            |         |                      | rock wool 50 mm 700 LS + LI + CS + CI                                          |  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 155 mm          |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
| max.                       |         |                      |                                                                                |  |        |                                    |                     |         |              |          |                 |  |                 |  |                                                |  |            |  |  |
| Ø42                        | 1,5     | non-insulated walls  | synth. rubber 25mm CS + CI                                                     |  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 112 mm          |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
|                            |         | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI                                       |  | EI 30  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides      | -        | 88 mm           |  | C/U + U/C + C/C |  |                                                |  |            |  |  |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI                                       |  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides      | -        | 112 mm          |  | C/U + U/C + C/C |  |                                                |  |            |  |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

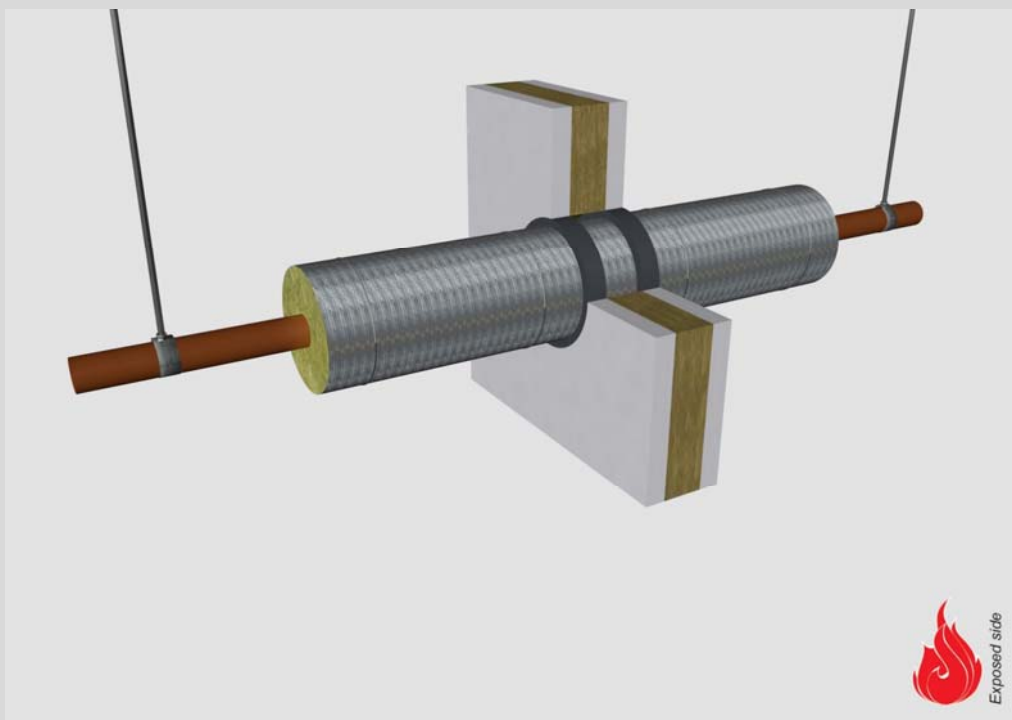
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
0225



## copper pipes

| service type <sup>1)</sup> |         | pipe insulation     | EI                                       | constructive element <sup>2)</sup> | Firesafe joint seal     |       | application | backing required | max. opening in construction | pipe end configuration | max. angle      |
|----------------------------|---------|---------------------|------------------------------------------|------------------------------------|-------------------------|-------|-------------|------------------|------------------------------|------------------------|-----------------|
| dØ (mm)                    | s1 (mm) |                     |                                          |                                    | width                   | depth |             |                  |                              |                        |                 |
| up to                      |         |                     |                                          |                                    |                         |       |             |                  |                              |                        |                 |
| Ø12                        | 1,0     |                     | synth. rubber 13mm 700 LS + LI + CS + CI | EI 90                              | CLT floors ≥ 140 mm     | 15 mm | 25 mm       | 2 sides          | -                            | 68 mm                  | C/U + U/C + C/C |
| Ø15                        | 1,0     |                     | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                             | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides          | -                            | 61 mm                  | C/U + U/C + C/C |
|                            |         |                     | synth. rubber 25mm 700 LS + LI + CS + CI | EI 90                              | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides          | -                            | 85 mm                  | C/U + U/C + C/C |
|                            |         |                     | rock wool 25 mm 700 LS + LI + CS + CI    | EI 90                              | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides          | -                            | 85 mm                  | C/U + U/C + C/C |
|                            |         |                     | rock wool 50 mm 700 LS + LI + CS + CI    | EI 120                             | flexible walls ≥ 100 mm | 6 mm  | 25 mm       | 2 sides          | -                            | 128 mm                 | C/U + U/C + C/C |
| Ø22                        | 1,1     | non-insulated walls | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60                              | flexible walls ≥ 75 mm  | 10 mm | 25 mm       | 2 sides          | -                            | 68 mm                  | C/U + U/C + C/C |
|                            |         | non-insulated walls | synth. rubber 25mm 700 LS + LI + CS + CI | EI 60                              | flexible walls ≥ 75 mm  | 10 mm | 25 mm       | 2 sides          | -                            | 92 mm                  | C/U + U/C + C/C |
|                            |         |                     | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60                              | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides          | -                            | 600 x 1500 mm          | C/U + U/C + C/C |
|                            |         |                     | synth. rubber 13mm 700 LS + LI + CS + CI | EI 90                              | rigid floors ≥ 150 mm   | 10 mm | 25 mm       | 2 sides          | -                            | 68 mm                  | C/U + U/C + C/C |
|                            |         |                     | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60                              | rigid floors ≥ 150 mm   | 10 mm | 25 mm       | 2 sides          | -                            | 600 x 5000 mm          | C/U + U/C + C/C |
| Ø28                        | 1,2     | non-insulated walls | synth. rubber 13mm 700 LS + LI + CS + CI | EI 60                              | flexible walls ≥ 75 mm  | 10 mm | 25 mm       | 2 sides          | -                            | 74 mm                  | C/U + U/C + C/C |
|                            |         | non-insulated walls | synth. rubber 25mm 700 LS + LI + CS + CI | EI 60                              | flexible walls ≥ 75 mm  | 10 mm | 25 mm       | 2 sides          | -                            | 98 mm                  | C/U + U/C + C/C |
| Ø35                        | 1,5     |                     | synth. rubber 13mm 700 LS + LI + CS + CI | EI 90                              | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides          | -                            | 81 mm                  | C/U + U/C + C/C |
|                            |         |                     | synth. rubber 25mm 700 LS + LI + CS + CI | EI 90                              | flexible walls ≥ 100 mm | 6 mm  | 25 mm       | 2 sides          | -                            | 98 mm                  | C/U + U/C + C/C |
|                            |         |                     | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                              | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides          | -                            | 105 mm                 | C/U + U/C + C/C |
|                            |         |                     | rock wool 50 mm 700 LS + LI + CS + CI    | EI 90                              | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides          | -                            | 155 mm                 | C/U + U/C + C/C |
| max.                       |         |                     |                                          |                                    |                         |       |             |                  |                              |                        |                 |
| Ø42                        | 1,5     | non-insulated walls | synth. rubber 25mm CS + CI               | EI 90                              | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides          | -                            | 112 mm                 | C/U + U/C + C/C |
|                            |         | non-insulated walls | synth. rubber 13mm 700 LS + LI + CS + CI | EI 30                              | flexible walls ≥ 75 mm  | 10 mm | 25 mm       | 2 sides          | -                            | 88 mm                  | C/U + U/C + C/C |
|                            |         | non-insulated walls | synth. rubber 25mm 700 LS + LI + CS + CI | EI 60                              | flexible walls ≥ 75 mm  | 10 mm | 25 mm       | 2 sides          | -                            | 112 mm                 | C/U + U/C + C/C |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

### tested property

### test method

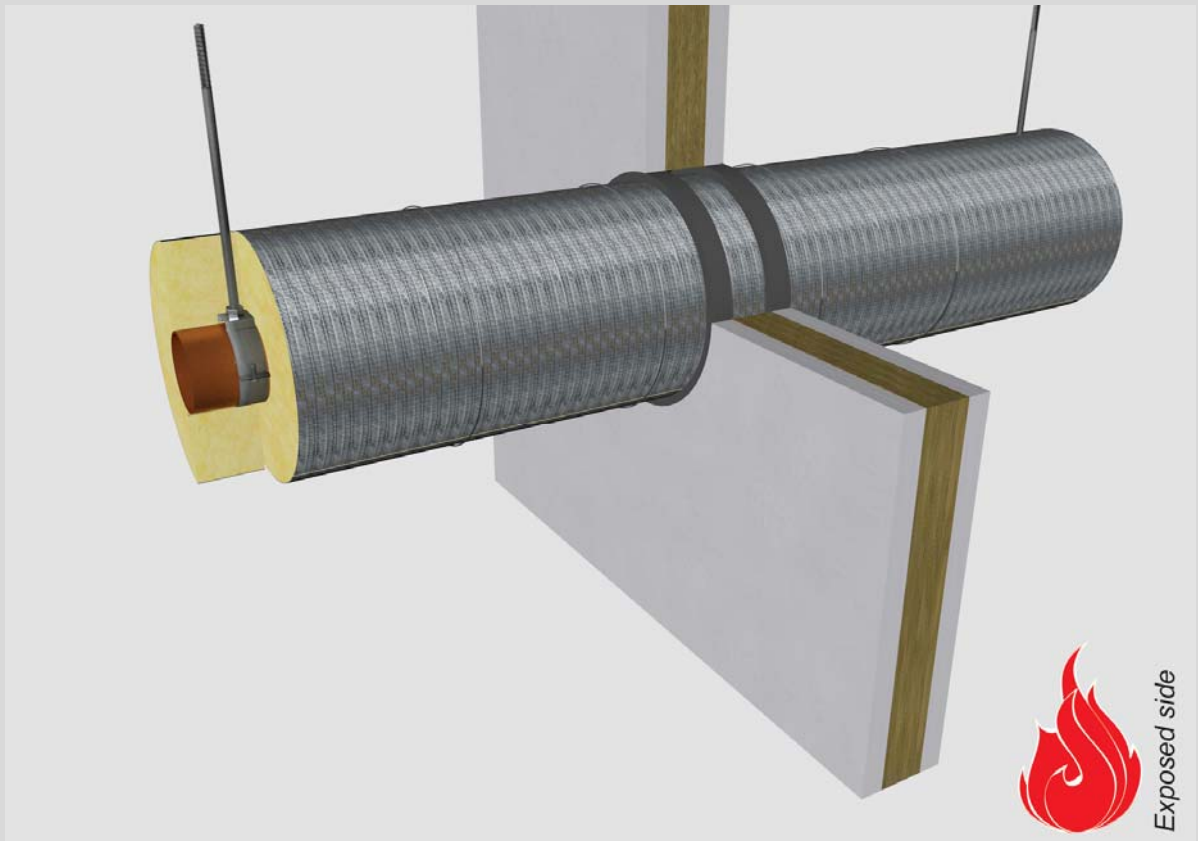
### service no.

## Firesafe

### fire resistance

EN 1366-3

21-7



## copper pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe insulation <sup>2)</sup>       |                                | EI     | constructive element <sup>3)</sup> | Firesafe joint seal |       | application | backing required | max. opening in construction | pipe end configuration | max. angle                                     |
|----------------------------|---------|-------------------------------------|--------------------------------|--------|------------------------------------|---------------------|-------|-------------|------------------|------------------------------|------------------------|------------------------------------------------|
| dØ (mm)                    | s1 (mm) | min. 75 kg/m³ eg Climpipe, Rockwool | or U Protect Pipe Section Alu2 |        |                                    | width               | depth |             |                  |                              |                        |                                                |
| Ø15                        | 1,0     | glass / rock wool 20mm              | 1200 CS + CI                   | EI 120 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 75 mm                        | C/U + U/C + C/C        | perpendicular + all angles between 90° and 45° |
|                            |         |                                     | 20mm 1200 CS + CI              | EI 240 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -                | 85 mm                        | U/C + C/C              |                                                |
|                            |         |                                     | 30mm 1200 CS + CI              | EI 120 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 95 mm                        | C/U + U/C + C/C        |                                                |
|                            |         |                                     | 30mm 1200 CS + CI              | EI 240 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -                | 105 mm                       | U/C + C/C              |                                                |
|                            |         |                                     | 40mm 1200 CS + CI              | EI 120 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 115 mm                       | C/U + U/C + C/C        |                                                |
|                            |         |                                     | 40mm 1200 CS + CI              | EI 240 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -                | 125 mm                       | U/C + C/C              |                                                |
|                            |         |                                     | 50mm 1200 CS + CI              | EI 120 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 135 mm                       | C/U + U/C + C/C        |                                                |
|                            |         |                                     | 50mm 1200 CS + CI              | EI 240 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -                | 145 mm                       | U/C + C/C              |                                                |
| max.<br>Ø76                | 2,1     | glass / rock wool 20mm              | 1200 CS + CI                   | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 136 mm                       | C/U + U/C + C/C        |                                                |
|                            |         |                                     | 20mm 1200 CS + CI              | EI 90  | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -                | 150 mm                       | U/C + C/C              |                                                |
|                            |         |                                     | 30mm 1200 CS + CI              | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 156 mm                       | C/U + U/C + C/C        |                                                |
|                            |         |                                     | 30mm 1200 CS + CI              | EI 90  | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -                | 166 mm                       | U/C + C/C              |                                                |
|                            |         |                                     | 40mm 1200 CS + CI              | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 176 mm                       | C/U + U/C + C/C        |                                                |
|                            |         |                                     | 40mm 1200 CS + CI              | EI 90  | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -                | 186 mm                       | U/C + C/C              |                                                |
|                            |         |                                     | 50mm 1200 CS + CI              | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 196 mm                       | C/U + U/C + C/C        |                                                |
|                            |         |                                     | 50mm 1200 CS + CI              | EI 90  | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -                | 206 mm                       | U/C + C/C              |                                                |
|                            |         |                                     | 60mm 1200 CS + CI              | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 216 mm                       | C/U + U/C + C/C        |                                                |
|                            |         |                                     | 60mm 1200 CS + CI              | EI 90  | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -                | 226 mm                       | U/C + C/C              |                                                |
|                            |         |                                     | 80mm 1200 CS + CI              | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 256 mm                       | C/U + U/C + C/C        |                                                |
|                            |         |                                     | 80mm 1200 CS + CI              | EI 240 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -                | 266 mm                       | U/C + C/C              |                                                |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Pipe insulation must be fastened individually (not wrapped!) with steel wire: at max. 50mm + 300mm from constructive element.

<sup>3)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

tested property

test method

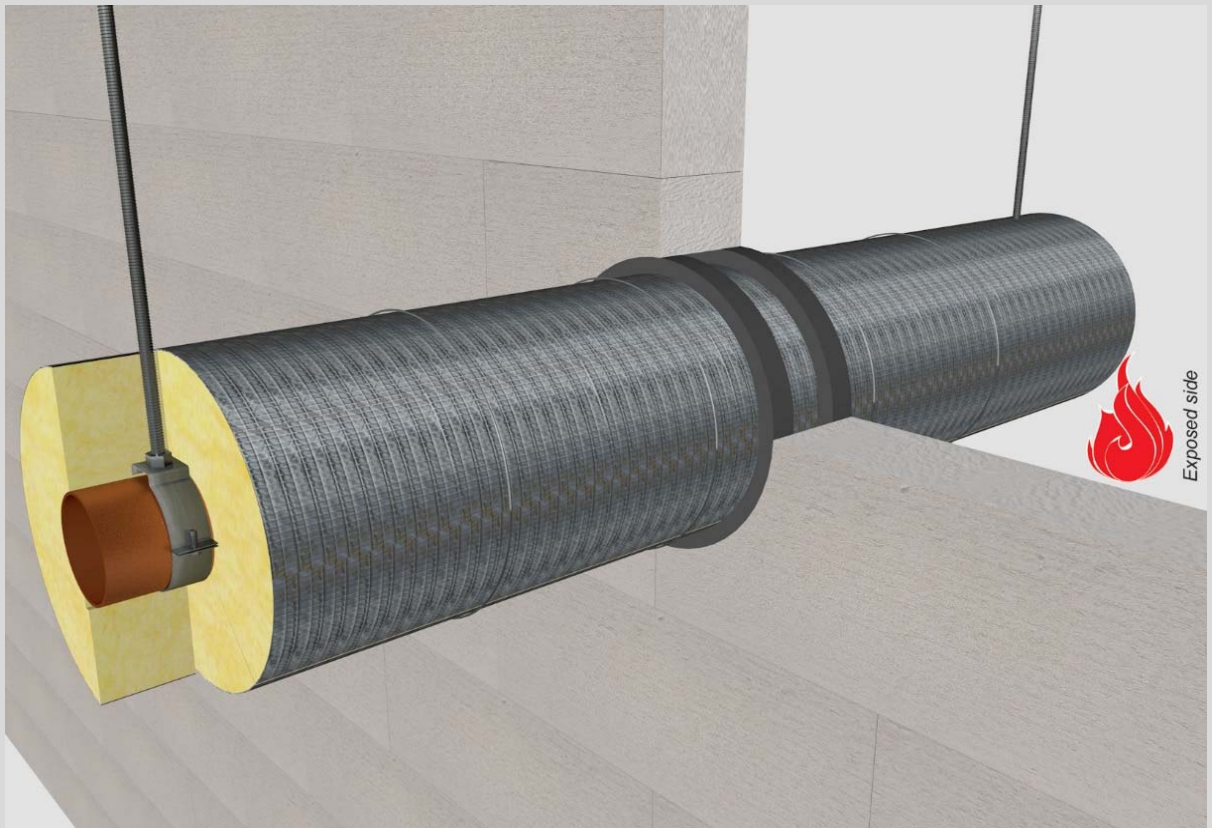
service no.

## Firesafe

fire resistance

EN 1366-3

21-7r



## copper pipes

### FT Graphite

| service type <sup>1)</sup> |              | pipe insulation <sup>2)</sup>                                         |                         | EI  |                         | constructive element <sup>3)</sup> |         | Firesafe joint seal |                 | application  |                 | backing         |                                                      | max. opening |  | pipe end |  | max. angle |  |
|----------------------------|--------------|-----------------------------------------------------------------------|-------------------------|----------------------------------------------------------------------------------------|-------------------------|------------------------------------|---------|---------------------|-----------------|--------------|-----------------|-----------------|------------------------------------------------------|--------------|--|----------|--|------------|--|
| dØ (mm)                    | s1 (mm)      | min. 75 kg/m³ eg Climpipe, Rockwool<br>or U Protect Pipe Section Alu2 |                         |                                                                                        |                         |                                    |         | width               | depth           | 1 or 2 sides | required        | in construction | configuration                                        |              |  |          |  |            |  |
| Ø15                        | 1,0          | glass / rock wool                                                     | 20mm                    | 1200 CS + CI                                                                           | EI <b>120</b>           | flexible walls ≥ 100 mm            | 10 mm   | 25 mm               | 2 sides         | -            | 75 mm           | C/U + U/C + C/C | perpendicular + all<br>angles between<br>90° and 45° |              |  |          |  |            |  |
|                            |              |                                                                       | 20mm                    | 1200 CS + CI                                                                           | EI <b>240</b>           | rigid walls ≥ 150 mm               | 15 mm   | 25 mm               | 2 sides         | -            | 85 mm           | U/C + C/C       |                                                      |              |  |          |  |            |  |
|                            |              | 30mm                                                                  | 1200 CS + CI            | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm | 10 mm                              | 25 mm   | 2 sides             | -               | 95 mm        | C/U + U/C + C/C |                 |                                                      |              |  |          |  |            |  |
|                            |              |                                                                       | 30mm                    | 1200 CS + CI                                                                           | EI <b>240</b>           | rigid walls ≥ 150 mm               | 15 mm   | 25 mm               | 2 sides         | -            | 105 mm          | U/C + C/C       |                                                      |              |  |          |  |            |  |
|                            |              | 40mm                                                                  | 1200 CS + CI            | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm | 10 mm                              | 25 mm   | 2 sides             | -               | 115 mm       | C/U + U/C + C/C |                 |                                                      |              |  |          |  |            |  |
|                            |              |                                                                       | 40mm                    | 1200 CS + CI                                                                           | EI <b>240</b>           | rigid walls ≥ 150 mm               | 15 mm   | 25 mm               | 2 sides         | -            | 125 mm          | U/C + C/C       |                                                      |              |  |          |  |            |  |
|                            |              | 50mm                                                                  | 1200 CS + CI            | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm | 10 mm                              | 25 mm   | 2 sides             | -               | 135 mm       | C/U + U/C + C/C |                 |                                                      |              |  |          |  |            |  |
|                            |              |                                                                       | 50mm                    | 1200 CS + CI                                                                           | EI <b>240</b>           | rigid walls ≥ 150 mm               | 15 mm   | 25 mm               | 2 sides         | -            | 145 mm          | U/C + C/C       |                                                      |              |  |          |  |            |  |
|                            |              | 60mm                                                                  | 1200 CS + CI            | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm    | 15 mm                              | 25 mm   | 2 sides             | -               | 165 mm       | U/C + C/C       |                 |                                                      |              |  |          |  |            |  |
|                            |              |                                                                       | 80mm                    | 1200 CS + CI                                                                           | EI <b>240</b>           | rigid walls ≥ 150 mm               | 15 mm   | 25 mm               | 2 sides         | -            | 205 mm          | U/C + C/C       |                                                      |              |  |          |  |            |  |
| max.                       |              |                                                                       |                         |                                                                                        |                         |                                    |         |                     |                 |              |                 |                 |                                                      |              |  |          |  |            |  |
| Ø76                        | 2,1          | glass / rock wool                                                     | 20mm                    | 1200 CS + CI                                                                           | EI <b>90</b>            | flexible walls ≥ 100 mm            | 10 mm   | 25 mm               | 2 sides         | -            | 136 mm          | C/U + U/C + C/C |                                                      |              |  |          |  |            |  |
|                            |              |                                                                       | 20mm                    | 1200 CS + CI                                                                           | EI <b>90</b>            | rigid walls ≥ 150 mm               | 15 mm   | 25 mm               | 2 sides         | -            | 150 mm          | U/C + C/C       |                                                      |              |  |          |  |            |  |
|                            |              | 30mm                                                                  | 1200 CS + CI            | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm | 10 mm                              | 25 mm   | 2 sides             | -               | 156 mm       | C/U + U/C + C/C |                 |                                                      |              |  |          |  |            |  |
|                            |              |                                                                       | 30mm                    | 1200 CS + CI                                                                           | EI <b>90</b>            | rigid walls ≥ 150 mm               | 15 mm   | 25 mm               | 2 sides         | -            | 166 mm          | U/C + C/C       |                                                      |              |  |          |  |            |  |
|                            |              | 40mm                                                                  | 1200 CS + CI            | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm | 10 mm                              | 25 mm   | 2 sides             | -               | 176 mm       | C/U + U/C + C/C |                 |                                                      |              |  |          |  |            |  |
|                            |              |                                                                       | 40mm                    | 1200 CS + CI                                                                           | EI <b>90</b>            | rigid walls ≥ 150 mm               | 15 mm   | 25 mm               | 2 sides         | -            | 186 mm          | U/C + C/C       |                                                      |              |  |          |  |            |  |
|                            |              | 50mm                                                                  | 1200 CS + CI            | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm | 10 mm                              | 25 mm   | 2 sides             | -               | 196 mm       | C/U + U/C + C/C |                 |                                                      |              |  |          |  |            |  |
|                            |              |                                                                       | 50mm                    | 1200 CS + CI                                                                           | EI <b>90</b>            | rigid walls ≥ 150 mm               | 15 mm   | 25 mm               | 2 sides         | -            | 206 mm          | U/C + C/C       |                                                      |              |  |          |  |            |  |
|                            |              | 60mm                                                                  | 1200 CS + CI            | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm | 10 mm                              | 25 mm   | 2 sides             | -               | 216 mm       | C/U + U/C + C/C |                 |                                                      |              |  |          |  |            |  |
|                            |              |                                                                       | 60mm                    | 1200 CS + CI                                                                           | EI <b>90</b>            | rigid walls ≥ 150 mm               | 15 mm   | 25 mm               | 2 sides         | -            | 226 mm          | U/C + C/C       |                                                      |              |  |          |  |            |  |
| 80mm                       | 1200 CS + CI | EI <b>90</b>                                                          | flexible walls ≥ 100 mm | 10 mm                                                                                  | 25 mm                   | 2 sides                            | -       | 256 mm              | C/U + U/C + C/C |              |                 |                 |                                                      |              |  |          |  |            |  |
|                            | 80mm         | 1200 CS + CI                                                          | EI <b>240</b>           | rigid walls ≥ 150 mm                                                                   | 15 mm                   | 25 mm                              | 2 sides | -                   | 266 mm          | U/C + C/C    |                 |                 |                                                      |              |  |          |  |            |  |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Pipe insulation must be fastened individually (not wrapped!) with steel wire: at max. 50mm + 300mm from constructive element.

<sup>3)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- other pipe  $d\varnothing + s1$  (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

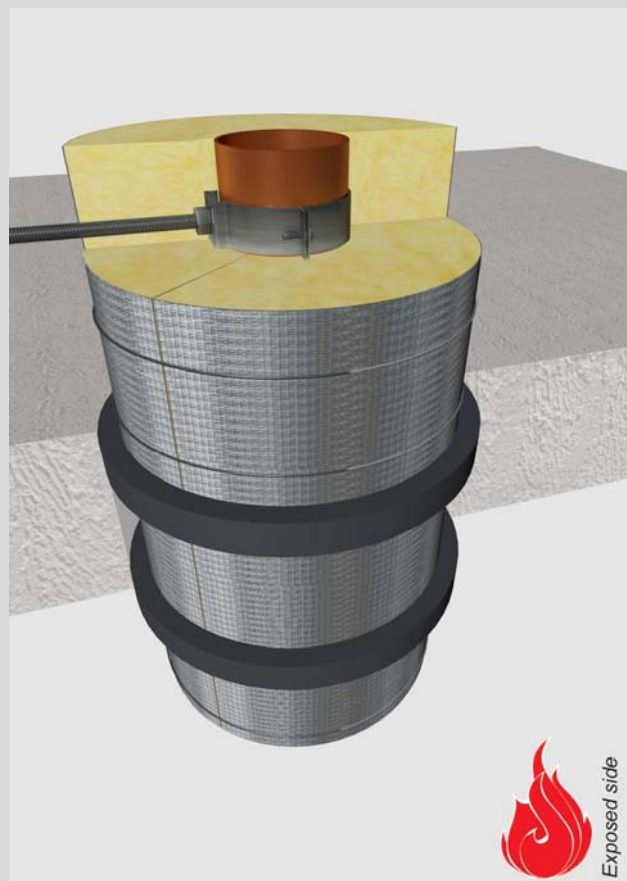
fire resistance

test method

EN 1366-3

service no.

22-6



## copper pipes

### FT Graphite

service type <sup>1)</sup>

pipe insulation <sup>2)</sup>

dØ (mm) s1 (mm) min. 75 kg/m<sup>3</sup> eg Climpipe, Rockwool  
or U Protect Pipe Section Alu2



EI

constructive element <sup>3)</sup>

Firesafe joint seal

width depth

application

1 or 2 sides

backing

required

max. opening

in construction

pipe end

configuration

max. angle

|      |     |                        |              |        |                       |       |       |         |   |        |           |                                                         |
|------|-----|------------------------|--------------|--------|-----------------------|-------|-------|---------|---|--------|-----------|---------------------------------------------------------|
| Ø15  | 1,0 | glass / rock wool 20mm | 1200 CS + CI | EI 240 | rigid floors ≥ 150 mm | 15 mm | 25 mm | 2 sides | - | 85 mm  | U/C + C/C | perpendicular +<br>all angles<br>between 90°<br>and 45° |
|      |     | 30mm                   | 1200 CS + CI | EI 240 | rigid floors ≥ 150 mm | 15 mm | 25 mm | 2 sides | - | 105 mm | U/C + C/C |                                                         |
|      |     | 40mm                   | 1200 CS + CI | EI 240 | rigid floors ≥ 150 mm | 15 mm | 25 mm | 2 sides | - | 125 mm | U/C + C/C |                                                         |
|      |     | 50mm                   | 1200 CS + CI | EI 240 | rigid floors ≥ 150 mm | 15 mm | 25 mm | 2 sides | - | 145 mm | U/C + C/C |                                                         |
|      |     | 60mm                   | 1200 CS + CI | EI 240 | rigid floors ≥ 150 mm | 15 mm | 25 mm | 2 sides | - | 165 mm | U/C + C/C |                                                         |
|      |     | 80mm                   | 1200 CS + CI | EI 240 | rigid floors ≥ 150 mm | 15 mm | 25 mm | 2 sides | - | 205 mm | U/C + C/C |                                                         |
| max. |     |                        |              |        |                       |       |       |         |   |        |           |                                                         |
| Ø76  | 2,1 | glass / rock wool 20mm | 1200 CS + CI | EI 90  | rigid floors ≥ 150 mm | 15 mm | 25 mm | 2 sides | - | 150 mm | U/C + C/C |                                                         |
|      |     | 30mm                   | 1200 CS + CI | EI 90  | rigid floors ≥ 150 mm | 15 mm | 25 mm | 2 sides | - | 166 mm | U/C + C/C |                                                         |
|      |     | 40mm                   | 1200 CS + CI | EI 90  | rigid floors ≥ 150 mm | 15 mm | 25 mm | 2 sides | - | 186 mm | U/C + C/C |                                                         |
|      |     | 50mm                   | 1200 CS + CI | EI 90  | rigid floors ≥ 150 mm | 15 mm | 25 mm | 2 sides | - | 206 mm | U/C + C/C |                                                         |
|      |     | 60mm                   | 1200 CS + CI | EI 90  | rigid floors ≥ 150 mm | 15 mm | 25 mm | 2 sides | - | 226 mm | U/C + C/C |                                                         |
|      |     | 80mm                   | 1200 CS + CI | EI 240 | rigid floors ≥ 150 mm | 15 mm | 25 mm | 2 sides | - | 266 mm | U/C + C/C |                                                         |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Pipe insulation must be fastened individually (not wrapped!) with steel wire: at max. 50mm + 300mm from constructive element.

<sup>3)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

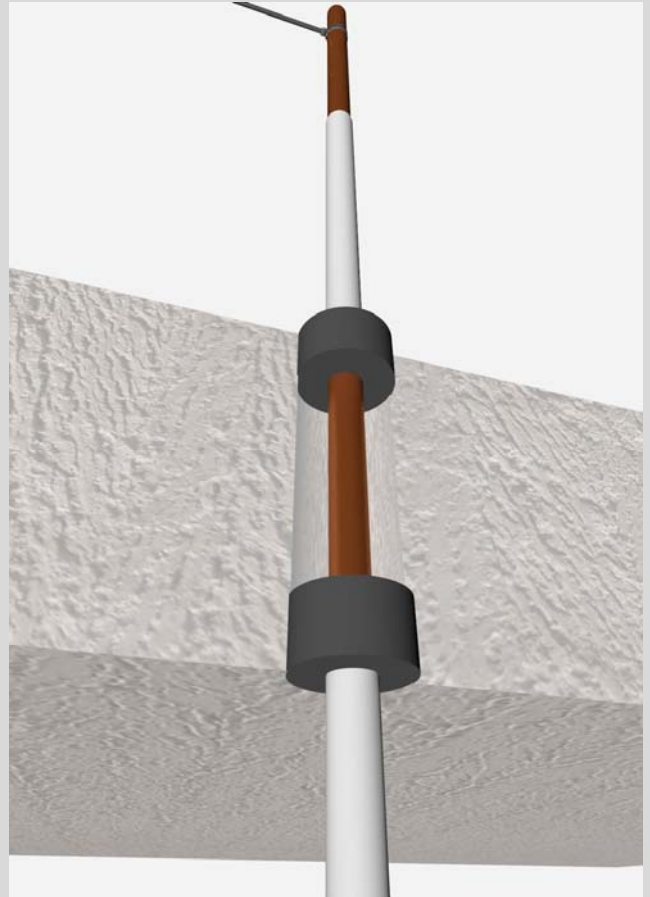
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
8-5-2



## copper pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe insulation      | EI                                                                                  | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end        | max. angle                                     |
|----------------------------|---------|----------------------|-------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|-----------------|------------------------------------------------|
| dØ (mm)                    | s1 (mm) | FT Coating DFT 0,8mm |  |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration   |                                                |
| Ø8                         | 1,0     | FT Coating 200 LI    | EI <b>90</b>                                                                        | flexible walls ≥ 100 mm            | -                   |       | 2 sides      | -        | 8 mm            | C/U + U/C + C/C | perpendicular + all angles between 90° and 45° |
| Ø12                        | 1,0     | FT Coating 300 LI    | EI <b>90</b>                                                                        | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 32 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>120</b>                                                                       | rigid walls ≥ 150 mm               | 10 mm               | 25 mm | 2 sides      | -        | 32 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>120</b>                                                                       | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 32 mm           | C/U + U/C + C/C |                                                |
| Ø15                        | 1,0     | -                    | EI <b>60</b>                                                                        | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 35 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>120</b>                                                                       | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 35 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>120</b>                                                                       | rigid walls ≥ 150 mm               | 14 mm               | 25 mm | 2 sides      | -        | 44 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>120</b>                                                                       | rigid floors ≥ 150 mm              | 14 mm               | 25 mm | 2 sides      | -        | 44 mm           | C/U + U/C + C/C |                                                |
| Ø22                        | 1,1     | FT Coating 300 LI    | EI <b>60</b>                                                                        | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 42 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>120</b>                                                                       | rigid walls ≥ 150 mm               | 10 mm               | 25 mm | 2 sides      | -        | 44 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>120</b>                                                                       | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 44 mm           | C/U + U/C + C/C |                                                |
| max.                       |         |                      |                                                                                     |                                    |                     |       |              |          |                 |                 |                                                |
| Ø28                        | 1,2     | FT Coating 300 LI    | EI <b>60</b>                                                                        | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 48 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>90</b>                                                                        | rigid walls ≥ 150 mm               | 10 mm               | 25 mm | 2 sides      | -        | 50 mm           | C/U + U/C + C/C |                                                |
|                            |         | FT Coating 200 LI    | EI <b>90</b>                                                                        | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides      | -        | 50 mm           | C/U + U/C + C/C |                                                |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

**principle detail****Firesafe**

tested property

fire resistance

test method

EN 1366-3

service no.

28-33

**copper pipes****FT Graphite**

| service type <sup>1)</sup> |         | pipe insulation           |                       |  EI | constructive element <sup>2)</sup>      | Firesafe joint seal |       | application | backing required | max. opening in construction | pipe end configuration | max. angle                                     |  |
|----------------------------|---------|---------------------------|-----------------------|----------------------------------------------------------------------------------------|-----------------------------------------|---------------------|-------|-------------|------------------|------------------------------|------------------------|------------------------------------------------|--|
| dØ (mm)                    | s1 (mm) | min. 60 kg/m³ eg Armaflex |                       |                                                                                        |                                         | width               | depth |             |                  |                              |                        |                                                |  |
| Ø12                        | 1,0     | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 90                                                                                  | <a href="#">CLT floors ≥ 140 mm</a>     | 15 mm               | 25 mm | 2 sides     | -                | 68 mm                        | C/U + U/C + C/C        | perpendicular + all angles between 90° and 45° |  |
| Ø15                        | 1,0     | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 120                                                                                 | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm               | 25 mm | 2 sides     | -                | 61 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | synth. rubber 25mm        | 700 LS + LI + CS + CI | EI 90                                                                                  | flexible walls ≥ 100 mm                 | 10 mm               | 25 mm | 2 sides     | -                | 85 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | rock wool 25 mm           | 700 LS + LI + CS + CI | EI 90                                                                                  | flexible walls ≥ 100 mm                 | 10 mm               | 25 mm | 2 sides     | -                | 85 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | rock wool 50 mm           | 700 LS + LI + CS + CI | EI 120                                                                                 | flexible walls ≥ 100 mm                 | 6 mm                | 25 mm | 2 sides     | -                | 128 mm                       | C/U + U/C + C/C        |                                                |  |
| Ø22                        | 1,1     | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 60                                                                                  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm               | 25 mm | 2 sides     | -                | 600 x 1500 mm                | C/U + U/C + C/C        |                                                |  |
|                            |         | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 90                                                                                  | rigid floors ≥ 150 mm                   | 10 mm               | 25 mm | 2 sides     | -                | 68 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 60                                                                                  | <a href="#">rigid floors ≥ 150 mm</a>   | 10 mm               | 25 mm | 2 sides     | -                | 600 x 5000 mm                | C/U + U/C + C/C        |                                                |  |
| max.                       |         |                           |                       |                                                                                        |                                         |                     |       |             |                  |                              |                        |                                                |  |
| Ø35                        | 1,5     | synth. rubber 13mm        | 700 LS + LI + CS + CI | EI 90                                                                                  | flexible walls ≥ 100 mm                 | 10 mm               | 25 mm | 2 sides     | -                | 81 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | synth. rubber 25mm        | 700 LS + LI + CS + CI | EI 90                                                                                  | flexible walls ≥ 100 mm                 | 6 mm                | 25 mm | 2 sides     | -                | 98 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | rock wool 25 mm           | 700 LS + LI + CS + CI | EI 60                                                                                  | flexible walls ≥ 100 mm                 | 10 mm               | 25 mm | 2 sides     | -                | 105 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | rock wool 50 mm           | 700 LS + LI + CS + CI | EI 90                                                                                  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm               | 25 mm | 2 sides     | -                | 155 mm                       | C/U + U/C + C/C        |                                                |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

**Notes:**

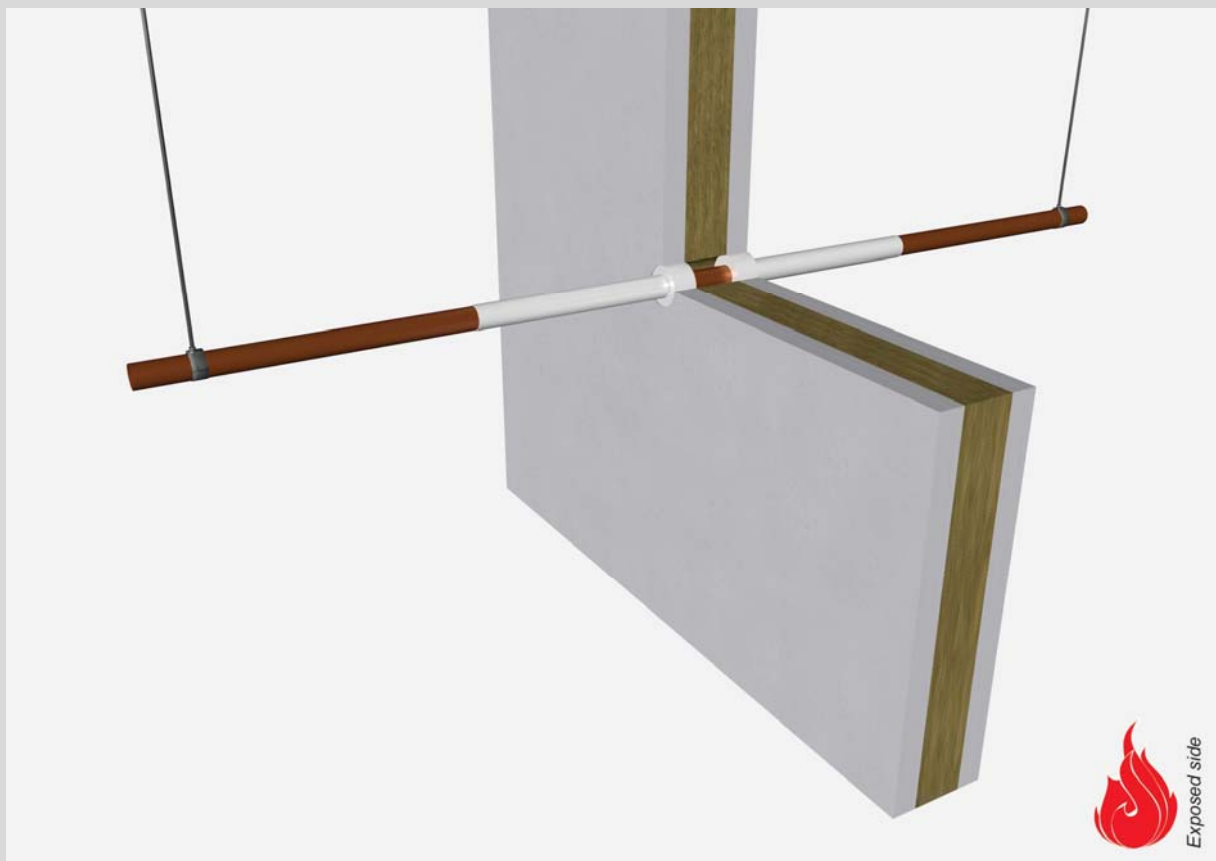
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

**principle detail****Firesafe****tested property****test method****service no.**

fire resistance

EN 1366-3

10-50

**copper pipes****FT Acrylic**

| service type <sup>1)</sup> |         | pipe insulation      |        | EI     | constructive element <sup>2)</sup> | Firesafe joint seal |       | application | backing      | max. opening | pipe end        | max. angle    |  |                                                |
|----------------------------|---------|----------------------|--------|--------|------------------------------------|---------------------|-------|-------------|--------------|--------------|-----------------|---------------|--|------------------------------------------------|
| dØ (mm)                    | s1 (mm) | FT Coating DFT 0,8mm |        |        |                                    |                     | width | depth       | 1 or 2 sides | required     | in construction | configuration |  |                                                |
| up to                      |         |                      |        |        |                                    |                     |       |             |              |              |                 |               |  | perpendicular + all angles between 90° and 45° |
| Ø8                         | 1,0     | -                    |        | EI 180 | rigid walls ≥ 150 mm               | 8 mm bead           |       | 1 side      | -            | 8 mm         | C/U + U/C + C/C |               |  |                                                |
| Ø8                         | 1,0     | -                    |        | EI 180 | rigid floors ≥ 150 mm              | 8 mm bead           |       | 1 side      | -            | 8 mm         | C/U + U/C + C/C |               |  |                                                |
| Ø8                         | 1,0     | FT Coating           | 200 LI | EI 90  | flexible walls ≥ 100 mm            | -                   |       | 2 sides     | -            | 8 mm         | C/U + U/C + C/C |               |  |                                                |
|                            |         |                      |        |        |                                    |                     |       |             |              |              |                 |               |  |                                                |
| Ø12                        | 1,0     | -                    |        | EI 120 | rigid walls ≥ 150 mm               | 10 mm               | 25 mm | 2 sides     | -            | 32 mm        | C/U + U/C + C/C |               |  |                                                |
|                            |         | -                    |        | EI 120 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -            | 32 mm        | C/U + U/C + C/C |               |  |                                                |
|                            |         | FT Coating           | 200 LI | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -            | 32 mm        | C/U + U/C + C/C |               |  |                                                |
|                            |         |                      |        |        |                                    |                     |       |             |              |              |                 |               |  |                                                |
| Ø15                        | 1,0     | -                    |        | EI 120 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -            | 44 mm        | C/U + U/C + C/C |               |  |                                                |
|                            |         | -                    |        | EI 120 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -            | 44 mm        | C/U + U/C + C/C |               |  |                                                |
|                            |         | FT Coating           | 200 LI | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -            | 35 mm        | C/U + U/C + C/C |               |  |                                                |
|                            |         |                      |        |        |                                    |                     |       |             |              |              |                 |               |  |                                                |
| Ø22                        | 1,1     | -                    |        | EI 60  | rigid walls ≥ 150 mm               | 10 mm               | 25 mm | 2 sides     | -            | 44 mm        | C/U + U/C + C/C |               |  |                                                |
|                            |         | -                    |        | EI 60  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -            | 44 mm        | C/U + U/C + C/C |               |  |                                                |
|                            |         | FT Coating           | 200 LI | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -            | 42 mm        | C/U + U/C + C/C |               |  |                                                |
|                            |         |                      |        |        |                                    |                     |       |             |              |              |                 |               |  |                                                |
| max.                       |         |                      |        |        |                                    |                     |       |             |              |              |                 |               |  |                                                |
| Ø28                        | 1,2     | -                    |        | EI 60  | rigid walls ≥ 150 mm               | 11 mm               | 25 mm | 2 sides     | -            | 50 mm        | C/U + U/C + C/C |               |  |                                                |
|                            |         | -                    |        | EI 60  | rigid floors ≥ 150 mm              | 11 mm               | 25 mm | 2 sides     | -            | 50 mm        | C/U + U/C + C/C |               |  |                                                |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm!

# Notes:

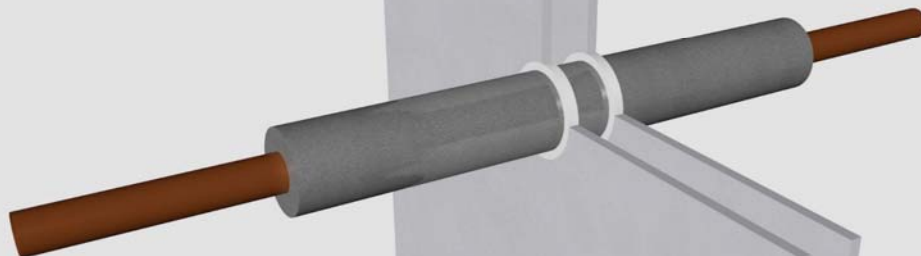
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
31-30



## copper pipes

| service type <sup>1)</sup> |         | pipe insulation      | EI                                       | constructive element <sup>2)</sup> | Firesafe joint seal     |           | application  | backing  | max. opening    | pipe end      | max. angle      |                                                |
|----------------------------|---------|----------------------|------------------------------------------|------------------------------------|-------------------------|-----------|--------------|----------|-----------------|---------------|-----------------|------------------------------------------------|
| dØ (mm)                    | s1 (mm) | non-standard config. |                                          |                                    | width                   | depth     | 1 or 2 sides | required | in construction | configuration |                 |                                                |
| up to                      |         |                      |                                          |                                    |                         |           |              |          |                 |               |                 |                                                |
| Ø12                        | 1,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                             | rigid walls ≥ 150 mm    | 10 mm     | 25 mm        | 2 sides  | -               | 58 mm         | C/U + U/C + C/C | perpendicular + all angles between 90° and 45° |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                             | rigid floors ≥ 150 mm   | 10 mm     | 25 mm        | 2 sides  | -               | 58 mm         | C/U + U/C + C/C |                                                |
| Ø15                        | 1,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                             | rigid walls ≥ 150 mm    | 10 mm     | 25 mm        | 2 sides  | -               | 61 mm         | C/U + U/C + C/C |                                                |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                             | rigid floors ≥ 150 mm   | 10 mm     | 25 mm        | 2 sides  | -               | 61 mm         | C/U + U/C + C/C |                                                |
|                            |         |                      | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                             | rigid walls ≥ 150 mm    | 7 mm      | 25 mm        | 2 sides  | -               | 82 mm         | C/U + U/C + C/C |                                                |
|                            |         |                      | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                             | rigid floors ≥ 150 mm   | 7 mm      | 25 mm        | 2 sides  | -               | 82 mm         | C/U + U/C + C/C |                                                |
| Ø22                        | 1,1     | non-insulated walls  | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                              | flexible walls ≥ 75 mm  | 10 mm     | 12,5 mm      | 2 sides  | -               | 92 mm         | C/U + U/C + C/C |                                                |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                             | rigid walls ≥ 150 mm    | 10 mm     | 25 mm        | 2 sides  | -               | 68 mm         | C/U + U/C + C/C |                                                |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                             | rigid floors ≥ 150 mm   | 10 mm     | 25 mm        | 2 sides  | -               | 68 mm         | C/U + U/C + C/C |                                                |
|                            |         |                      | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                             | rigid walls ≥ 150 mm    | 5 mm      | 25 mm        | 2 sides  | -               | 82 mm         | C/U + U/C + C/C |                                                |
|                            |         |                      | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                             | rigid floors ≥ 150 mm   | 5 mm      | 25 mm        | 2 sides  | -               | 82 mm         | C/U + U/C + C/C |                                                |
| Ø28                        | 1,2     | non-insulated walls  | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                              | flexible walls ≥ 75 mm  | 10 mm     | 12,5 mm      | 2 sides  | -               | 98 mm         | C/U + U/C + C/C |                                                |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                             | rigid walls ≥ 150 mm    | 10 mm     | 25 mm        | 2 sides  | -               | 74 mm         | C/U + U/C + C/C |                                                |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                             | rigid floors ≥ 150 mm   | 10 mm     | 25 mm        | 2 sides  | -               | 74 mm         | C/U + U/C + C/C |                                                |
| Ø32                        | 1,5     |                      | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                             | rigid walls ≥ 150 mm    | 10 mm     | 25 mm        | 2 sides  | -               | 102 mm        | C/U + U/C + C/C |                                                |
|                            |         |                      | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                             | rigid floors ≥ 150 mm   | 10 mm     | 25 mm        | 2 sides  | -               | 102 mm        | C/U + U/C + C/C |                                                |
| Ø42                        | 1,5     | non-insulated walls  | rock wool 25 mm 1100 LS + LI + CS + CI   | EI 90                              | flexible walls ≥ 100 mm | 10 mm     | 25 mm        | 2 sides  | -               | 112 mm        | C/U + U/C + C/C |                                                |
|                            |         | non-insulated walls  | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                              | flexible walls ≥ 75 mm  | 10 mm     | 12,5 mm      | 2 sides  | -               | 112 mm        | C/U + U/C + C/C |                                                |
| max.                       |         |                      |                                          |                                    |                         |           |              |          |                 |               |                 |                                                |
| Ø54                        | 2,0     |                      | rock wool 32 mm 1150 LI                  | EI 120                             | rigid walls ≥ 150 mm    | smokeseal |              | 2 sides  | -               | 200 x 200 mm  | C/C             |                                                |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
30-36



## copper pipes

| service type <sup>1)</sup> |         | pipe insulation      |                                          |  | constructive element <sup>2)</sup>      |           | Firesafe joint seal |         | application  |              | backing         |                 | max. opening  |                                                | pipe end |  | max. angle |  |
|----------------------------|---------|----------------------|------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------|-----------|---------------------|---------|--------------|--------------|-----------------|-----------------|---------------|------------------------------------------------|----------|--|------------|--|
| dØ (mm)                    | s1 (mm) | non-standard config. |                                          |                                                                                     | min. 60 kg/m³ eg Armaflex               |           | width               | depth   | 1 or 2 sides | required     | in construction |                 | configuration |                                                |          |  |            |  |
| up to                      |         |                      |                                          |                                                                                     |                                         |           |                     |         |              |              |                 |                 |               |                                                |          |  |            |  |
| Ø12                        | 1,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm     | 25 mm               | 2 sides | -            | 58 mm        |                 | C/U + U/C + C/C |               | perpendicular + all angles between 90° and 45° |          |  |            |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm     | 25 mm               | 2 sides | -            | 58 mm        |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
| Ø15                        | 1,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm     | 25 mm               | 2 sides | -            | 61 mm        |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm     | 25 mm               | 2 sides | -            | 61 mm        |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
|                            |         |                      | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid walls ≥ 150 mm                    | 7 mm      | 25 mm               | 2 sides | -            | 82 mm        |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
|                            |         |                      | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid floors ≥ 150 mm                   | 7 mm      | 25 mm               | 2 sides | -            | 82 mm        |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
| Ø22                        | 1,1     | non-insulated walls  | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                                                                               | flexible walls ≥ 75 mm                  | 10 mm     | 12,5 mm             | 2 sides | -            | 92 mm        |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm     | 25 mm               | 2 sides | -            | 68 mm        |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm     | 25 mm               | 2 sides | -            | 68 mm        |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
|                            |         |                      | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid walls ≥ 150 mm                    | 5 mm      | 25 mm               | 2 sides | -            | 82 mm        |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
|                            |         |                      | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid floors ≥ 150 mm                   | 5 mm      | 25 mm               | 2 sides | -            | 82 mm        |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
| Ø28                        | 1,2     | non-insulated walls  | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                                                                               | flexible walls ≥ 75 mm                  | 10 mm     | 12,5 mm             | 2 sides | -            | 98 mm        |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | <a href="#">rigid walls ≥ 150 mm</a>    | 10 mm     | 25 mm               | 2 sides | -            | 74 mm        |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | <a href="#">rigid floors ≥ 150 mm</a>   | 10 mm     | 25 mm               | 2 sides | -            | 74 mm        |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
| Ø32                        | 1,5     |                      | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | <a href="#">rigid walls ≥ 150 mm</a>    | 10 mm     | 25 mm               | 2 sides | -            | 102 mm       |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
|                            |         |                      | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | <a href="#">rigid floors ≥ 150 mm</a>   | 10 mm     | 25 mm               | 2 sides | -            | 102 mm       |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
| Ø42                        | 1,5     | non-insulated walls  | rock wool 25 mm 1100 LS + LI + CS + CI   | EI 90                                                                               | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm     | 25 mm               | 2 sides | -            | 112 mm       |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
|                            |         | non-insulated walls  | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                                                                               | <a href="#">flexible walls ≥ 75 mm</a>  | 10 mm     | 12,5 mm             | 2 sides | -            | 112 mm       |                 | C/U + U/C + C/C |               |                                                |          |  |            |  |
| max.                       |         |                      |                                          |                                                                                     |                                         |           |                     |         |              |              |                 |                 |               |                                                |          |  |            |  |
| Ø54                        | 2,0     |                      | rock wool 32 mm 1150 LI                  | EI 120                                                                              | <div>rigid walls ≥ 150 mm</div>         | smokeseal |                     | 2 sides | -            | 200 x 200 mm |                 | C/C             |               |                                                |          |  |            |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

# Notes:

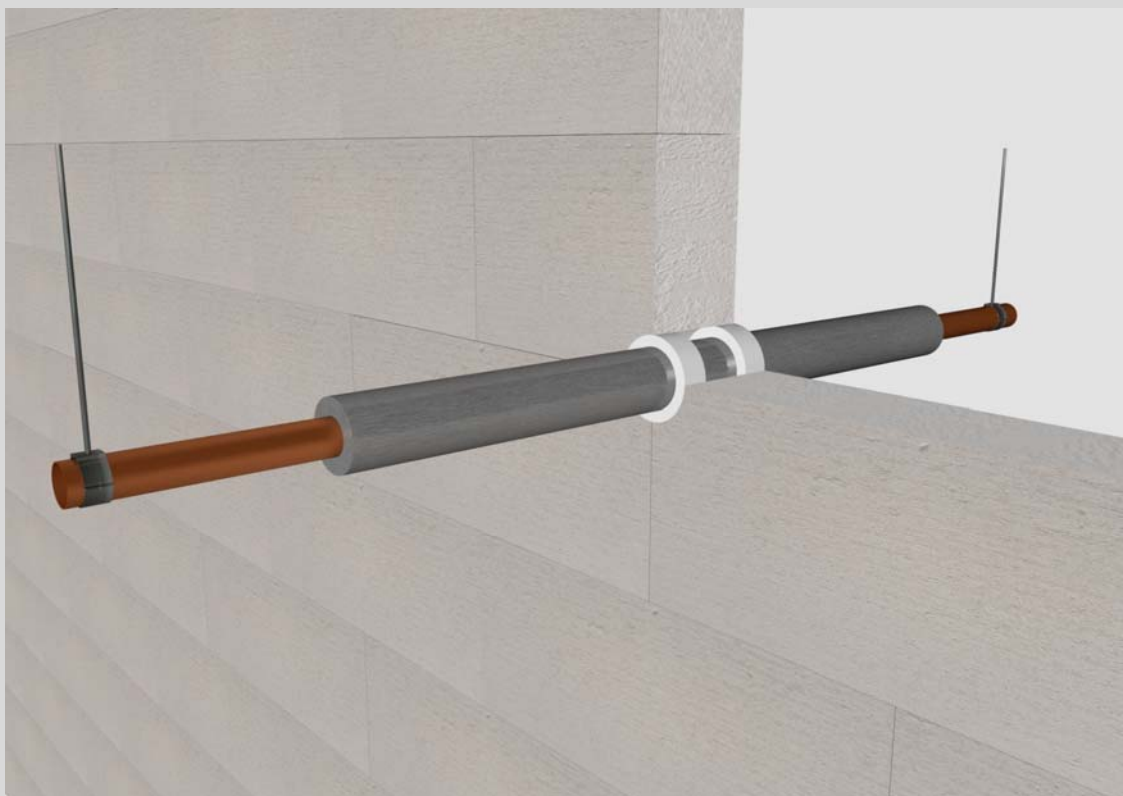
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
8-6-4r



## copper pipes

| service type <sup>1)</sup> |         | pipe insulation           |                                          |  | EI                      | constructive element <sup>2)</sup> | Firesafe joint seal |         | application | backing      | max. opening    | pipe end configuration                         | max. angle |              |
|----------------------------|---------|---------------------------|------------------------------------------|-------------------------------------------------------------------------------------|-------------------------|------------------------------------|---------------------|---------|-------------|--------------|-----------------|------------------------------------------------|------------|--------------|
| dØ (mm)                    | s1 (mm) | min. 60 kg/m³ eg Armaflex |                                          |                                                                                     |                         |                                    | width               | depth   |             |              |                 |                                                |            | 1 or 2 sides |
| up to                      |         |                           |                                          |                                                                                     |                         |                                    |                     |         |             |              |                 |                                                |            |              |
| Ø12                        | 1,0     |                           | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm    | 10 mm                              | 25 mm               | 2 sides | -           | 58 mm        | C/U + U/C + C/C | perpendicular + all angles between 90° and 45° |            |              |
|                            |         |                           | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm   | 10 mm                              | 25 mm               | 2 sides | -           | 58 mm        | C/U + U/C + C/C |                                                |            |              |
| Ø15                        | 1,0     |                           | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm    | 10 mm                              | 25 mm               | 2 sides | -           | 61 mm        | C/U + U/C + C/C |                                                |            |              |
|                            |         |                           | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm   | 10 mm                              | 25 mm               | 2 sides | -           | 61 mm        | C/U + U/C + C/C |                                                |            |              |
|                            |         |                           | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid walls ≥ 150 mm    | 7 mm                               | 25 mm               | 2 sides | -           | 82 mm        | C/U + U/C + C/C |                                                |            |              |
|                            |         |                           | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid floors ≥ 150 mm   | 7 mm                               | 25 mm               | 2 sides | -           | 82 mm        | C/U + U/C + C/C |                                                |            |              |
| Ø22                        | 1,1     | non-insulated walls       | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                                                                               | flexible walls ≥ 75 mm  | 10 mm                              | 25 mm               | 2 sides | -           | 92 mm        | C/U + U/C + C/C |                                                |            |              |
|                            |         |                           | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm    | 10 mm                              | 25 mm               | 2 sides | -           | 68 mm        | C/U + U/C + C/C |                                                |            |              |
|                            |         |                           | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm   | 10 mm                              | 25 mm               | 2 sides | -           | 68 mm        | C/U + U/C + C/C |                                                |            |              |
|                            |         |                           | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid walls ≥ 150 mm    | 5 mm                               | 25 mm               | 2 sides | -           | 82 mm        | C/U + U/C + C/C |                                                |            |              |
|                            |         |                           | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid floors ≥ 150 mm   | 5 mm                               | 25 mm               | 2 sides | -           | 82 mm        | C/U + U/C + C/C |                                                |            |              |
| Ø28                        | 1,2     | non-insulated walls       | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                                                                               | flexible walls ≥ 75 mm  | 10 mm                              | 25 mm               | 2 sides | -           | 98 mm        | C/U + U/C + C/C |                                                |            |              |
|                            |         |                           | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm    | 10 mm                              | 25 mm               | 2 sides | -           | 74 mm        | C/U + U/C + C/C |                                                |            |              |
|                            |         |                           | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm   | 10 mm                              | 25 mm               | 2 sides | -           | 74 mm        | C/U + U/C + C/C |                                                |            |              |
| Ø32                        | 1,5     |                           | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid walls ≥ 150 mm    | 10 mm                              | 25 mm               | 2 sides | -           | 102 mm       | C/U + U/C + C/C |                                                |            |              |
|                            |         |                           | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid floors ≥ 150 mm   | 10 mm                              | 25 mm               | 2 sides | -           | 102 mm       | C/U + U/C + C/C |                                                |            |              |
| Ø42                        | 1,5     | non-insulated walls       | rock wool 25 mm LS + LI + CS + CI        | EI 90                                                                               | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 112 mm       | C/U + U/C + C/C |                                                |            |              |
|                            |         | non-insulated walls       | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                                                                               | flexible walls ≥ 75 mm  | 10 mm                              | 25 mm               | 2 sides | -           | 112 mm       | C/U + U/C + C/C |                                                |            |              |
| max.                       |         |                           |                                          |                                                                                     |                         |                                    |                     |         |             |              |                 |                                                |            |              |
| Ø54                        | 2,0     |                           | rock wool 32 mm 1150 LI                  | EI 120                                                                              | rigid walls ≥ 150 mm    | smokesal                           |                     | 2 sides | -           | 200 x 200 mm | C/C             |                                                |            |              |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

# Notes:

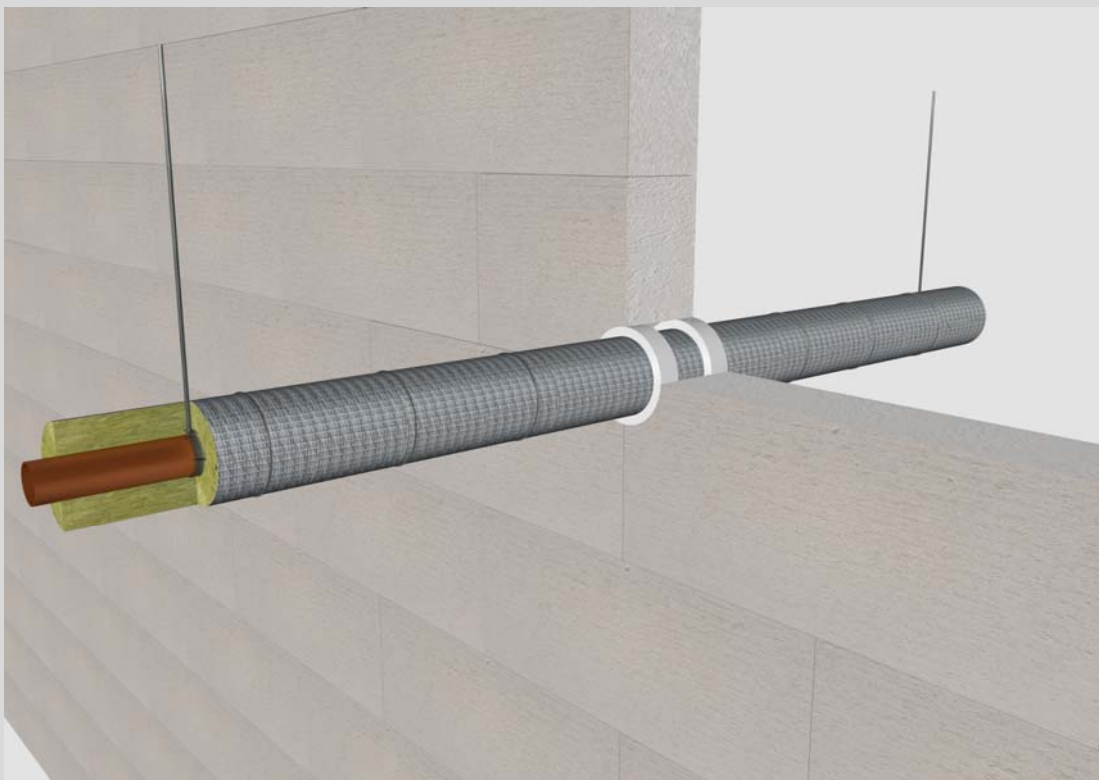
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
8-7-5r



## copper pipes

| service type <sup>1)</sup> |         | pipe insulation                       |                                          |  | constructive element <sup>2)</sup>      |          | Firesafe joint seal |         | application  | backing      | max. opening    | pipe end                                       | max. angle |  |
|----------------------------|---------|---------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------|----------|---------------------|---------|--------------|--------------|-----------------|------------------------------------------------|------------|--|
| dØ (mm)                    | s1 (mm) | min. 60 kg/m <sup>3</sup> eg Armaflex |                                          |                                                                                     |                                         |          | width               | depth   | 1 or 2 sides | required     | in construction | configuration                                  |            |  |
| up to                      |         |                                       |                                          |                                                                                     |                                         |          |                     |         |              |              |                 |                                                |            |  |
| Ø12                        | 1,0     |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm    | 25 mm               | 2 sides | -            | 58 mm        | C/U + U/C + C/C | perpendicular + all angles between 90° and 45° |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm    | 25 mm               | 2 sides | -            | 58 mm        | C/U + U/C + C/C |                                                |            |  |
| Ø15                        | 1,0     |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm    | 25 mm               | 2 sides | -            | 61 mm        | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm    | 25 mm               | 2 sides | -            | 61 mm        | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid walls ≥ 150 mm                    | 7 mm     | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid floors ≥ 150 mm                   | 7 mm     | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |                                                |            |  |
| Ø22                        | 1,1     | non-insulated walls                   | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                                                                               | flexible walls ≥ 75 mm                  | 10 mm    | 25 mm               | 2 sides | -            | 92 mm        | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm    | 25 mm               | 2 sides | -            | 68 mm        | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm    | 25 mm               | 2 sides | -            | 68 mm        | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid walls ≥ 150 mm                    | 5 mm     | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid floors ≥ 150 mm                   | 5 mm     | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |                                                |            |  |
| Ø28                        | 1,2     | non-insulated walls                   | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                                                                               | flexible walls ≥ 75 mm                  | 10 mm    | 25 mm               | 2 sides | -            | 98 mm        | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | <a href="#">rigid walls ≥ 150 mm</a>    | 10 mm    | 25 mm               | 2 sides | -            | 74 mm        | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | <a href="#">rigid floors ≥ 150 mm</a>   | 10 mm    | 25 mm               | 2 sides | -            | 74 mm        | C/U + U/C + C/C |                                                |            |  |
| Ø32                        | 1,5     |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | <a href="#">rigid walls ≥ 150 mm</a>    | 10 mm    | 25 mm               | 2 sides | -            | 102 mm       | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | <a href="#">rigid floors ≥ 150 mm</a>   | 10 mm    | 25 mm               | 2 sides | -            | 102 mm       | C/U + U/C + C/C |                                                |            |  |
| Ø42                        | 1,5     | non-insulated walls                   | rock wool 25 mm LS + LI + CS + CI        | EI 90                                                                               | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm    | 25 mm               | 2 sides | -            | 112 mm       | C/U + U/C + C/C |                                                |            |  |
|                            |         | non-insulated walls                   | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                                                                               | <a href="#">flexible walls ≥ 75 mm</a>  | 10 mm    | 25 mm               | 2 sides | -            | 112 mm       | C/U + U/C + C/C |                                                |            |  |
| max.                       |         |                                       |                                          |                                                                                     |                                         |          |                     |         |              |              |                 |                                                |            |  |
| Ø54                        | 2,0     |                                       | rock wool 32 mm 1150 LI                  | EI 120                                                                              | <div>rigid walls ≥ 150 mm</div>         | smokesal |                     | 2 sides | -            | 200 x 200 mm | C/C             |                                                |            |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

test method

service no.

fire resistance

EN 1366-3

8-3-4



## copper pipes

### FT Acrylic

| service type <sup>1)</sup> |         | pipe insulation |        |  EI | constructive element <sup>2)</sup> | Firesafe joint seal  |       | application | backing      | max. opening | pipe end        | max. angle |                                                |
|----------------------------|---------|-----------------|--------|----------------------------------------------------------------------------------------|------------------------------------|----------------------|-------|-------------|--------------|--------------|-----------------|------------|------------------------------------------------|
| dØ (mm)                    | s1 (mm) |                 |        |                                                                                        |                                    | FT Coating DFT 0,8mm | width | depth       | 1 or 2 sides | required     | in construction |            | configuration                                  |
| up to                      |         |                 |        |                                                                                        |                                    |                      |       |             |              |              |                 |            | perpendicular + all angles between 90° and 45° |
| Ø8                         | 1,0     | -               |        | EI <b>180</b>                                                                          | rigid walls ≥ 150 mm               | 8 mm bead            |       | 1 side      | -            | 8 mm         | C/U + U/C + C/C |            |                                                |
| Ø8                         | 1,0     | -               |        | EI <b>180</b>                                                                          | rigid floors ≥ 150 mm              | 8 mm bead            |       | 1 side      | -            | 8 mm         | C/U + U/C + C/C |            |                                                |
| Ø8                         | 1,0     | FT Coating      | 200 LI | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | -                    |       | 2 sides     | -            | 8 mm         | C/U + U/C + C/C |            |                                                |
|                            |         |                 |        |                                                                                        |                                    |                      |       |             |              |              |                 |            |                                                |
| Ø12                        | 1,0     | -               |        | EI <b>120</b>                                                                          | rigid walls ≥ 150 mm               | 10 mm                | 25 mm | 2 sides     | -            | 32 mm        | C/U + U/C + C/C |            |                                                |
|                            |         | -               |        | EI <b>120</b>                                                                          | rigid floors ≥ 150 mm              | 10 mm                | 25 mm | 2 sides     | -            | 32 mm        | C/U + U/C + C/C |            |                                                |
|                            |         | FT Coating      | 200 LI | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm                | 25 mm | 2 sides     | -            | 32 mm        | C/U + U/C + C/C |            |                                                |
|                            |         |                 |        |                                                                                        |                                    |                      |       |             |              |              |                 |            |                                                |
| Ø15                        | 1,0     | -               |        | EI <b>120</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm                | 25 mm | 2 sides     | -            | 44 mm        | C/U + U/C + C/C |            |                                                |
|                            |         | -               |        | EI <b>120</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm                | 25 mm | 2 sides     | -            | 44 mm        | C/U + U/C + C/C |            |                                                |
|                            |         | FT Coating      | 200 LI | EI <b>60</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm                | 25 mm | 2 sides     | -            | 35 mm        | C/U + U/C + C/C |            |                                                |
|                            |         |                 |        |                                                                                        |                                    |                      |       |             |              |              |                 |            |                                                |
| Ø22                        | 1,1     | -               |        | EI <b>60</b>                                                                           | rigid walls ≥ 150 mm               | 10 mm                | 25 mm | 2 sides     | -            | 44 mm        | C/U + U/C + C/C |            |                                                |
|                            |         | -               |        | EI <b>60</b>                                                                           | rigid floors ≥ 150 mm              | 10 mm                | 25 mm | 2 sides     | -            | 44 mm        | C/U + U/C + C/C |            |                                                |
|                            |         | FT Coating      | 200 LI | EI <b>60</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm                | 25 mm | 2 sides     | -            | 42 mm        | C/U + U/C + C/C |            |                                                |
|                            |         |                 |        |                                                                                        |                                    |                      |       |             |              |              |                 |            |                                                |
| max.                       |         |                 |        |                                                                                        |                                    |                      |       |             |              |              |                 |            |                                                |
| Ø28                        | 1,2     | -               |        | EI <b>60</b>                                                                           | rigid walls ≥ 150 mm               | 11 mm                | 25 mm | 2 sides     | -            | 50 mm        | C/U + U/C + C/C |            |                                                |
|                            |         | -               |        | EI <b>60</b>                                                                           | rigid floors ≥ 150 mm              | 11 mm                | 25 mm | 2 sides     | -            | 50 mm        | C/U + U/C + C/C |            |                                                |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm!

## Notes:

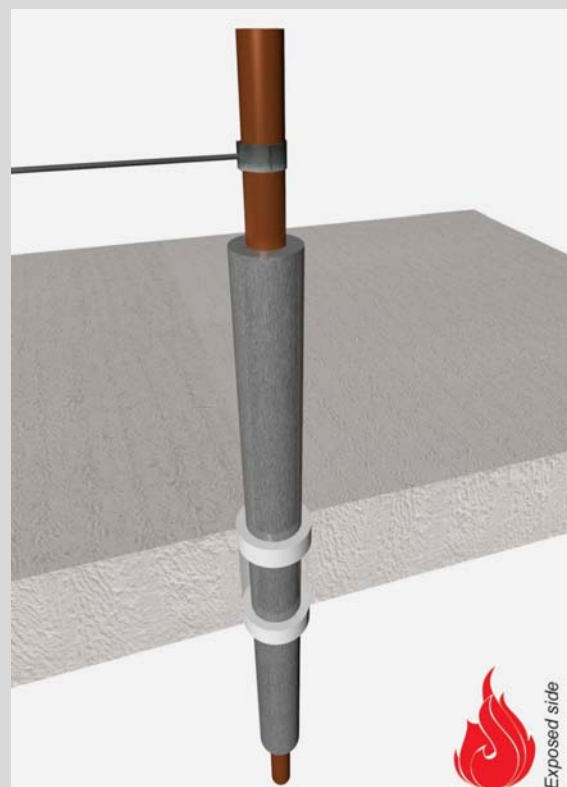
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
8-6-4



## copper pipes

| service type <sup>1)</sup> |         | pipe insulation                       |                                          |  | constructive element <sup>2)</sup> |          | Firesafe joint seal |              | application | backing         | max. opening    | pipe end                                       | max. angle |  |
|----------------------------|---------|---------------------------------------|------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------|----------|---------------------|--------------|-------------|-----------------|-----------------|------------------------------------------------|------------|--|
| dØ (mm)                    | s1 (mm) | min. 60 kg/m <sup>3</sup> eg Armaflex |                                          |                                                                                     |                                    | width    | depth               | 1 or 2 sides | required    | in construction | configuration   |                                                |            |  |
| up to                      |         |                                       |                                          |                                                                                     |                                    |          |                     |              |             |                 |                 |                                                |            |  |
| Ø12                        | 1,0     |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm               | 10 mm    | 25 mm               | 2 sides      | -           | 58 mm           | C/U + U/C + C/C | perpendicular + all angles between 90° and 45° |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm              | 10 mm    | 25 mm               | 2 sides      | -           | 58 mm           | C/U + U/C + C/C |                                                |            |  |
| Ø15                        | 1,0     |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm               | 10 mm    | 25 mm               | 2 sides      | -           | 61 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm              | 10 mm    | 25 mm               | 2 sides      | -           | 61 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid walls ≥ 150 mm               | 7 mm     | 25 mm               | 2 sides      | -           | 82 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid floors ≥ 150 mm              | 7 mm     | 25 mm               | 2 sides      | -           | 82 mm           | C/U + U/C + C/C |                                                |            |  |
| Ø22                        | 1,1     | non-insulated walls                   | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                                                                               | flexible walls ≥ 75 mm             | 10 mm    | 25 mm               | 2 sides      | -           | 92 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm               | 10 mm    | 25 mm               | 2 sides      | -           | 68 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm              | 10 mm    | 25 mm               | 2 sides      | -           | 68 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid walls ≥ 150 mm               | 5 mm     | 25 mm               | 2 sides      | -           | 82 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid floors ≥ 150 mm              | 5 mm     | 25 mm               | 2 sides      | -           | 82 mm           | C/U + U/C + C/C |                                                |            |  |
| Ø28                        | 1,2     | non-insulated walls                   | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                                                                               | flexible walls ≥ 75 mm             | 10 mm    | 25 mm               | 2 sides      | -           | 98 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm               | 10 mm    | 25 mm               | 2 sides      | -           | 74 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm              | 10 mm    | 25 mm               | 2 sides      | -           | 74 mm           | C/U + U/C + C/C |                                                |            |  |
| Ø32                        | 1,5     |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid walls ≥ 150 mm               | 10 mm    | 25 mm               | 2 sides      | -           | 102 mm          | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                              | rigid floors ≥ 150 mm              | 10 mm    | 25 mm               | 2 sides      | -           | 102 mm          | C/U + U/C + C/C |                                                |            |  |
| Ø42                        | 1,5     | non-insulated walls                   | rock wool 25 mm LS + LI + CS + CI        | EI 90                                                                               | flexible walls ≥ 100 mm            | 10 mm    | 25 mm               | 2 sides      | -           | 112 mm          | C/U + U/C + C/C |                                                |            |  |
|                            |         | non-insulated walls                   | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                                                                               | flexible walls ≥ 75 mm             | 10 mm    | 25 mm               | 2 sides      | -           | 112 mm          | C/U + U/C + C/C |                                                |            |  |
| max.                       |         |                                       |                                          |                                                                                     |                                    |          |                     |              |             |                 |                 |                                                |            |  |
| Ø54                        | 2,0     |                                       | rock wool 32 mm 1150 LI                  | EI 120                                                                              | rigid walls ≥ 150 mm               | smokesal |                     | 2 sides      | -           | 200 x 200 mm    | C/C             |                                                |            |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
8-7-5



## copper pipes

| service type <sup>1)</sup> |         | pipe insulation                       |                                          |  EI | constructive element <sup>2)</sup>      |          | Firesafe joint seal |              | application | backing         | max. opening    | pipe end                                       | max. angle |  |
|----------------------------|---------|---------------------------------------|------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------|----------|---------------------|--------------|-------------|-----------------|-----------------|------------------------------------------------|------------|--|
| dØ (mm)                    | s1 (mm) | min. 60 kg/m <sup>3</sup> eg Armaflex |                                          |                                                                                        |                                         | width    | depth               | 1 or 2 sides | required    | in construction | configuration   |                                                |            |  |
| up to                      |         |                                       |                                          |                                                                                        |                                         |          |                     |              |             |                 |                 |                                                |            |  |
| Ø12                        | 1,0     |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                                 | rigid walls ≥ 150 mm                    | 10 mm    | 25 mm               | 2 sides      | -           | 58 mm           | C/U + U/C + C/C | perpendicular + all angles between 90° and 45° |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                                 | rigid floors ≥ 150 mm                   | 10 mm    | 25 mm               | 2 sides      | -           | 58 mm           | C/U + U/C + C/C |                                                |            |  |
| Ø15                        | 1,0     |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                                 | rigid walls ≥ 150 mm                    | 10 mm    | 25 mm               | 2 sides      | -           | 61 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                                 | rigid floors ≥ 150 mm                   | 10 mm    | 25 mm               | 2 sides      | -           | 61 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                                 | rigid walls ≥ 150 mm                    | 7 mm     | 25 mm               | 2 sides      | -           | 82 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                                 | rigid floors ≥ 150 mm                   | 7 mm     | 25 mm               | 2 sides      | -           | 82 mm           | C/U + U/C + C/C |                                                |            |  |
| Ø22                        | 1,1     | non-insulated walls                   | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                                                                                  | flexible walls ≥ 75 mm                  | 10 mm    | 25 mm               | 2 sides      | -           | 92 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                                 | rigid walls ≥ 150 mm                    | 10 mm    | 25 mm               | 2 sides      | -           | 68 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                                 | rigid floors ≥ 150 mm                   | 10 mm    | 25 mm               | 2 sides      | -           | 68 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                                 | rigid walls ≥ 150 mm                    | 5 mm     | 25 mm               | 2 sides      | -           | 82 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                                 | rigid floors ≥ 150 mm                   | 5 mm     | 25 mm               | 2 sides      | -           | 82 mm           | C/U + U/C + C/C |                                                |            |  |
| Ø28                        | 1,2     | non-insulated walls                   | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                                                                                  | flexible walls ≥ 75 mm                  | 10 mm    | 25 mm               | 2 sides      | -           | 98 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                                 | <a href="#">rigid walls ≥ 150 mm</a>    | 10 mm    | 25 mm               | 2 sides      | -           | 74 mm           | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120                                                                                 | <a href="#">rigid floors ≥ 150 mm</a>   | 10 mm    | 25 mm               | 2 sides      | -           | 74 mm           | C/U + U/C + C/C |                                                |            |  |
| Ø32                        | 1,5     |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                                 | <a href="#">rigid walls ≥ 150 mm</a>    | 10 mm    | 25 mm               | 2 sides      | -           | 102 mm          | C/U + U/C + C/C |                                                |            |  |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120                                                                                 | <a href="#">rigid floors ≥ 150 mm</a>   | 10 mm    | 25 mm               | 2 sides      | -           | 102 mm          | C/U + U/C + C/C |                                                |            |  |
| Ø42                        | 1,5     | non-insulated walls                   | rock wool 25 mm LS + LI + CS + CI        | EI 90                                                                                  | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm    | 25 mm               | 2 sides      | -           | 112 mm          | C/U + U/C + C/C |                                                |            |  |
|                            |         | non-insulated walls                   | rock wool 25 mm 700 LS + LI + CS + CI    | EI 60                                                                                  | <a href="#">flexible walls ≥ 75 mm</a>  | 10 mm    | 25 mm               | 2 sides      | -           | 112 mm          | C/U + U/C + C/C |                                                |            |  |
| max.                       |         |                                       |                                          |                                                                                        |                                         |          |                     |              |             |                 |                 |                                                |            |  |
| Ø54                        | 2,0     |                                       | rock wool 32 mm 1150 LI                  | EI 120                                                                                 | rigid walls ≥ 150 mm                    | smokesal |                     | 2 sides      | -           | 200 x 200 mm    | C/C             |                                                |            |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

STEEL classification ≤ Ø219 mm

Fire performances are valid for range of dØ pipe diameter + s1 pipe thickness within the same pipe material:

steel

dØ max. 219,1 mm

s1 max. 14,2 mm

pipe insulation brands eg Climpipe, Rockwool, Armaflex, U Protect Pipe Section Alu2

steel Ø12 up to Ø219

| dØ                 | s1                               | pipe insulation                           |
|--------------------|----------------------------------|-------------------------------------------|
|                    | 1,0 up to 4,5 mm                 | non-insulated                             |
|                    | Ø12 up to Ø219 mm                |                                           |
|                    | 1,0 up to 14,2 mm                | + pipe insulation                         |
|                    | Ø15 up to Ø219 mm                | + synth. rubber, min. 60 kg/m³            |
|                    | 10mm                             |                                           |
|                    | 13mm                             |                                           |
|                    | 25mm                             |                                           |
|                    | 1,0 up to 14,2 mm                | + pipe insulation                         |
|                    | Ø15 up to Ø219 mm                | + glass or rock wool (alu), min. 75 kg/m³ |
|                    | 20 up to 30mm                    |                                           |
|                    | 40mm                             |                                           |
|                    | 50mm                             |                                           |
|                    | 60mm                             |                                           |
|                    | 80mm                             |                                           |
|                    | 1,0 up to 14,2 mm                | + pipe insulation                         |
| Ø15 up to Ø219 mm  | + rock wool (alu), min. 90 kg/m³ |                                           |
| 25mm               |                                  |                                           |
| 50mm               |                                  |                                           |
| 3,25 up to 14,2 mm | + pipe insulation                |                                           |
| Ø42 up to Ø219 mm  | + PIR, min. 33 kg/m³             |                                           |
| 25mm               |                                  |                                           |
| 50mm               |                                  |                                           |

suitable Firesafe products within classification:

| FT Graphite<br>DoP CPR-16/0094                                                                                     |                                              | FT Acrylic or FT Paste<br>DoP CPR-16/0094                                                                          |                                              | Fire Wrap<br>DoP CPR-15/0339                                                                                    |                              |
|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------|
| walls                                                                                                              | floors                                       | walls                                                                                                              | floors                                       | walls                                                                                                           | floors                       |
| individual results max.<br>EI 120_in wall                                                                          | individual results max.<br>EI 120_in floor 5 | individual results max.<br>EI 180_in wall                                                                          | individual results max.<br>EI 180_in floor 5 |                                                                                                                 |                              |
| EI 90_in wall 1+2+3                                                                                                | EI 90_in floor 5                             |                                                                                                                    |                                              |                                                                                                                 |                              |
| EI 120_in wall 1+2+3                                                                                               | EI 60_in floor 5<br>EI 90_in floor 7         | individual results max.<br>EI 120_in wall 3                                                                        | individual results max.<br>EI 120_in floor 5 |                                                                                                                 | EI 90_in floor 7<br>2 layer  |
| individual results max.<br>EI 90_in wall 1-n100<br>EI 60_in wall 1-n75                                             |                                              |                                                                                                                    |                                              |                                                                                                                 |                              |
| EI 60_in wall 1+2+3<br>EI 60_in wall 1-n100                                                                        | EI 60_in floor 5                             |                                                                                                                    |                                              | EI 60_in wall 1+2+3<br>1 layer                                                                                  | EI 90_in floor 5<br>2 layer  |
| individual results max.<br>EI 60_in wall 1-n75                                                                     |                                              |                                                                                                                    |                                              | EI 90_in wall 1+2+3<br>1 layer                                                                                  | EI 90_in floor 5<br>2 layer  |
| EI 60_in wall 1+2+3                                                                                                | EI 90_in floor 5                             |                                                                                                                    |                                              | EI 120_in wall 1+2+3<br>2 layer                                                                                 | EI 120_in floor 5<br>2 layer |
| EI 60_in wall 1+2+3                                                                                                | EI 90_in floor 5                             |                                                                                                                    |                                              | EI 60_in wall 1+2+3<br>3 layer                                                                                  | EI 120_in floor 5<br>3 layer |
| EI 90_in wall 1+2+3                                                                                                | EI 90_in floor 5                             |                                                                                                                    |                                              | EI 60_in wall 1+2+3<br>3 layer                                                                                  | EI 120_in floor 5<br>3 layer |
| EI 90_in wall 1+2+3                                                                                                | EI 180_in floor 5                            |                                                                                                                    |                                              |                                                                                                                 |                              |
| EI 60_in wall 1+2+3                                                                                                |                                              | EI 120_in wall 3<br>EI 60_in wall 1-n100<br>individual results max.<br>EI 30_in wall 1-n75                         | EI 120_in floor 5<br>also on FT Board        |                                                                                                                 |                              |
| EI 90_in wall 1+2+3                                                                                                |                                              | individual results max.<br>EI 90_in wall 1-n100                                                                    |                                              |                                                                                                                 |                              |
| EI 60_in wall 1+2+3                                                                                                | EI 180_in floor 5                            |                                                                                                                    |                                              |                                                                                                                 |                              |
| EI 60_in wall 1+2+3                                                                                                | EI 90_in floor 5                             |                                                                                                                    |                                              |                                                                                                                 |                              |
| joint details: min. W x D, default:<br>walls: 10 x 25 mm, apply on 2 sides<br>floors: 15 x 25 mm, apply on 2 sides |                                              | joint details: min. W x D, default:<br>walls: 10 x 25 mm, apply on 2 sides<br>floors: 15 x 25 mm, apply on 2 sides |                                              | default:<br>walls: apply on 2 sides<br>floors: apply on 1 side<br>always apply smokeseeal FT Acrylic on 2 sides |                              |

supporting construction

Constructive element must be classified acc. EN 13501-2 for the required fire resistance period:

1: flexible wall ≥100mm, insulated  
1-n100: flexible wall ≥100mm, non-insulated  
1-n75: flexible wall ≥75mm, non-insulated  
2: rigid wall ≥100mm  
3: rigid wall ≥150mm  
4: flexible ceiling ≥150mm  
5: rigid floor ≥150mm  
6: CLT wall ≥100mm  
7: CLT floor ≥140mm

Max. opening in constructive element: see principle detail. Use FT Board if opening is larger; see how-to-read.

Penetration services must be supported; support distance walls max. 500mm support distance floors max. 400mm

Min. length pipe insulation LI / LS / CS / CI: see principle detail.

EN norms for plastic pipes

how-to-read

acoustical

smokeseeal

NOTE:

CONDUITS: see STEEL CONDUITS

SPIRAL pipes: see AIR CONTROL

Firesafe FoA d22-1 - page 12

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

**principle detail****Firesafe****tested property**

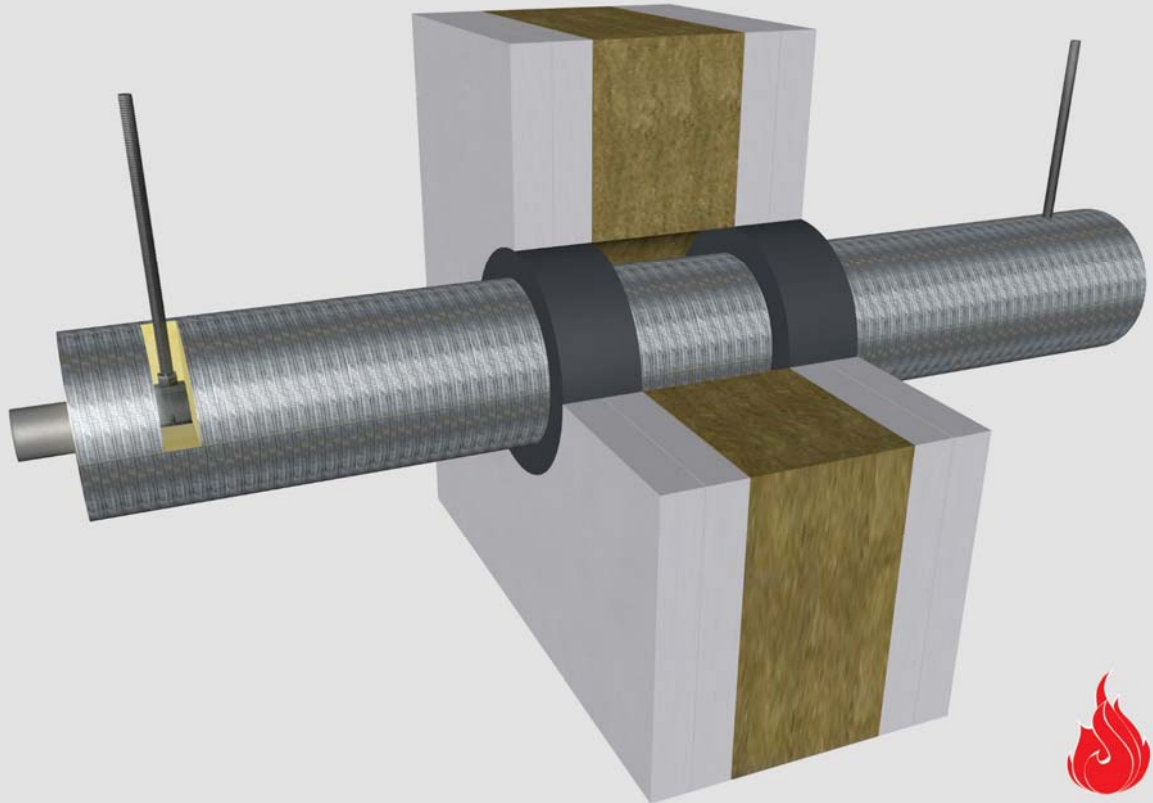
fire resistance

**test method**

EN 1366-3

**service no.**

19-51

**steel pipes****FT Graphite****service type <sup>1)</sup>****pipe insulation <sup>2)</sup>****EI****constructive element <sup>3)</sup>****Firesafe joint seal****application****backing****max. opening****pipe end****max. angle**

dØ (mm) s1 (mm) min. 75 kg/m<sup>3</sup> eg Climpipe, Rockwool  
or U Protect Pipe Section Alu2

width depth

1 or 2 sides

required

in construction

configuration

| Ø15   | 1,0  | glass / rock wool 20mm | 1200 CS + CI | EI 120 | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | - | 75 mm  | C/U + U/C + C/C | perpendicular + all<br>angles between 90°<br>and 45° |
|-------|------|------------------------|--------------|--------|-------------------------|-------|-------|---------|---|--------|-----------------|------------------------------------------------------|
|       |      | 20mm                   | 1200 CS + CI | EI 240 | rigid walls ≥ 150 mm    | 15 mm | 25 mm | 2 sides | - | 85 mm  | U/C + C/C       |                                                      |
|       |      | 30mm                   | 1200 CS + CI | EI 120 | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | - | 95 mm  | C/U + U/C + C/C |                                                      |
|       |      | 30mm                   | 1200 CS + CI | EI 240 | rigid walls ≥ 150 mm    | 15 mm | 25 mm | 2 sides | - | 105 mm | U/C + C/C       |                                                      |
|       |      | 40mm                   | 1200 CS + CI | EI 120 | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | - | 115 mm | C/U + U/C + C/C |                                                      |
|       |      | 40mm                   | 1200 CS + CI | EI 240 | rigid walls ≥ 150 mm    | 15 mm | 25 mm | 2 sides | - | 125 mm | U/C + C/C       |                                                      |
|       |      | 50mm                   | 1200 CS + CI | EI 120 | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | - | 135 mm | C/U + U/C + C/C |                                                      |
|       |      | 50mm                   | 1200 CS + CI | EI 240 | rigid walls ≥ 150 mm    | 15 mm | 25 mm | 2 sides | - | 145 mm | U/C + C/C       |                                                      |
|       |      | 60mm                   | 1200 CS + CI | EI 240 | rigid walls ≥ 150 mm    | 15 mm | 25 mm | 2 sides | - | 165 mm | U/C + C/C       |                                                      |
|       |      | 80mm                   | 1200 CS + CI | EI 240 | rigid walls ≥ 150 mm    | 15 mm | 25 mm | 2 sides | - | 205 mm | U/C + C/C       |                                                      |
| Ø42,2 | 3,25 | 20mm glass / rock wool | 1200 CS + CI | EI 120 | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | - | 102 mm | C/U + U/C + C/C |                                                      |
|       |      | 20mm                   | 1200 CS + CI | EI 90  | rigid walls ≥ 150 mm    | 15 mm | 25 mm | 2 sides | - | 112 mm | C/U + U/C + C/C |                                                      |
|       |      | 30mm                   | 1200 CS + CI | EI 120 | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | - | 122 mm | C/U + U/C + C/C |                                                      |
|       |      | 30mm                   | 1200 CS + CI | EI 90  | rigid walls ≥ 150 mm    | 15 mm | 25 mm | 2 sides | - | 132 mm | C/U + U/C + C/C |                                                      |
|       |      | 40mm                   | 1200 CS + CI | EI 120 | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | - | 142 mm | C/U + U/C + C/C |                                                      |
|       |      | 40mm                   | 1200 CS + CI | EI 90  | rigid walls ≥ 150 mm    | 15 mm | 25 mm | 2 sides | - | 152 mm | C/U + U/C + C/C |                                                      |
|       |      | 50mm                   | 1200 CS + CI | EI 120 | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | - | 162 mm | C/U + U/C + C/C |                                                      |
|       |      | 50mm                   | 1200 CS + CI | EI 90  | rigid walls ≥ 150 mm    | 15 mm | 25 mm | 2 sides | - | 172 mm | C/U + U/C + C/C |                                                      |
|       |      | 60mm                   | 1200 CS + CI | EI 90  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | - | 182 mm | C/U + U/C + C/C |                                                      |
|       |      | 60mm                   | 1200 CS + CI | EI 90  | rigid walls ≥ 150 mm    | 15 mm | 25 mm | 2 sides | - | 192 mm | C/U + U/C + C/C |                                                      |
|       |      | 80mm                   | 1200 CS + CI | EI 90  | flexible walls ≥ 100 mm | 10 mm | 25 mm | 2 sides | - | 222 mm | C/U + U/C + C/C |                                                      |
|       |      | 80mm                   | 1200 CS + CI | EI 180 | rigid walls ≥ 150 mm    | 15 mm | 25 mm | 2 sides | - | 244 mm | C/U + U/C + C/C |                                                      |

&gt;&gt; contined on page 2

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Pipe insulation must be fastened individually (not wrapped!) with steel wire: at max. 50mm + 300mm from constructive element.

<sup>3)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

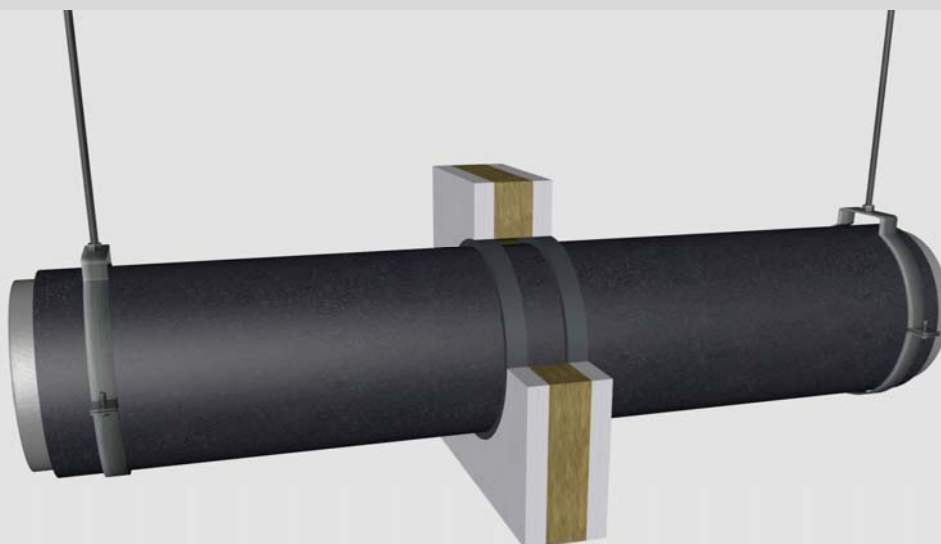
test method

service no.

fire resistance

EN 1366-3

19-3



## steel pipes

| service type <sup>1)</sup> |         | pipe insulation      |                                           |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application | backing required | max. opening in construction | pipe end configuration | max. angle                                     |  |
|----------------------------|---------|----------------------|-------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|-------------|------------------|------------------------------|------------------------|------------------------------------------------|--|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m <sup>3</sup> eg Armaflex     |                                                                                        |                                    | width               | depth |             |                  |                              |                        |                                                |  |
| up to                      |         |                      |                                           |                                                                                        |                                    |                     |       |             |                  |                              |                        |                                                |  |
| Ø15                        | 1,0     |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 61 mm                        | C/U + U/C + C/C        | perpendicular + all angles between 90° and 45° |  |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 85 mm                        | C/U + U/C + C/C        |                                                |  |
| Ø22                        | 1,1     |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 600 x 1200 mm + 25%          | C/U + U/C + C/C        |                                                |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 90                                                                                  | rigid walls ≥ 150 mm               | 10 mm               | 25 mm | 2 sides     | -                | 68 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         |                      |                                           |                                                                                        |                                    |                     |       |             |                  |                              |                        |                                                |  |
| Ø35                        | 1,5     |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 81 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 6 mm                | 25 mm | 2 sides     | -                | 98 mm                        | C/U + U/C + C/C        |                                                |  |
| Ø42,2                      | 3,25    |                      | synth. rubber 10mm 1000 LS + LI + CS + CI | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 82 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | non-insulated walls  | synth. rubber 13mm CS + CI                | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 88 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | non-insulated walls  | synth. rubber 25mm CS + CI                | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 112 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         |                      | synth. rubber 10mm 1000 LS + LI + CS + CI | EI 240                                                                                 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -                | 102 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 89 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         |                      | synth. rubber 13mm 750 LS + LI + CS + CI  | EI 180                                                                                 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -                | 98 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 112 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         |                      | synth. rubber 25mm 750 LS + LI + CS + CI  | EI 180                                                                                 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -                | 122 mm                       | C/U + U/C + C/C        |                                                |  |
| Ø54                        | 1,5     | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm               | 25 mm | 2 sides     | -                | 100 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm               | 25 mm | 2 sides     | -                | 124 mm                       | C/U + U/C + C/C        |                                                |  |
| Ø90                        | 3,0     | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 30                                                                                  | flexible walls ≥ 75 mm             | 10 mm               | 25 mm | 2 sides     | -                | 136 mm                       | C/U + U/C + C/C        |                                                |  |
| Ø101,6                     | 3,6     |                      | synth. rubber 13mm 1000 LS + LI + CS + CI | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 600 x 1200 mm + 25%          | C/U + U/C + C/C        |                                                |  |
| Ø114                       | 3,0     | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 30                                                                                  | flexible walls ≥ 75 mm             | 10 mm               | 25 mm | 2 sides     | -                | 160 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 30                                                                                  | flexible walls ≥ 75 mm             | 10 mm               | 25 mm | 2 sides     | -                | 184 mm                       | C/U + U/C + C/C        |                                                |  |
| Ø140                       | 4,0     | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 30                                                                                  | flexible walls ≥ 75 mm             | 10 mm               | 25 mm | 2 sides     | -                | 186 mm                       | C/U + U/C + C/C        |                                                |  |
| max.                       |         |                      |                                           |                                                                                        |                                    |                     |       |             |                  |                              |                        |                                                |  |
| Ø219,1                     | 14,2    |                      | synth. rubber 10mm 1000 LS + LI + CS + CI | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 259 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         |                      | synth. rubber 13mm 1000 LS + LI + CS + CI | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 265 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | non-insulated walls  | synth. rubber 25mm CS + CI                | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 289 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         |                      | synth. rubber 25mm 1000 LS + LI + CS + CI | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 600 x 1200 mm                | C/U + U/C + C/C        |                                                |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

**principle detail****Firesafe****tested property**

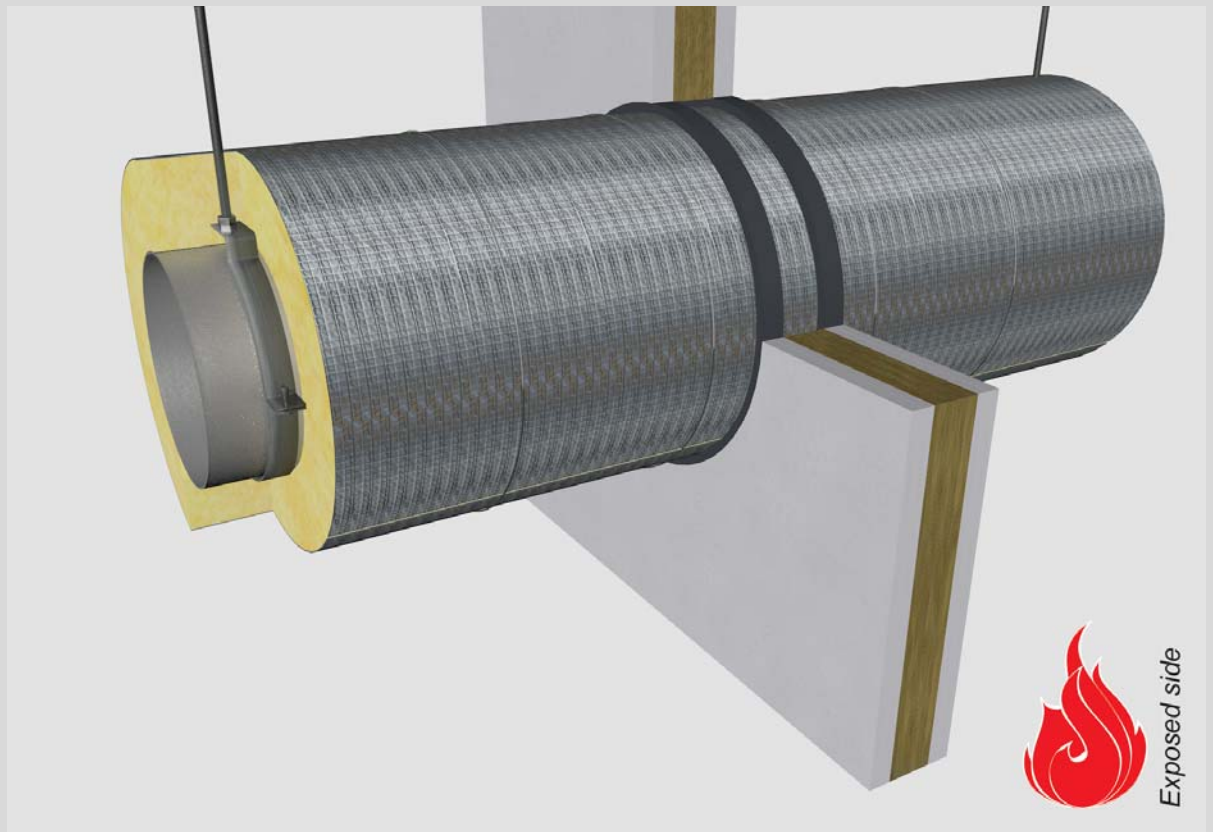
fire resistance

**test method**

EN 1366-3

**service no.**

21-1

**steel pipes****FT Graphite**

| service type <sup>1)</sup> |         | pipe insulation <sup>2)</sup>                                                     |                   |  EI | constructive element <sup>3)</sup> | Firesafe joint seal |       | application | backing | max. opening | pipe end configuration | max. angle                                     |
|----------------------------|---------|-----------------------------------------------------------------------------------|-------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|-------------|---------|--------------|------------------------|------------------------------------------------|
| dØ (mm)                    | s1 (mm) | min. 75 kg/m <sup>3</sup> eg Climpipe, Rockwool<br>or U Protect Pipe Section Alu2 |                   |                                                                                        |                                    | width               | depth |             |         |              |                        |                                                |
| Ø76                        | 2,1     | glass / rock wool 20mm                                                            | 1200 CS + CI      | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 136 mm       | C/U + U/C + C/C        | perpendicular + all angles between 90° and 45° |
|                            |         |                                                                                   | 20mm 1200 CS + CI | EI 90                                                                                  | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 150 mm       | U/C + C/C              |                                                |
|                            |         |                                                                                   | 30mm 1200 CS + CI | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 156 mm       | C/U + U/C + C/C        |                                                |
|                            |         |                                                                                   | 30mm 1200 CS + CI | EI 90                                                                                  | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 166 mm       | U/C + C/C              |                                                |
|                            |         |                                                                                   | 40mm 1200 CS + CI | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 176 mm       | C/U + U/C + C/C        |                                                |
|                            |         |                                                                                   | 40mm 1200 CS + CI | EI 90                                                                                  | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 186 mm       | U/C + C/C              |                                                |
|                            |         |                                                                                   | 50mm 1200 CS + CI | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 196 mm       | C/U + U/C + C/C        |                                                |
|                            |         |                                                                                   | 50mm 1200 CS + CI | EI 90                                                                                  | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 206 mm       | U/C + C/C              |                                                |
|                            |         |                                                                                   | 60mm 1200 CS + CI | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 216 mm       | C/U + U/C + C/C        |                                                |
|                            |         |                                                                                   | 60mm 1200 CS + CI | EI 90                                                                                  | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 226 mm       | U/C + C/C              |                                                |
|                            |         |                                                                                   | 80mm 1200 CS + CI | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 256 mm       | C/U + U/C + C/C        |                                                |
|                            |         |                                                                                   | 80mm 1200 CS + CI | EI 240                                                                                 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -       | 266 mm       | U/C + C/C              |                                                |
| max.                       |         |                                                                                   |                   |                                                                                        |                                    |                     |       |             |         |              |                        |                                                |
| Ø219,1                     | 4,5     | glass / rock wool 20mm                                                            | 1200 CS + CI      | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 279 mm       | C/U + U/C + C/C        |                                                |
|                            |         |                                                                                   | 30mm 1200 CS + CI | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 299 mm       | C/U + U/C + C/C        |                                                |
|                            |         |                                                                                   | 40mm 1200 CS + CI | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 319 mm       | C/U + U/C + C/C        |                                                |
|                            |         |                                                                                   | 50mm 1200 CS + CI | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 339 mm       | C/U + U/C + C/C        |                                                |
|                            |         |                                                                                   | 60mm 1200 CS + CI | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 359 mm       | C/U + U/C + C/C        |                                                |
|                            |         |                                                                                   | 80mm 1200 CS + CI | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -       | 399 mm       | C/U + U/C + C/C        |                                                |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Pipe insulation must be fastened individually (not wrapped!) with steel wire: at max. 50mm + 300mm from constructive element.

<sup>3)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

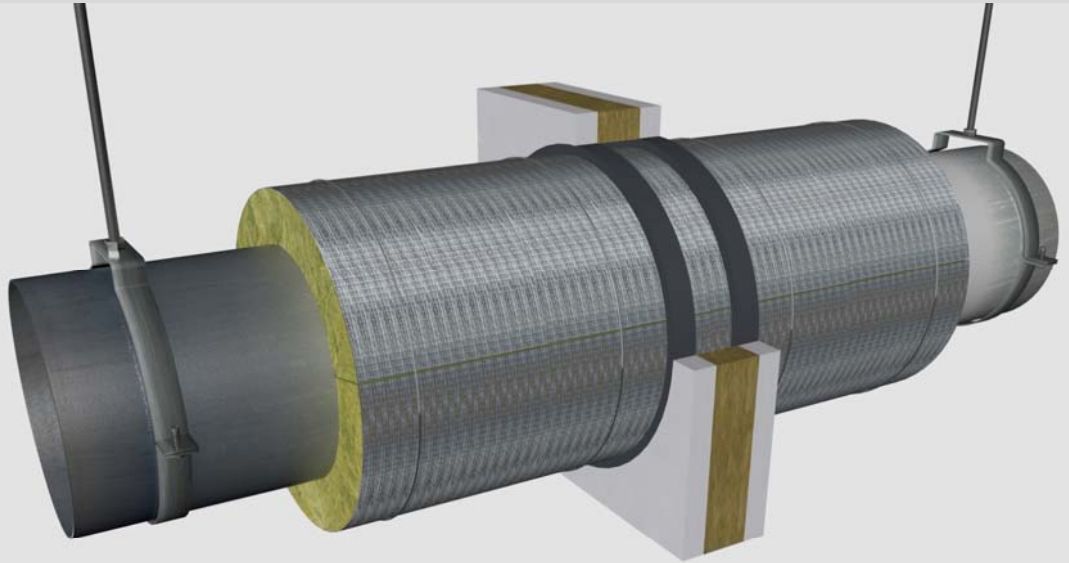
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

tested property  
test method  
service no.

## Firesafe

fire resistance  
EN 1366-3  
0202



## steel pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe insulation                           |                        |  | EI                      | constructive element <sup>2)</sup> | Firesafe joint seal |         | application | backing required | max. opening in construction | pipe end configuration                         | max. angle |
|----------------------------|---------|-------------------------------------------|------------------------|-------------------------------------------------------------------------------------|-------------------------|------------------------------------|---------------------|---------|-------------|------------------|------------------------------|------------------------------------------------|------------|
| dØ (mm)                    | s1 (mm) | min. 90 kg/m <sup>3</sup> eg Rockwool 810 |                        |                                                                                     |                         |                                    | width               | depth   |             |                  |                              |                                                |            |
| Ø15                        | 1,0     | stone wool 25 mm                          | 700 LS + LI + CS + CI  | EI <b>90</b>                                                                        | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 85 mm            | C/U + U/C + C/C              | perpendicular + all angles between 90° and 45° |            |
|                            |         | 50 mm                                     | 700 LS + LI + CS + CI  | EI <b>120</b>                                                                       | flexible walls ≥ 100 mm | 6 mm                               | 25 mm               | 2 sides | -           | 128 mm           | C/U + U/C + C/C              |                                                |            |
| Ø35                        | 1,5     | stone wool 25 mm                          | 700 LS + LI + CS + CI  | EI <b>60</b>                                                                        | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 105 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         | 50 mm                                     | 700 LS + LI + CS + CI  | EI <b>90</b>                                                                        | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 155 mm           | C/U + U/C + C/C              |                                                |            |
| Ø42,2                      | 3,25    | stone wool 25 mm                          | 700 LS + LI + CS + CI  | EI <b>60</b>                                                                        | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 112 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         | 50 mm                                     | 700 LS + LI + CS + CI  | EI <b>90</b>                                                                        | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 162 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         | PIR 25 mm                                 | 1000 LS + LI + CS + CI | EI <b>120</b>                                                                       | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 112 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         | 25 mm                                     | 1000 LS + LI + CS + CI | EI <b>240</b>                                                                       | rigid walls ≥ 150 mm    | 15 mm                              | 25 mm               | 2 sides | -           | 122 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         | 25 mm                                     | 1000 LS + LI + CS + CI | EI <b>240</b>                                                                       | rigid floors ≥ 150 mm   | 15 mm                              | 25 mm               | 2 sides | -           | 122 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         | 50 mm                                     | 1000 LS + LI + CS + CI | EI <b>120</b>                                                                       | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 162 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         | 50 mm                                     | 1000 LS + LI + CS + CI | EI <b>240</b>                                                                       | rigid walls ≥ 150 mm    | 15 mm                              | 25 mm               | 2 sides | -           | 172 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         | 50 mm                                     | 1000 LS + LI + CS + CI | EI <b>240</b>                                                                       | rigid floors ≥ 150 mm   | 15 mm                              | 25 mm               | 2 sides | -           | 172 mm           | C/U + U/C + C/C              |                                                |            |
| max.                       |         |                                           |                        |                                                                                     |                         |                                    |                     |         |             |                  |                              |                                                |            |
| Ø219,1                     | 4,5     | stone wool 25 mm                          | 700 LS + LI + CS + CI  | EI <b>90</b>                                                                        | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 289 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         | 25 mm                                     | 1000 LS + LI + CS + CI | EI <b>120</b>                                                                       | rigid floors ≥ 150 mm   | 15 mm                              | 25 mm               | 2 sides | -           | 300 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         | 50 mm                                     | 700 LS + LI + CS + CI  | EI <b>90</b>                                                                        | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 339 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         | PIR 25 mm                                 | 1000 LS + LI + CS + CI | EI <b>60</b>                                                                        | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 289 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         | 25 mm                                     | 1000 LS + LI + CS + CI | EI <b>180</b>                                                                       | rigid floors ≥ 150 mm   | 15 mm                              | 25 mm               | 2 sides | -           | 299 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         | 50 mm                                     | 1000 LS + LI + CS + CI | EI <b>60</b>                                                                        | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 2 sides | -           | 339 mm           | C/U + U/C + C/C              |                                                |            |
|                            |         | 50 mm                                     | 1000 LS + LI + CS + CI | EI <b>90</b>                                                                        | rigid floors ≥ 150 mm   | 15 mm                              | 25 mm               | 2 sides | -           | 349 mm           | C/U + U/C + C/C              |                                                |            |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

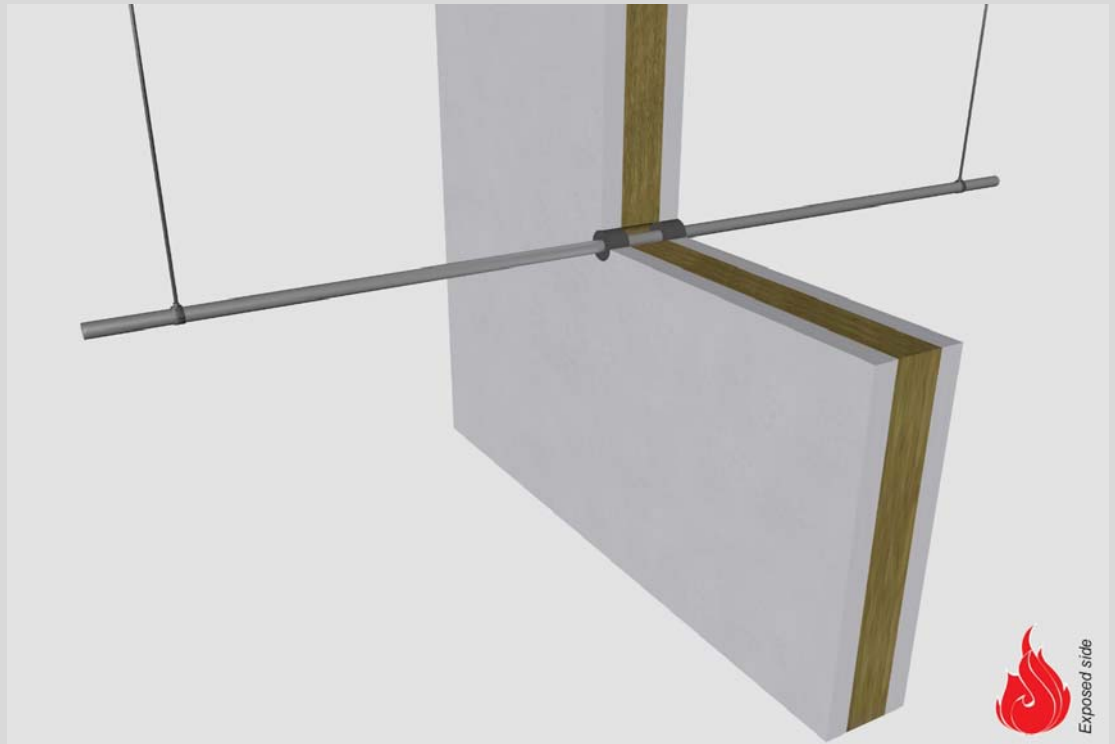
test method

service no.

fire resistance

EN 1366-3

20-12



## steel pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe insulation                       |        |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application | backing required | max. opening in construction | pipe end configuration | max. angle                                     |  |
|----------------------------|---------|---------------------------------------|--------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|-------------|------------------|------------------------------|------------------------|------------------------------------------------|--|
| dØ (mm)                    | s1 (mm) | FT Coating DFT 0,8mm<br>PA sealer 3mm |        |                                                                                        |                                    | width               | depth |             |                  |                              |                        |                                                |  |
| Ø8                         | 1,0     | FT Coating                            | 200 LI | EI 90                                                                                  | flexible walls ≥ 100 mm            | -                   | -     | 2 sides     | -                | 8 mm                         | C/U + U/C + C/C        | perpendicular + all angles between 90° and 45° |  |
| Ø12                        | 1,0     | FT Coating                            | 300 LI | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 32 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | FT Coating                            | 200 LI | EI 120                                                                                 | rigid walls ≥ 150 mm               | 10 mm               | 25 mm | 2 sides     | -                | 32 mm                        | C/U + U/C + C/C        |                                                |  |
| Ø15                        | 1,0     | -                                     |        | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 35 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | FT Coating                            | 200 LI | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 35 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | FT Coating                            | 200 LI | EI 120                                                                                 | rigid walls ≥ 150 mm               | 14 mm               | 25 mm | 2 sides     | -                | 44 mm                        | C/U + U/C + C/C        |                                                |  |
| Ø22                        | 1,1     | FT Coating                            | 300 LI | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 42 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | FT Coating                            | 200 LI | EI 120                                                                                 | rigid walls ≥ 150 mm               | 10 mm               | 25 mm | 2 sides     | -                | 44 mm                        | C/U + U/C + C/C        |                                                |  |
| Ø26,9                      | 2,9     | FT Coating                            | 300 LI | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 47 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | FT Coating                            | 200 LI | EI 120                                                                                 | rigid walls ≥ 150 mm               | 10 mm               | 25 mm | 2 sides     | -                | 50 mm                        | C/U + U/C + C/C        |                                                |  |
| Ø28                        | 1,2     | FT Coating                            | 300 LI | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 48 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | FT Coating                            | 200 LI | EI 90                                                                                  | rigid walls ≥ 150 mm               | 10 mm               | 25 mm | 2 sides     | -                | 50 mm                        | C/U + U/C + C/C        |                                                |  |
| 42,2                       | 3,25    | -                                     |        | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 62 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | FT Coating                            | 300 LI | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 62 mm                        | C/U + U/C + C/C        |                                                |  |
|                            |         | PA sealer                             | 300 LI | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 61 mm                        | C/U + U/C + C/C        |                                                |  |
| 60,3                       | 3,0     | FT Coating                            | 200 LI | EI 90                                                                                  | rigid walls ≥ 150 mm               | 10 mm               | 25 mm | 2 sides     | -                | 82 mm                        | C/U + U/C + C/C        |                                                |  |
| max.                       |         |                                       |        |                                                                                        |                                    |                     |       |             |                  |                              |                        |                                                |  |
| Ø219,1                     | 4,5     | PA sealer                             | 300 LI | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 245 mm                       | C/U + U/C + C/C        |                                                |  |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

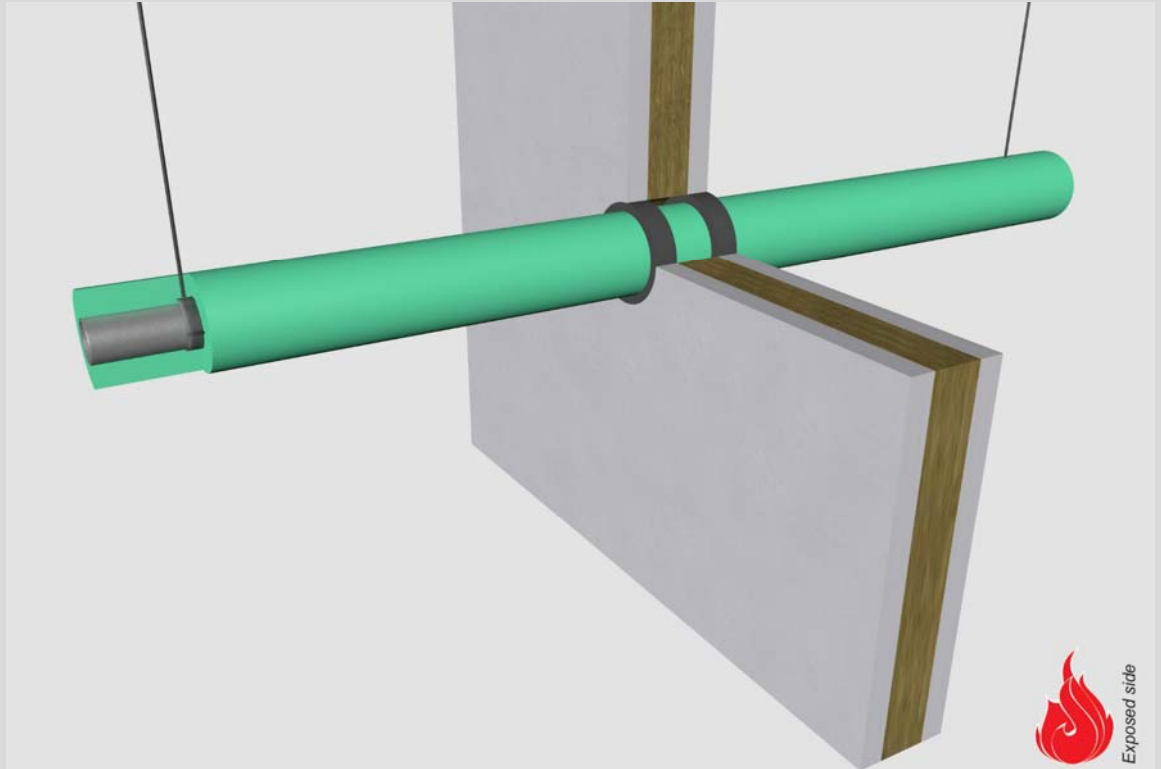
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- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥ 100mm is also applicable for **rigid walls** ≥ 100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

tested property  
test method  
service no.

## Firesafe

fire resistance  
EN 1366-3  
15-17



## steel pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe insulation                                                                |                        |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application | backing required | max. opening in construction | pipe end configuration | max. angle                                     |  |
|----------------------------|---------|--------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|-------------|------------------|------------------------------|------------------------|------------------------------------------------|--|
| dØ (mm)                    | s1 (mm) | min. 90 kg/m <sup>3</sup> eg Rockwool 810<br>min. 33 kg/m <sup>3</sup> for PIR |                        |                                                                                        |                                    | width               | depth |             |                  |                              |                        |                                                |  |
| Ø15                        | 1,0     | rock wool 25 mm                                                                | 700 LS + LI + CS + CI  | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 85 mm                        | C/U + U/C + C/C        | perpendicular + all angles between 90° and 45° |  |
|                            |         | 50 mm                                                                          | 700 LS + LI + CS + CI  | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 6 mm                | 25 mm | 2 sides     | -                | 128 mm                       | C/U + U/C + C/C        |                                                |  |
| Ø35                        | 1,5     | rock wool 25 mm                                                                | 700 LS + LI + CS + CI  | EI <b>60</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 105 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | 50 mm                                                                          | 700 LS + LI + CS + CI  | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 155 mm                       | C/U + U/C + C/C        |                                                |  |
| Ø42,2                      | 3,25    | rock wool 25 mm                                                                | 700 LS + LI + CS + CI  | EI <b>60</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 112 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | 50 mm                                                                          | 700 LS + LI + CS + CI  | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 162 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | PIR 25 mm                                                                      | 1000 LS + LI + CS + CI | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 112 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | 25 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -                | 122 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | 25 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>240</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 122 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | 50 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 162 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | 50 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides     | -                | 172 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | 50 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>240</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 172 mm                       | C/U + U/C + C/C        |                                                |  |
| max.                       |         |                                                                                |                        |                                                                                        |                                    |                     |       |             |                  |                              |                        |                                                |  |
| Ø219,1                     | 4,5     | rock wool 25 mm                                                                | 700 LS + LI + CS + CI  | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 289 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | 25 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>120</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 300 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | 50 mm                                                                          | 700 LS + LI + CS + CI  | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 339 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | PIR 25 mm                                                                      | 1000 LS + LI + CS + CI | EI <b>60</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 289 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | 25 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>180</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 299 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | 50 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>60</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides     | -                | 339 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | 50 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>90</b>                                                                           | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 349 mm                       | C/U + U/C + C/C        |                                                |  |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥ 100mm is also applicable for rigid walls ≥ 100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

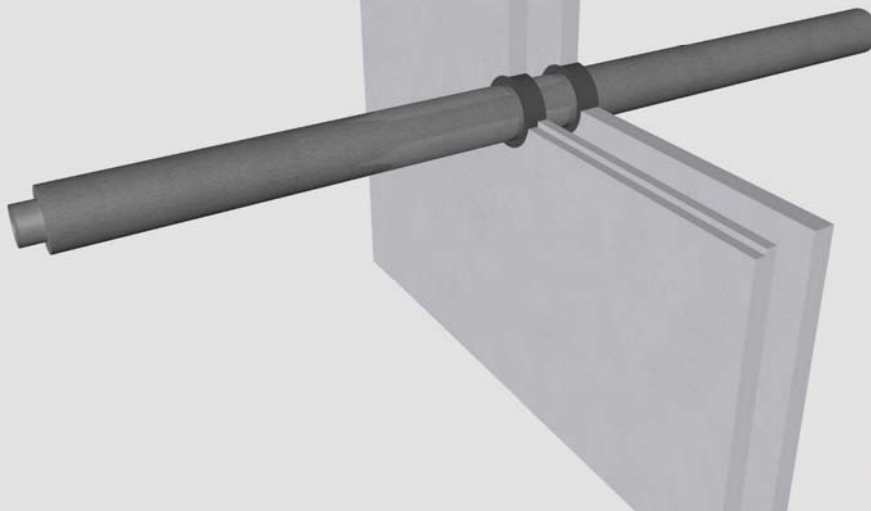
test method

service no.

fire resistance

EN 1366-3

30-29



## steel pipes

| service type <sup>1)</sup> |         | pipe insulation      |                                           | EI     | constructive element <sup>2)</sup> | Firesafe joint seal |         | application  | backing  | max. opening        | pipe end        | max. angle |
|----------------------------|---------|----------------------|-------------------------------------------|--------|------------------------------------|---------------------|---------|--------------|----------|---------------------|-----------------|------------|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m <sup>3</sup> eg Armaflex     |        |                                    | width               | depth   | 1 or 2 sides | required | in construction     | configuration   |            |
| <b>up to</b>               |         |                      |                                           |        |                                    |                     |         |              |          |                     |                 |            |
| Ø15                        | 1,00    |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 120 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 61 mm               | C/U + U/C + C/C |            |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 85 mm               | C/U + U/C + C/C |            |
| Ø22                        | 1,10    |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 600 x 1200 mm + 25% | C/U + U/C + C/C |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 90  | rigid walls ≥ 150 mm               | 10 mm               | 25 mm   | 2 sides      | -        | 68 mm               | C/U + U/C + C/C |            |
| Ø35                        | 1,50    |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 81 mm               | C/U + U/C + C/C |            |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 90  | flexible walls ≥ 100 mm            | 6 mm                | 25 mm   | 2 sides      | -        | 98 mm               | C/U + U/C + C/C |            |
| Ø42,2                      | 3,25    |                      | synth. rubber 10mm 1000 LS + LI + CS + CI | EI 120 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 82 mm               | C/U + U/C + C/C |            |
|                            | 1,50    | non-insulated walls  | synth. rubber 13mm CS + CI                | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 88 mm               | C/U + U/C + C/C |            |
|                            | 1,50    | non-insulated walls  | synth. rubber 25mm CS + CI                | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 112 mm              | C/U + U/C + C/C |            |
|                            | 3,25    |                      | synth. rubber 10mm 1000 LS + LI + CS + CI | EI 240 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm   | 2 sides      | -        | 102 mm              | C/U + U/C + C/C |            |
|                            | 3,25    |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 120 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 89 mm               | C/U + U/C + C/C |            |
|                            | 3,25    |                      | synth. rubber 13mm 750 LS + LI + CS + CI  | EI 180 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm   | 2 sides      | -        | 98 mm               | C/U + U/C + C/C |            |
|                            | 3,25    |                      | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 120 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 112 mm              | C/U + U/C + C/C |            |
|                            | 3,25    |                      | synth. rubber 25mm 750 LS + LI + CS + CI  | EI 180 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm   | 2 sides      | -        | 122 mm              | C/U + U/C + C/C |            |
| Ø54                        | 1,50    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides      | -        | 100 mm              | C/U + U/C + C/C |            |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides      | -        | 124 mm              | C/U + U/C + C/C |            |
| Ø90                        | 3,00    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 30  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides      | -        | 136 mm              | C/U + U/C + C/C |            |
| Ø101,6                     | 3,60    |                      | synth. rubber 13mm 1000 LS + LI + CS + CI | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 600 x 1200 mm + 25% | C/U + U/C + C/C |            |
| Ø114                       | 3,00    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 30  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides      | -        | 160 mm              | C/U + U/C + C/C |            |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 30  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides      | -        | 184 mm              | C/U + U/C + C/C |            |
| Ø140                       | 4,00    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 30  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides      | -        | 198 mm              | C/U + U/C + C/C |            |
| <b>max.</b>                |         |                      |                                           |        |                                    |                     |         |              |          |                     |                 |            |
| Ø219,1                     | 14,20   |                      | synth. rubber 10mm 1000 LS + LI + CS + CI | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 259 mm              | C/U + U/C + C/C |            |
|                            |         |                      | synth. rubber 13mm 1000 LS + LI + CS + CI | EI 120 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 265 mm              | C/U + U/C + C/C |            |
|                            |         | non-insulated walls  | synth. rubber 25mm CS + CI                | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 289 mm              | C/U + U/C + C/C |            |
|                            |         |                      | synth. rubber 25mm 1000 LS + LI + CS + CI | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides      | -        | 600 x 1200 mm       | C/U + U/C + C/C |            |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

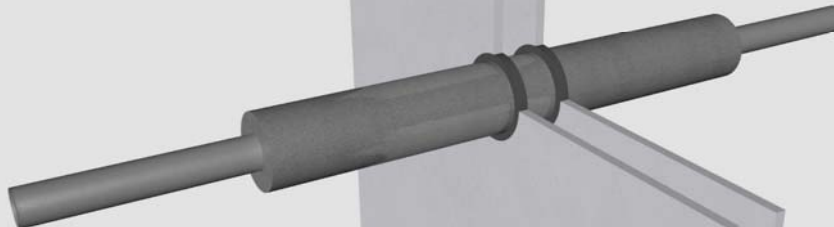
test method

service no.

fire resistance

EN 1366-3

31-24



## steel pipes

| service type <sup>1)</sup> |         | pipe insulation      |                                           |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |         | application | backing | max. opening        | pipe end configuration | max. angle |
|----------------------------|---------|----------------------|-------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|---------|-------------|---------|---------------------|------------------------|------------|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m <sup>3</sup> eg Armaflex     |                                                                                        |                                    | width               | depth   |             |         |                     |                        |            |
| up to                      |         |                      |                                           |                                                                                        |                                    |                     |         |             |         |                     |                        |            |
| Ø15                        | 1,00    |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -       | 61 mm               | C/U + U/C + C/C        |            |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -       | 85 mm               | C/U + U/C + C/C        |            |
|                            |         |                      |                                           |                                                                                        |                                    |                     |         |             |         |                     |                        |            |
| Ø22                        | 1,10    |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -       | 600 x 1200 mm + 25% | C/U + U/C + C/C        |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 90                                                                                  | rigid walls ≥ 150 mm               | 10 mm               | 25 mm   | 2 sides     | -       | 68 mm               | C/U + U/C + C/C        |            |
|                            |         |                      |                                           |                                                                                        |                                    |                     |         |             |         |                     |                        |            |
| Ø35                        | 1,50    |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -       | 81 mm               | C/U + U/C + C/C        |            |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 6 mm                | 25 mm   | 2 sides     | -       | 98 mm               | C/U + U/C + C/C        |            |
|                            |         |                      |                                           |                                                                                        |                                    |                     |         |             |         |                     |                        |            |
| Ø42,2                      | 3,25    |                      | synth. rubber 10mm 1000 LS + LI + CS + CI | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -       | 82 mm               | C/U + U/C + C/C        |            |
|                            | 1,50    | non-insulated walls  | synth. rubber 13mm CS + CI                | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -       | 88 mm               | C/U + U/C + C/C        |            |
|                            | 1,50    | non-insulated walls  | synth. rubber 25mm CS + CI                | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -       | 112 mm              | C/U + U/C + C/C        |            |
|                            | 3,25    |                      | synth. rubber 10mm 1000 LS + LI + CS + CI | EI 240                                                                                 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm   | 2 sides     | -       | 102 mm              | C/U + U/C + C/C        |            |
|                            | 3,25    |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -       | 89 mm               | C/U + U/C + C/C        |            |
|                            | 3,25    |                      | synth. rubber 13mm 750 LS + LI + CS + CI  | EI 180                                                                                 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm   | 2 sides     | -       | 98 mm               | C/U + U/C + C/C        |            |
|                            | 3,25    |                      | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -       | 112 mm              | C/U + U/C + C/C        |            |
|                            | 3,25    |                      | synth. rubber 25mm 750 LS + LI + CS + CI  | EI 180                                                                                 | rigid walls ≥ 150 mm               | 15 mm               | 25 mm   | 2 sides     | -       | 122 mm              | C/U + U/C + C/C        |            |
|                            |         |                      |                                           |                                                                                        |                                    |                     |         |             |         |                     |                        |            |
| Ø54                        | 1,50    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides     | -       | 100 mm              | C/U + U/C + C/C        |            |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides     | -       | 124 mm              | C/U + U/C + C/C        |            |
|                            |         |                      |                                           |                                                                                        |                                    |                     |         |             |         |                     |                        |            |
| Ø90                        | 3,00    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 30                                                                                  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides     | -       | 136 mm              | C/U + U/C + C/C        |            |
|                            |         |                      |                                           |                                                                                        |                                    |                     |         |             |         |                     |                        |            |
| Ø101,6                     | 3,60    |                      | synth. rubber 13mm 1000 LS + LI + CS + CI | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -       | 600 x 1200 mm + 25% | C/U + U/C + C/C        |            |
|                            |         |                      |                                           |                                                                                        |                                    |                     |         |             |         |                     |                        |            |
| Ø114                       | 3,00    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 30                                                                                  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides     | -       | 160 mm              | C/U + U/C + C/C        |            |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 30                                                                                  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides     | -       | 184 mm              | C/U + U/C + C/C        |            |
|                            |         |                      |                                           |                                                                                        |                                    |                     |         |             |         |                     |                        |            |
| Ø140                       | 4,00    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 30                                                                                  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides     | -       | 198 mm              | C/U + U/C + C/C        |            |
| max.                       |         |                      |                                           |                                                                                        |                                    |                     |         |             |         |                     |                        |            |
| Ø219,1                     | 14,20   |                      | synth. rubber 10mm 1000 LS + LI + CS + CI | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -       | 259 mm              | C/U + U/C + C/C        |            |
|                            |         |                      | synth. rubber 13mm 1000 LS + LI + CS + CI | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -       | 265 mm              | C/U + U/C + C/C        |            |
|                            |         | non-insulated walls  | synth. rubber 25mm CS + CI                | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -       | 289 mm              | C/U + U/C + C/C        |            |
|                            |         |                      | synth. rubber 25mm 1000 LS + LI + CS + CI | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -       | 600 x 1200 mm       | C/U + U/C + C/C        |            |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

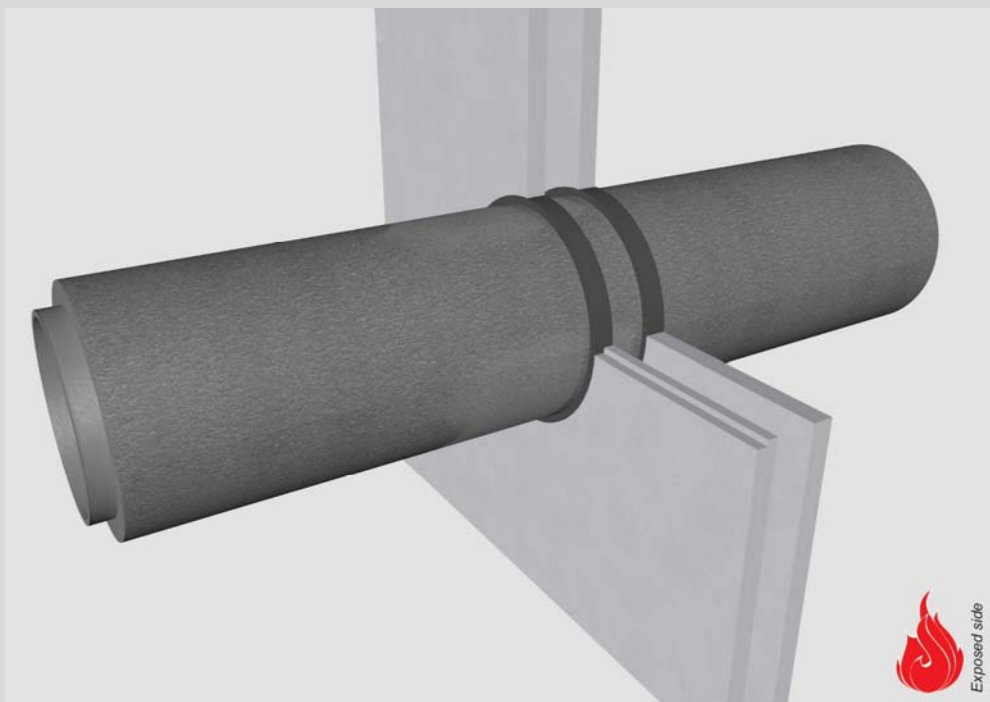
test method

service no.

fire resistance

EN 1366-3

30-32



## steel pipes

| service type <sup>1)</sup> |         | pipe insulation      |                                           |  EI | constructive element <sup>2)</sup> |       | Firesafe joint seal |         | application | backing required    | max. opening in construction | pipe end configuration                         | max. angle |
|----------------------------|---------|----------------------|-------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------|-------|---------------------|---------|-------------|---------------------|------------------------------|------------------------------------------------|------------|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m <sup>3</sup> eg Armaflex     |                                                                                        | width                              | depth |                     |         |             |                     |                              |                                                |            |
| up to                      |         |                      |                                           |                                                                                        |                                    |       |                     |         |             |                     |                              |                                                |            |
| Ø15                        | 1,00    |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm | 25 mm               | 2 sides | -           | 61 mm               | C/U + U/C + C/C              |                                                |            |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm | 25 mm               | 2 sides | -           | 85 mm               | C/U + U/C + C/C              |                                                |            |
|                            |         |                      |                                           |                                                                                        |                                    |       |                     |         |             |                     |                              |                                                |            |
| Ø22                        | 1,10    |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm | 25 mm               | 2 sides | -           | 600 x 1200 mm + 25% | C/U + U/C + C/C              |                                                |            |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 90                                                                                  | rigid walls ≥ 150 mm               | 10 mm | 25 mm               | 2 sides | -           | 68 mm               | C/U + U/C + C/C              |                                                |            |
|                            |         |                      |                                           |                                                                                        |                                    |       |                     |         |             |                     |                              |                                                |            |
| Ø35                        | 1,50    |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm | 25 mm               | 2 sides | -           | 81 mm               | C/U + U/C + C/C              |                                                |            |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 6 mm  | 25 mm               | 2 sides | -           | 98 mm               | C/U + U/C + C/C              |                                                |            |
|                            |         |                      |                                           |                                                                                        |                                    |       |                     |         |             |                     |                              |                                                |            |
| Ø42,2                      | 3,25    |                      | synth. rubber 10mm 1000 LS + LI + CS + CI | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm | 25 mm               | 2 sides | -           | 82 mm               | C/U + U/C + C/C              |                                                |            |
|                            | 1,50    | non-insulated walls  | synth. rubber 13mm CS + CI                | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm | 25 mm               | 2 sides | -           | 88 mm               | C/U + U/C + C/C              |                                                |            |
|                            | 1,50    | non-insulated walls  | synth. rubber 25mm CS + CI                | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm | 25 mm               | 2 sides | -           | 112 mm              | C/U + U/C + C/C              |                                                |            |
|                            | 3,25    |                      | synth. rubber 10mm 1000 LS + LI + CS + CI | EI 240                                                                                 | rigid walls ≥ 150 mm               | 15 mm | 25 mm               | 2 sides | -           | 102 mm              | C/U + U/C + C/C              |                                                |            |
|                            | 3,25    |                      | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm | 25 mm               | 2 sides | -           | 89 mm               | C/U + U/C + C/C              |                                                |            |
|                            | 3,25    |                      | synth. rubber 13mm 750 LS + LI + CS + CI  | EI 180                                                                                 | rigid walls ≥ 150 mm               | 15 mm | 25 mm               | 2 sides | -           | 98 mm               | C/U + U/C + C/C              |                                                |            |
|                            | 3,25    |                      | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm | 25 mm               | 2 sides | -           | 112 mm              | C/U + U/C + C/C              |                                                |            |
|                            | 3,25    |                      | synth. rubber 25mm 750 LS + LI + CS + CI  | EI 180                                                                                 | rigid walls ≥ 150 mm               | 15 mm | 25 mm               | 2 sides | -           | 122 mm              | C/U + U/C + C/C              |                                                |            |
|                            |         |                      |                                           |                                                                                        |                                    |       |                     |         |             |                     |                              |                                                |            |
| Ø54                        | 1,50    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm | 12,5 mm             | 2 sides | -           | 100 mm              | C/U + U/C + C/C              | perpendicular + all angles between 90° and 45° |            |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm | 12,5 mm             | 2 sides | -           | 124 mm              | C/U + U/C + C/C              |                                                |            |
|                            |         |                      |                                           |                                                                                        |                                    |       |                     |         |             |                     |                              |                                                |            |
| Ø90                        | 3,00    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 30                                                                                  | flexible walls ≥ 75 mm             | 10 mm | 12,5 mm             | 2 sides | -           | 136 mm              | C/U + U/C + C/C              |                                                |            |
|                            |         |                      |                                           |                                                                                        |                                    |       |                     |         |             |                     |                              |                                                |            |
| Ø101,6                     | 3,60    |                      | synth. rubber 13mm 1000 LS + LI + CS + CI | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm | 25 mm               | 2 sides | -           | 600 x 1200 mm + 25% | C/U + U/C + C/C              |                                                |            |
|                            |         |                      |                                           |                                                                                        |                                    |       |                     |         |             |                     |                              |                                                |            |
| Ø114                       | 3,00    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 30                                                                                  | flexible walls ≥ 75 mm             | 10 mm | 12,5 mm             | 2 sides | -           | 160 mm              | C/U + U/C + C/C              |                                                |            |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI  | EI 30                                                                                  | flexible walls ≥ 75 mm             | 10 mm | 12,5 mm             | 2 sides | -           | 184 mm              | C/U + U/C + C/C              |                                                |            |
|                            |         |                      |                                           |                                                                                        |                                    |       |                     |         |             |                     |                              |                                                |            |
| Ø140                       | 4,00    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI  | EI 30                                                                                  | flexible walls ≥ 75 mm             | 10 mm | 12,5 mm             | 2 sides | -           | 198 mm              | C/U + U/C + C/C              |                                                |            |
|                            |         |                      |                                           |                                                                                        |                                    |       |                     |         |             |                     |                              |                                                |            |
| max.                       |         |                      |                                           |                                                                                        |                                    |       |                     |         |             |                     |                              |                                                |            |
| Ø219,1                     | 14,20   |                      | synth. rubber 10mm 1000 LS + LI + CS + CI | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm | 25 mm               | 2 sides | -           | 259 mm              | C/U + U/C + C/C              |                                                |            |
|                            |         |                      | synth. rubber 13mm 1000 LS + LI + CS + CI | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm | 25 mm               | 2 sides | -           | 265 mm              | C/U + U/C + C/C              |                                                |            |
|                            |         | non-insulated walls  | synth. rubber 25mm CS + CI                | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm | 25 mm               | 2 sides | -           | 289 mm              | C/U + U/C + C/C              |                                                |            |
|                            |         |                      | synth. rubber 25mm 1000 LS + LI + CS + CI | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm | 25 mm               | 2 sides | -           | 600 x 1200 mm       | C/U + U/C + C/C              |                                                |            |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls  $\geq 100\text{mm}$  is also applicable for **rigid walls**  $\geq 100\text{mm}$
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

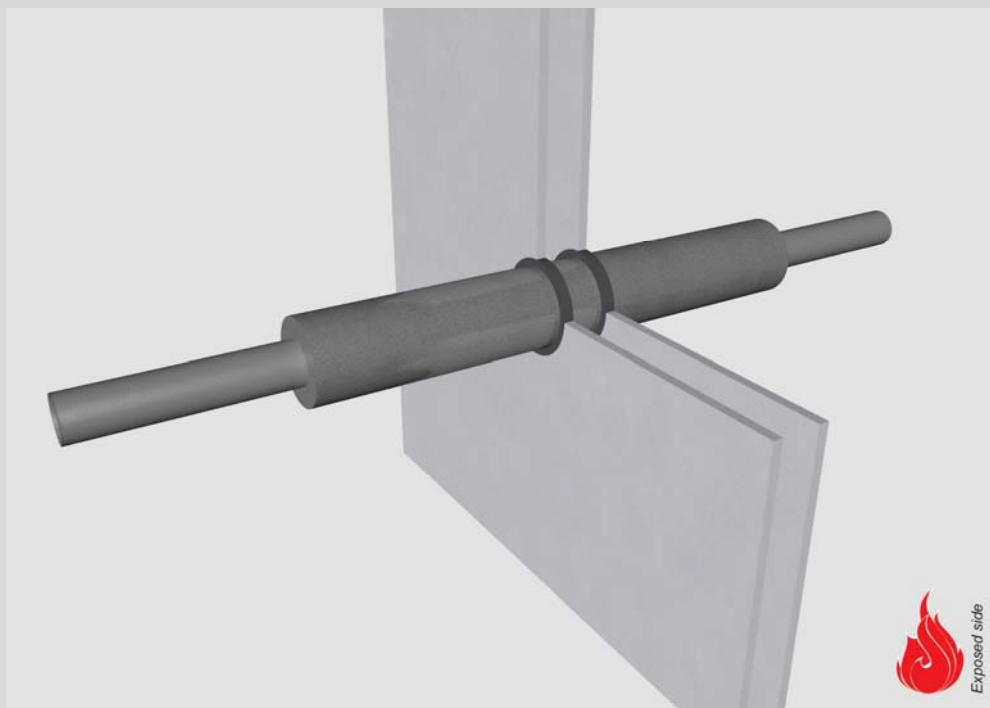
test method

service no.

fire resistance

EN 1366-3

31-25



## steel pipes

| service type <sup>1)</sup> |         | pipe insulation      |  EI | constructive element <sup>2)</sup>    | Firesafe joint seal     |       | application | backing      | max. opening | pipe end            | max. angle      |                                                |
|----------------------------|---------|----------------------|----------------------------------------------------------------------------------------|---------------------------------------|-------------------------|-------|-------------|--------------|--------------|---------------------|-----------------|------------------------------------------------|
| dØ (mm)                    | s1 (mm) | non-standard config. |                                                                                        | min. 60 kg/m <sup>3</sup> eg Armaflex |                         | width | depth       | 1 or 2 sides | required     | in construction     |                 | configuration                                  |
| up to                      |         |                      |                                                                                        |                                       |                         |       |             |              |              |                     |                 |                                                |
| Ø15                        | 1,00    |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 120                                | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides      | -            | 61 mm               | C/U + U/C + C/C |                                                |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI                                               | EI 90                                 | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides      | -            | 85 mm               | C/U + U/C + C/C |                                                |
|                            |         |                      |                                                                                        |                                       |                         |       |             |              |              |                     |                 |                                                |
| Ø22                        | 1,10    |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 60                                 | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides      | -            | 600 x 1200 mm + 25% | C/U + U/C + C/C |                                                |
|                            |         |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 90                                 | rigid walls ≥ 150 mm    | 10 mm | 25 mm       | 2 sides      | -            | 68 mm               | C/U + U/C + C/C |                                                |
|                            |         |                      |                                                                                        |                                       |                         |       |             |              |              |                     |                 |                                                |
| Ø35                        | 1,50    |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 90                                 | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides      | -            | 81 mm               | C/U + U/C + C/C |                                                |
|                            |         |                      | synth. rubber 25mm 700 LS + LI + CS + CI                                               | EI 90                                 | flexible walls ≥ 100 mm | 6 mm  | 25 mm       | 2 sides      | -            | 98 mm               | C/U + U/C + C/C |                                                |
|                            |         |                      |                                                                                        |                                       |                         |       |             |              |              |                     |                 |                                                |
| Ø42,2                      | 3,25    |                      | synth. rubber 10mm 1000 LS + LI + CS + CI                                              | EI 120                                | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides      | -            | 82 mm               | C/U + U/C + C/C |                                                |
|                            | 1,50    | non-insulated walls  | synth. rubber 13mm CS + CI                                                             | EI 90                                 | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides      | -            | 88 mm               | C/U + U/C + C/C |                                                |
|                            | 1,50    | non-insulated walls  | synth. rubber 25mm CS + CI                                                             | EI 90                                 | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides      | -            | 112 mm              | C/U + U/C + C/C |                                                |
|                            | 3,25    |                      | synth. rubber 10mm 1000 LS + LI + CS + CI                                              | EI 240                                | rigid walls ≥ 150 mm    | 15 mm | 25 mm       | 2 sides      | -            | 102 mm              | C/U + U/C + C/C |                                                |
|                            | 3,25    |                      | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 120                                | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides      | -            | 89 mm               | C/U + U/C + C/C |                                                |
|                            | 3,25    |                      | synth. rubber 13mm 750 LS + LI + CS + CI                                               | EI 180                                | rigid walls ≥ 150 mm    | 15 mm | 25 mm       | 2 sides      | -            | 98 mm               | C/U + U/C + C/C |                                                |
|                            | 3,25    |                      | synth. rubber 25mm 700 LS + LI + CS + CI                                               | EI 120                                | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides      | -            | 112 mm              | C/U + U/C + C/C |                                                |
|                            | 3,25    |                      | synth. rubber 25mm 750 LS + LI + CS + CI                                               | EI 180                                | rigid walls ≥ 150 mm    | 15 mm | 25 mm       | 2 sides      | -            | 122 mm              | C/U + U/C + C/C |                                                |
|                            |         |                      |                                                                                        |                                       |                         |       |             |              |              |                     |                 |                                                |
| Ø54                        | 1,50    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 60                                 | flexible walls ≥ 75 mm  | 10 mm | 12,5 mm     | 2 sides      | -            | 100 mm              | C/U + U/C + C/C | perpendicular + all angles between 90° and 45° |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI                                               | EI 60                                 | flexible walls ≥ 75 mm  | 10 mm | 12,5 mm     | 2 sides      | -            | 124 mm              | C/U + U/C + C/C |                                                |
|                            |         |                      |                                                                                        |                                       |                         |       |             |              |              |                     |                 |                                                |
| Ø90                        | 3,00    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 30                                 | flexible walls ≥ 75 mm  | 10 mm | 12,5 mm     | 2 sides      | -            | 136 mm              | C/U + U/C + C/C |                                                |
|                            |         |                      |                                                                                        |                                       |                         |       |             |              |              |                     |                 |                                                |
| Ø101,6                     | 3,60    |                      | synth. rubber 13mm 1000 LS + LI + CS + CI                                              | EI 60                                 | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides      | -            | 600 x 1200 mm + 25% | C/U + U/C + C/C |                                                |
|                            |         |                      |                                                                                        |                                       |                         |       |             |              |              |                     |                 |                                                |
| Ø114                       | 3,00    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 30                                 | flexible walls ≥ 75 mm  | 10 mm | 12,5 mm     | 2 sides      | -            | 160 mm              | C/U + U/C + C/C |                                                |
|                            |         | non-insulated walls  | synth. rubber 25mm 700 LS + LI + CS + CI                                               | EI 30                                 | flexible walls ≥ 75 mm  | 10 mm | 12,5 mm     | 2 sides      | -            | 184 mm              | C/U + U/C + C/C |                                                |
|                            |         |                      |                                                                                        |                                       |                         |       |             |              |              |                     |                 |                                                |
| Ø140                       | 4,00    | non-insulated walls  | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 30                                 | flexible walls ≥ 75 mm  | 10 mm | 12,5 mm     | 2 sides      | -            | 198 mm              | C/U + U/C + C/C |                                                |
| max.                       |         |                      |                                                                                        |                                       |                         |       |             |              |              |                     |                 |                                                |
| Ø219,1                     | 14,20   |                      | synth. rubber 10mm 1000 LS + LI + CS + CI                                              | EI 90                                 | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides      | -            | 259 mm              | C/U + U/C + C/C |                                                |
|                            |         |                      | synth. rubber 13mm 1000 LS + LI + CS + CI                                              | EI 120                                | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides      | -            | 265 mm              | C/U + U/C + C/C |                                                |
|                            |         | non-insulated walls  | synth. rubber 25mm CS + CI                                                             | EI 60                                 | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides      | -            | 289 mm              | C/U + U/C + C/C |                                                |
|                            |         |                      | synth. rubber 25mm 1000 LS + LI + CS + CI                                              | EI 60                                 | flexible walls ≥ 100 mm | 10 mm | 25 mm       | 2 sides      | -            | 600 x 1200 mm       | C/U + U/C + C/C |                                                |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance  $\leq 500\text{mm}$ .

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls  $\geq 100\text{mm}$  is also applicable for rigid walls  $\geq 100\text{mm}$ !

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

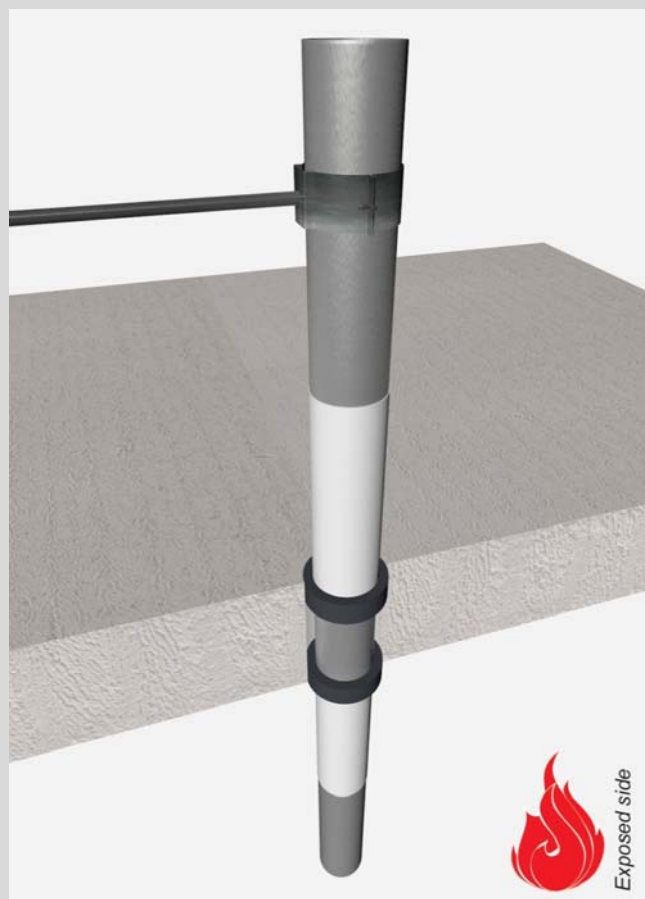
test method

service no.

fire resistance

EN 1366-3

8-5-6



## steel pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe insulation |           |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application | backing required | max. opening in construction | pipe end configuration | max. angle                                     |
|----------------------------|---------|-----------------|-----------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|-------------|------------------|------------------------------|------------------------|------------------------------------------------|
| dØ (mm)                    | s1 (mm) | FT Coating      | DFT 0,8mm |                                                                                        |                                    | width               | depth |             |                  |                              |                        |                                                |
|                            |         | PA sealer 3mm   |           |                                                                                        |                                    |                     |       |             |                  |                              |                        |                                                |
| Ø12                        | 1,0     | FT Coating      | 200 LI    | EI <b>120</b>                                                                          | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -                | 32 mm                        | C/U + U/C + C/C        | perpendicular + all angles between 90° and 45° |
| Ø15                        | 1,0     | FT Coating      | 200 LI    | EI <b>120</b>                                                                          | rigid floors ≥ 150 mm              | 14 mm               | 25 mm | 2 sides     | -                | 44 mm                        | C/U + U/C + C/C        |                                                |
| Ø22                        | 1,1     | FT Coating      | 200 LI    | EI <b>120</b>                                                                          | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -                | 44 mm                        | C/U + U/C + C/C        |                                                |
| Ø26,9                      | 2,9     | FT Coating      | 200 LI    | EI <b>120</b>                                                                          | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -                | 50 mm                        | C/U + U/C + C/C        |                                                |
| Ø28                        | 1,2     | FT Coating      | 200 LI    | EI <b>90</b>                                                                           | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -                | 50 mm                        | C/U + U/C + C/C        |                                                |
| max.                       |         |                 |           |                                                                                        |                                    |                     |       |             |                  |                              |                        |                                                |
| 60,3                       | 3,0     | FT Coating      | 200 LI    | EI <b>90</b>                                                                           | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -                | 82 mm                        | C/U + U/C + C/C        |                                                |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

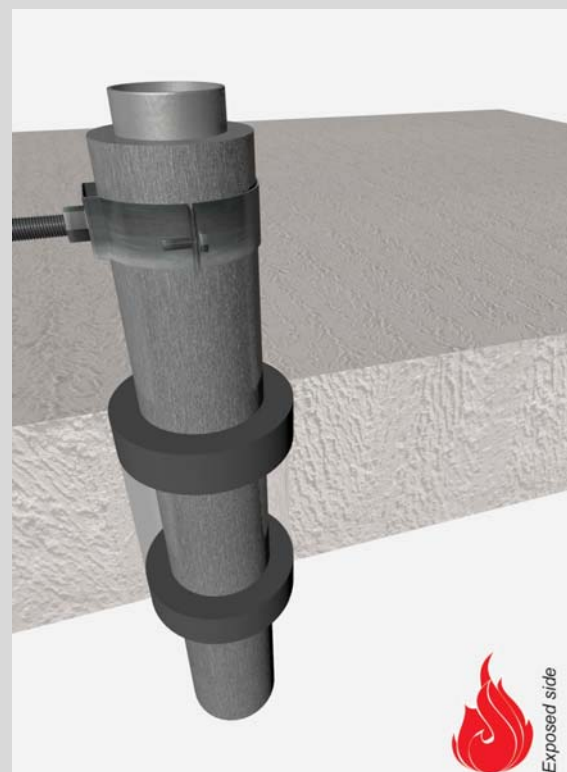
- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
22-16



## steel pipes

steel pipes

|                            |         |                           |                        |                                                                                        |                                    | FT Graphite         |       |             |         |               |                 |                                                |              |
|----------------------------|---------|---------------------------|------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|-------------|---------|---------------|-----------------|------------------------------------------------|--------------|
| service type <sup>1)</sup> |         | pipe insulation           |                        |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application | backing | max. opening  | pipe end        | max. angle                                     |              |
| dØ (mm)                    | s1 (mm) | min. 60 kg/m³ eg Armaflex |                        |                                                                                        |                                    | width               | depth |             |         |               |                 |                                                | 1 or 2 sides |
| Ø22                        | 1,1     | synth. rubber 13mm        | 700 LS + LI + CS + CI  | EI 90                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -       | 68 mm         | C/U + U/C + C/C | perpendicular + all angles between 90° and 45° |              |
|                            |         | synth. rubber 13mm        | 700 LS + LI + CS + CI  | EI 60                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -       | 600 x 5000 mm | C/U + U/C + C/C |                                                |              |
| Ø42,2                      | 3,25    | synth. rubber 10mm        | 1000 LS + LI + CS + CI | EI 240                                                                                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 102 mm        | C/U + U/C + C/C |                                                |              |
|                            |         | synth. rubber 13mm        | 750 LS + LI + CS + CI  | EI 180                                                                                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 98 mm         | C/U + U/C + C/C |                                                |              |
|                            |         | synth. rubber 13mm        | 700 LS + LI + CS + CI  | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm | 2 sides     | -       | 98 mm         | C/U + U/C + C/C |                                                |              |
|                            |         | synth. rubber 25mm        | 750 LS + LI + CS + CI  | EI 180                                                                                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 122 mm        | C/U + U/C + C/C |                                                |              |
| Ø89,9                      | 3,0     | synth. rubber 13mm        | 700 LS + LI + CS + CI  | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm | 2 sides     | -       | 146 mm        | C/U + U/C + C/C |                                                |              |
| Ø101,6                     | 3,6     | synth. rubber 13mm        | 1000 LS + LI + CS + CI | EI 90                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -       | 148 mm        | C/U + U/C + C/C |                                                |              |
|                            |         | synth. rubber 13mm        | 1000 LS + LI + CS + CI | EI 60                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -       | 600 x 5000 mm | C/U + U/C + C/C |                                                |              |
| max.                       |         |                           |                        |                                                                                        |                                    |                     |       |             |         |               |                 |                                                |              |
| Ø219,1                     | 14,2    | synth. rubber 10mm        | 1000 LS + LI + CS + CI | EI 90                                                                                  | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 269 mm        | C/U + U/C + C/C |                                                |              |
|                            |         | synth. rubber 13mm        | 750 LS + LI + CS + CI  | EI 60                                                                                  | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 276 mm        | C/U + U/C + C/C |                                                |              |
|                            |         | synth. rubber 25mm        | 750 LS + LI + CS + CI  | EI 60                                                                                  | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -       | 300 mm        | C/U + U/C + C/C |                                                |              |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

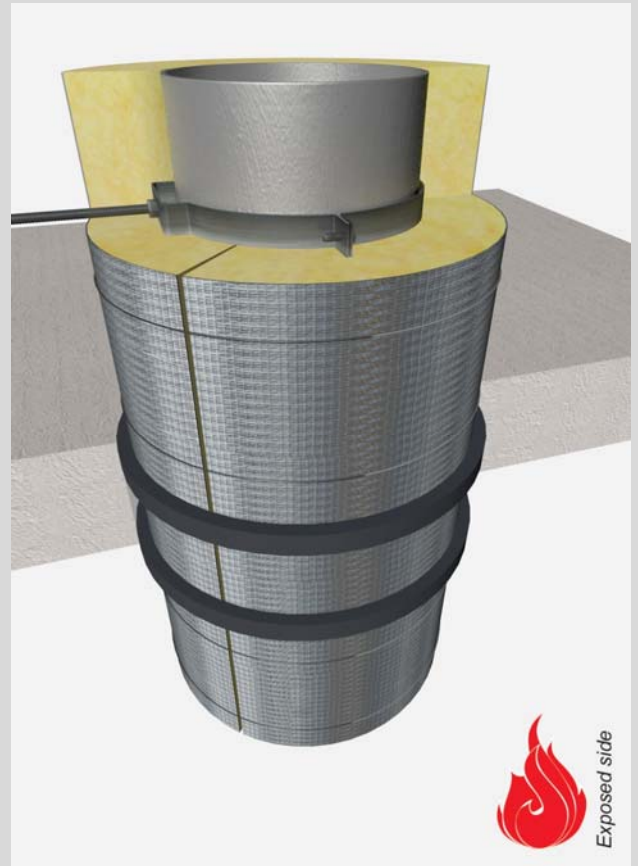
fire resistance

test method

EN 1366-3

service no.

22-1



## steel pipes

| service type <sup>1)</sup> |         | pipe insulation <sup>2)</sup>                                                     |              |  | EI                    | constructive element <sup>3)</sup> | Firesafe joint seal |         | application | backing | max. opening    | pipe end                                             | max. angle      |              |
|----------------------------|---------|-----------------------------------------------------------------------------------|--------------|-------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------|---------|-------------|---------|-----------------|------------------------------------------------------|-----------------|--------------|
| dØ (mm)                    | s1 (mm) | min. 75 kg/m <sup>3</sup> eg Climpipe, Rockwool<br>or U Protect Pipe Section Alu2 |              |                                                                                     |                       |                                    | width               | depth   |             |         |                 |                                                      |                 | 1 or 2 sides |
| Ø15                        | 1,0     | glass / rock wool 20mm                                                            | 1200 CS + CI | EI 240                                                                              | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 85 mm   | U/C + C/C       | perpendicular + all<br>angles between 90°<br>and 45° |                 |              |
|                            |         |                                                                                   | 30mm         | 1200 CS + CI                                                                        | EI 240                | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -       | 105 mm          |                                                      | U/C + C/C       |              |
|                            |         |                                                                                   | 40mm         | 1200 CS + CI                                                                        | EI 240                | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -       | 125 mm          |                                                      | U/C + C/C       |              |
|                            |         |                                                                                   | 50mm         | 1200 CS + CI                                                                        | EI 240                | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -       | 145 mm          |                                                      | U/C + C/C       |              |
|                            |         |                                                                                   | 60mm         | 1200 CS + CI                                                                        | EI 240                | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -       | 165 mm          |                                                      | U/C + C/C       |              |
|                            |         |                                                                                   | 80mm         | 1200 CS + CI                                                                        | EI 240                | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -       | 205 mm          |                                                      | U/C + C/C       |              |
| Ø42,2                      | 3,25    | glass / rock wool 20mm                                                            | 1200 CS + CI | EI 90                                                                               | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 112 mm  | C/U + U/C + C/C |                                                      |                 |              |
|                            |         |                                                                                   | 30mm         | 1200 CS + CI                                                                        | EI 90                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -       | 132 mm          |                                                      | C/U + U/C + C/C |              |
|                            |         |                                                                                   | 40mm         | 1200 CS + CI                                                                        | EI 90                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -       | 152 mm          |                                                      | C/U + U/C + C/C |              |
|                            |         |                                                                                   | 50mm         | 1200 CS + CI                                                                        | EI 90                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -       | 172 mm          |                                                      | C/U + U/C + C/C |              |
|                            |         |                                                                                   | 60mm         | 1200 CS + CI                                                                        | EI 90                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -       | 192 mm          |                                                      | C/U + U/C + C/C |              |
|                            |         |                                                                                   | 80mm         | 1200 CS + CI                                                                        | EI 180                | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -       | 244 mm          |                                                      | C/U + U/C + C/C |              |
| Ø76                        | 2,1     | glass / rock wool 20mm                                                            | 1200 CS + CI | EI 90                                                                               | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 150 mm  | U/C + C/C       |                                                      |                 |              |
|                            |         |                                                                                   | 30mm         | 1200 CS + CI                                                                        | EI 90                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -       | 166 mm          |                                                      | U/C + C/C       |              |
|                            |         |                                                                                   | 40mm         | 1200 CS + CI                                                                        | EI 90                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -       | 186 mm          |                                                      | U/C + C/C       |              |
|                            |         |                                                                                   | 50mm         | 1200 CS + CI                                                                        | EI 90                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -       | 206 mm          |                                                      | U/C + C/C       |              |
|                            |         |                                                                                   | 60mm         | 1200 CS + CI                                                                        | EI 90                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -       | 226 mm          |                                                      | U/C + C/C       |              |
|                            |         |                                                                                   | 80mm         | 1200 CS + CI                                                                        | EI 240                | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -       | 266 mm          |                                                      | U/C + C/C       |              |
| max.                       |         |                                                                                   |              |                                                                                     |                       |                                    |                     |         |             |         |                 |                                                      |                 |              |
| Ø219,1                     | 4,5     | glass / rock wool 20mm                                                            | 1200 CS + CI | EI 90                                                                               | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 289 mm  | C/U + U/C + C/C |                                                      |                 |              |
| Ø219,1                     | 4,5     | 30mm                                                                              | 1200 CS + CI | EI 90                                                                               | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 309 mm  | C/U + U/C + C/C |                                                      |                 |              |
| Ø219,1                     | 4,5     | 40mm                                                                              | 1200 CS + CI | EI 90                                                                               | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 329 mm  | C/U + U/C + C/C |                                                      |                 |              |
| Ø219,1                     | 4,5     | 50mm                                                                              | 1200 CS + CI | EI 90                                                                               | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 349 mm  | C/U + U/C + C/C |                                                      |                 |              |
| Ø219,1                     | 4,5     | 60mm                                                                              | 1200 CS + CI | EI 90                                                                               | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 369 mm  | C/U + U/C + C/C |                                                      |                 |              |
| Ø219,1                     | 4,5     | 80mm                                                                              | 1200 CS + CI | EI 180                                                                              | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 409 mm  | C/U + U/C + C/C |                                                      |                 |              |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Pipe insulation must be fastened individually (not wrapped!) with steel wire: at max. 50mm + 300mm from constructive element.

<sup>3)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

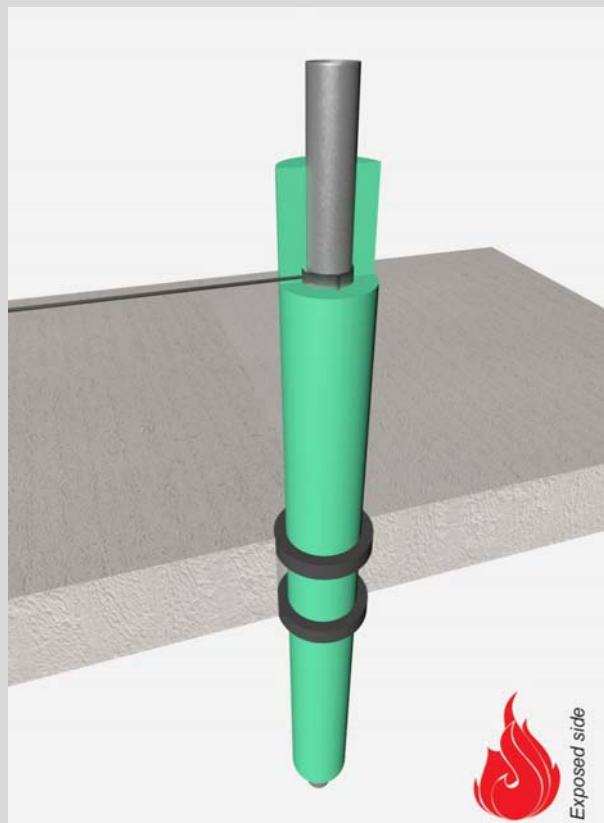
test method

service no.

fire resistance

EN 1366-3

17-5-1



## steel pipes

### FT Graphite

| service type <sup>1)</sup> |         | pipe insulation                                                                |                        |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end        | max. angle                                     |
|----------------------------|---------|--------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|--------------|----------|-----------------|-----------------|------------------------------------------------|
| dØ (mm)                    | s1 (mm) | min. 90 kg/m <sup>3</sup> eg Rockwool 810<br>min. 33 kg/m <sup>3</sup> for PIR |                        |                                                                                        |                                    | width               | depth | 1 or 2 sides | required | in construction | configuration   |                                                |
| Ø15                        | 1,0     | rock wool 25 mm                                                                | 700 LS + LI + CS + CI  | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 85 mm           | C/U + U/C + C/C | perpendicular + all angles between 90° and 45° |
|                            |         | 50 mm                                                                          | 700 LS + LI + CS + CI  | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 6 mm                | 25 mm | 2 sides      | -        | 128 mm          | C/U + U/C + C/C |                                                |
| Ø35                        | 1,5     | rock wool 25 mm                                                                | 700 LS + LI + CS + CI  | EI <b>60</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 105 mm          | C/U + U/C + C/C |                                                |
|                            |         | 50 mm                                                                          | 700 LS + LI + CS + CI  | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 155 mm          | C/U + U/C + C/C |                                                |
| Ø42,2                      | 3,25    | rock wool 25 mm                                                                | 700 LS + LI + CS + CI  | EI <b>60</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 112 mm          | C/U + U/C + C/C |                                                |
|                            |         | 50 mm                                                                          | 700 LS + LI + CS + CI  | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 162 mm          | C/U + U/C + C/C |                                                |
|                            |         | PIR 25 mm                                                                      | 1000 LS + LI + CS + CI | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 112 mm          | C/U + U/C + C/C |                                                |
|                            |         | 25 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides      | -        | 122 mm          | C/U + U/C + C/C |                                                |
|                            |         | 25 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>240</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides      | -        | 122 mm          | C/U + U/C + C/C |                                                |
|                            |         | 50 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>120</b>                                                                          | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 162 mm          | C/U + U/C + C/C |                                                |
|                            |         | 50 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>240</b>                                                                          | rigid walls ≥ 150 mm               | 15 mm               | 25 mm | 2 sides      | -        | 172 mm          | C/U + U/C + C/C |                                                |
|                            |         | 50 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>240</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides      | -        | 172 mm          | C/U + U/C + C/C |                                                |
| max.                       |         |                                                                                |                        |                                                                                        |                                    |                     |       |              |          |                 |                 |                                                |
| Ø219,1                     | 4,5     | rock wool 25 mm                                                                | 700 LS + LI + CS + CI  | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 289 mm          | C/U + U/C + C/C |                                                |
|                            |         | 25 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>120</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides      | -        | 300 mm          | C/U + U/C + C/C |                                                |
|                            |         | 50 mm                                                                          | 700 LS + LI + CS + CI  | EI <b>90</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 339 mm          | C/U + U/C + C/C |                                                |
|                            |         | PIR 25 mm                                                                      | 1000 LS + LI + CS + CI | EI <b>60</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 289 mm          | C/U + U/C + C/C |                                                |
|                            |         | 25 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>180</b>                                                                          | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides      | -        | 299 mm          | C/U + U/C + C/C |                                                |
|                            |         | 50 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>60</b>                                                                           | flexible walls ≥ 100 mm            | 10 mm               | 25 mm | 2 sides      | -        | 339 mm          | C/U + U/C + C/C |                                                |
|                            |         | 50 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>90</b>                                                                           | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides      | -        | 349 mm          | C/U + U/C + C/C |                                                |
|                            |         | 50 mm                                                                          | 1000 LS + LI + CS + CI | EI <b>90</b>                                                                           | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides      | -        | 349 mm          | C/U + U/C + C/C |                                                |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

test method

service no.

fire resistance

EN 1366-3

28-50



## steel pipes

steel pipes

|                            |         |                           |                        |                                                                                        |                                    | FT Graphite         |       |             |                  |                              |                        |                                                |  |
|----------------------------|---------|---------------------------|------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|-------------|------------------|------------------------------|------------------------|------------------------------------------------|--|
| service type <sup>1)</sup> |         | pipe insulation           |                        |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application | backing required | max. opening in construction | pipe end configuration | max. angle                                     |  |
| dØ (mm)                    | s1 (mm) | min. 60 kg/m³ eg Armaflex |                        |                                                                                        |                                    | width               | depth |             |                  |                              |                        |                                                |  |
| Ø22                        | 1,10    | synth. rubber 13mm        | 700 LS + LI + CS + CI  | EI 90                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -                | 68 mm                        | C/U + U/C + C/C        | perpendicular + all angles between 90° and 45° |  |
|                            |         | synth. rubber 13mm        | 700 LS + LI + CS + CI  | EI 60                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -                | 600 x 5000 mm                | C/U + U/C + C/C        |                                                |  |
| Ø42,2                      | 3,25    | synth. rubber 10mm        | 1000 LS + LI + CS + CI | EI 240                                                                                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 102 mm                       | C/U + U/C + C/C        |                                                |  |
|                            | 3,25    | synth. rubber 13mm        | 750 LS + LI + CS + CI  | EI 180                                                                                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 98 mm                        | C/U + U/C + C/C        |                                                |  |
|                            | 2,60    | synth. rubber 13mm        | 700 LS + LI + CS + CI  | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm | 2 sides     | -                | 98 mm                        | C/U + U/C + C/C        |                                                |  |
|                            | 3,25    | synth. rubber 25mm        | 750 LS + LI + CS + CI  | EI 180                                                                                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 122 mm                       | C/U + U/C + C/C        |                                                |  |
| Ø89,9                      | 3,00    | synth. rubber 13mm        | 700 LS + LI + CS + CI  | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm | 2 sides     | -                | 146 mm                       | C/U + U/C + C/C        |                                                |  |
| Ø101,6                     | 3,60    | synth. rubber 13mm        | 1000 LS + LI + CS + CI | EI 90                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -                | 148 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | synth. rubber 13mm        | 1000 LS + LI + CS + CI | EI 60                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -                | 600 x 5000 mm                | C/U + U/C + C/C        |                                                |  |
| max.                       |         |                           |                        |                                                                                        |                                    |                     |       |             |                  |                              |                        |                                                |  |
| Ø219,1                     | 14,20   | synth. rubber 10mm        | 1000 LS + LI + CS + CI | EI 90                                                                                  | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 269 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | synth. rubber 13mm        | 750 LS + LI + CS + CI  | EI 60                                                                                  | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 276 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | synth. rubber 25mm        | 750 LS + LI + CS + CI  | EI 60                                                                                  | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 300 mm                       | C/U + U/C + C/C        |                                                |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
28-52



## steel pipes

steel pipes

|                            |         |                           |                        |                                                                                        |                                    | FT Graphite         |       |             |                  |                              |                        |                                                |  |
|----------------------------|---------|---------------------------|------------------------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-------|-------------|------------------|------------------------------|------------------------|------------------------------------------------|--|
| service type <sup>1)</sup> |         | pipe insulation           |                        |  EI | constructive element <sup>2)</sup> | Firesafe joint seal |       | application | backing required | max. opening in construction | pipe end configuration | max. angle                                     |  |
| dØ (mm)                    | s1 (mm) | min. 60 kg/m³ eg Armaflex |                        |                                                                                        |                                    | width               | depth |             |                  |                              |                        |                                                |  |
| Ø22                        | 1,10    | synth. rubber 13mm        | 700 LS + LI + CS + CI  | EI 90                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -                | 68 mm                        | C/U + U/C + C/C        | perpendicular + all angles between 90° and 45° |  |
|                            |         | synth. rubber 13mm        | 700 LS + LI + CS + CI  | EI 60                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -                | 600 x 5000 mm                | C/U + U/C + C/C        |                                                |  |
| Ø42,2                      | 3,25    | synth. rubber 10mm        | 1000 LS + LI + CS + CI | EI 240                                                                                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 102 mm                       | C/U + U/C + C/C        |                                                |  |
|                            | 3,25    | synth. rubber 13mm        | 750 LS + LI + CS + CI  | EI 180                                                                                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 98 mm                        | C/U + U/C + C/C        |                                                |  |
|                            | 2,60    | synth. rubber 13mm        | 700 LS + LI + CS + CI  | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm | 2 sides     | -                | 98 mm                        | C/U + U/C + C/C        |                                                |  |
|                            | 3,25    | synth. rubber 25mm        | 750 LS + LI + CS + CI  | EI 180                                                                                 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 122 mm                       | C/U + U/C + C/C        |                                                |  |
| Ø89,9                      | 3,00    | synth. rubber 13mm        | 700 LS + LI + CS + CI  | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm | 2 sides     | -                | 146 mm                       | C/U + U/C + C/C        |                                                |  |
| Ø101,6                     | 3,60    | synth. rubber 13mm        | 1000 LS + LI + CS + CI | EI 90                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -                | 148 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | synth. rubber 13mm        | 1000 LS + LI + CS + CI | EI 60                                                                                  | rigid floors ≥ 150 mm              | 10 mm               | 25 mm | 2 sides     | -                | 600 x 5000 mm                | C/U + U/C + C/C        |                                                |  |
| max.                       |         |                           |                        |                                                                                        |                                    |                     |       |             |                  |                              |                        |                                                |  |
| Ø219,1                     | 14,20   | synth. rubber 10mm        | 1000 LS + LI + CS + CI | EI 90                                                                                  | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 269 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | synth. rubber 13mm        | 750 LS + LI + CS + CI  | EI 60                                                                                  | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 276 mm                       | C/U + U/C + C/C        |                                                |  |
|                            |         | synth. rubber 25mm        | 750 LS + LI + CS + CI  | EI 60                                                                                  | rigid floors ≥ 150 mm              | 15 mm               | 25 mm | 2 sides     | -                | 300 mm                       | C/U + U/C + C/C        |                                                |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property

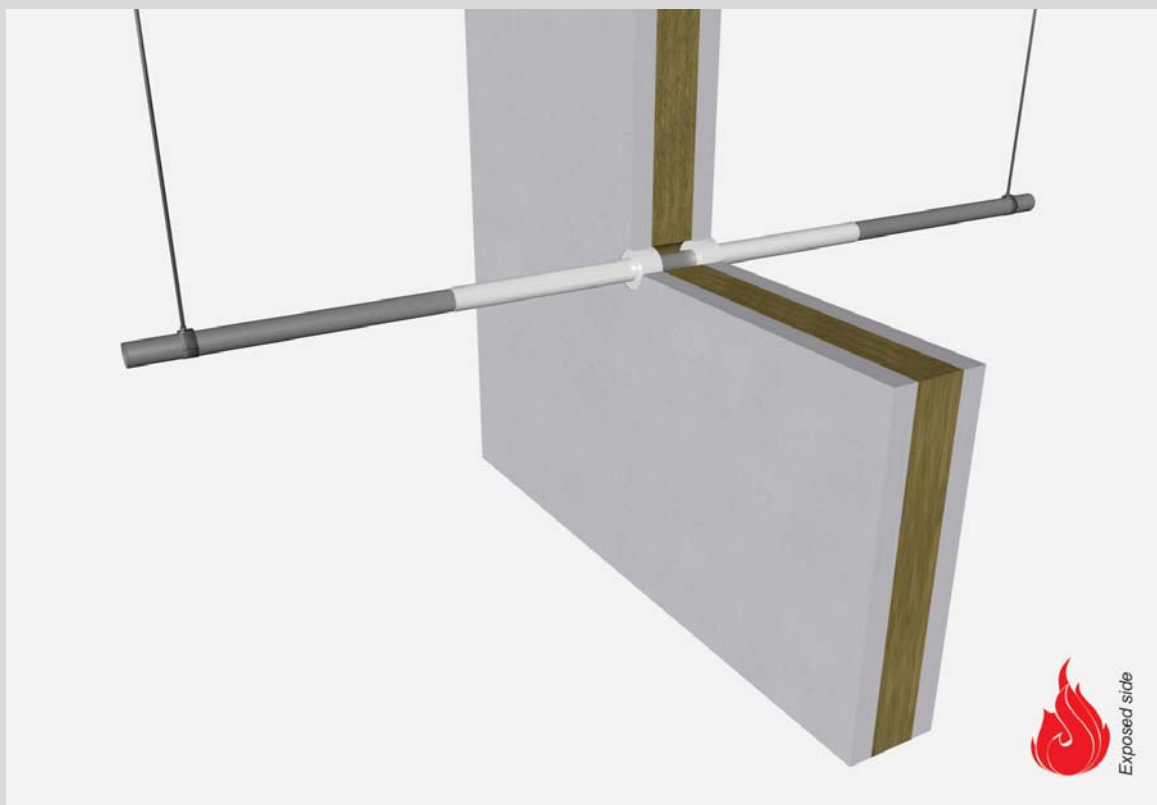
test method

service no.

fire resistance

EN 1366-3

10-50s



## steel pipes

### FT Acrylic

| service type <sup>1)</sup> |         | pipe insulation      |            | EI     | constructive element <sup>2)</sup> | Firesafe joint seal   |           | application  | backing  | max. opening    | pipe end      | max. angle                                              |  |
|----------------------------|---------|----------------------|------------|--------|------------------------------------|-----------------------|-----------|--------------|----------|-----------------|---------------|---------------------------------------------------------|--|
| dØ (mm)                    | s1 (mm) | FT Coating DFT 0,8mm |            |        |                                    | width                 | depth     | 1 or 2 sides | required | in construction | configuration |                                                         |  |
| up to                      |         |                      |            |        |                                    |                       |           |              |          |                 |               |                                                         |  |
| Ø12                        | 1,0     | -                    |            | EI 120 | rigid walls ≥ 150 mm               | 10 mm                 | 25 mm     | 2 sides      | -        | 32 mm           | C/U           | perpendicular +<br>all angles<br>between 90°<br>and 45° |  |
|                            |         | -                    |            | EI 120 | rigid floors ≥ 150 mm              | 10 mm                 | 25 mm     | 2 sides      | -        | 32 mm           | C/U           |                                                         |  |
|                            |         | FT Coating           | 200 LI     | EI 90  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm     | 2 sides      | -        | 32 mm           | C/U           |                                                         |  |
| Ø15                        | 1,0     | -                    |            | EI 120 | rigid walls ≥ 150 mm               | 15 mm                 | 25 mm     | 2 sides      | -        | 44 mm           | C/U           |                                                         |  |
|                            |         | -                    |            | EI 120 | rigid floors ≥ 150 mm              | 15 mm                 | 25 mm     | 2 sides      | -        | 44 mm           | C/U           |                                                         |  |
|                            |         | FT Coating           | 200 LI     | EI 60  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm     | 2 sides      | -        | 35 mm           | C/U           |                                                         |  |
| Ø22                        | 1,1     | -                    |            | EI 60  | rigid walls ≥ 150 mm               | 10 mm                 | 25 mm     | 2 sides      | -        | 44 mm           | C/U           |                                                         |  |
|                            |         | -                    |            | EI 60  | rigid floors ≥ 150 mm              | 10 mm                 | 25 mm     | 2 sides      | -        | 44 mm           | C/U           |                                                         |  |
|                            |         | FT Coating           | 200 LI     | EI 60  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm     | 2 sides      | -        | 42 mm           | C/U           |                                                         |  |
| Ø26,9                      | 2,9     | -                    |            | EI 120 | rigid walls ≥ 150 mm               | 11 mm                 | 25 mm     | 2 sides      | -        | 50 mm           | C/U           |                                                         |  |
|                            |         | -                    |            | EI 120 | rigid floors ≥ 150 mm              | 11 mm                 | 25 mm     | 2 sides      | -        | 50 mm           | C/U           |                                                         |  |
| Ø28                        | 1,2     | -                    |            | EI 60  | rigid walls ≥ 150 mm               | 11 mm                 | 25 mm     | 2 sides      | -        | 50 mm           | C/U           |                                                         |  |
|                            |         | -                    |            | EI 60  | rigid floors ≥ 150 mm              | 11 mm                 | 25 mm     | 2 sides      | -        | 50 mm           | C/U           |                                                         |  |
|                            |         | max. 2x bundled      | FT Coating | 200 LI | EI 180                             | rigid walls ≥ 150 mm  | smokeseal | 2 sides      | -        | 70 mm           | C/U           |                                                         |  |
|                            |         | max. 2x bundled      | FT Coating | 200 LI | EI 180                             | rigid floors ≥ 150 mm | smokeseal | 2 sides      | -        | 70 mm           | C/U           |                                                         |  |
| Ø42,2                      | 3,25    | FT Coating           | 200 LI     | EI 180 | rigid walls ≥ 150 mm               | smokeseal             |           | 2 sides      | -        | 50 mm           | C/U           |                                                         |  |
|                            |         | FT Coating           | 200 LI     | EI 180 | rigid floors ≥ 150 mm              | smokeseal             |           | 2 sides      | -        | 50 mm           | C/U           |                                                         |  |
| max.                       |         |                      |            |        |                                    |                       |           |              |          |                 |               |                                                         |  |
| 60,3                       | 3,0     | -                    |            | EI 120 | rigid walls ≥ 150 mm               | 10 mm                 | 25 mm     | 2 sides      | -        | 82 mm           | C/U           |                                                         |  |
|                            |         | -                    |            | EI 120 | rigid floors ≥ 150 mm              | 10 mm                 | 25 mm     | 2 sides      | -        | 82 mm           | C/U           |                                                         |  |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

# Notes:

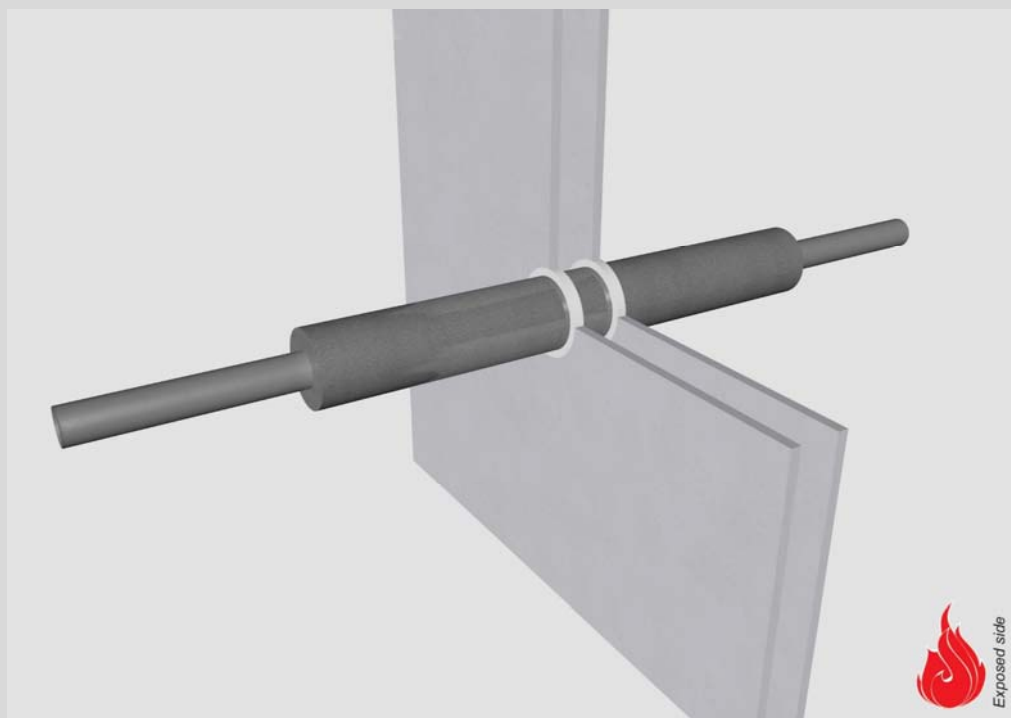
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

# principle detail

# Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
31-32



## steel pipes

| service type <sup>1)</sup> |         |                      | pipe insulation                       |                        | EI                                                                                  | constructive element <sup>2)</sup>      |           | Firesafe joint seal |         | application  | backing      | max. opening    | pipe end                                   | max. angle |  |
|----------------------------|---------|----------------------|---------------------------------------|------------------------|-------------------------------------------------------------------------------------|-----------------------------------------|-----------|---------------------|---------|--------------|--------------|-----------------|--------------------------------------------|------------|--|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m <sup>3</sup> eg Amalflex |                        |  |                                         |           | width               | depth   | 1 or 2 sides | required     | in construction | configuration                              |            |  |
| up to                      |         |                      |                                       |                        |                                                                                     |                                         |           |                     |         |              |              |                 |                                            |            |  |
| Ø12                        | 1,00    |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm     | 25 mm               | 2 sides | -            | 58 mm        | C/U + U/C + C/C | perpendicular + angles between 90° and 45° |            |  |
|                            |         |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm     | 25 mm               | 2 sides | -            | 58 mm        | C/U + U/C + C/C |                                            |            |  |
| Ø15                        | 1,00    |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm     | 25 mm               | 2 sides | -            | 61 mm        | C/U + U/C + C/C |                                            |            |  |
|                            |         |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm     | 25 mm               | 2 sides | -            | 61 mm        | C/U + U/C + C/C |                                            |            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm                    | 7 mm      | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |                                            |            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 7 mm      | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |                                            |            |  |
| Ø22                        | 1,10    |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm     | 25 mm               | 2 sides | -            | 68 mm        | C/U + U/C + C/C |                                            |            |  |
|                            |         |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm     | 25 mm               | 2 sides | -            | 68 mm        | C/U + U/C + C/C |                                            |            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm                    | 5 mm      | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |                                            |            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 5 mm      | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |                                            |            |  |
| Ø28                        | 1,20    |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | <a href="#">rigid walls ≥ 150 mm</a>    | 10 mm     | 25 mm               | 2 sides | -            | 74 mm        | C/U + U/C + C/C |                                            |            |  |
|                            |         |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | <a href="#">rigid floors ≥ 150 mm</a>   | 10 mm     | 25 mm               | 2 sides | -            | 74 mm        | C/U + U/C + C/C |                                            |            |  |
| Ø32                        | 1,50    |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm     | 25 mm               | 2 sides | -            | 102 mm       | C/U + U/C + C/C |                                            |            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm     | 25 mm               | 2 sides | -            | 102 mm       | C/U + U/C + C/C |                                            |            |  |
| Ø42,2                      | 1,50    | non-insulated walls  | rock wool 25 mm                       | 500 LI + CS + CI       | EI 90                                                                               | flexible walls ≥ 100 mm                 | 10 mm     | 25 mm               | 2 sides | -            | 112 mm       | C/U + U/C + C/C |                                            |            |  |
|                            | 1,50    | non-insulated walls  | rock wool 50 mm                       | 500 LI + CS + CI       | EI 90                                                                               | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm     | 25 mm               | 2 sides | -            | 162mm        | C/U + U/C + C/C |                                            |            |  |
|                            | 3,25    |                      | rock wool 25 mm                       | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm                    | 9 mm      | 25 mm               | 2 sides | -            | 110 mm       | C/U + U/C + C/C |                                            |            |  |
|                            | 3,25    |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 9 mm      | 25 mm               | 2 sides | -            | 110 mm       | C/U + U/C + C/C |                                            |            |  |
| Ø54                        | 2,00    | non-insulated walls  | rock wool 25 mm                       | 700 LS + LI + CS + CI  | EI 30                                                                               | flexible walls ≥ 75 mm                  | 10 mm     | 12,5 mm             | 2 sides | -            | 124 mm       | C/U + U/C + C/C |                                            |            |  |
|                            |         |                      | rock wool 32 mm                       | 500 LI + CS + CI       | EI 120                                                                              | rigid walls ≥ 150 mm                    | smokeseal | 2 sides             | -       | 200 x 200 mm | C/C          |                 |                                            |            |  |
| Ø114                       | 3,00    | non-insulated walls  | rock wool 25 mm                       | 700 LS + LI + CS + CI  | EI 30                                                                               | <a href="#">flexible walls ≥ 75 mm</a>  | 10 mm     | 12,5 mm             | 2 sides | -            | 184 mm       | C/U + U/C + C/C |                                            |            |  |
| max.                       |         |                      |                                       |                        |                                                                                     |                                         |           |                     |         |              |              |                 |                                            |            |  |
| Ø219,1                     | 14,20   | non-insulated walls  | rock wool 25 mm                       | 1100 LS + LI + CS + CI | EI 60                                                                               | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm     | 25 mm               | 2 sides | -            | 289 mm       | C/U + U/C + C/C |                                            |            |  |
|                            |         |                      | rock wool 25 mm                       | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 15 mm     | 25 mm               | 2 sides | -            | 299 mm       | C/U + U/C + C/C |                                            |            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | <a href="#">rigid floors ≥ 150 mm</a>   | 15 mm     | 25 mm               | 2 sides | -            | 600 x 700 mm | C/U + U/C + C/C |                                            |            |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

# Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
8-6-4rs



## steel pipes

| steel pipes                |         |                                       |                                          |        |                                    | FT Acrylic          |         |             |              |              |                 |            |                                                |          |
|----------------------------|---------|---------------------------------------|------------------------------------------|--------|------------------------------------|---------------------|---------|-------------|--------------|--------------|-----------------|------------|------------------------------------------------|----------|
| service type <sup>1)</sup> |         | pipe insulation                       |                                          | EI     | constructive element <sup>2)</sup> | Firesafe joint seal |         | application | backing      | max. opening | pipe end        | max. angle |                                                |          |
| dØ (mm)                    | s1 (mm) | min. 60 kg/m <sup>3</sup> eg Armaflex |                                          |        |                                    | width               | depth   |             |              |              |                 |            | 1 or 2 sides                                   | required |
| up to                      |         |                                       |                                          |        |                                    |                     |         |             |              |              |                 |            | perpendicular + all angles between 90° and 45° |          |
| Ø12                        | 1,0     |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120 | rigid walls ≥ 150 mm               | 10 mm               | 25 mm   | 2 sides     | -            | 58 mm        | C/U + U/C + C/C |            |                                                |          |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm   | 2 sides     | -            | 58 mm        | C/U + U/C + C/C |            |                                                |          |
| Ø15                        | 1,0     |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120 | rigid walls ≥ 150 mm               | 10 mm               | 25 mm   | 2 sides     | -            | 61 mm        | C/U + U/C + C/C |            |                                                |          |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm   | 2 sides     | -            | 61 mm        | C/U + U/C + C/C |            |                                                |          |
|                            |         |                                       | rock wool 25mm 1000 LS + LI + CS + CI    | EI 120 | rigid walls ≥ 150 mm               | 7 mm                | 25 mm   | 2 sides     | -            | 82 mm        | C/U + U/C + C/C |            |                                                |          |
|                            |         |                                       | rock wool 25mm 1000 LS + LI + CS + CI    | EI 120 | rigid floors ≥ 150 mm              | 7 mm                | 25 mm   | 2 sides     | -            | 82 mm        | C/U + U/C + C/C |            |                                                |          |
| Ø22                        | 1,1     |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120 | rigid walls ≥ 150 mm               | 10 mm               | 25 mm   | 2 sides     | -            | 68 mm        | C/U + U/C + C/C |            |                                                |          |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm   | 2 sides     | -            | 68 mm        | C/U + U/C + C/C |            |                                                |          |
|                            |         |                                       | rock wool 25mm 1000 LS + LI + CS + CI    | EI 120 | rigid walls ≥ 150 mm               | 5 mm                | 25 mm   | 2 sides     | -            | 82 mm        | C/U + U/C + C/C |            |                                                |          |
|                            |         |                                       | rock wool 25mm 1000 LS + LI + CS + CI    | EI 120 | rigid floors ≥ 150 mm              | 5 mm                | 25 mm   | 2 sides     | -            | 82 mm        | C/U + U/C + C/C |            |                                                |          |
| Ø28                        | 1,2     |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120 | rigid walls ≥ 150 mm               | 10 mm               | 25 mm   | 2 sides     | -            | 74 mm        | C/U + U/C + C/C |            |                                                |          |
|                            |         |                                       | synth. rubber 13mm 700 LS + LI + CS + CI | EI 120 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm   | 2 sides     | -            | 74 mm        | C/U + U/C + C/C |            |                                                |          |
| Ø32                        | 1,5     |                                       | rock wool 25mm 1000 LS + LI + CS + CI    | EI 120 | rigid walls ≥ 150 mm               | 10 mm               | 25 mm   | 2 sides     | -            | 102 mm       | C/U + U/C + C/C |            |                                                |          |
|                            |         |                                       | rock wool 25mm 1000 LS + LI + CS + CI    | EI 120 | rigid floors ≥ 150 mm              | 10 mm               | 25 mm   | 2 sides     | -            | 102 mm       | C/U + U/C + C/C |            |                                                |          |
| Ø42,2                      | 3,25    | non-insulated walls                   | rock wool 25 mm LI + CS + CI             | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -            | 112 mm       | C/U + U/C + C/C |            |                                                |          |
|                            |         | non-insulated walls                   | rock wool 50 mm LI + CS + CI             | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -            | 162mm        | C/U + U/C + C/C |            |                                                |          |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120 | rigid walls ≥ 150 mm               | 9 mm                | 25 mm   | 2 sides     | -            | 110 mm       | C/U + U/C + C/C |            |                                                |          |
|                            |         |                                       | rock wool 25mm 1000 LS + LI + CS + CI    | EI 120 | rigid floors ≥ 150 mm              | 9 mm                | 25 mm   | 2 sides     | -            | 110 mm       | C/U + U/C + C/C |            |                                                |          |
| Ø54                        | 2,0     | non-insulated walls                   | rock wool 25 mm 700 LS + LI + CS + CI    | EI 30  | flexible walls ≥ 75 mm             | 10 mm               | 25 mm   | 2 sides     | -            | 124 mm       | C/U + U/C + C/C |            |                                                |          |
|                            |         |                                       | rock wool 32 mm 1150 LI                  | EI 120 | rigid walls ≥ 150 mm               | smokesal            | 2 sides | -           | 200 x 200 mm | C/C          |                 |            |                                                |          |
| Ø114                       | 3,0     | non-insulated walls                   | rock wool 25 mm 700 LS + LI + CS + CI    | EI 30  | flexible walls ≥ 75 mm             | 10 mm               | 25 mm   | 2 sides     | -            | 184 mm       | C/U + U/C + C/C |            |                                                |          |
| max.                       |         |                                       |                                          |        |                                    |                     |         |             |              |              |                 |            |                                                |          |
| Ø219,1                     | 4,50    | non-insulated walls                   | rock wool 25 mm LS + LI + CS + CI        | EI 60  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides     | -            | 289 mm       | C/U + U/C + C/C |            |                                                |          |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI   | EI 120 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -            | 299 mm       | C/U + U/C + C/C |            |                                                |          |
|                            |         |                                       | rock wool 25mm 1000 LS + LI + CS + CI    | EI 120 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides     | -            | 600 x 700 mm | C/U + U/C + C/C |            |                                                |          |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

**principle detail****Firesafe**

tested property

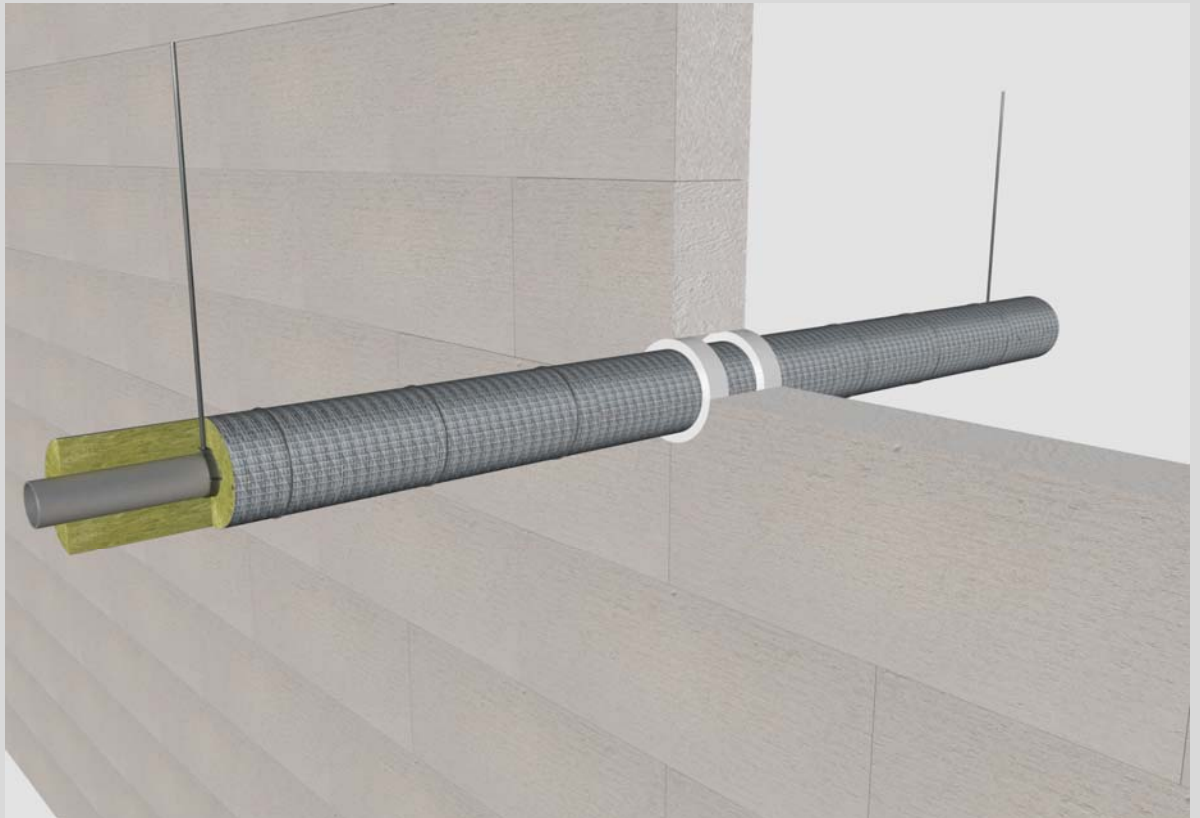
test method

service no.

fire resistance

EN 1366-3

8-7-5rs

**steel pipes****FT Acrylic**

| service type <sup>1)</sup> |         | pipe insulation           |                              |  | EI                    | constructive element <sup>2)</sup> | Firesafe joint seal |         | application | backing required | max. opening in construction | pipe end configuration                         | max. angle |  |
|----------------------------|---------|---------------------------|------------------------------|-------------------------------------------------------------------------------------|-----------------------|------------------------------------|---------------------|---------|-------------|------------------|------------------------------|------------------------------------------------|------------|--|
| dØ (mm)                    | s1 (mm) | min. 60 kg/m³ eg Armaflex |                              |                                                                                     |                       |                                    | width               | depth   |             |                  |                              |                                                |            |  |
| up to                      |         |                           |                              |                                                                                     |                       |                                    |                     |         |             |                  |                              |                                                |            |  |
| Ø12                        | 1,0     | synth. rubber 13mm        | 700 LS + LI + CS + CI        | EI 120                                                                              | rigid walls ≥ 150 mm  | 10 mm                              | 25 mm               | 2 sides | -           | 58 mm            | C/U + U/C + C/C              | perpendicular + all angles between 90° and 45° |            |  |
|                            |         |                           | 13mm 700 LS + LI + CS + CI   | EI 120                                                                              | rigid floors ≥ 150 mm | 10 mm                              | 25 mm               | 2 sides | -           | 58 mm            | C/U + U/C + C/C              |                                                |            |  |
| Ø15                        | 1,0     | synth. rubber 13mm        | 700 LS + LI + CS + CI        | EI 120                                                                              | rigid walls ≥ 150 mm  | 10 mm                              | 25 mm               | 2 sides | -           | 61 mm            | C/U + U/C + C/C              |                                                |            |  |
|                            |         |                           | 13mm 700 LS + LI + CS + CI   | EI 120                                                                              | rigid floors ≥ 150 mm | 10 mm                              | 25 mm               | 2 sides | -           | 61 mm            | C/U + U/C + C/C              |                                                |            |  |
|                            |         | rock wool 25mm            | 1000 LS + LI + CS + CI       | EI 120                                                                              | rigid walls ≥ 150 mm  | 7 mm                               | 25 mm               | 2 sides | -           | 82 mm            | C/U + U/C + C/C              |                                                |            |  |
|                            |         |                           | 25mm 1000 LS + LI + CS + CI  | EI 120                                                                              | rigid floors ≥ 150 mm | 7 mm                               | 25 mm               | 2 sides | -           | 82 mm            | C/U + U/C + C/C              |                                                |            |  |
| Ø22                        | 1,1     | synth. rubber 13mm        | 700 LS + LI + CS + CI        | EI 120                                                                              | rigid walls ≥ 150 mm  | 10 mm                              | 25 mm               | 2 sides | -           | 68 mm            | C/U + U/C + C/C              |                                                |            |  |
|                            |         |                           | 13mm 700 LS + LI + CS + CI   | EI 120                                                                              | rigid floors ≥ 150 mm | 10 mm                              | 25 mm               | 2 sides | -           | 68 mm            | C/U + U/C + C/C              |                                                |            |  |
|                            |         | rock wool 25mm            | 1000 LS + LI + CS + CI       | EI 120                                                                              | rigid walls ≥ 150 mm  | 5 mm                               | 25 mm               | 2 sides | -           | 82 mm            | C/U + U/C + C/C              |                                                |            |  |
|                            |         |                           | 25mm 1000 LS + LI + CS + CI  | EI 120                                                                              | rigid floors ≥ 150 mm | 5 mm                               | 25 mm               | 2 sides | -           | 82 mm            | C/U + U/C + C/C              |                                                |            |  |
| Ø28                        | 1,2     | synth. rubber 13mm        | 700 LS + LI + CS + CI        | EI 120                                                                              | rigid walls ≥ 150 mm  | 10 mm                              | 25 mm               | 2 sides | -           | 74 mm            | C/U + U/C + C/C              |                                                |            |  |
|                            |         |                           | 13mm 700 LS + LI + CS + CI   | EI 120                                                                              | rigid floors ≥ 150 mm | 10 mm                              | 25 mm               | 2 sides | -           | 74 mm            | C/U + U/C + C/C              |                                                |            |  |
| Ø32                        | 1,5     | rock wool 25mm            | 1000 LS + LI + CS + CI       | EI 120                                                                              | rigid walls ≥ 150 mm  | 10 mm                              | 25 mm               | 2 sides | -           | 102 mm           | C/U + U/C + C/C              |                                                |            |  |
|                            |         |                           | 25mm 1000 LS + LI + CS + CI  | EI 120                                                                              | rigid floors ≥ 150 mm | 10 mm                              | 25 mm               | 2 sides | -           | 102 mm           | C/U + U/C + C/C              |                                                |            |  |
| Ø42,2                      | 3,25    | rock wool 25 mm           | 1000 LS + LI + CS + CI       | EI 120                                                                              | rigid walls ≥ 150 mm  | 9 mm                               | 25 mm               | 2 sides | -           | 110 mm           | C/U + U/C + C/C              |                                                |            |  |
|                            |         |                           | 25 mm 1000 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm | 9 mm                               | 25 mm               | 2 sides | -           | 110 mm           | C/U + U/C + C/C              |                                                |            |  |
| Ø54                        | 2,0     | rock wool 32 mm           | 1150 LI                      | EI 120                                                                              | rigid walls ≥ 150 mm  | smokeseal                          |                     | 2 sides | -           | 200 x 200 mm     | C/C                          |                                                |            |  |
| max.                       |         |                           |                              |                                                                                     |                       |                                    |                     |         |             |                  |                              |                                                |            |  |
| Ø219,1                     | 4,50    | rock wool 25 mm           | 1000 LS + LI + CS + CI       | EI 120                                                                              | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 299 mm           | C/U + U/C + C/C              |                                                |            |  |
|                            |         |                           | 25 mm 1000 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm | 15 mm                              | 25 mm               | 2 sides | -           | 600 x 700 mm     | C/U + U/C + C/C              |                                                |            |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

# Notes:

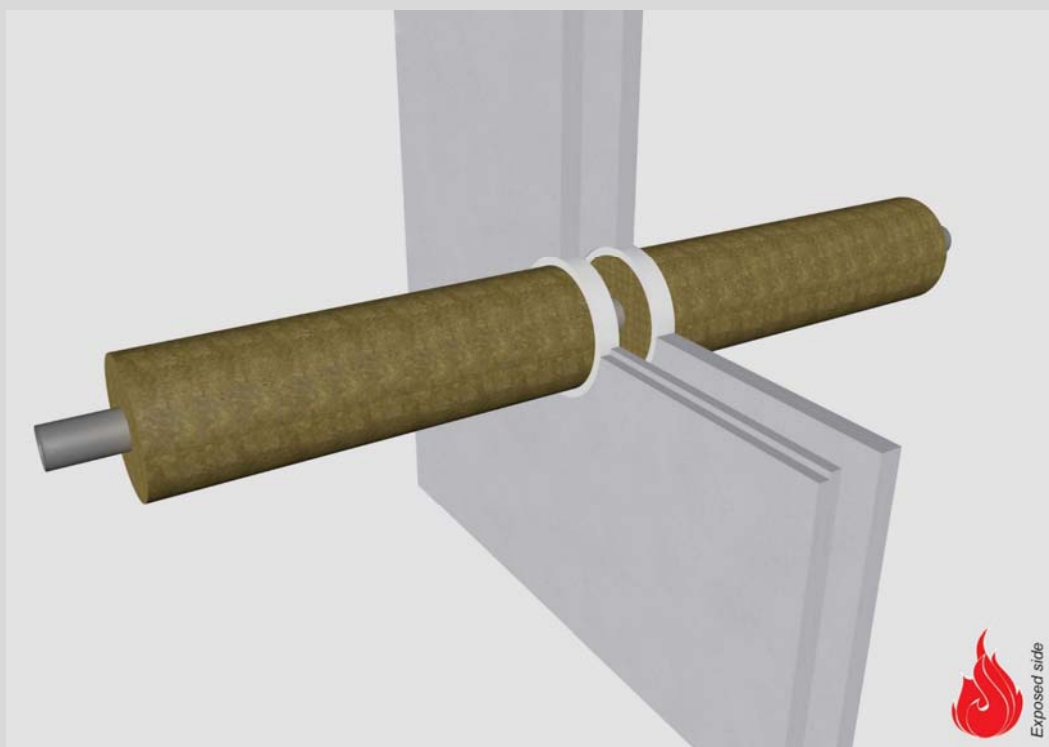
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

# principle detail

# Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
30-37b



## steel pipes

| service type <sup>1)</sup> |         |                      | pipe insulation                       |                        | EI                                                                                  | constructive element <sup>2)</sup>      |           | Firesafe joint seal |         | application  | backing      | max. opening    | pipe end      | max. angle                                 |  |
|----------------------------|---------|----------------------|---------------------------------------|------------------------|-------------------------------------------------------------------------------------|-----------------------------------------|-----------|---------------------|---------|--------------|--------------|-----------------|---------------|--------------------------------------------|--|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m <sup>3</sup> eg Amalflex |                        |  |                                         |           | width               | depth   | 1 or 2 sides | required     | in construction | configuration |                                            |  |
| up to                      |         |                      |                                       |                        |                                                                                     |                                         |           |                     |         |              |              |                 |               |                                            |  |
| Ø12                        | 1,00    |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm     | 25 mm               | 2 sides | -            | 58 mm        | C/U + U/C + C/C |               | perpendicular + angles between 90° and 45° |  |
|                            |         |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm     | 25 mm               | 2 sides | -            | 58 mm        | C/U + U/C + C/C |               |                                            |  |
| Ø15                        | 1,00    |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm     | 25 mm               | 2 sides | -            | 61 mm        | C/U + U/C + C/C |               |                                            |  |
|                            |         |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm     | 25 mm               | 2 sides | -            | 61 mm        | C/U + U/C + C/C |               |                                            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm                    | 7 mm      | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |               |                                            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 7 mm      | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |               |                                            |  |
| Ø22                        | 1,10    |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm     | 25 mm               | 2 sides | -            | 68 mm        | C/U + U/C + C/C |               |                                            |  |
|                            |         |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm     | 25 mm               | 2 sides | -            | 68 mm        | C/U + U/C + C/C |               |                                            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm                    | 5 mm      | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |               |                                            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 5 mm      | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |               |                                            |  |
| Ø28                        | 1,20    |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | <a href="#">rigid walls ≥ 150 mm</a>    | 10 mm     | 25 mm               | 2 sides | -            | 74 mm        | C/U + U/C + C/C |               |                                            |  |
|                            |         |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120                                                                              | <a href="#">rigid floors ≥ 150 mm</a>   | 10 mm     | 25 mm               | 2 sides | -            | 74 mm        | C/U + U/C + C/C |               |                                            |  |
| Ø32                        | 1,50    |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm                    | 10 mm     | 25 mm               | 2 sides | -            | 102 mm       | C/U + U/C + C/C |               |                                            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 10 mm     | 25 mm               | 2 sides | -            | 102 mm       | C/U + U/C + C/C |               |                                            |  |
| Ø42,2                      | 1,50    | non-insulated walls  | rock wool 25 mm                       | 500 LI + CS + CI       | EI 90                                                                               | flexible walls ≥ 100 mm                 | 10 mm     | 25 mm               | 2 sides | -            | 112 mm       | C/U + U/C + C/C |               |                                            |  |
|                            | 1,50    | non-insulated walls  | rock wool 50 mm                       | 500 LI + CS + CI       | EI 90                                                                               | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm     | 25 mm               | 2 sides | -            | 162mm        | C/U + U/C + C/C |               |                                            |  |
|                            | 3,25    |                      | rock wool 25 mm                       | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid walls ≥ 150 mm                    | 9 mm      | 25 mm               | 2 sides | -            | 110 mm       | C/U + U/C + C/C |               |                                            |  |
|                            | 3,25    |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 9 mm      | 25 mm               | 2 sides | -            | 110 mm       | C/U + U/C + C/C |               |                                            |  |
| Ø54                        | 2,00    | non-insulated walls  | rock wool 25 mm                       | 700 LS + LI + CS + CI  | EI 30                                                                               | flexible walls ≥ 75 mm                  | 10 mm     | 12,5 mm             | 2 sides | -            | 124 mm       | C/U + U/C + C/C |               |                                            |  |
|                            |         |                      | rock wool 32 mm                       | 500 LI + CS + CI       | EI 120                                                                              | rigid walls ≥ 150 mm                    | smokeseal |                     | 2 sides | -            | 200 x 200 mm | C/C             |               |                                            |  |
| Ø114                       | 3,00    | non-insulated walls  | rock wool 25 mm                       | 700 LS + LI + CS + CI  | EI 30                                                                               | <a href="#">flexible walls ≥ 75 mm</a>  | 10 mm     | 12,5 mm             | 2 sides | -            | 184 mm       | C/U + U/C + C/C |               |                                            |  |
| max.                       |         |                      |                                       |                        |                                                                                     |                                         |           |                     |         |              |              |                 |               |                                            |  |
| Ø219,1                     | 14,20   | non-insulated walls  | rock wool 25 mm                       | 1100 LS + LI + CS + CI | EI 60                                                                               | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm     | 25 mm               | 2 sides | -            | 289 mm       | C/U + U/C + C/C |               |                                            |  |
|                            |         |                      | rock wool 25 mm                       | 1000 LS + LI + CS + CI | EI 120                                                                              | rigid floors ≥ 150 mm                   | 15 mm     | 25 mm               | 2 sides | -            | 299 mm       | C/U + U/C + C/C |               |                                            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120                                                                              | <a href="#">rigid floors ≥ 150 mm</a>   | 15 mm     | 25 mm               | 2 sides | -            | 600 x 700 mm | C/U + U/C + C/C |               |                                            |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

**principle detail**
**Firesafe**

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
30-38


**steel pipes**

| service type <sup>1)</sup> |         |                      | pipe insulation                       |                        | EI     | constructive element <sup>2)</sup> |  | Firesafe joint seal |         | application  | backing  | max. opening    | pipe end        | max. angle                                 |  |
|----------------------------|---------|----------------------|---------------------------------------|------------------------|--------|------------------------------------|--|---------------------|---------|--------------|----------|-----------------|-----------------|--------------------------------------------|--|
| dØ (mm)                    | s1 (mm) | non-standard config. | min. 60 kg/m <sup>3</sup> eg Amalflex |                        |        |                                    |  | width               | depth   | 1 or 2 sides | required | in construction | configuration   |                                            |  |
| up to                      |         |                      |                                       |                        |        |                                    |  |                     |         |              |          |                 |                 |                                            |  |
| Ø12                        | 1,00    |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120 | rigid walls ≥ 150 mm               |  | 10 mm               | 25 mm   | 2 sides      | -        | 58 mm           | C/U + U/C + C/C | perpendicular + angles between 90° and 45° |  |
|                            |         |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120 | rigid floors ≥ 150 mm              |  | 10 mm               | 25 mm   | 2 sides      | -        | 58 mm           | C/U + U/C + C/C |                                            |  |
| Ø15                        | 1,00    |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120 | rigid walls ≥ 150 mm               |  | 10 mm               | 25 mm   | 2 sides      | -        | 61 mm           | C/U + U/C + C/C |                                            |  |
|                            |         |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120 | rigid floors ≥ 150 mm              |  | 10 mm               | 25 mm   | 2 sides      | -        | 61 mm           | C/U + U/C + C/C |                                            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120 | rigid walls ≥ 150 mm               |  | 7 mm                | 25 mm   | 2 sides      | -        | 82 mm           | C/U + U/C + C/C |                                            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120 | rigid floors ≥ 150 mm              |  | 7 mm                | 25 mm   | 2 sides      | -        | 82 mm           | C/U + U/C + C/C |                                            |  |
| Ø22                        | 1,10    |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120 | rigid walls ≥ 150 mm               |  | 10 mm               | 25 mm   | 2 sides      | -        | 68 mm           | C/U + U/C + C/C |                                            |  |
|                            |         |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120 | rigid floors ≥ 150 mm              |  | 10 mm               | 25 mm   | 2 sides      | -        | 68 mm           | C/U + U/C + C/C |                                            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120 | rigid walls ≥ 150 mm               |  | 5 mm                | 25 mm   | 2 sides      | -        | 82 mm           | C/U + U/C + C/C |                                            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120 | rigid floors ≥ 150 mm              |  | 5 mm                | 25 mm   | 2 sides      | -        | 82 mm           | C/U + U/C + C/C |                                            |  |
| Ø28                        | 1,20    |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120 | rigid walls ≥ 150 mm               |  | 10 mm               | 25 mm   | 2 sides      | -        | 74 mm           | C/U + U/C + C/C |                                            |  |
|                            |         |                      | synth. rubber 13mm                    | 700 LS + LI + CS + CI  | EI 120 | rigid floors ≥ 150 mm              |  | 10 mm               | 25 mm   | 2 sides      | -        | 74 mm           | C/U + U/C + C/C |                                            |  |
| Ø32                        | 1,50    |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120 | rigid walls ≥ 150 mm               |  | 10 mm               | 25 mm   | 2 sides      | -        | 102 mm          | C/U + U/C + C/C |                                            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120 | rigid floors ≥ 150 mm              |  | 10 mm               | 25 mm   | 2 sides      | -        | 102 mm          | C/U + U/C + C/C |                                            |  |
| Ø42,2                      | 1,50    | non-insulated walls  | rock wool 25 mm                       | 500 LI + CS + CI       | EI 90  | flexible walls ≥ 100 mm            |  | 10 mm               | 25 mm   | 2 sides      | -        | 112 mm          | C/U + U/C + C/C |                                            |  |
|                            | 1,50    | non-insulated walls  | rock wool 50 mm                       | 500 LI + CS + CI       | EI 90  | flexible walls ≥ 100 mm            |  | 10 mm               | 25 mm   | 2 sides      | -        | 162mm           | C/U + U/C + C/C |                                            |  |
|                            | 3,25    |                      | rock wool 25 mm                       | 1000 LS + LI + CS + CI | EI 120 | rigid walls ≥ 150 mm               |  | 9 mm                | 25 mm   | 2 sides      | -        | 110 mm          | C/U + U/C + C/C |                                            |  |
|                            | 3,25    |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120 | rigid floors ≥ 150 mm              |  | 9 mm                | 25 mm   | 2 sides      | -        | 110 mm          | C/U + U/C + C/C |                                            |  |
| Ø54                        | 2,00    | non-insulated walls  | rock wool 25 mm                       | 700 LS + LI + CS + CI  | EI 30  | flexible walls ≥ 75 mm             |  | 10 mm               | 12,5 mm | 2 sides      | -        | 124 mm          | C/U + U/C + C/C |                                            |  |
|                            |         |                      | rock wool 32 mm                       | 500 LI + CS + CI       | EI 120 | rigid walls ≥ 150 mm               |  | smokeseal           |         | 2 sides      | -        | 200 x 200 mm    | C/C             |                                            |  |
| Ø114                       | 3,00    | non-insulated walls  | rock wool 25 mm                       | 700 LS + LI + CS + CI  | EI 30  | flexible walls ≥ 75 mm             |  | 10 mm               | 12,5 mm | 2 sides      | -        | 184 mm          | C/U + U/C + C/C |                                            |  |
| max.                       |         |                      |                                       |                        |        |                                    |  |                     |         |              |          |                 |                 |                                            |  |
| Ø219,1                     | 14,20   | non-insulated walls  | rock wool 25 mm                       | 1100 LS + LI + CS + CI | EI 60  | flexible walls ≥ 100 mm            |  | 10 mm               | 25 mm   | 2 sides      | -        | 289 mm          | C/U + U/C + C/C |                                            |  |
|                            |         |                      | rock wool 25 mm                       | 1000 LS + LI + CS + CI | EI 120 | rigid floors ≥ 150 mm              |  | 15 mm               | 25 mm   | 2 sides      | -        | 299 mm          | C/U + U/C + C/C |                                            |  |
|                            |         |                      | rock wool 25mm                        | 1000 LS + LI + CS + CI | EI 120 | rigid floors ≥ 150 mm              |  | 15 mm               | 25 mm   | 2 sides      | -        | 600 x 700 mm    | C/U + U/C + C/C |                                            |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

# Notes:

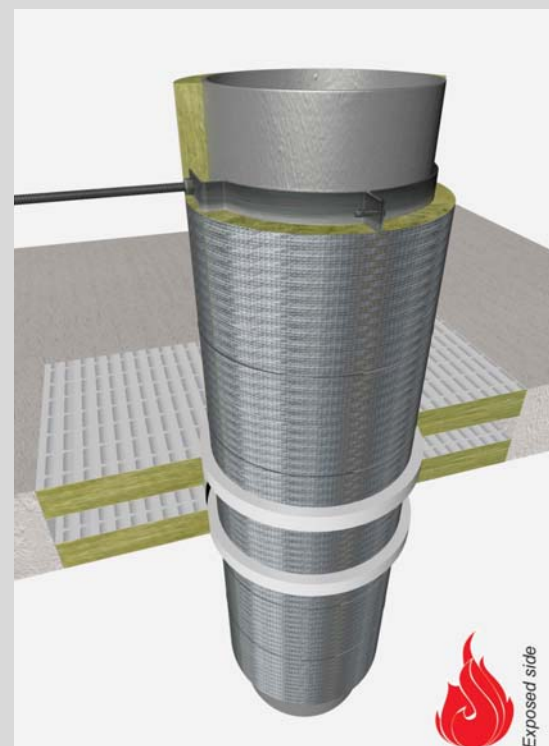
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

# principle detail

# Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
17-54



## steel pipes

| service type <sup>1)</sup> |         | pipe insulation            |                                          |  | constructive element <sup>2)</sup>      |           | Firesafe joint seal |         | application  | backing      | max. opening    | pipe end                                   | max. angle |  |  |
|----------------------------|---------|----------------------------|------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------|-----------|---------------------|---------|--------------|--------------|-----------------|--------------------------------------------|------------|--|--|
| dØ (mm)                    | s1 (mm) | non-standard config.       |                                          |                                                                                     | min. 60 kg/m <sup>3</sup> eg Amalflex   |           | width               | depth   | 1 or 2 sides | required     | in construction | configuration                              |            |  |  |
| up to                      |         |                            |                                          |                                                                                     |                                         |           |                     |         |              |              |                 |                                            |            |  |  |
| Ø12                        | 1,0     |                            | synth. rubber 13mm 700 LS + LI + CS + CI | EI <b>120</b>                                                                       | rigid walls ≥ 150 mm                    | 10 mm     | 25 mm               | 2 sides | -            | 58 mm        | C/U + U/C + C/C | perpendicular + angles between 90° and 45° |            |  |  |
|                            |         |                            | synth. rubber 13mm 700 LS + LI + CS + CI | EI <b>120</b>                                                                       | rigid floors ≥ 150 mm                   | 10 mm     | 25 mm               | 2 sides | -            | 58 mm        | C/U + U/C + C/C |                                            |            |  |  |
| Ø15                        | 1,0     |                            | synth. rubber 13mm 700 LS + LI + CS + CI | EI <b>120</b>                                                                       | rigid walls ≥ 150 mm                    | 10 mm     | 25 mm               | 2 sides | -            | 61 mm        | C/U + U/C + C/C |                                            |            |  |  |
|                            |         |                            | synth. rubber 13mm 700 LS + LI + CS + CI | EI <b>120</b>                                                                       | rigid floors ≥ 150 mm                   | 10 mm     | 25 mm               | 2 sides | -            | 61 mm        | C/U + U/C + C/C |                                            |            |  |  |
|                            |         |                            | rock wool 25mm 1000 LS + LI + CS + CI    | EI <b>120</b>                                                                       | rigid walls ≥ 150 mm                    | 7 mm      | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |                                            |            |  |  |
|                            |         |                            | rock wool 25mm 1000 LS + LI + CS + CI    | EI <b>120</b>                                                                       | rigid floors ≥ 150 mm                   | 7 mm      | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |                                            |            |  |  |
| Ø22                        | 1,1     |                            | synth. rubber 13mm 700 LS + LI + CS + CI | EI <b>120</b>                                                                       | rigid walls ≥ 150 mm                    | 10 mm     | 25 mm               | 2 sides | -            | 68 mm        | C/U + U/C + C/C |                                            |            |  |  |
|                            |         |                            | synth. rubber 13mm 700 LS + LI + CS + CI | EI <b>120</b>                                                                       | rigid floors ≥ 150 mm                   | 10 mm     | 25 mm               | 2 sides | -            | 68 mm        | C/U + U/C + C/C |                                            |            |  |  |
|                            |         |                            | rock wool 25mm 1000 LS + LI + CS + CI    | EI <b>120</b>                                                                       | rigid walls ≥ 150 mm                    | 5 mm      | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |                                            |            |  |  |
|                            |         |                            | rock wool 25mm 1000 LS + LI + CS + CI    | EI <b>120</b>                                                                       | rigid floors ≥ 150 mm                   | 5 mm      | 25 mm               | 2 sides | -            | 82 mm        | C/U + U/C + C/C |                                            |            |  |  |
| Ø28                        | 1,2     |                            | synth. rubber 13mm 700 LS + LI + CS + CI | EI <b>120</b>                                                                       | <a href="#">rigid walls ≥ 150 mm</a>    | 10 mm     | 25 mm               | 2 sides | -            | 74 mm        | C/U + U/C + C/C |                                            |            |  |  |
|                            |         |                            | synth. rubber 13mm 700 LS + LI + CS + CI | EI <b>120</b>                                                                       | <a href="#">rigid floors ≥ 150 mm</a>   | 10 mm     | 25 mm               | 2 sides | -            | 74 mm        | C/U + U/C + C/C |                                            |            |  |  |
| Ø32                        | 1,5     |                            | rock wool 25mm 1000 LS + LI + CS + CI    | EI <b>120</b>                                                                       | rigid walls ≥ 150 mm                    | 10 mm     | 25 mm               | 2 sides | -            | 102 mm       | C/U + U/C + C/C |                                            |            |  |  |
|                            |         |                            | rock wool 25mm 1000 LS + LI + CS + CI    | EI <b>120</b>                                                                       | rigid floors ≥ 150 mm                   | 10 mm     | 25 mm               | 2 sides | -            | 102 mm       | C/U + U/C + C/C |                                            |            |  |  |
| Ø42,2                      | 3,25    | <b>non-insulated walls</b> | rock wool 25 mm LI + CS + CI             | EI <b>90</b>                                                                        | flexible walls ≥ 100 mm                 | 10 mm     | 25 mm               | 2 sides | -            | 112 mm       | C/U + U/C + C/C |                                            |            |  |  |
|                            |         | <b>non-insulated walls</b> | rock wool 50 mm LI + CS + CI             | EI <b>90</b>                                                                        | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm     | 25 mm               | 2 sides | -            | 162mm        | C/U + U/C + C/C |                                            |            |  |  |
|                            |         |                            | rock wool 25 mm 1000 LS + LI + CS + CI   | EI <b>120</b>                                                                       | rigid walls ≥ 150 mm                    | 9 mm      | 25 mm               | 2 sides | -            | 110 mm       | C/U + U/C + C/C |                                            |            |  |  |
|                            |         |                            | rock wool 25mm 1000 LS + LI + CS + CI    | EI <b>120</b>                                                                       | rigid floors ≥ 150 mm                   | 9 mm      | 25 mm               | 2 sides | -            | 110 mm       | C/U + U/C + C/C |                                            |            |  |  |
| Ø54                        | 2,0     | <b>non-insulated walls</b> | rock wool 25 mm 700 LS + LI + CS + CI    | EI <b>30</b>                                                                        | flexible walls ≥ 75 mm                  | 10 mm     | 25 mm               | 2 sides | -            | 124 mm       | C/U + U/C + C/C |                                            |            |  |  |
|                            |         |                            | rock wool 32 mm 1150 LI                  | EI <b>120</b>                                                                       | rigid walls ≥ 150 mm                    | smokeseal |                     | 2 sides | -            | 200 x 200 mm | C/C             |                                            |            |  |  |
| Ø114                       | 3,0     | <b>non-insulated walls</b> | rock wool 25 mm 700 LS + LI + CS + CI    | EI <b>30</b>                                                                        | <a href="#">flexible walls ≥ 75 mm</a>  | 10 mm     | 25 mm               | 2 sides | -            | 184 mm       | C/U + U/C + C/C |                                            |            |  |  |
| max.                       |         |                            |                                          |                                                                                     |                                         |           |                     |         |              |              |                 |                                            |            |  |  |
| Ø219,1                     | 4,50    | <b>non-insulated walls</b> | rock wool 25 mm LS + LI + CS + CI        | EI <b>60</b>                                                                        | <a href="#">flexible walls ≥ 100 mm</a> | 10 mm     | 25 mm               | 2 sides | -            | 289 mm       | C/U + U/C + C/C |                                            |            |  |  |
|                            |         |                            | rock wool 25 mm 1000 LS + LI + CS + CI   | EI <b>120</b>                                                                       | rigid floors ≥ 150 mm                   | 15 mm     | 25 mm               | 2 sides | -            | 299 mm       | C/U + U/C + C/C |                                            |            |  |  |
|                            |         |                            | rock wool 25mm 1000 LS + LI + CS + CI    | EI <b>120</b>                                                                       | <a href="#">rigid floors ≥ 150 mm</a>   | 15 mm     | 25 mm               | 2 sides | -            | 600 x 700 mm | C/U + U/C + C/C |                                            |            |  |  |

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

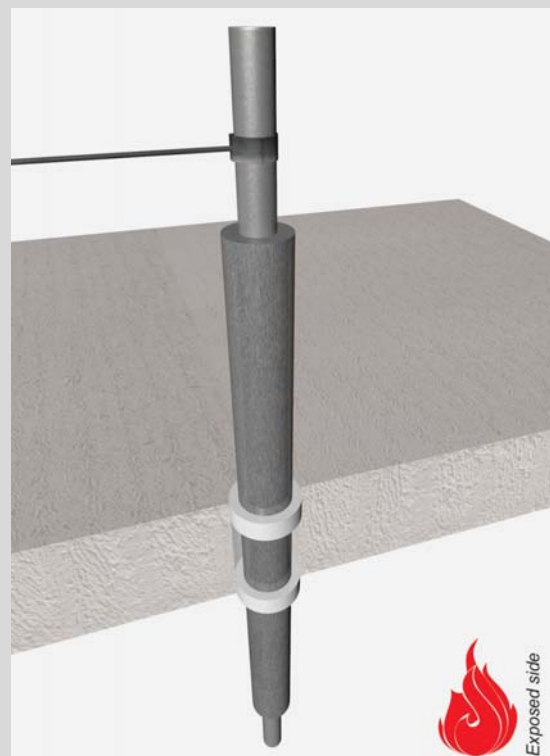
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

## Firesafe

tested property  
test method  
service no.

fire resistance  
EN 1366-3  
8-6-4s



Exposed side

## steel pipes

| service type <sup>1)</sup> |         | pipe insulation                       |                                        |  EI | constructive element <sup>2)</sup> | Firesafe joint seal   |       | application  | backing  | max. opening    | pipe end        | max. angle      |
|----------------------------|---------|---------------------------------------|----------------------------------------|----------------------------------------------------------------------------------------|------------------------------------|-----------------------|-------|--------------|----------|-----------------|-----------------|-----------------|
| dØ (mm)                    | s1 (mm) | min. 60 kg/m <sup>3</sup> eg Armaflex |                                        |                                                                                        |                                    | width                 | depth | 1 or 2 sides | required | in construction | configuration   |                 |
| up to                      |         |                                       |                                        |                                                                                        |                                    |                       |       |              |          |                 |                 |                 |
| Ø12                        | 1,0     |                                       |                                        | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 120                             | rigid walls ≥ 150 mm  | 10 mm | 25 mm        | 2 sides  | -               | 58 mm           | C/U + U/C + C/C |
|                            |         |                                       |                                        | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 120                             | rigid floors ≥ 150 mm | 10 mm | 25 mm        | 2 sides  | -               | 58 mm           | C/U + U/C + C/C |
| Ø15                        | 1,0     |                                       |                                        | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 120                             | rigid walls ≥ 150 mm  | 10 mm | 25 mm        | 2 sides  | -               | 61 mm           | C/U + U/C + C/C |
|                            |         |                                       |                                        | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 120                             | rigid floors ≥ 150 mm | 10 mm | 25 mm        | 2 sides  | -               | 61 mm           | C/U + U/C + C/C |
|                            |         |                                       |                                        | rock wool 25mm 1000 LS + LI + CS + CI                                                  | EI 120                             | rigid walls ≥ 150 mm  | 7 mm  | 25 mm        | 2 sides  | -               | 82 mm           | C/U + U/C + C/C |
|                            |         |                                       |                                        | rock wool 25mm 1000 LS + LI + CS + CI                                                  | EI 120                             | rigid floors ≥ 150 mm | 7 mm  | 25 mm        | 2 sides  | -               | 82 mm           | C/U + U/C + C/C |
| Ø22                        | 1,1     |                                       |                                        | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 120                             | rigid walls ≥ 150 mm  | 10 mm | 25 mm        | 2 sides  | -               | 68 mm           | C/U + U/C + C/C |
|                            |         |                                       |                                        | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 120                             | rigid floors ≥ 150 mm | 10 mm | 25 mm        | 2 sides  | -               | 68 mm           | C/U + U/C + C/C |
|                            |         |                                       |                                        | rock wool 25mm 1000 LS + LI + CS + CI                                                  | EI 120                             | rigid walls ≥ 150 mm  | 5 mm  | 25 mm        | 2 sides  | -               | 82 mm           | C/U + U/C + C/C |
|                            |         |                                       |                                        | rock wool 25mm 1000 LS + LI + CS + CI                                                  | EI 120                             | rigid floors ≥ 150 mm | 5 mm  | 25 mm        | 2 sides  | -               | 82 mm           | C/U + U/C + C/C |
| Ø28                        | 1,2     |                                       |                                        | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 120                             | rigid walls ≥ 150 mm  | 10 mm | 25 mm        | 2 sides  | -               | 74 mm           | C/U + U/C + C/C |
|                            |         |                                       |                                        | synth. rubber 13mm 700 LS + LI + CS + CI                                               | EI 120                             | rigid floors ≥ 150 mm | 10 mm | 25 mm        | 2 sides  | -               | 74 mm           | C/U + U/C + C/C |
| Ø32                        | 1,5     |                                       |                                        | rock wool 25mm 1000 LS + LI + CS + CI                                                  | EI 120                             | rigid walls ≥ 150 mm  | 10 mm | 25 mm        | 2 sides  | -               | 102 mm          | C/U + U/C + C/C |
|                            |         |                                       |                                        | rock wool 25mm 1000 LS + LI + CS + CI                                                  | EI 120                             | rigid floors ≥ 150 mm | 10 mm | 25 mm        | 2 sides  | -               | 102 mm          | C/U + U/C + C/C |
| Ø42,2                      | 3,25    | non-insulated walls                   | rock wool 25 mm LI + CS + CI           | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm | 2 sides      | -        | 112 mm          | C/U + U/C + C/C |                 |
|                            |         | non-insulated walls                   | rock wool 50 mm LI + CS + CI           | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm | 2 sides      | -        | 162mm           | C/U + U/C + C/C |                 |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI | EI 120                                                                                 | rigid walls ≥ 150 mm               | 9 mm                  | 25 mm | 2 sides      | -        | 110 mm          | C/U + U/C + C/C |                 |
|                            |         |                                       | rock wool 25mm 1000 LS + LI + CS + CI  | EI 120                                                                                 | rigid floors ≥ 150 mm              | 9 mm                  | 25 mm | 2 sides      | -        | 110 mm          | C/U + U/C + C/C |                 |
| Ø54                        | 2,0     | non-insulated walls                   | rock wool 25 mm 700 LS + LI + CS + CI  | EI 30                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 25 mm | 2 sides      | -        | 124 mm          | C/U + U/C + C/C |                 |
|                            |         |                                       | rock wool 32 mm 1150 LI                | EI 120                                                                                 | rigid walls ≥ 150 mm               | smokesal              |       | 2 sides      | -        | 200 x 200 mm    | C/C             |                 |
| Ø114                       | 3,0     | non-insulated walls                   | rock wool 25 mm 700 LS + LI + CS + CI  | EI 30                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 25 mm | 2 sides      | -        | 184 mm          | C/U + U/C + C/C |                 |
| max.                       |         |                                       |                                        |                                                                                        |                                    |                       |       |              |          |                 |                 |                 |
| Ø219,1                     | 4,50    | non-insulated walls                   | rock wool 25 mm LS + LI + CS + CI      | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm | 2 sides      | -        | 289 mm          | C/U + U/C + C/C |                 |
|                            |         |                                       | rock wool 25 mm 1000 LS + LI + CS + CI | EI 120                                                                                 | rigid floors ≥ 150 mm              | 15 mm                 | 25 mm | 2 sides      | -        | 299 mm          | C/U + U/C + C/C |                 |
|                            |         |                                       | rock wool 25mm 1000 LS + LI + CS + CI  | EI 120                                                                                 | rigid floors ≥ 150 mm              | 15 mm                 | 25 mm | 2 sides      | -        | 600 x 700 mm    | C/U + U/C + C/C |                 |

perpendicular + all angles between 90° and 45°

in FT Board 2S 50 mm

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- angle: perpendicular + all angles between 90° and 45°

**principle detail****Firesafe**

tested property

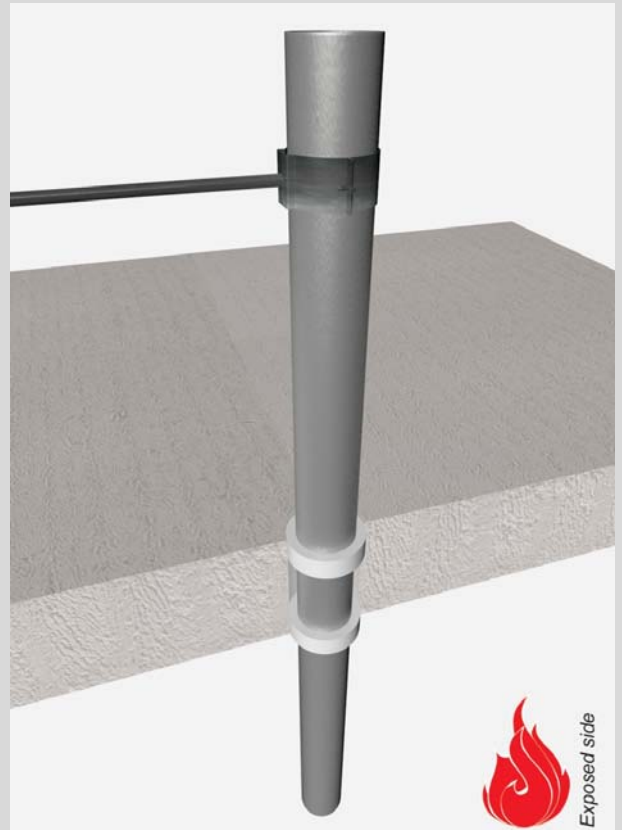
fire resistance

test method

EN 1366-3

service no.

8-3-6

**steel pipes****FT Acrylic**

| service type <sup>1)</sup> |         | pipe insulation      |            |  EI | constructive element <sup>2)</sup> | Firesafe joint seal   |           | application | backing required | max. opening in construction | pipe end configuration | max. angle                                              |              |
|----------------------------|---------|----------------------|------------|----------------------------------------------------------------------------------------|------------------------------------|-----------------------|-----------|-------------|------------------|------------------------------|------------------------|---------------------------------------------------------|--------------|
| dØ (mm)                    | s1 (mm) | FT Coating DFT 0,8mm |            |                                                                                        |                                    | width                 | depth     |             |                  |                              |                        |                                                         | 1 or 2 sides |
| up to                      |         |                      |            |                                                                                        |                                    |                       |           |             |                  |                              |                        |                                                         |              |
| Ø12                        | 1,0     | -                    | -          | EI 120                                                                                 | rigid walls ≥ 150 mm               | 10 mm                 | 25 mm     | 2 sides     | -                | 32 mm                        | C/U                    | perpendicular +<br>all angles<br>between 90°<br>and 45° |              |
|                            |         | -                    | -          | EI 120                                                                                 | rigid floors ≥ 150 mm              | 10 mm                 | 25 mm     | 2 sides     | -                | 32 mm                        | C/U                    |                                                         |              |
|                            |         | FT Coating           | 200 LI     | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm     | 2 sides     | -                | 32 mm                        | C/U                    |                                                         |              |
| Ø15                        | 1,0     | -                    | -          | EI 120                                                                                 | rigid walls ≥ 150 mm               | 15 mm                 | 25 mm     | 2 sides     | -                | 44 mm                        | C/U                    |                                                         |              |
|                            |         | -                    | -          | EI 120                                                                                 | rigid floors ≥ 150 mm              | 15 mm                 | 25 mm     | 2 sides     | -                | 44 mm                        | C/U                    |                                                         |              |
|                            |         | FT Coating           | 200 LI     | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm     | 2 sides     | -                | 35 mm                        | C/U                    |                                                         |              |
| Ø22                        | 1,1     | -                    | -          | EI 60                                                                                  | rigid walls ≥ 150 mm               | 10 mm                 | 25 mm     | 2 sides     | -                | 44 mm                        | C/U                    |                                                         |              |
|                            |         | -                    | -          | EI 60                                                                                  | rigid floors ≥ 150 mm              | 10 mm                 | 25 mm     | 2 sides     | -                | 44 mm                        | C/U                    |                                                         |              |
|                            |         | FT Coating           | 200 LI     | EI 60                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm     | 2 sides     | -                | 42 mm                        | C/U                    |                                                         |              |
| Ø26,9                      | 2,9     | -                    | -          | EI 120                                                                                 | rigid walls ≥ 150 mm               | 11 mm                 | 25 mm     | 2 sides     | -                | 50 mm                        | C/U                    |                                                         |              |
|                            |         | -                    | -          | EI 120                                                                                 | rigid floors ≥ 150 mm              | 11 mm                 | 25 mm     | 2 sides     | -                | 50 mm                        | C/U                    |                                                         |              |
| Ø28                        | 1,2     | -                    | -          | EI 60                                                                                  | rigid walls ≥ 150 mm               | 11 mm                 | 25 mm     | 2 sides     | -                | 50 mm                        | C/U                    |                                                         |              |
|                            |         | -                    | -          | EI 60                                                                                  | rigid floors ≥ 150 mm              | 11 mm                 | 25 mm     | 2 sides     | -                | 50 mm                        | C/U                    |                                                         |              |
|                            |         | max. 2x bundled      | FT Coating | 200 LI                                                                                 | EI 180                             | rigid walls ≥ 150 mm  | smokeseal | 2 sides     | -                | 70 mm                        | C/U                    |                                                         |              |
|                            |         | max. 2x bundled      | FT Coating | 200 LI                                                                                 | EI 180                             | rigid floors ≥ 150 mm | smokeseal | 2 sides     | -                | 70 mm                        | C/U                    |                                                         |              |
| Ø42,2                      | 3,25    | FT Coating           | 200 LI     | EI 180                                                                                 | rigid walls ≥ 150 mm               | smokeseal             |           | 2 sides     | -                | 50 mm                        | C/U                    |                                                         |              |
|                            |         | FT Coating           | 200 LI     | EI 180                                                                                 | rigid floors ≥ 150 mm              | smokeseal             |           | 2 sides     | -                | 50 mm                        | C/U                    |                                                         |              |
| max.                       |         |                      |            |                                                                                        |                                    |                       |           |             |                  |                              |                        |                                                         |              |
| 60,3                       | 3,0     | -                    | -          | EI 120                                                                                 | rigid walls ≥ 150 mm               | 10 mm                 | 25 mm     | 2 sides     | -                | 82 mm                        | C/U                    |                                                         |              |
|                            |         | -                    | -          | EI 120                                                                                 | rigid floors ≥ 150 mm              | 10 mm                 | 25 mm     | 2 sides     | -                | 82 mm                        | C/U                    |                                                         |              |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

field of application

metal pipe penetrations

fire resistance - EI classification acc. EN 13501-2 / EN 1366-3

certification - EAD 350454-00-1104

Firesafe

► INDEX

PE + PP + PVC

plastic cable conduits

PP-R

PP-MD

PP-MX

aluPE-X

PE-Xa

copper

steel

steel conduits

cast iron

trays + ladders + wire mesh

cables + bundles

fire dampers

air transfer grilles

duct cladding

linear joints

socket boxes

blank seals

EN norms for plastic pipes

how-to-read

acoustical

environmental

CAST IRON ≤ Ø110 mm

Fire performances are valid for **range** of **dØ** pipe diameter + **s1** pipe thickness within the same pipe material:

cast iron

dØ max. 110 mm

s1 max. 3,5 mm

pipe insulation brands eg Rockwool, Armaflex

dØ

s1

pipe insulation

steel Ø12 up to Ø219

3,5 mm

Ø58 up to Ø110 mm

non-insulated

3,5 mm

Ø58 up to Ø110 mm

+ pipe insulation

+ synth. rubber, min. 60 kg/m³

13mm

3,5 mm

Ø58 up to Ø110 mm

+ rock wool (alu), min. 85 kg/m³

20 mm

30mm

suitable Firesafe products within classification:

FT Acrylic or FT Paste

DoP CPR-16/0094

walls

floors

EI 90 in wall 6

EI 90 in floor 7

EI 90 in wall 6

EI 90 in floor 7

joint details: min. W x D, default:  
walls: 5 x 25 mm, apply on 2 sides  
floors: 5 x 25 mm, apply on 2 sides

Fire Wrap

DoP CPR-15/0339

walls

floors

max.  
EI 90 in wall 6  
2 layer

max.  
EI 90 in floor 7  
2 layer

default:  
walls: apply on 2 sides  
floors: apply on 2 sides  
always apply smoke seal FT Acrylic on 2 sides

supporting construction

Constructive element must be classified acc. EN 13501-2 for the required fire resistance period:

1: flexible wall ≥100mm, insulated  
1-n100: flexible wall ≥100mm, **non-insulated**  
1-n75: flexible wall ≥75mm, **non-insulated**  
2: rigid wall ≥100mm  
3: rigid wall ≥150mm  
4: flexible ceiling ≥150mm  
5: rigid floor ≥150mm  
6: CLT wall ≥100mm  
7: CLT floor ≥140mm

Max. opening in constructive element: see principle detail. Use FT Board if opening is larger; see how-to-read.

Penetration services must be **supported**;  
support distance walls max. 500mm  
support distance floors max. 400mm

Min. length pipe insulation LI / LS / CS / CI:  
see [principle detail](#).

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## Notes:

- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

tested property  
test method  
service no.

## Firesafe

fire resistance  
EN 1366-3  
27-7



## cast iron pipes

### FT Acrylic

| service type <sup>1)</sup> |         | pipe insulation |                                                | EI    | constructive element <sup>2)</sup>  | Firesafe joint seal |       | application | backing | max. opening<br>in construction | pipe end<br>configuration | max. angle                                           |
|----------------------------|---------|-----------------|------------------------------------------------|-------|-------------------------------------|---------------------|-------|-------------|---------|---------------------------------|---------------------------|------------------------------------------------------|
| dØ (mm)                    | s1 (mm) |                 | min. 85 kg/m <sup>3</sup> eg Rockwool or Paroc |       |                                     | width               | depth |             |         |                                 |                           |                                                      |
| Ø58                        | 3,5     | rock wool 20 mm | 600 LI + CS + CI                               | EI 90 | <a href="#">CLT walls ≥ 100 mm</a>  | 5 mm                | 25 mm | 2 sides     | -       | 68 mm                           | C/U + U/C + C/C           | perpendicular + all<br>angles between<br>90° and 45° |
|                            |         | rock wool 20 mm | 600 LI + CS + CI                               | EI 90 | <a href="#">CLT floors ≥ 140 mm</a> | 5 mm                | 25 mm | 2 sides     | -       | 68 mm                           | C/U + U/C + C/C           |                                                      |
| Ø110                       | 3,5     | rock wool 30 mm | 600 LI + CS + CI                               | EI 90 | <a href="#">CLT walls ≥ 100 mm</a>  | 5 mm                | 25 mm | 2 sides     | -       | 120 mm                          | C/U + U/C + C/C           |                                                      |
|                            |         | rock wool 30 mm | 600 LI + CS + CI                               | EI 90 | <a href="#">CLT floors ≥ 140 mm</a> | 5 mm                | 25 mm | 2 sides     | -       | 120 mm                          | C/U + U/C + C/C           |                                                      |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

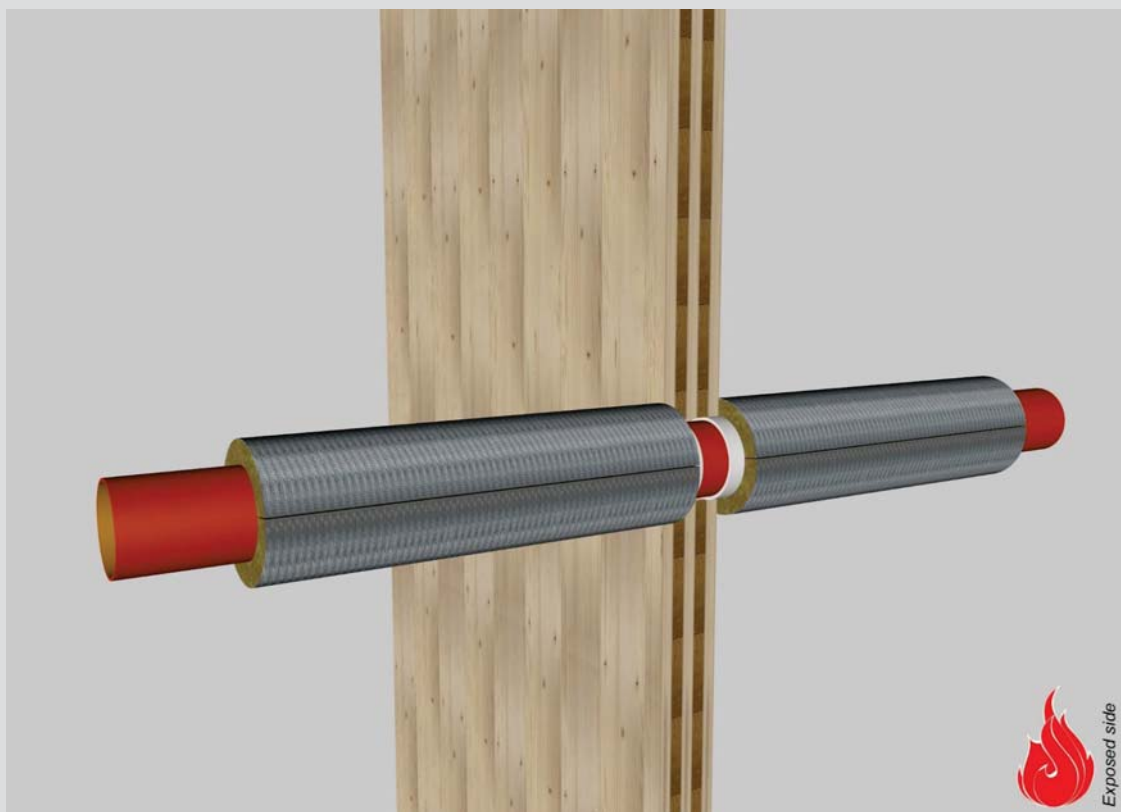
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

tested property  
test method  
service no.

## Firesafe

fire resistance  
EN 1366-3  
27-8



## cast iron pipes

### FT Acrylic

| service type <sup>1)</sup> |         | pipe insulation                    |                  | EI    | constructive element <sup>2)</sup>  |      | Firesafe joint seal |         | application  | backing  | max. opening    | pipe end        | max. angle                                     |
|----------------------------|---------|------------------------------------|------------------|-------|-------------------------------------|------|---------------------|---------|--------------|----------|-----------------|-----------------|------------------------------------------------|
| dØ (mm)                    | s1 (mm) | min. 85 kg/m³ eg Rockwool or Paroc |                  |       |                                     |      | width               | depth   | 1 or 2 sides | required | in construction | configuration   |                                                |
| Ø58                        | 3,5     | rock wool 20 mm                    | 600 LI + CS + CI | EI 90 | <a href="#">CLT walls ≥ 100 mm</a>  | 5 mm | 25 mm               | 2 sides | -            | -        | 68 mm           | C/U + U/C + C/C | perpendicular + all angles between 90° and 45° |
|                            |         | rock wool 20 mm                    | 600 LI + CS + CI | EI 90 | <a href="#">CLT floors ≥ 140 mm</a> | 5 mm | 25 mm               | 2 sides | -            | -        | 68 mm           | C/U + U/C + C/C |                                                |
| Ø110                       | 3,5     | rock wool 30 mm                    | 600 LI + CS + CI | EI 90 | <a href="#">CLT walls ≥ 100 mm</a>  | 5 mm | 25 mm               | 2 sides | -            | -        | 120 mm          | C/U + U/C + C/C |                                                |
|                            |         | rock wool 30 mm                    | 600 LI + CS + CI | EI 90 | <a href="#">CLT floors ≥ 140 mm</a> | 5 mm | 25 mm               | 2 sides | -            | -        | 120 mm          | C/U + U/C + C/C |                                                |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

#### Notes:

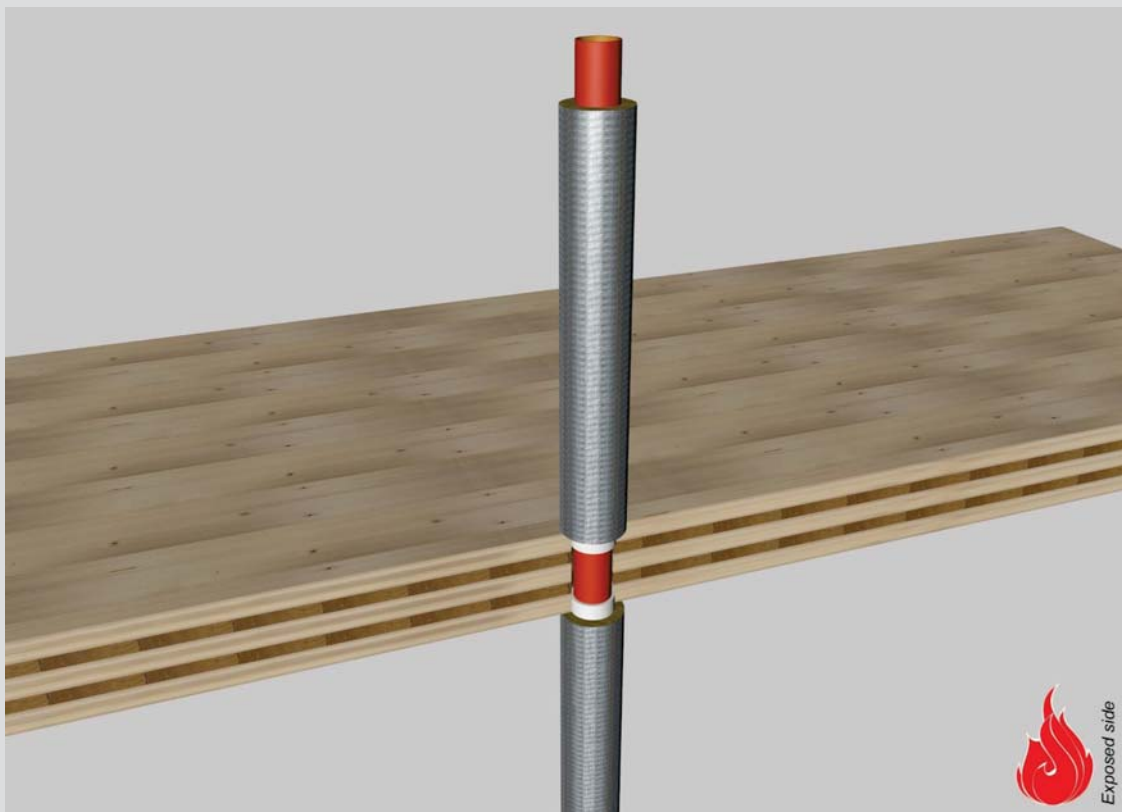
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

#### principle detail

tested property  
test method  
service no.

#### Firesafe

fire resistance  
EN 1366-3  
28-17



## cast iron pipes

### FT Acrylic

| service type <sup>1)</sup> |         | pipe insulation                    |                  | EI    | constructive element <sup>2)</sup>  |  | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end        | max. angle                                     |
|----------------------------|---------|------------------------------------|------------------|-------|-------------------------------------|--|---------------------|-------|--------------|----------|-----------------|-----------------|------------------------------------------------|
| dØ (mm)                    | s1 (mm) | min. 85 kg/m³ eg Rockwool or Paroc |                  |       |                                     |  | width               | depth | 1 or 2 sides | required | in construction | configuration   |                                                |
| Ø58                        | 3,5     | rock wool 20 mm                    | 600 LI + CS + CI | EI 90 | <a href="#">CLT walls ≥ 100 mm</a>  |  | 5 mm                | 25 mm | 2 sides      | -        | 68 mm           | C/U + U/C + C/C | perpendicular + all angles between 90° and 45° |
|                            |         | rock wool 20 mm                    | 600 LI + CS + CI | EI 90 | <a href="#">CLT floors ≥ 140 mm</a> |  | 5 mm                | 25 mm | 2 sides      | -        | 68 mm           | C/U + U/C + C/C |                                                |
| Ø110                       | 3,5     | rock wool 30 mm                    | 600 LI + CS + CI | EI 90 | <a href="#">CLT walls ≥ 100 mm</a>  |  | 5 mm                | 25 mm | 2 sides      | -        | 120 mm          | C/U + U/C + C/C |                                                |
|                            |         | rock wool 30 mm                    | 600 LI + CS + CI | EI 90 | <a href="#">CLT floors ≥ 140 mm</a> |  | 5 mm                | 25 mm | 2 sides      | -        | 120 mm          | C/U + U/C + C/C |                                                |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

## Notes:

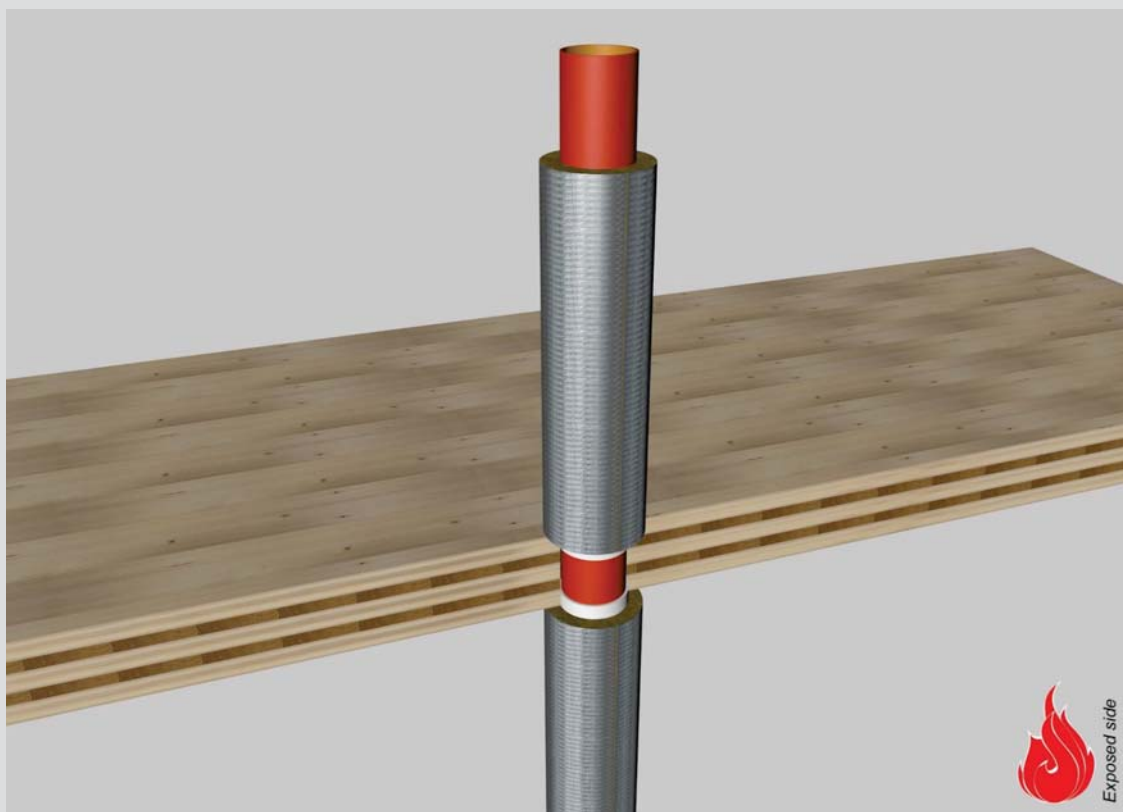
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor
- **other pipe dØ + s1** (thickness) are allowed within range and same pipe material
- angle: perpendicular + all angles between 90° and 45°

## principle detail

tested property  
test method  
service no.

## Firesafe

fire resistance  
EN 1366-3  
28-18



## cast iron pipes

### FT Acrylic

| service type <sup>1)</sup> |         | pipe insulation                    |                  | EI    | constructive element <sup>2)</sup>  |  | Firesafe joint seal |       | application  | backing  | max. opening    | pipe end        | max. angle                                     |
|----------------------------|---------|------------------------------------|------------------|-------|-------------------------------------|--|---------------------|-------|--------------|----------|-----------------|-----------------|------------------------------------------------|
| dØ (mm)                    | s1 (mm) | min. 85 kg/m³ eg Rockwool or Paroc |                  |       |                                     |  | width               | depth | 1 or 2 sides | required | in construction | configuration   |                                                |
| Ø58                        | 3,5     | rock wool 20 mm                    | 600 LI + CS + CI | EI 90 | <a href="#">CLT walls ≥ 100 mm</a>  |  | 5 mm                | 25 mm | 2 sides      | -        | 68 mm           | C/U + U/C + C/C | perpendicular + all angles between 90° and 45° |
|                            |         | rock wool 20 mm                    | 600 LI + CS + CI | EI 90 | <a href="#">CLT floors ≥ 140 mm</a> |  | 5 mm                | 25 mm | 2 sides      | -        | 68 mm           | C/U + U/C + C/C |                                                |
| Ø110                       | 3,5     | rock wool 30 mm                    | 600 LI + CS + CI | EI 90 | <a href="#">CLT walls ≥ 100 mm</a>  |  | 5 mm                | 25 mm | 2 sides      | -        | 120 mm          | C/U + U/C + C/C |                                                |
|                            |         | rock wool 30 mm                    | 600 LI + CS + CI | EI 90 | <a href="#">CLT floors ≥ 140 mm</a> |  | 5 mm                | 25 mm | 2 sides      | -        | 120 mm          | C/U + U/C + C/C |                                                |

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

**TRAYS + LADDERS + WIRE MESH classification ≤ 600 mm**

Fire performances are valid for for **range** of **cable group** +  
max. **Cu mm<sup>2</sup>** with steel services:

**cable group 1 + 2 + 3 + 5**

dØ up to 80 mm

**cable group 4 (data + fibre optic)**

dØ up to 100 mm

service size Cu mm<sup>2</sup> cable specs

**cable trays ≤ 500mm + cable ladders ≤ 300mm**

max. Cu mm<sup>2</sup> = **29647**

each cable assembly within max. Cu mm<sup>2</sup>;  
**all** cable groups are allowed, max.:

Ø 21mm group 1 - small sheathed  
Ø 61mm group 2 - medium sheathed  
Ø 80mm group 3 - large sheathed  
Ø 100mm group 4 - data + fibre optic  
Ø 23mm group 5 - non-sheathed

**all conduits:**  
max. 3x Ø 16mm steel / plastic

max. Cu mm<sup>2</sup> = **15707**

each cable assembly within max. Cu mm<sup>2</sup>;  
**all** cable groups are allowed, max.:

Ø 21mm group 1 - small sheathed  
Ø 47mm group 2 - medium sheathed  
Ø 52mm group 3 - large sheathed  
Ø 100mm group 4 - data + fibre optic  
Ø 23mm group 5 - non-sheathed

**all conduits:**  
max. 3x Ø 16mm steel / plastic

**trays /  
ladders  
≤ 600mm**

max. Cu mm<sup>2</sup> = **12619**

each cable assembly within max. Cu mm<sup>2</sup>;  
allowed cable groups:

group 1 - small sheathed  
group 4 - data + fibre optic

**wire mesh trays  
≤ 600mm**

max. Cu mm<sup>2</sup> = **6401**

each cable assembly within max. Cu mm<sup>2</sup>;  
allowed cable groups:

group 1 - small sheathed  
group 2 - medium sheathed  
group 4 - data + fibre optic

**suitable Firesafe products within classification:**

FT Graphite

DoP CPR-16/0094

FT Acrylic or FT Paste

DoP CPR-16/0094

**FT Board** or

GPG

DoP CPR-16/0103

**EI 60 in wall 1+2+3**

**EI 30 in wall 1+2+3**

**EI 30 in wall 2+3**

**EI 60 in floor 5**

2x 50mm 2S

100mm

2x 50mm 2S

100mm

**1x** 50mm 2S

50mm

2x 50mm 2S

100mm

max. opening (mm)

support distance (mm)

600x1200

at 250mm + 500mm

600x1200

at 500mm

600x1200

at 500mm

600x5000

at 250mm + 400mm

**EI 60 in wall 1+2+3**

**EI 60 in wall 1+2+3**

**EI 60 in floor 5**

**EI 60 in floor 5**

2x 50mm 2S

100mm

2x 50mm 2S

100mm

600x1200 +25%

at 500mm

600x5000

at 250mm + 400mm

results max.

**EI 180 in wall 3**

**EI 120 in wall 1+2+3**

**EI 60 in wall 1+2+3**

**EI 30 in wall 1n-75**

**1x** 50mm 2S

50mm

-

-

-

-

620 x 70

at 500mm

620 x 70

at 500mm

220 x 80

at 250mm + 500mm

**EI 60 in wall 1+2+3**

**EI 90 in wall 1+2+3**

**EI 30 in wall 1n-75**

**EI 60 in floor 5**

2x 50mm 2S

100mm

2x 50mm 2S

100mm

-

-

2x 50mm 2S

100mm

730 x 230

at 250mm + 500mm

660 x 120

at 250mm + 500mm

420 x 100

at 250mm + 500mm

600 x 800

at 400mm

joint details, default:

walls: 5mm around cables, apply on 2 sides  
floors: 5mm around cables, apply on 2 sides

finish, default:

**NO** coating on cables, cable tray or on  
constructive element !

Max. opening in  
constructive element:  
see also principle detail.

Penetration services must  
be **supported**.

Constructive element must be classified acc. EN  
13501-2 for the required fire resistance period:

1: flexible wall ≥100mm, insulated

**1-n100:** flexible wall ≥100mm, **non-insulated**

**1-n75:** flexible wall ≥75mm, **non-insulated**

2: rigid wall ≥100mm

3: rigid wall ≥150mm

4: flexible ceiling ≥150mm

5: rigid floor ≥150mm

6: CLT wall ≥100mm

7: CLT floor ≥140mm

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[environmental](#)

# Notes:

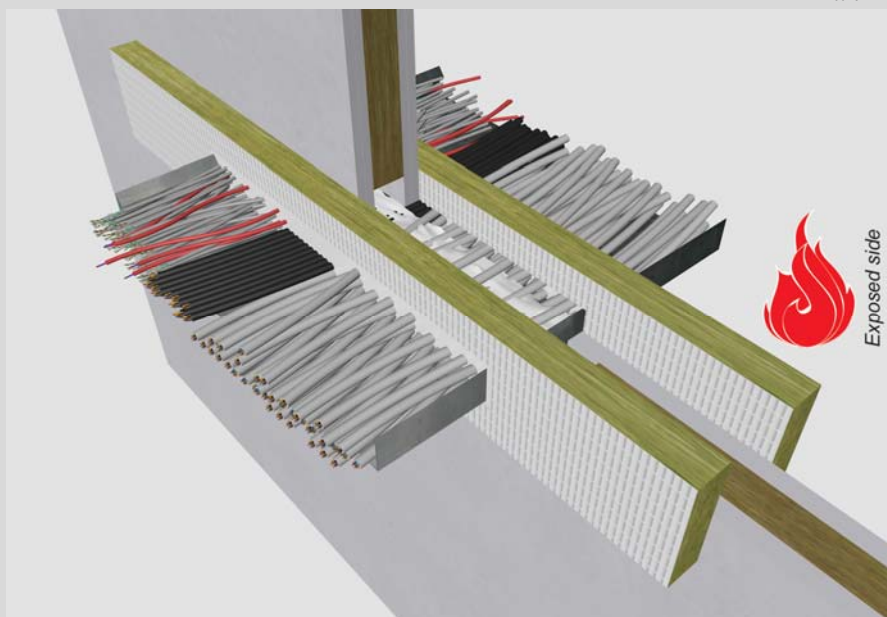
- installation instructions in TDS
- **all cable dØ** are allowed within group type and max. Cu mm<sup>2</sup>
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- default: coating on cables and/or trays is **NOT** required!

# principle detail

# Firesafe

tested property  
test method  
service no.  
tested property  
test method

fire resistance  
EN 1366-3  
21-15  
smoke resistance  
EN 1634-3  
NEN 6075



## cables in trays + ladders + wire mesh

### cable specs

### assembly

### service specs

### EI

### constructive element <sup>1)</sup>

### FT Acrylic

### Firesafe joint seal

### width (mm)

### application

### 1 or 2 sides

### max. opening

### in construction

### FT Board

### Firesafe fire board

### type 2S 50 mm

### 1 or 2 sides

### finish

### required

### support distance <sup>2)</sup>

### service

## trays, perforated + non-perforated

### cables only

|                                                                                                                                                                                                                                 |       |               |                                  |                                                                                                     |                              |                                          |                                                                  |                                         |                  |                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|----------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------|------------------------------------------|------------------------------------------------------------------|-----------------------------------------|------------------|--------------------------------------------------|
| group 1 - small sheathed ≤ Ø 21mm<br>group 2 - medium sheathed ≤ Ø 50mm<br>group 3 - large sheathed ≤ Ø 80mm<br>group 4 - data + fibre optic ≤ Ø 100mm<br>group 5 - non-sheathed ≤ Ø 23mm<br>plastic or steel conduits ≤ Ø 16mm | 29647 | ≤ 500 x 60 mm | EI 60<br>EI 30<br>EI 30<br>EI 60 | flexible walls ≥ 100 mm<br>flexible walls ≥ 100 mm<br>rigid walls ≥ 100 mm<br>rigid floors ≥ 150 mm | 5 mm<br>5 mm<br>5 mm<br>5 mm | 2 sides<br>2 sides<br>2 sides<br>2 sides | 600 x 1200 mm<br>600 x 1200 mm<br>600 x 1200 mm<br>600 x 5000 mm | 2 sides<br>2 sides<br>1 side<br>2 sides | -<br>-<br>-<br>- | 250 + 500 mm<br>500 mm<br>500 mm<br>250 + 400 mm |
| group 1 - small sheathed ≤ Ø 21mm<br>group 4 - data + fibre optic                                                                                                                                                               | 12619 | ≤ 600 x 50 mm | EI 60<br>EI 120                  | flexible walls ≥ 100 mm<br>flexible walls ≥ 100 mm                                                  | 10 mm<br>10 mm               | 2 sides<br>2 sides                       | 620 x 70 mm<br>620 x 70 mm                                       | -<br>1 side                             | -<br>-           | 500 mm<br>500 mm                                 |
| group 1 - small sheathed ≤ Ø 21mm<br>group 4 - data + fibre optic                                                                                                                                                               | 1806  | ≤ 350 x 60 mm | EI 90                            | rigid walls ≥ 150 mm                                                                                | -                            | -                                        | 450 x 200 mm                                                     | 1 side                                  | 200 LI *         | 500 mm                                           |
| group 4 - data + fibre optic                                                                                                                                                                                                    | 12842 | ≤ 200 x 60 mm | non-insulated walls<br>EI 30     | flexible walls ≥ 75 mm                                                                              | 10 mm 12,5 mm                | 2 sides                                  | 220 x 80 mm                                                      | 2 sides                                 | 20 mm **         | 500 mm                                           |

### cables + pipes (mixed configuration)

|                                                                                                                                                                                                                                 |       |               |                |                                                  |              |                    |                                      |                    |        |                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|----------------|--------------------------------------------------|--------------|--------------------|--------------------------------------|--------------------|--------|------------------------|
| group 1 - small sheathed ≤ Ø 21mm<br>group 2 - medium sheathed ≤ Ø 50mm<br>group 3 - large sheathed ≤ Ø 80mm<br>group 4 - data + fibre optic ≤ Ø 100mm<br>group 5 - non-sheathed ≤ Ø 23mm<br>plastic or steel conduits ≤ Ø 16mm | 15707 | ≤ 500 x 60 mm | EI 60<br>EI 60 | flexible walls ≥ 100 mm<br>rigid floors ≥ 150 mm | 5 mm<br>5 mm | 2 sides<br>2 sides | 600 x 1200 mm + 25%<br>600 x 5000 mm | 2 sides<br>2 sides | -<br>- | 500 mm<br>250 + 400 mm |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|----------------|--------------------------------------------------|--------------|--------------------|--------------------------------------|--------------------|--------|------------------------|

## cable ladders

### cables only

|                                                                                                                                                                                                                                 |       |               |                                  |                                                                                                     |                              |                                          |                                                                  |                                         |                  |                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|----------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------|------------------------------------------|------------------------------------------------------------------|-----------------------------------------|------------------|--------------------------------------------------|
| group 1 - small sheathed ≤ Ø 21mm<br>group 2 - medium sheathed ≤ Ø 50mm<br>group 3 - large sheathed ≤ Ø 80mm<br>group 4 - data + fibre optic ≤ Ø 100mm<br>group 5 - non-sheathed ≤ Ø 23mm<br>plastic or steel conduits ≤ Ø 16mm | 29647 | ≤ 300 x 60 mm | EI 60<br>EI 30<br>EI 30<br>EI 60 | flexible walls ≥ 100 mm<br>flexible walls ≥ 100 mm<br>rigid walls ≥ 100 mm<br>rigid floors ≥ 150 mm | 5 mm<br>5 mm<br>5 mm<br>5 mm | 2 sides<br>2 sides<br>2 sides<br>2 sides | 600 x 1200 mm<br>600 x 1200 mm<br>600 x 1200 mm<br>600 x 5000 mm | 2 sides<br>2 sides<br>1 side<br>2 sides | -<br>-<br>-<br>- | 250 + 500 mm<br>500 mm<br>500 mm<br>250 + 400 mm |
| group 1 - small sheathed ≤ Ø 21mm<br>group 4 - data + fibre optic                                                                                                                                                               | 12842 | ≤ 200 x 60 mm | non-insulated walls<br>EI 30     | flexible walls ≥ 75 mm                                                                              | 10 mm 12,5 mm                | 2 sides                                  | 220 x 80 mm                                                      | 2 sides                                 | 20 mm **         | 500 mm                                           |
| group 4 - data + fibre optic                                                                                                                                                                                                    | 2781  | ≤ 350 x 60 mm | EI 120                           | rigid walls ≥ 150 mm                                                                                | -                            | -                                        | 450 x 200 mm                                                     | 1 side                                  | 200 LI *         | 500 mm                                           |
| group 1 - small sheathed ≤ Ø 21mm<br>group 2 - medium sheathed ≤ Ø 50mm                                                                                                                                                         | 780   | ≤ 300 x 60 mm | EI 180                           | rigid floors ≥ 150 mm                                                                               | -                            | -                                        | 400 x 200 mm                                                     | 2 sides                                 | -                | 400 mm                                           |

>> continued on page 2

in FT Board 2S 50 mm

\* FT Coating, DFT 0.8mm

\*\* 20 mm perimeter

<sup>1)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

<sup>2)</sup> Penetration services (cable trays etc.) must be supported.

# Notes:

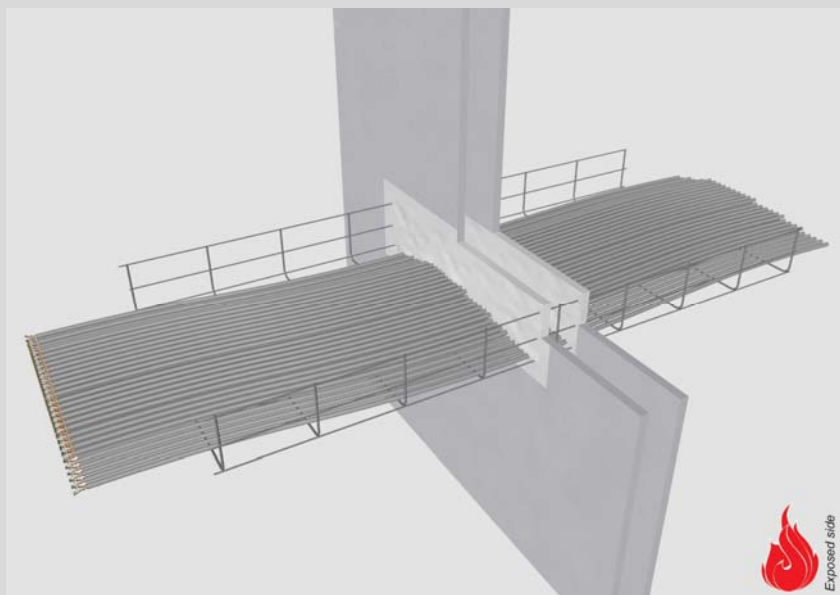
- installation instructions in TDS
- **all cable dØ** are allowed within group type and max. Cu mm<sup>2</sup>
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- default: coating on cables and/or trays is **NOT** required!

# principle detail

# Firesafe

tested property  
test method  
service no.  
tested property  
test method

fire resistance  
EN 1366-3  
31-59  
smoke resistance  
EN 1634-3  
NEN 6075



Exposed side

## cables in trays + ladders + wire mesh

| cable specs                                                                                                                                                                                                                     | assembly                      | service specs  |                      | EI    | constructive element <sup>1)</sup>                                                | Firesafe joint seal                           | application  | max. opening        | Firesafe fire board           | finish   | support distance <sup>2)</sup> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------|----------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------|--------------|---------------------|-------------------------------|----------|--------------------------------|
| group                                                                                                                                                                                                                           | Cu (mm <sup>2</sup> )<br>max. | (steel)        | non-standard config. |       |                                                                                   | width (mm)                                    | 1 or 2 sides | in construction     | type 2S 50 mm<br>1 or 2 sides | required | service                        |
| cable ladders                                                                                                                                                                                                                   |                               |                |                      |       |                                                                                   |                                               |              |                     |                               |          |                                |
| cables + pipes (mixed configuration)                                                                                                                                                                                            |                               |                |                      |       |                                                                                   |                                               |              |                     |                               |          |                                |
| group 1 - small sheathed ≤ Ø 21mm<br>group 2 - medium sheathed ≤ Ø 50mm<br>group 3 - large sheathed ≤ Ø 80mm<br>group 4 - data + fibre optic ≤ Ø 100mm<br>group 5 - non-sheathed ≤ Ø 23mm<br>plastic or steel conduits ≤ Ø 16mm | 15707                         | ≤ 300 x 60 mm  |                      | EI 60 | flexible walls ≥ 100 mm                                                           | 5 mm                                          | 2 sides      | 600 x 1200 mm + 25% | 2 sides                       | -        | 500 mm                         |
|                                                                                                                                                                                                                                 |                               |                |                      | EI 60 | rigid floors ≥ 150 mm                                                             | 5 mm                                          | 2 sides      | 600 x 5000 mm       | 2 sides                       | -        | 250 + 400 mm                   |
|                                                                                                                                                                                                                                 |                               |                |                      |       |                                                                                   |                                               |              |                     |                               |          |                                |
| trays, wire mesh                                                                                                                                                                                                                |                               |                |                      |       |                                                                                   |                                               |              |                     |                               |          |                                |
| cables only                                                                                                                                                                                                                     |                               |                |                      |       |                                                                                   |                                               |              |                     |                               |          |                                |
| group 1 - small sheathed ≤ Ø 21mm                                                                                                                                                                                               | 15266                         | ≤ 400 x 80 mm  | non-insulated walls  | EI 60 | flexible walls ≥ 75 mm                                                            | 10 mm 12,5 mm                                 | 2 sides      | 420 x 100 mm        | 2 sides                       | 20 mm ** | 500 mm                         |
| group 4 - data + fibre optic                                                                                                                                                                                                    | 12842                         | 400 x 80 mm    | non-insulated walls  | EI 30 | flexible walls ≥ 75 mm                                                            | 10 mm 12,5 mm                                 | 2 sides      | 420 x 100 mm        | 2 sides                       | 20 mm ** | 500 mm                         |
|                                                                                                                                                                                                                                 | 6401                          | ≤ 600 x 55 mm  |                      | EI 90 | flexible walls ≥ 100 mm<br>no trimming, no wall insulation<br>for 100mm perimeter | 5 mm                                          | 2 sides      | 660 x 120 mm        | 2 sides                       | -        | 250 + 500 mm                   |
| cables + pipes (mixed configuration)                                                                                                                                                                                            |                               |                |                      |       |                                                                                   |                                               |              |                     |                               |          |                                |
| group 1 - small sheathed ≤ Ø 21mm<br>group 2 - medium sheathed ≤ Ø 50mm<br>group 4 - data + fibre optic                                                                                                                         | 6093                          | ≤ 600 x 105 mm |                      | EI 60 | flexible walls ≥ 100 mm<br>no trimming, no wall insulation<br>for 100mm perimeter | 5 mm                                          | 2 sides      | 730 x 230 mm        | 2 sides                       | -        | 250 + 500 mm                   |
| group 1 - small sheathed ≤ Ø 21mm<br>group 4 - data + fibre optic                                                                                                                                                               | 6374                          | ≤ 600 x 60 mm  |                      | EI 60 | rigid floors ≥ 150 mm                                                             | 5 mm                                          | 2 sides      | 600 x 800 mm        | 2 sides                       | -        | 400 mm                         |
| in FT Board 2S 50 mm                                                                                                                                                                                                            |                               |                |                      |       |                                                                                   | * FT Coating, DFT 0,8mm<br>** 20 mm perimeter |              |                     |                               |          |                                |

<sup>1)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

<sup>2)</sup> Penetration services (cable trays etc.) must be supported.

## Notes:

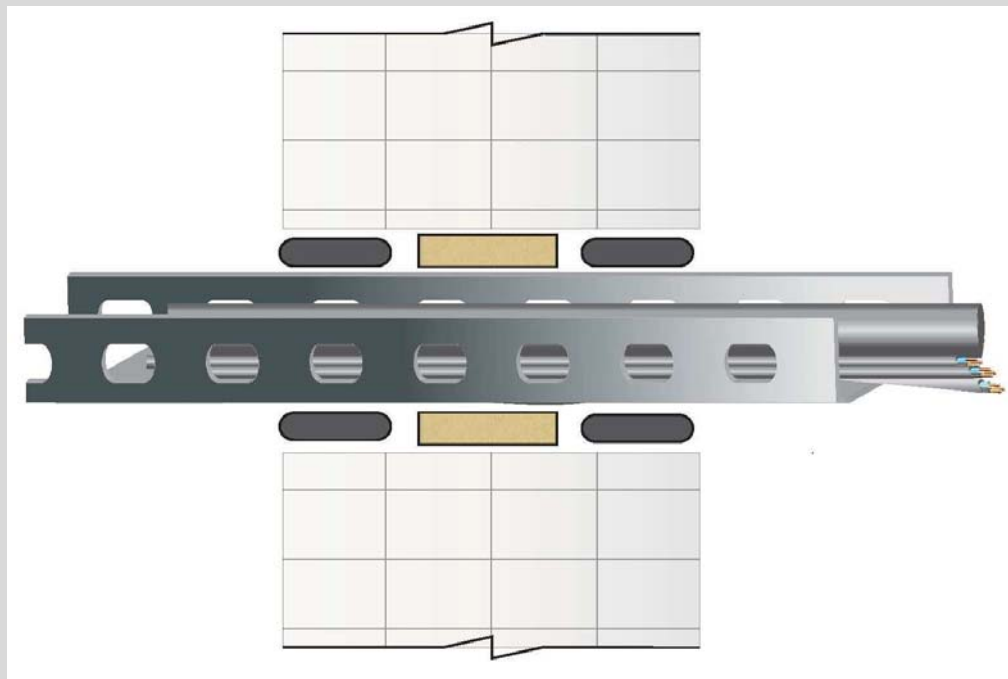
- installation instructions in TDS
- **all cable dØ** are allowed within group type and max. Cu mm<sup>2</sup>
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- default: coating on cables and/or trays is **NOT** required!

## principle detail

## Firesafe

tested property  
test method  
service no.  
tested property  
test method

fire resistance  
EN 1366-3  
0144  
smoke resistance  
EN 1634-3



## cables in trays + ladders

| cable specs                                                                                                                                                                                                                     |          | service specs         |               | El             | constructive element <sup>1)</sup>               | Firesafe joint seal | application        | max. opening                         | Firesafe fire board | finish                  | support distance <sup>2)</sup> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------|---------------|----------------|--------------------------------------------------|---------------------|--------------------|--------------------------------------|---------------------|-------------------------|--------------------------------|
| group                                                                                                                                                                                                                           | assembly | (steel)               |               |                |                                                  | width (mm)          | 1 or 2 sides       | in construction                      | type 2S 50 mm       | required                | service                        |
|                                                                                                                                                                                                                                 |          | Cu (mm <sup>2</sup> ) |               |                |                                                  |                     |                    |                                      | 1 or 2 sides        |                         |                                |
|                                                                                                                                                                                                                                 |          | max.                  |               |                |                                                  |                     |                    |                                      |                     |                         |                                |
| trays, perforated + non-perforated                                                                                                                                                                                              |          |                       |               |                |                                                  |                     |                    |                                      |                     |                         |                                |
| cables only                                                                                                                                                                                                                     |          |                       |               |                |                                                  |                     |                    |                                      |                     |                         |                                |
| group 1 - small sheathed ≤ Ø 21mm<br>group 4 - data + fibre optic                                                                                                                                                               |          | 1806                  | ≤ 350 x 60 mm | El 90          | rigid walls ≥ 150 mm                             | -                   | -                  | 450 x 200 mm                         | 1 side              | 200 LI *<br>unexp. side | 500 mm                         |
| group 1 - small sheathed ≤ Ø 21mm                                                                                                                                                                                               |          | 524                   | ≤ 150 x 25 mm | El 180         | rigid walls ≥ 150 mm                             | 40 mm               | 2 sides            | 200 x 100 mm                         | -                   | RW                      | 500 mm                         |
| cables + pipes (mixed configuration)                                                                                                                                                                                            |          |                       |               |                |                                                  |                     |                    |                                      |                     |                         |                                |
| group 1 - small sheathed ≤ Ø 21mm<br>group 2 - medium sheathed ≤ Ø 50mm<br>group 3 - large sheathed ≤ Ø 80mm<br>group 4 - data + fibre optic ≤ Ø 100mm<br>group 5 - non-sheathed ≤ Ø 23mm<br>plastic or steel conduits ≤ Ø 16mm |          | 15707                 | ≤ 500 x 60 mm | El 60<br>El 60 | flexible walls ≥ 100 mm<br>rigid floors ≥ 150 mm | 5 mm<br>5 mm        | 2 sides<br>2 sides | 600 x 1200 mm + 25%<br>600 x 5000 mm | 2 sides<br>2 sides  | -<br>-                  | 500 mm<br>250 + 400 mm         |
| cable ladders                                                                                                                                                                                                                   |          |                       |               |                |                                                  |                     |                    |                                      |                     |                         |                                |
| cables only                                                                                                                                                                                                                     |          |                       |               |                |                                                  |                     |                    |                                      |                     |                         |                                |
| group 4 - data + fibre optic                                                                                                                                                                                                    |          | 2781                  | ≤ 350 x 60 mm | El 120         | rigid walls ≥ 150 mm                             | -                   | -                  | 450 x 200 mm                         | 1 side              | 200 LI *<br>2 sides     | 500 mm                         |
| group 1 - small sheathed ≤ Ø 21mm<br>group 2 - medium sheathed ≤ Ø 50mm                                                                                                                                                         |          | 780                   | ≤ 300 x 60 mm | El 180         | rigid floors ≥ 150 mm                            | -                   | -                  | 400 x 200 mm                         | 2 sides             |                         | 400 mm                         |
| cables + pipes (mixed configuration)                                                                                                                                                                                            |          |                       |               |                |                                                  |                     |                    |                                      |                     |                         |                                |
| group 1 - small sheathed ≤ Ø 21mm<br>group 2 - medium sheathed ≤ Ø 50mm<br>group 3 - large sheathed ≤ Ø 80mm<br>group 4 - data + fibre optic ≤ Ø 100mm<br>group 5 - non-sheathed ≤ Ø 23mm<br>plastic or steel conduits ≤ Ø 16mm |          | 15707                 | ≤ 500 x 60 mm | El 60<br>El 60 | flexible walls ≥ 100 mm<br>rigid floors ≥ 150 mm | 5 mm<br>5 mm        | 2 sides<br>2 sides | 600 x 1200 mm + 25%<br>600 x 5000 mm | 2 sides<br>2 sides  | -<br>-                  | 500 mm<br>250 + 400 mm         |

in FT Board 2S 50 mm

<sup>1)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

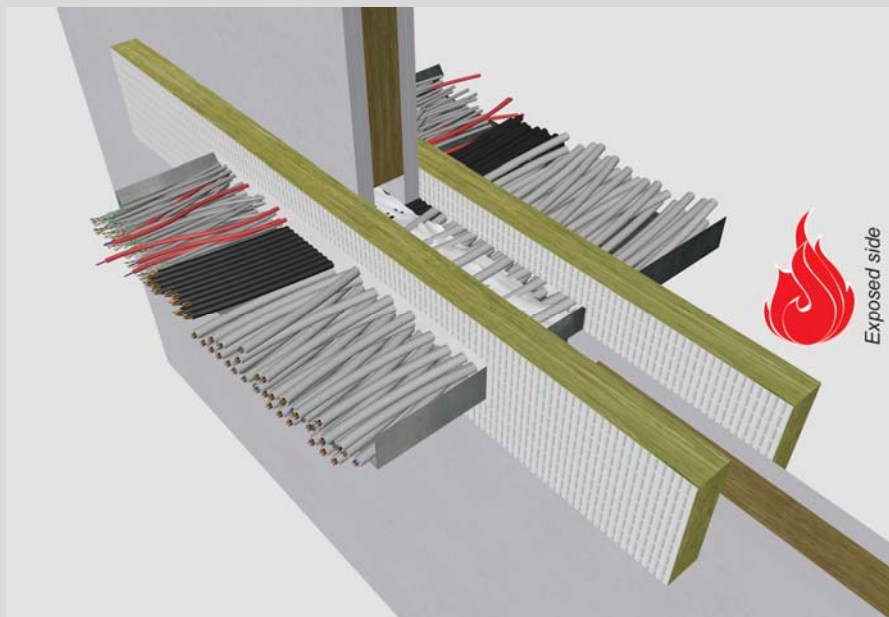
- installation instructions in TDS
- **all cable dØ** are allowed within group type and max. Cu mm<sup>2</sup>
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- default: coating on cables and/or trays is **NOT** required!

## principle detail

tested property  
test method  
service no.  
tested property  
test method

## Firesafe

fire resistance  
EN 1366-3  
21-15  
smoke resistance  
EN 1634-3  
NEN 6075



## cables in trays + ladders + wire mesh

| cable specs | assembly | service specs                 | EI      | constructive element <sup>1)</sup> | Firesafe joint seal | application  | max. opening    | Firesafe fire board           | finish   | support distance <sup>2)</sup> |
|-------------|----------|-------------------------------|---------|------------------------------------|---------------------|--------------|-----------------|-------------------------------|----------|--------------------------------|
|             | group    | Cu (mm <sup>2</sup> )<br>max. | (steel) | non-standard config.               | width (mm)          | 1 or 2 sides | in construction | type 2S 50 mm<br>1 or 2 sides | required | service                        |

### trays, perforated + non-perforated

#### cables only

|                                                                                                                                                                                                                                 |       |               |                     |                                  |                                                                                                     |                              |                                          |                                                                  |                                         |                  |                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|---------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------|------------------------------------------|------------------------------------------------------------------|-----------------------------------------|------------------|--------------------------------------------------|
| group 1 - small sheathed ≤ Ø 21mm<br>group 2 - medium sheathed ≤ Ø 50mm<br>group 3 - large sheathed ≤ Ø 80mm<br>group 4 - data + fibre optic ≤ Ø 100mm<br>group 5 - non-sheathed ≤ Ø 23mm<br>plastic or steel conduits ≤ Ø 16mm | 29647 | ≤ 500 x 60 mm |                     | EI 60<br>EI 30<br>EI 30<br>EI 60 | flexible walls ≥ 100 mm<br>flexible walls ≥ 100 mm<br>rigid walls ≥ 100 mm<br>rigid floors ≥ 150 mm | 5 mm<br>5 mm<br>5 mm<br>5 mm | 2 sides<br>2 sides<br>2 sides<br>2 sides | 600 x 1200 mm<br>600 x 1200 mm<br>600 x 1200 mm<br>600 x 5000 mm | 2 sides<br>2 sides<br>1 side<br>2 sides | -<br>-<br>-<br>- | 250 + 500 mm<br>500 mm<br>500 mm<br>250 + 400 mm |
| group 1 - small sheathed ≤ Ø 21mm<br>group 4 - data + fibre optic                                                                                                                                                               | 12619 | ≤ 600 x 50 mm |                     | EI 60<br>EI 120                  | flexible walls ≥ 100 mm<br>flexible walls ≥ 100 mm                                                  | 10 mm<br>10 mm               | 2 sides<br>2 sides                       | 620 x 70 mm<br>620 x 70 mm                                       | -<br>1 side                             | -<br>-           | 500 mm<br>500 mm                                 |
| group 1 - small sheathed ≤ Ø 21mm<br>group 4 - data + fibre optic                                                                                                                                                               | 1806  | ≤ 350 x 60 mm |                     | EI 90                            | rigid walls ≥ 150 mm                                                                                | -                            | -                                        | 450 x 200 mm                                                     | 1 side                                  | 200 LI *         | 500 mm                                           |
| group 4 - data + fibre optic                                                                                                                                                                                                    | 12842 | ≤ 200 x 60 mm | non-insulated walls | EI 30                            | flexible walls ≥ 75 mm                                                                              | 10 mm 12,5 mm                | 2 sides                                  | 220 x 80 mm                                                      | 2 sides                                 | 20 mm **         | 500 mm                                           |

#### cables + pipes (mixed configuration)

|                                                                                                                                                                                                                                 |       |               |  |                |                                                  |              |                    |                                      |                    |        |                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|--|----------------|--------------------------------------------------|--------------|--------------------|--------------------------------------|--------------------|--------|------------------------|
| group 1 - small sheathed ≤ Ø 21mm<br>group 2 - medium sheathed ≤ Ø 50mm<br>group 3 - large sheathed ≤ Ø 80mm<br>group 4 - data + fibre optic ≤ Ø 100mm<br>group 5 - non-sheathed ≤ Ø 23mm<br>plastic or steel conduits ≤ Ø 16mm | 15707 | ≤ 500 x 60 mm |  | EI 60<br>EI 60 | flexible walls ≥ 100 mm<br>rigid floors ≥ 150 mm | 5 mm<br>5 mm | 2 sides<br>2 sides | 600 x 1200 mm + 25%<br>600 x 5000 mm | 2 sides<br>2 sides | -<br>- | 500 mm<br>250 + 400 mm |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|--|----------------|--------------------------------------------------|--------------|--------------------|--------------------------------------|--------------------|--------|------------------------|

### cable ladders

#### cables only

|                                                                                                                                                                                                                                 |       |               |                     |                                  |                                                                                                     |                              |                                          |                                                                  |                                         |                  |                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---------------|---------------------|----------------------------------|-----------------------------------------------------------------------------------------------------|------------------------------|------------------------------------------|------------------------------------------------------------------|-----------------------------------------|------------------|--------------------------------------------------|
| group 1 - small sheathed ≤ Ø 21mm<br>group 2 - medium sheathed ≤ Ø 50mm<br>group 3 - large sheathed ≤ Ø 80mm<br>group 4 - data + fibre optic ≤ Ø 100mm<br>group 5 - non-sheathed ≤ Ø 23mm<br>plastic or steel conduits ≤ Ø 16mm | 29647 | ≤ 300 x 60 mm |                     | EI 60<br>EI 30<br>EI 30<br>EI 60 | flexible walls ≥ 100 mm<br>flexible walls ≥ 100 mm<br>rigid walls ≥ 100 mm<br>rigid floors ≥ 150 mm | 5 mm<br>5 mm<br>5 mm<br>5 mm | 2 sides<br>2 sides<br>2 sides<br>2 sides | 600 x 1200 mm<br>600 x 1200 mm<br>600 x 1200 mm<br>600 x 5000 mm | 2 sides<br>2 sides<br>1 side<br>2 sides | -<br>-<br>-<br>- | 250 + 500 mm<br>500 mm<br>500 mm<br>250 + 400 mm |
| group 1 - small sheathed ≤ Ø 21mm<br>group 4 - data + fibre optic                                                                                                                                                               | 12842 | ≤ 200 x 60 mm | non-insulated walls | EI 30                            | flexible walls ≥ 75 mm                                                                              | 10 mm 12,5 mm                | 2 sides                                  | 220 x 80 mm                                                      | 2 sides                                 | 20 mm **         | 500 mm                                           |
| group 4 - data + fibre optic                                                                                                                                                                                                    | 2781  | ≤ 350 x 60 mm |                     | EI 120                           | rigid walls ≥ 150 mm                                                                                | -                            | -                                        | 450 x 200 mm                                                     | 1 side                                  | 200 LI *         | 500 mm                                           |
| group 1 - small sheathed ≤ Ø 21mm<br>group 2 - medium sheathed ≤ Ø 50mm                                                                                                                                                         | 780   | ≤ 300 x 60 mm |                     | EI 180                           | rigid floors ≥ 150 mm                                                                               | -                            | -                                        | 400 x 200 mm                                                     | 2 sides                                 |                  | 400 mm                                           |

>> continued on page 2

in FT Board 2S 50 mm

\* FT Coating, DFT 0.8mm

\*\* 20 mm perimeter

<sup>1)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

<sup>2)</sup> Penetration services (cable trays etc.) must be supported.

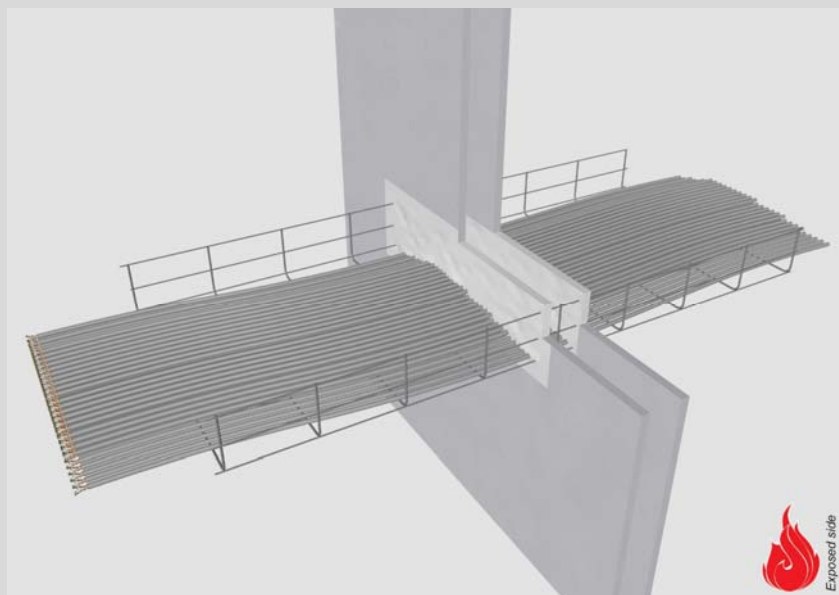
**Notes:**

- installation instructions in TDS
- **all cable dØ** are allowed within group type and max. Cu mm<sup>2</sup>
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm
- default: coating on cables and/or trays is **NOT** required!

**principle detail**
**Firesafe**

tested property  
test method  
service no.  
tested property  
test method

fire resistance  
EN 1366-3  
31-59  
smoke resistance  
EN 1634-3  
NEN 6075


**cables in trays + ladders + wire mesh**

| cable specs                                                                                                                                                                                                                     | assembly                      | service specs  |                      | EI    | constructive element <sup>1)</sup>                                                | Firesafe joint seal                           | application  | max. opening        | Firesafe fire board           | finish   | support distance <sup>2)</sup> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----------------|----------------------|-------|-----------------------------------------------------------------------------------|-----------------------------------------------|--------------|---------------------|-------------------------------|----------|--------------------------------|
| group                                                                                                                                                                                                                           | Cu (mm <sup>2</sup> )<br>max. | (steel)        | non-standard config. |       |                                                                                   | width (mm)                                    | 1 or 2 sides | in construction     | type 2S 50 mm<br>1 or 2 sides | required | service                        |
| cable ladders                                                                                                                                                                                                                   |                               |                |                      |       |                                                                                   |                                               |              |                     |                               |          |                                |
| cables + pipes (mixed configuration)                                                                                                                                                                                            |                               |                |                      |       |                                                                                   |                                               |              |                     |                               |          |                                |
| group 1 - small sheathed ≤ Ø 21mm<br>group 2 - medium sheathed ≤ Ø 50mm<br>group 3 - large sheathed ≤ Ø 80mm<br>group 4 - data + fibre optic ≤ Ø 100mm<br>group 5 - non-sheathed ≤ Ø 23mm<br>plastic or steel conduits ≤ Ø 16mm | 15707                         | ≤ 300 x 60 mm  |                      | EI 60 | flexible walls ≥ 100 mm                                                           | 5 mm                                          | 2 sides      | 600 x 1200 mm + 25% | 2 sides                       | -        | 500 mm                         |
|                                                                                                                                                                                                                                 |                               |                |                      | EI 60 | rigid floors ≥ 150 mm                                                             | 5 mm                                          | 2 sides      | 600 x 5000 mm       | 2 sides                       | -        | 250 + 400 mm                   |
|                                                                                                                                                                                                                                 |                               |                |                      |       |                                                                                   |                                               |              |                     |                               |          |                                |
| trays, wire mesh                                                                                                                                                                                                                |                               |                |                      |       |                                                                                   |                                               |              |                     |                               |          |                                |
| cables only                                                                                                                                                                                                                     |                               |                |                      |       |                                                                                   |                                               |              |                     |                               |          |                                |
| group 1 - small sheathed ≤ Ø 21mm                                                                                                                                                                                               | 15266                         | ≤ 400 x 80 mm  | non-insulated walls  | EI 60 | flexible walls ≥ 75 mm                                                            | 10 mm 12,5 mm                                 | 2 sides      | 420 x 100 mm        | 2 sides                       | 20 mm ** | 500 mm                         |
| group 4 - data + fibre optic                                                                                                                                                                                                    | 12842                         | 400 x 80 mm    | non-insulated walls  | EI 30 | flexible walls ≥ 75 mm                                                            | 10 mm 12,5 mm                                 | 2 sides      | 420 x 100 mm        | 2 sides                       | 20 mm ** | 500 mm                         |
|                                                                                                                                                                                                                                 | 6401                          | ≤ 600 x 55 mm  |                      | EI 90 | flexible walls ≥ 100 mm<br>no trimming, no wall insulation<br>for 100mm perimeter | 5 mm                                          | 2 sides      | 660 x 120 mm        | 2 sides                       | -        | 250 + 500 mm                   |
| cables + pipes (mixed configuration)                                                                                                                                                                                            |                               |                |                      |       |                                                                                   |                                               |              |                     |                               |          |                                |
| group 1 - small sheathed ≤ Ø 21mm<br>group 2 - medium sheathed ≤ Ø 50mm<br>group 4 - data + fibre optic                                                                                                                         | 6093                          | ≤ 600 x 105 mm |                      | EI 60 | flexible walls ≥ 100 mm<br>no trimming, no wall insulation<br>for 100mm perimeter | 5 mm                                          | 2 sides      | 730 x 230 mm        | 2 sides                       | -        | 250 + 500 mm                   |
| group 1 - small sheathed ≤ Ø 21mm<br>group 4 - data + fibre optic                                                                                                                                                               | 6374                          | ≤ 600 x 60 mm  |                      | EI 60 | rigid floors ≥ 150 mm                                                             | 5 mm                                          | 2 sides      | 600 x 800 mm        | 2 sides                       | -        | 400 mm                         |
| in FT Board 2S 50 mm                                                                                                                                                                                                            |                               |                |                      |       |                                                                                   | * FT Coating, DFT 0.8mm<br>** 20 mm perimeter |              |                     |                               |          |                                |

<sup>1)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

<sup>2)</sup> Penetration services (cable trays etc.) must be supported.

**CABLE BUNDLES classification ≤ 121 mm**

Fire performances are valid for for **range of cable group + max. Cu mm<sup>2</sup>:**

**cable group 1 + 2 + 4 + 5**

dØ up to 31 mm

**also cables in plastic conduits**

dØ up to 110 mm

**bundle size****cable specs****max. Ø 40 mm**

cable assembly within max. Cu mm<sup>2</sup>;  
allowed cable groups:

group 1 - small sheathed  
group 2 - medium sheathed  
group 4 - data + fibre optic  
conduit, plastic

**max. Ø 55 mm**

cable assembly within max. Cu mm<sup>2</sup>;  
allowed cable groups:

group 1 - small sheathed  
group 4 - data + fibre optic  
conduit, plastic

**max. Ø 121 mm**

cable assembly within max. Cu mm<sup>2</sup>;  
allowed cable groups:

group 1 - small sheathed  
group 2 - medium sheathed  
group 4 - data + fibre optic  
conduit, plastic

**suitable Firesafe products within classification:****FT Graphite**

DoP CPR-16/0094

**FT Acrylic or FT Paste**

DoP CPR-16/0094

**Cable Transit**

DoP CPR-15/0339

**Flex Plug**

DoP CPR-15/0339

**FIRE COLLAR**

DoP CPR-15/0339

**supporting construction**

**Constructive element** must be classified acc. EN 13501-2 for the required fire resistance period:

1: flexible wall ≥100mm, insulated

**1-n100: flexible wall ≥100mm, non-insulated**

**1-n75: flexible wall ≥75mm, non-insulated**

2: rigid wall ≥100mm

3: rigid wall ≥150mm

4: flexible ceiling ≥150mm

5: rigid floor ≥150mm

6: CLT wall ≥100mm

7: CLT floor ≥140mm

Max. opening in constructive element: see principle detail. Use FT Board if opening is larger; see how-to-read.

Penetration services must be **supported**;  
support distance walls max. 500mm  
support distance floors max. 400mm

[EI 60 in wall 1-n75](#)

[EI 120 in wall 1+2+3](#)

[EI 90 in wall 1-n100](#)

[EI 60 in wall 1-n75](#)

[EI 90 in wall 6](#)

[EI 240 in floor 5](#)

[EI 120 in ceiling 4](#)

[EI 90 in floor 7](#)

[EI 120 in wall 1+2](#)

[EI 240 in wall 3](#)

[EI 90 in wall 6](#)

[EI 240 in floor 5](#)

[EI 90 in floor 7](#)

[EI 90 in wall 1+2](#)

[EI 180 in wall 3](#)

[EI 180 in floor 5](#)

[EI 120 in wall 1+2+3](#)

[EI 90 in wall 6](#)

[EI 180 in floor 5](#)

also on FT Board

[EI 90 in floor 7](#)

[EI 120 in wall 1+2+3](#)

[EI 90 in wall 6](#)

[EI 90 in floor 7](#)

[EI 90 in wall 1+2+3](#)

[EI 120 in floor 5](#)

[EI 120 in wall 1+2](#)

[EI 240 in wall 3](#)

[EI 240 in floor 5](#)

[EI 120 in wall 1+2+3](#)

[EI 240 in floor 5](#)

joint details: min. W x D, default:  
walls: 10 x 25 mm, apply on 2 sides  
floors: 15 x 25 mm, apply on 2 sides

position centrally in construction  
mount with FT Acrylic  
put loose rock wool ≥ 100kg/m<sup>3</sup>  
in transit on 2 sides

position centrally in  
construction

default:  
walls: apply on 2 sides  
floors: apply on 1 side  
apply smoke seal FT Acrylic

NOTE:  
CONDUITS in trays + ladders: see  
**CABLE TRAYS**

[► INDEX](#)[PE + PP + PVC](#)[plastic cable conduits](#)[PP-R](#)[PP-MD](#)[PP-MX](#)[aluPE-X](#)[PE-Xa](#)[copper](#)[steel](#)[steel conduits](#)[cast iron](#)[trays + ladders + wire mesh](#)[cables + bundles](#)[fire dampers](#)[air transfer grilles](#)[duct cladding](#)[linear joints](#)[socket boxes](#)[blank seals](#)[EN norms for plastic pipes](#)[how-to-read](#)[acoustical](#)[environmental](#)

**Notes:**

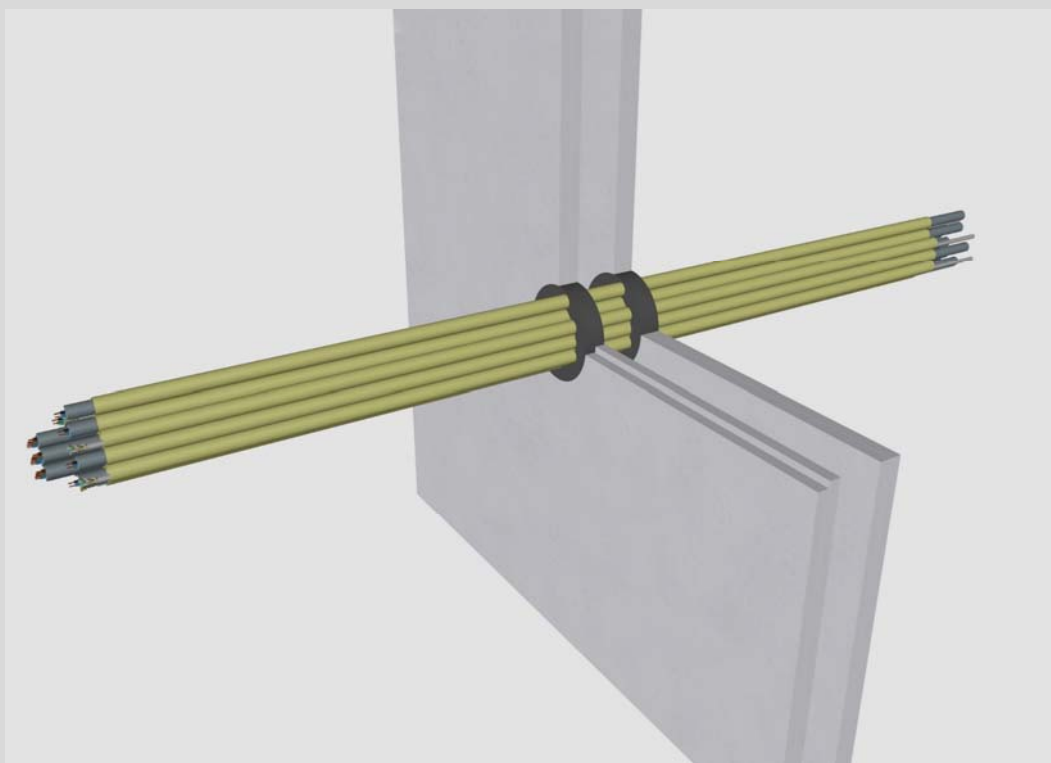
- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other cable dØ** are allowed within range and same conduit material

**Firesafe**

fire resistance

EN 1366-3

30-47


**cables**

| bundle<br>dØ (mm) | cable specs <sup>1)</sup>          |                    | assembly     |                      | EI  | constructive element <sup>2)</sup> | Firesafe joint seal   |         | application<br>1 or 2 sides | backing<br>required | max. opening<br>in construction |
|-------------------|------------------------------------|--------------------|--------------|----------------------|----------------------------------------------------------------------------------------|------------------------------------|-----------------------|---------|-----------------------------|---------------------|---------------------------------|
|                   | group                              | conduit            | Cu (mm²)     | non-standard config. |                                                                                        |                                    | width                 | depth   |                             |                     |                                 |
| up to             |                                    |                    | max.         |                      |                                                                                        |                                    |                       |         |                             |                     |                                 |
| Ø50               | group 1 -small sheathed ≤ Ø 16mm   | -                  | 2048         | non-insulated walls  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm   | 2 sides                     | -                   | Ø70                             |
|                   | group 4 - data + fibre optic       | -                  | 1766         | non-insulated walls  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm   | 2 sides                     | -                   | Ø40                             |
|                   | group 1 -small sheathed ≤ Ø 16mm   | -                  | 1862         | non-insulated walls  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 12,5 mm | 2 sides                     | -                   | Ø70                             |
|                   | group 4 - data + fibre optic       | -                  | 1605         | non-insulated walls  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 12,5 mm | 2 sides                     | -                   | Ø40                             |
|                   | group 1 -small sheathed ≤ Ø 16mm   | PE/PVC conduit *   | 233          | non-insulated walls  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 12,5 mm | 2 sides                     | -                   | Ø70                             |
|                   | group 4 - data + fibre optic       | PE conduit *       | 201          | non-insulated walls  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 12,5 mm | 2 sides                     | -                   | Ø70                             |
| Ø110              | group 1 -small sheathed ≤ Ø 16mm   | PVC conduit **     | 1582         | non-insulated walls  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm   | 2 sides                     | -                   | Ø110 or 120x40                  |
|                   | group 4 - data + fibre optic       | PVC conduit **     | 1582         | non-insulated walls  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm   | 2 sides                     | -                   | Ø110 or 120x40                  |
|                   | mix of group 1 + 4                 | PVC conduit **     | 1582         | non-insulated walls  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm   | 2 sides                     | -                   | Ø110 or 120x40                  |
|                   | group 1 -small sheathed ≤ Ø 16mm   | PVC conduit        | 762          | non-insulated walls  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 12,5 mm | 2 sides                     | -                   | Ø110                            |
|                   | group 4 - data + fibre optic       | PVC conduit        | 762          | non-insulated walls  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 12,5 mm | 2 sides                     | -                   | Ø110                            |
|                   | mix of group 1 + 4                 | PVC conduit        | 762          | non-insulated walls  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 12,5 mm | 2 sides                     | -                   | Ø110                            |
|                   | group 1 -small sheathed ≤ Ø 16mm   | -                  | 8429         |                      | EI 90                                                                                  | CLT walls ≥ 100 mm                 | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø130                            |
|                   | group 1 -small sheathed ≤ Ø 16mm   | -                  | 8429         |                      | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø130                            |
| max.              |                                    |                    |              |                      |                                                                                        |                                    |                       |         |                             |                     |                                 |
| Ø121              | <blank>                            | PVC conduit        | -            |                      | EI 90                                                                                  | CLT walls ≥ 100 mm                 | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø140                            |
|                   | <blank>                            | PVC conduit        | -            |                      | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø140                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | -                  | 9309         |                      | EI 120                                                                                 | flexible walls ≥ 100 mm            | 30 mm                 | 25 mm   | 2 sides                     | 50 mm RW            | Ø170                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *    | 730          |                      | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm   | 2 sides                     | -                   | Ø110                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit       | 621          |                      | EI 120                                                                                 | flexible walls ≥ 100 mm            | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit       | 621          |                      | EI 120                                                                                 | flexible walls ≥ 100 mm            | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | mix of group 1 + 2                 | hdPE conduit       | 621          |                      | EI 120                                                                                 | flexible walls ≥ 100 mm            | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *    | 487          |                      | EI 60                                                                                  | shaft walls ≥ 75 mm                | 10 mm                 | 25 mm   | 2 sides                     | -                   | 300 x 1200 mm                   |
|                   | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit       | 621          |                      | EI 120                                                                                 | flexible ceilings ≥ 150 mm         | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit       | 621          |                      | EI 120                                                                                 | flexible ceilings ≥ 150 mm         | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | mix of group 1 + 2                 | hdPE conduit       | 621          |                      | EI 120                                                                                 | flexible ceilings ≥ 150 mm         | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | PP-MD conduit *    | 487          |                      | EI 240                                                                                 | rigid floors ≥ 150 mm              | -                     | 40 mm   | 2 sides                     | -                   | Ø110                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit       | 621          |                      | EI 120                                                                                 | rigid floors ≥ 150 mm              | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit       | 621          |                      | EI 120                                                                                 | rigid floors ≥ 150 mm              | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   |                                    | mix of group 1 + 2 | hdPE conduit | 621                  |                                                                                        | EI 120                             | rigid floors ≥ 150 mm | 15 mm   | 25 mm                       | 2 sides             | -                               |

\* Both rigid + corrugated conduits. 'eccentric to zero' position in opening is allowed.

\*\* Both rigid + corrugated conduits. 'eccentric to zero' position and in opening is allowed, incl. in row: max. 120 x 40 mm.

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥ 100mm is also applicable for rigid walls ≥ 100mm!

in FT Board 2S 50 mm

**Notes:**

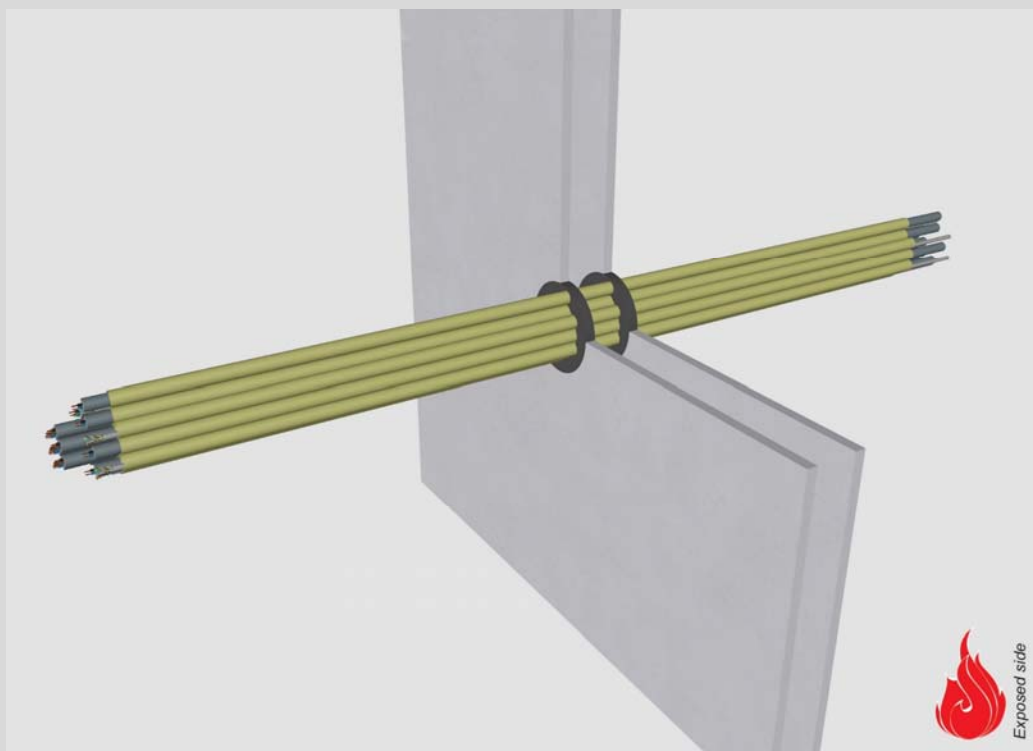
- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other cable dØ** are allowed within range and same conduit material

**Firesafe**

fire resistance

EN 1366-3

31-66


**cables**

| bundle<br>dØ (mm) | cable specs <sup>1)</sup><br>group | conduit            | assembly<br>Cu (mm <sup>2</sup> ) | non-standard config. |  EI | constructive element <sup>2)</sup> | Firesafe joint seal   |         | application<br>1 or 2 sides | backing<br>required | max. opening<br>in construction |
|-------------------|------------------------------------|--------------------|-----------------------------------|----------------------|----------------------------------------------------------------------------------------|------------------------------------|-----------------------|---------|-----------------------------|---------------------|---------------------------------|
|                   |                                    |                    |                                   |                      |                                                                                        |                                    | width                 | depth   |                             |                     |                                 |
| up to             |                                    | max.               |                                   |                      |                                                                                        |                                    |                       |         |                             |                     |                                 |
| Ø50               | group 1 -small sheathed ≤ Ø 16mm   | -                  | 2048                              | non-insulated walls  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm   | 2 sides                     | -                   | Ø70                             |
|                   | group 4 - data + fibre optic       | -                  | 1766                              | non-insulated walls  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm   | 2 sides                     | -                   | Ø40                             |
|                   | group 1 -small sheathed ≤ Ø 16mm   | -                  | 1862                              | non-insulated walls  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 12,5 mm | 2 sides                     | -                   | Ø70                             |
|                   | group 4 - data + fibre optic       | -                  | 1605                              | non-insulated walls  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 12,5 mm | 2 sides                     | -                   | Ø40                             |
|                   | group 1 -small sheathed ≤ Ø 16mm   | PE/PVC conduit *   | 233                               | non-insulated walls  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 12,5 mm | 2 sides                     | -                   | Ø70                             |
|                   | group 4 - data + fibre optic       | PE conduit *       | 201                               | non-insulated walls  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 12,5 mm | 2 sides                     | -                   | Ø70                             |
| Ø110              | group 1 -small sheathed ≤ Ø 16mm   | PVC conduit **     | 1582                              | non-insulated walls  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm   | 2 sides                     | -                   | Ø110 or 120x40                  |
|                   | group 4 - data + fibre optic       | PVC conduit **     | 1582                              | non-insulated walls  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm   | 2 sides                     | -                   | Ø110 or 120x40                  |
|                   | mix of group 1 + 4                 | PVC conduit **     | 1582                              | non-insulated walls  | EI 90                                                                                  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm   | 2 sides                     | -                   | Ø110 or 120x40                  |
|                   | group 1 -small sheathed ≤ Ø 16mm   | PVC conduit        | 762                               | non-insulated walls  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 12,5 mm | 2 sides                     | -                   | Ø110                            |
|                   | group 4 - data + fibre optic       | PVC conduit        | 762                               | non-insulated walls  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 12,5 mm | 2 sides                     | -                   | Ø110                            |
|                   | mix of group 1 + 4                 | PVC conduit        | 762                               | non-insulated walls  | EI 60                                                                                  | flexible walls ≥ 75 mm             | 10 mm                 | 12,5 mm | 2 sides                     | -                   | Ø110                            |
|                   | group 1 -small sheathed ≤ Ø 16mm   | -                  | 8429                              |                      | EI 90                                                                                  | CLT walls ≥ 100 mm                 | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø130                            |
|                   | group 1 -small sheathed ≤ Ø 16mm   | -                  | 8429                              |                      | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø130                            |
| max.              |                                    |                    |                                   |                      |                                                                                        |                                    |                       |         |                             |                     |                                 |
| Ø121              | <blank>                            | PVC conduit        | -                                 |                      | EI 90                                                                                  | CLT walls ≥ 100 mm                 | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø140                            |
|                   | <blank>                            | PVC conduit        | -                                 |                      | EI 90                                                                                  | CLT floors ≥ 140 mm                | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø140                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | -                  | 9309                              |                      | EI 120                                                                                 | flexible walls ≥ 100 mm            | 30 mm                 | 25 mm   | 2 sides                     | 50 mm RW            | Ø170                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *    | 730                               |                      | EI 120                                                                                 | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm   | 2 sides                     | -                   | Ø110                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit       | 621                               |                      | EI 120                                                                                 | flexible walls ≥ 100 mm            | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit       | 621                               |                      | EI 120                                                                                 | flexible walls ≥ 100 mm            | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | mix of group 1 + 2                 | hdPE conduit       | 621                               |                      | EI 120                                                                                 | flexible walls ≥ 100 mm            | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *    | 487                               |                      | EI 60                                                                                  | shaft walls ≥ 75 mm                | 10 mm                 | 25 mm   | 2 sides                     | -                   | 300 x 1200 mm                   |
|                   | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit       | 621                               |                      | EI 120                                                                                 | flexible ceilings ≥ 150 mm         | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit       | 621                               |                      | EI 120                                                                                 | flexible ceilings ≥ 150 mm         | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | mix of group 1 + 2                 | hdPE conduit       | 621                               |                      | EI 120                                                                                 | flexible ceilings ≥ 150 mm         | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | PP-MD conduit *    | 487                               |                      | EI 240                                                                                 | rigid floors ≥ 150 mm              | -                     | 40 mm   | 2 sides                     | -                   | Ø110                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit       | 621                               |                      | EI 120                                                                                 | rigid floors ≥ 150 mm              | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit       | 621                               |                      | EI 120                                                                                 | rigid floors ≥ 150 mm              | 15 mm                 | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   |                                    | mix of group 1 + 2 | hdPE conduit                      | 621                  |                                                                                        | EI 120                             | rigid floors ≥ 150 mm | 15 mm   | 25 mm                       | 2 sides             | -                               |

\* Both rigid + corrugated conduits. 'eccentric to zero' position in opening is allowed.

\*\* Both rigid + corrugated conduits. 'eccentric to zero' position and in opening is allowed, incl. in row: max. 120 x 40 mm.

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

in FT Board 2S 50 mm

## Notes:

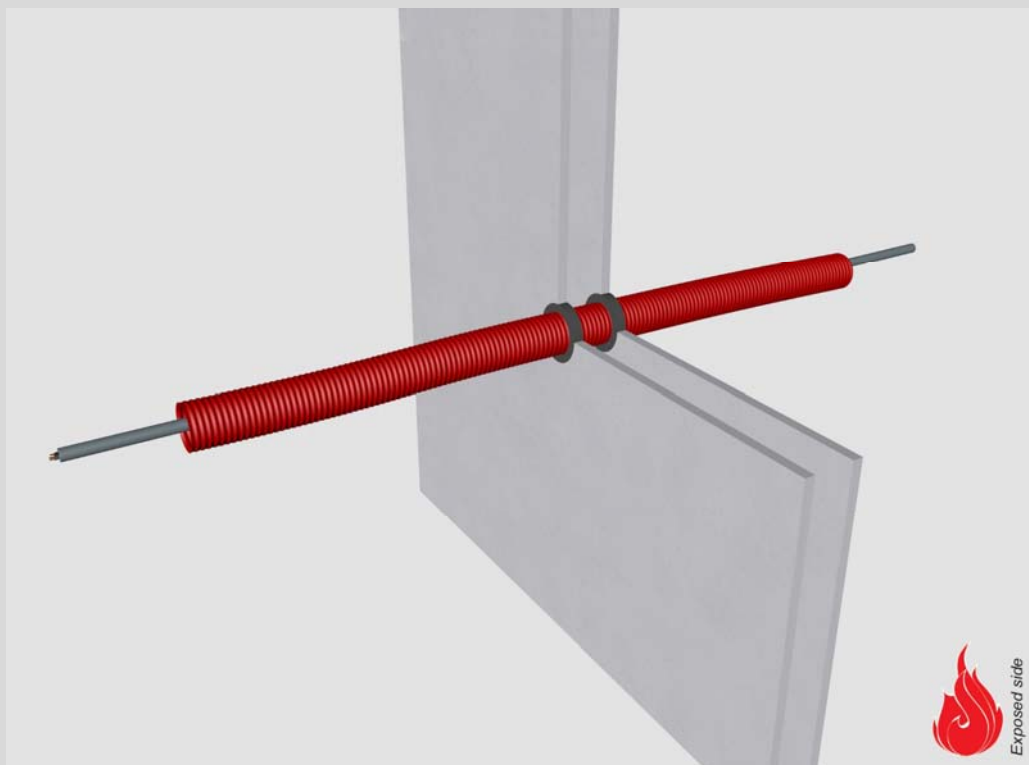
- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other cable dØ** are allowed within range and same conduit material

Firesafe

fire resistance

EN 1366-3

31-52



## cables

| bundle<br>dØ (mm) | cable specs <sup>1)</sup><br>group | conduit          | assembly<br>Cu (mm²) | non-standard config. | EI     | constructive element <sup>2)</sup> | Firesafe joint seal |         | application<br>1 or 2 sides | backing<br>required | max. opening<br>in construction |
|-------------------|------------------------------------|------------------|----------------------|----------------------|--------|------------------------------------|---------------------|---------|-----------------------------|---------------------|---------------------------------|
|                   |                                    |                  |                      |                      |        |                                    | width               | depth   |                             |                     |                                 |
| up to             |                                    |                  |                      |                      |        |                                    | max.                |         |                             |                     |                                 |
| Ø50               | group 1 -small sheathed ≤ Ø 16mm   | -                | 2048                 | non-insulated walls  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides                     | -                   | Ø70                             |
|                   | group 4 - data + fibre optic       | -                | 1766                 | non-insulated walls  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides                     | -                   | Ø40                             |
|                   | group 1 -small sheathed ≤ Ø 16mm   | -                | 1862                 | non-insulated walls  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides                     | -                   | Ø70                             |
|                   | group 4 - data + fibre optic       | -                | 1605                 | non-insulated walls  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides                     | -                   | Ø40                             |
|                   | group 1 -small sheathed ≤ Ø 16mm   | PE/PVC conduit * | 233                  | non-insulated walls  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides                     | -                   | Ø70                             |
|                   | group 4 - data + fibre optic       | PE conduit *     | 201                  | non-insulated walls  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides                     | -                   | Ø70                             |
| Ø110              | group 1 -small sheathed ≤ Ø 16mm   | PVC conduit **   | 1582                 | non-insulated walls  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides                     | -                   | Ø110 or 120x40                  |
|                   | group 4 - data + fibre optic       | PVC conduit **   | 1582                 | non-insulated walls  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides                     | -                   | Ø110 or 120x40                  |
|                   | mix of group 1 + 4                 | PVC conduit **   | 1582                 | non-insulated walls  | EI 90  | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides                     | -                   | Ø110 or 120x40                  |
|                   | group 1 -small sheathed ≤ Ø 16mm   | PVC conduit      | 762                  | non-insulated walls  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides                     | -                   | Ø110                            |
|                   | group 4 - data + fibre optic       | PVC conduit      | 762                  | non-insulated walls  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides                     | -                   | Ø110                            |
|                   | mix of group 1 + 4                 | PVC conduit      | 762                  | non-insulated walls  | EI 60  | flexible walls ≥ 75 mm             | 10 mm               | 12,5 mm | 2 sides                     | -                   | Ø110                            |
|                   | group 1 -small sheathed ≤ Ø 16mm   | -                | 8429                 |                      | EI 90  | CLT walls ≥ 100 mm                 | 15 mm               | 25 mm   | 2 sides                     | -                   | Ø130                            |
|                   | group 1 -small sheathed ≤ Ø 16mm   | -                | 8429                 |                      | EI 90  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm   | 2 sides                     | -                   | Ø130                            |
| max.              |                                    |                  |                      |                      |        |                                    |                     |         |                             |                     |                                 |
| Ø121              | <blank>                            | PVC conduit      | -                    |                      | EI 90  | CLT walls ≥ 100 mm                 | 15 mm               | 25 mm   | 2 sides                     | -                   | Ø140                            |
|                   | <blank>                            | PVC conduit      | -                    |                      | EI 90  | CLT floors ≥ 140 mm                | 15 mm               | 25 mm   | 2 sides                     | -                   | Ø140                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | -                | 9309                 |                      | EI 120 | flexible walls ≥ 100 mm            | 30 mm               | 25 mm   | 2 sides                     | 50 mm RW            | Ø170                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *  | 730                  |                      | EI 120 | flexible walls ≥ 100 mm            | 10 mm               | 25 mm   | 2 sides                     | -                   | Ø110                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit     | 621                  |                      | EI 120 | flexible walls ≥ 100 mm            | 15 mm               | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit     | 621                  |                      | EI 120 | flexible walls ≥ 100 mm            | 15 mm               | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | mix of group 1 + 2                 | hdPE conduit     | 621                  |                      | EI 120 | flexible walls ≥ 100 mm            | 15 mm               | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *  | 487                  |                      | EI 60  | shaft walls ≥ 75 mm                | 10 mm               | 25 mm   | 2 sides                     | -                   | 300 x 1200 mm                   |
|                   | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit     | 621                  |                      | EI 120 | flexible ceilings ≥ 150 mm         | 15 mm               | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit     | 621                  |                      | EI 120 | flexible ceilings ≥ 150 mm         | 15 mm               | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | mix of group 1 + 2                 | hdPE conduit     | 621                  |                      | EI 120 | flexible ceilings ≥ 150 mm         | 15 mm               | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | PP-MD conduit *  | 487                  |                      | EI 240 | rigid floors ≥ 150 mm              | -                   | 40 mm   | 2 sides                     | -                   | Ø110                            |
|                   | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit     | 621                  |                      | EI 120 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit     | 621                  |                      | EI 120 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides                     | -                   | Ø102                            |
|                   | mix of group 1 + 2                 | hdPE conduit     | 621                  |                      | EI 120 | rigid floors ≥ 150 mm              | 15 mm               | 25 mm   | 2 sides                     | -                   | Ø102                            |

\* Both rigid + corrugated conduits. 'eccentric to zero' position in opening is allowed.

\*\* Both rigid + corrugated conduits. 'eccentric to zero' position in opening is allowed, incl. in row: max. 120 x 40 mm.

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥ 100mm is also applicable for rigid walls ≥ 100mm!

in FT Board 2S 50 mm

# Notes:

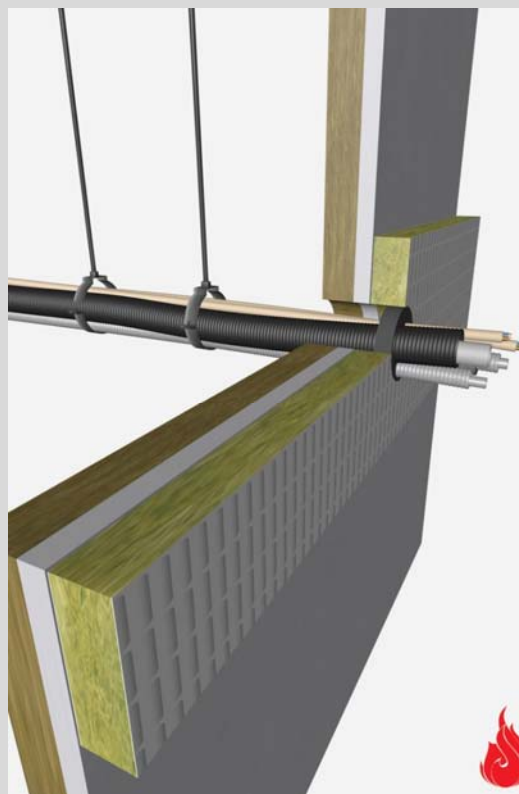
- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other cable dØ** are allowed within range and same conduit material

# Firesafe

fire resistance

EN 1366-3

16-6c



## cables

| bundle<br>dØ (mm) | cable specs <sup>1)</sup>          |                    | assembly              |                      | EI     | constructive element <sup>2)</sup> |                       | Firesafe joint seal |         | application<br>1 or 2 sides | backing<br>required | max. opening<br>in construction |
|-------------------|------------------------------------|--------------------|-----------------------|----------------------|--------|------------------------------------|-----------------------|---------------------|---------|-----------------------------|---------------------|---------------------------------|
|                   | group                              | conduit            | Cu (mm <sup>2</sup> ) | non-standard config. |        | width                              | depth                 |                     |         |                             |                     |                                 |
| up to             |                                    | max.               |                       |                      |        |                                    |                       |                     |         |                             |                     |                                 |
| Ø50               | group 1 -small sheathed ≤ Ø 16mm   | -                  | 1862                  | non-insulated walls  | EI 90  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm               | 2 sides | -                           | Ø70                 |                                 |
|                   | group 4 - data + fibre optic       | -                  | 1605                  | non-insulated walls  | EI 90  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm               | 2 sides | -                           | Ø40                 |                                 |
|                   | group 1 -small sheathed ≤ Ø 16mm   | -                  | 1862                  | non-insulated walls  | EI 60  | flexible walls ≥ 75 mm             | 10 mm                 | 25 mm               | 2 sides | -                           | Ø70                 |                                 |
|                   | group 4 - data + fibre optic       | -                  | 1605                  | non-insulated walls  | EI 60  | flexible walls ≥ 75 mm             | 10 mm                 | 25 mm               | 2 sides | -                           | Ø40                 |                                 |
|                   | group 1 -small sheathed ≤ Ø 16mm   | PE/PVC conduit *   | 186                   | non-insulated walls  | EI 60  | flexible walls ≥ 75 mm             | 10 mm                 | 25 mm               | 2 sides | -                           | Ø70                 |                                 |
|                   | group 4 - data + fibre optic       | PE conduit *       | 161                   | non-insulated walls  | EI 60  | flexible walls ≥ 75 mm             | 10 mm                 | 25 mm               | 2 sides | -                           | Ø70                 |                                 |
| Ø110              | group 1 -small sheathed ≤ Ø 16mm   | PVC conduit **     | 1438                  | non-insulated walls  | EI 90  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm               | 2 sides | -                           | Ø110 or 120x40      |                                 |
|                   | group 4 - data + fibre optic       | PVC conduit **     | 1438                  | non-insulated walls  | EI 90  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm               | 2 sides | -                           | Ø110 or 120x40      |                                 |
|                   | mix of group 1 + 4                 | PVC conduit **     | 1438                  | non-insulated walls  | EI 90  | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm               | 2 sides | -                           | Ø110 or 120x40      |                                 |
|                   | group 1 -small sheathed ≤ Ø 16mm   | PVC conduit        | 693                   | non-insulated walls  | EI 60  | flexible walls ≥ 75 mm             | 10 mm                 | 25 mm               | 2 sides | -                           | Ø110                |                                 |
|                   | group 4 - data + fibre optic       | PVC conduit        | 693                   | non-insulated walls  | EI 60  | flexible walls ≥ 75 mm             | 10 mm                 | 25 mm               | 2 sides | -                           | Ø110                |                                 |
|                   | mix of group 1 + 4                 | PVC conduit        | 693                   | non-insulated walls  | EI 60  | flexible walls ≥ 75 mm             | 10 mm                 | 25 mm               | 2 sides | -                           | Ø110                |                                 |
|                   | group 1 -small sheathed ≤ Ø 16mm   | -                  | 8429                  |                      | EI 90  | CLT walls ≥ 100 mm                 | 15 mm                 | 25 mm               | 2 sides | -                           | Ø130                |                                 |
|                   | group 1 -small sheathed ≤ Ø 16mm   | -                  | 8429                  |                      | EI 90  | CLT floors ≥ 140 mm                | 15 mm                 | 25 mm               | 2 sides | -                           | Ø130                |                                 |
| max.              |                                    |                    |                       |                      |        |                                    |                       |                     |         |                             |                     |                                 |
| Ø121              | <blank>                            | PVC conduit        | -                     |                      | EI 90  | CLT walls ≥ 100 mm                 | 15 mm                 | 25 mm               | 2 sides | -                           | Ø140                |                                 |
|                   | <blank>                            | PVC conduit        | -                     |                      | EI 90  | CLT floors ≥ 140 mm                | 15 mm                 | 25 mm               | 2 sides | -                           | Ø140                |                                 |
|                   | group 1 - small sheathed ≤ Ø 21mm  | -                  | 9309                  |                      | EI 120 | flexible walls ≥ 100 mm            | 30 mm                 | 25 mm               | 2 sides | 50 mm RW                    | Ø170                |                                 |
|                   | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *    | 730                   |                      | EI 120 | flexible walls ≥ 100 mm            | 10 mm                 | 25 mm               | 2 sides | -                           | Ø110                |                                 |
|                   | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit       | 621                   |                      | EI 120 | flexible walls ≥ 100 mm            | 15 mm                 | 25 mm               | 2 sides | -                           | Ø102                |                                 |
|                   | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit       | 621                   |                      | EI 120 | flexible walls ≥ 100 mm            | 15 mm                 | 25 mm               | 2 sides | -                           | Ø102                |                                 |
|                   | mix of group 1 + 2                 | hdPE conduit       | 621                   |                      | EI 120 | flexible walls ≥ 100 mm            | 15 mm                 | 25 mm               | 2 sides | -                           | Ø102                |                                 |
|                   | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *    | 487                   |                      | EI 60  | shaft walls ≥ 75 mm                | 10 mm                 | 25 mm               | 2 sides | -                           | 300 x 1200 mm       |                                 |
|                   | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit       | 621                   |                      | EI 120 | flexible ceilings ≥ 150 mm         | 15 mm                 | 25 mm               | 2 sides | -                           | Ø102                |                                 |
|                   | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit       | 621                   |                      | EI 120 | flexible ceilings ≥ 150 mm         | 15 mm                 | 25 mm               | 2 sides | -                           | Ø102                |                                 |
|                   | mix of group 1 + 2                 | hdPE conduit       | 621                   |                      | EI 120 | flexible ceilings ≥ 150 mm         | 15 mm                 | 25 mm               | 2 sides | -                           | Ø102                |                                 |
|                   | group 1 - small sheathed ≤ Ø 21mm  | PP-MD conduit *    | 487                   |                      | EI 240 | rigid floors ≥ 150 mm              | -                     | 40 mm               | 2 sides | -                           | Ø110                |                                 |
|                   | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit       | 621                   |                      | EI 120 | rigid floors ≥ 150 mm              | 15 mm                 | 25 mm               | 2 sides | -                           | Ø102                |                                 |
|                   | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit       | 621                   |                      | EI 120 | rigid floors ≥ 150 mm              | 15 mm                 | 25 mm               | 2 sides | -                           | Ø102                |                                 |
|                   |                                    | mix of group 1 + 2 | hdPE conduit          | 621                  |        | EI 120                             | rigid floors ≥ 150 mm | 15 mm               | 25 mm   | 2 sides                     | -                   | Ø102                            |

\* Both rigid + corrugated conduits. 'eccentric to zero' position in opening is allowed.

\*\* Both rigid + corrugated conduits. 'eccentric to zero' position and in opening is allowed, incl. in row: max. 120 x 40 mm.

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

## Notes:

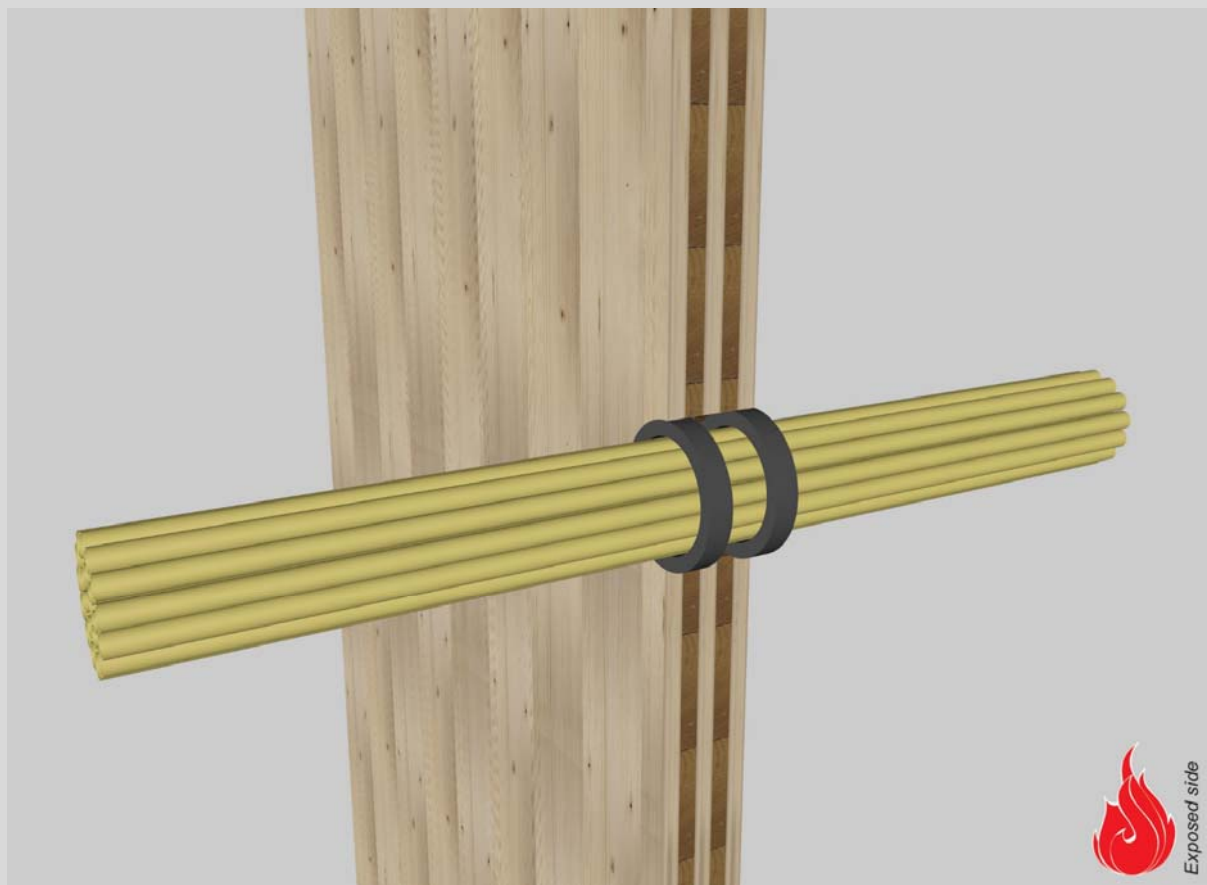
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other cable dØ** are allowed within group type and same conduit material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm

## Firesafe

fire resistance

EN 1366-3

27-18



## cables

### FT Graphite

| bundle     |      | cable specs <sup>1)</sup>          |                 | assembly |        | EI  | constructive element <sup>2)</sup> |       | Firesafe joint seal |          | application     | backing | max. opening |
|------------|------|------------------------------------|-----------------|----------|--------|----------------------------------------------------------------------------------------|------------------------------------|-------|---------------------|----------|-----------------|---------|--------------|
| dØ (mm)    |      | group                              | conduit         | Cu (mm²) |        |                                                                                        | width                              | depth | 1 or 2 sides        | required | in construction |         |              |
| max.       |      | max.                               |                 |          |        |                                                                                        |                                    |       |                     |          |                 |         |              |
| up to Ø121 | Ø110 | group 1 -small sheathed ≤ Ø 16mm   | -               | 8429     | EI 90  | <a href="#">CLT walls ≥ 100 mm</a>                                                     | 15 mm                              | 25 mm | 2 sides             | -        | Ø130            |         |              |
|            | Ø110 | group 1 -small sheathed ≤ Ø 16mm   | -               | 8429     | EI 90  | <a href="#">CLT floors ≥ 140 mm</a>                                                    | 15 mm                              | 25 mm | 2 sides             | -        | Ø130            |         |              |
|            | Ø121 | <blank>                            | PVC conduit     | -        | EI 90  | <a href="#">CLT walls ≥ 100 mm</a>                                                     | 15 mm                              | 25 mm | 2 sides             | -        | Ø140            |         |              |
|            | Ø121 | <blank>                            | PVC conduit     | -        | EI 90  | <a href="#">CLT floors ≥ 140 mm</a>                                                    | 15 mm                              | 25 mm | 2 sides             | -        | Ø140            |         |              |
|            | Ø121 | group 1 - small sheathed ≤ Ø 21mm  | -               | 9309     | EI 120 | flexible walls ≥ 100 mm                                                                | 30 mm                              | 25 mm | 2 sides             | 50 mm RW | Ø170            |         |              |
|            | Ø121 | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit * | 730      | EI 120 | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm | 2 sides             | -        | Ø110            |         |              |
|            | Ø121 | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit    | 621      | EI 120 | flexible walls ≥ 100 mm                                                                | 15 mm                              | 25 mm | 2 sides             | -        | Ø102            |         |              |
|            | Ø121 | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit    | 621      | EI 120 | flexible walls ≥ 100 mm                                                                | 15 mm                              | 25 mm | 2 sides             | -        | Ø102            |         |              |
|            | Ø121 | mix of group 1 + 2                 | hdPE conduit    | 621      | EI 120 | flexible walls ≥ 100 mm                                                                | 15 mm                              | 25 mm | 2 sides             | -        | Ø102            |         |              |
|            | Ø121 | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit * | 487      | EI 60  | shaft walls ≥ 75 mm                                                                    | 10 mm                              | 25 mm | 2 sides             | -        | 300 x 1200 mm   |         |              |
|            | Ø121 | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit    | 621      | EI 120 | flexible ceilings ≥ 150 mm                                                             | 15 mm                              | 25 mm | 2 sides             | -        | Ø102            |         |              |
|            | Ø121 | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit    | 621      | EI 120 | flexible ceilings ≥ 150 mm                                                             | 15 mm                              | 25 mm | 2 sides             | -        | Ø102            |         |              |
|            | Ø121 | mix of group 1 + 2                 | hdPE conduit    | 621      | EI 120 | flexible ceilings ≥ 150 mm                                                             | 15 mm                              | 25 mm | 2 sides             | -        | Ø102            |         |              |
|            | Ø121 | group 1 - small sheathed ≤ Ø 21mm  | PP-MD conduit * | 487      | EI 240 | rigid floors ≥ 150 mm                                                                  | -                                  | 40 mm | 2 sides             | -        | Ø110            |         |              |
|            | Ø121 | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit    | 621      | EI 120 | rigid floors ≥ 150 mm                                                                  | 15 mm                              | 25 mm | 2 sides             | -        | Ø102            |         |              |
|            | Ø121 | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit    | 621      | EI 120 | rigid floors ≥ 150 mm                                                                  | 15 mm                              | 25 mm | 2 sides             | -        | Ø102            |         |              |
|            | Ø121 | mix of group 1 + 2                 | hdPE conduit    | 621      | EI 120 | rigid floors ≥ 150 mm                                                                  | 15 mm                              | 25 mm | 2 sides             | -        | Ø102            |         |              |

in FT Board 2S 50 mm

\* Both rigid + corrugated conduits. 'eccentric to zero' position in opening is allowed.

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm!

## Notes:

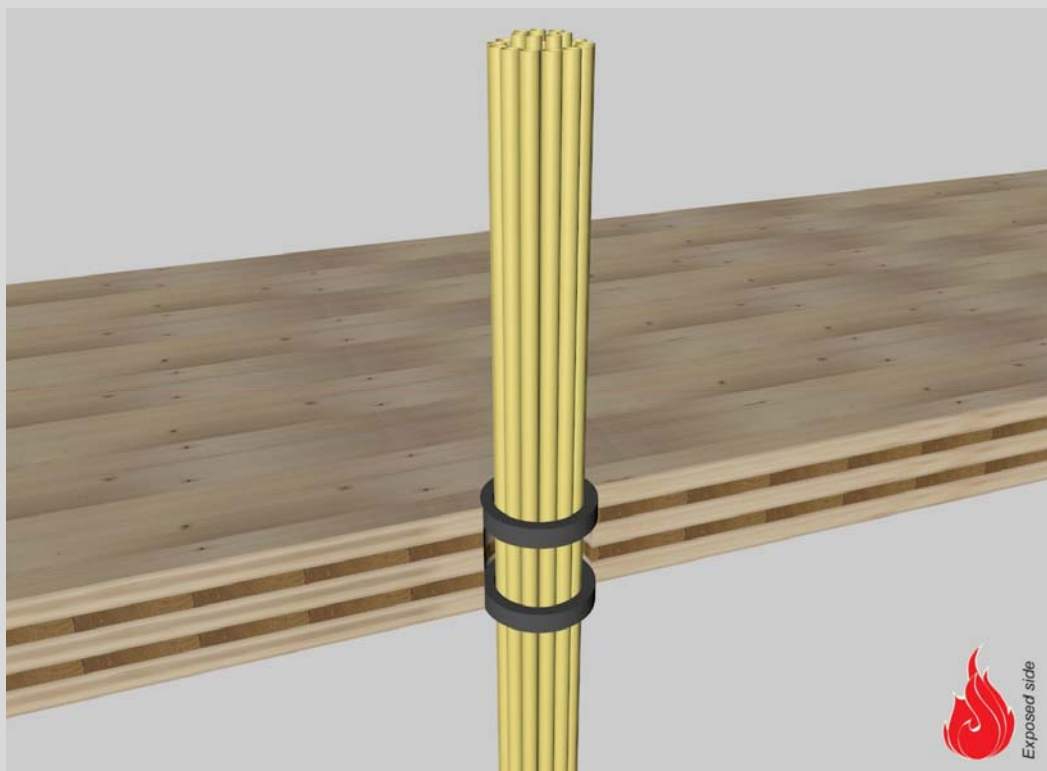
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other cable dØ** are allowed within group type and same conduit material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm

## Firesafe

fire resistance

EN 1366-3

28-38



## cables

### FT Graphite

|            | bundle<br>dØ (mm) | cable specs <sup>1)</sup><br>group | conduit         | assembly<br>Cu (mm <sup>2</sup> ) |  EI | constructive element <sup>2)</sup>  | Firesafe joint seal |       | application<br>1 or 2 sides | backing<br>required | max. opening<br>in construction |
|------------|-------------------|------------------------------------|-----------------|-----------------------------------|----------------------------------------------------------------------------------------|-------------------------------------|---------------------|-------|-----------------------------|---------------------|---------------------------------|
|            |                   |                                    |                 |                                   |                                                                                        |                                     | width               | depth |                             |                     |                                 |
| max.       |                   | max.                               |                 |                                   |                                                                                        |                                     |                     |       |                             |                     |                                 |
| up to Ø121 | Ø110              | group 1 -small sheathed ≤ Ø 16mm   | -               | 8429                              | EI 90                                                                                  | <a href="#">CLT walls ≥ 100 mm</a>  | 15 mm               | 25 mm | 2 sides                     | -                   | Ø130                            |
|            | Ø110              | group 1 -small sheathed ≤ Ø 16mm   | -               | 8429                              | EI 90                                                                                  | <a href="#">CLT floors ≥ 140 mm</a> | 15 mm               | 25 mm | 2 sides                     | -                   | Ø130                            |
|            | Ø121              | <blank>                            | PVC conduit     | -                                 | EI 90                                                                                  | <a href="#">CLT walls ≥ 100 mm</a>  | 15 mm               | 25 mm | 2 sides                     | -                   | Ø140                            |
|            | Ø121              | <blank>                            | PVC conduit     | -                                 | EI 90                                                                                  | <a href="#">CLT floors ≥ 140 mm</a> | 15 mm               | 25 mm | 2 sides                     | -                   | Ø140                            |
|            | Ø121              | group 1 - small sheathed ≤ Ø 21mm  | -               | 9309                              | EI 120                                                                                 | flexible walls ≥ 100 mm             | 30 mm               | 25 mm | 2 sides                     | 50 mm RW            | Ø170                            |
|            | Ø121              | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit * | 730                               | EI 120                                                                                 | flexible walls ≥ 100 mm             | 10 mm               | 25 mm | 2 sides                     | -                   | Ø110                            |
|            | Ø121              | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit    | 621                               | EI 120                                                                                 | flexible walls ≥ 100 mm             | 15 mm               | 25 mm | 2 sides                     | -                   | Ø102                            |
|            | Ø121              | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit    | 621                               | EI 120                                                                                 | flexible walls ≥ 100 mm             | 15 mm               | 25 mm | 2 sides                     | -                   | Ø102                            |
|            | Ø121              | mix of group 1 + 2                 | hdPE conduit    | 621                               | EI 120                                                                                 | flexible walls ≥ 100 mm             | 15 mm               | 25 mm | 2 sides                     | -                   | Ø102                            |
|            | Ø121              | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit * | 487                               | EI 60                                                                                  | shaft walls ≥ 75 mm                 | 10 mm               | 25 mm | 2 sides                     | -                   | 300 x 1200 mm                   |
|            | Ø121              | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit    | 621                               | EI 120                                                                                 | flexible ceilings ≥ 150 mm          | 15 mm               | 25 mm | 2 sides                     | -                   | Ø102                            |
|            | Ø121              | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit    | 621                               | EI 120                                                                                 | flexible ceilings ≥ 150 mm          | 15 mm               | 25 mm | 2 sides                     | -                   | Ø102                            |
|            | Ø121              | mix of group 1 + 2                 | hdPE conduit    | 621                               | EI 120                                                                                 | flexible ceilings ≥ 150 mm          | 15 mm               | 25 mm | 2 sides                     | -                   | Ø102                            |
|            | Ø121              | group 1 - small sheathed ≤ Ø 21mm  | PP-MD conduit * | 487                               | EI 240                                                                                 | rigid floors ≥ 150 mm               | -                   | 40 mm | 2 sides                     | -                   | Ø110                            |
|            | Ø121              | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit    | 621                               | EI 120                                                                                 | rigid floors ≥ 150 mm               | 15 mm               | 25 mm | 2 sides                     | -                   | Ø102                            |
|            | Ø121              | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit    | 621                               | EI 120                                                                                 | rigid floors ≥ 150 mm               | 15 mm               | 25 mm | 2 sides                     | -                   | Ø102                            |
|            | Ø121              | mix of group 1 + 2                 | hdPE conduit    | 621                               | EI 120                                                                                 | rigid floors ≥ 150 mm               | 15 mm               | 25 mm | 2 sides                     | -                   | Ø102                            |

in FT Board 2S 50 mm

\* Both rigid + corrugated conduits. 'eccentric to zero' position in opening is allowed.

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm!

## Notes:

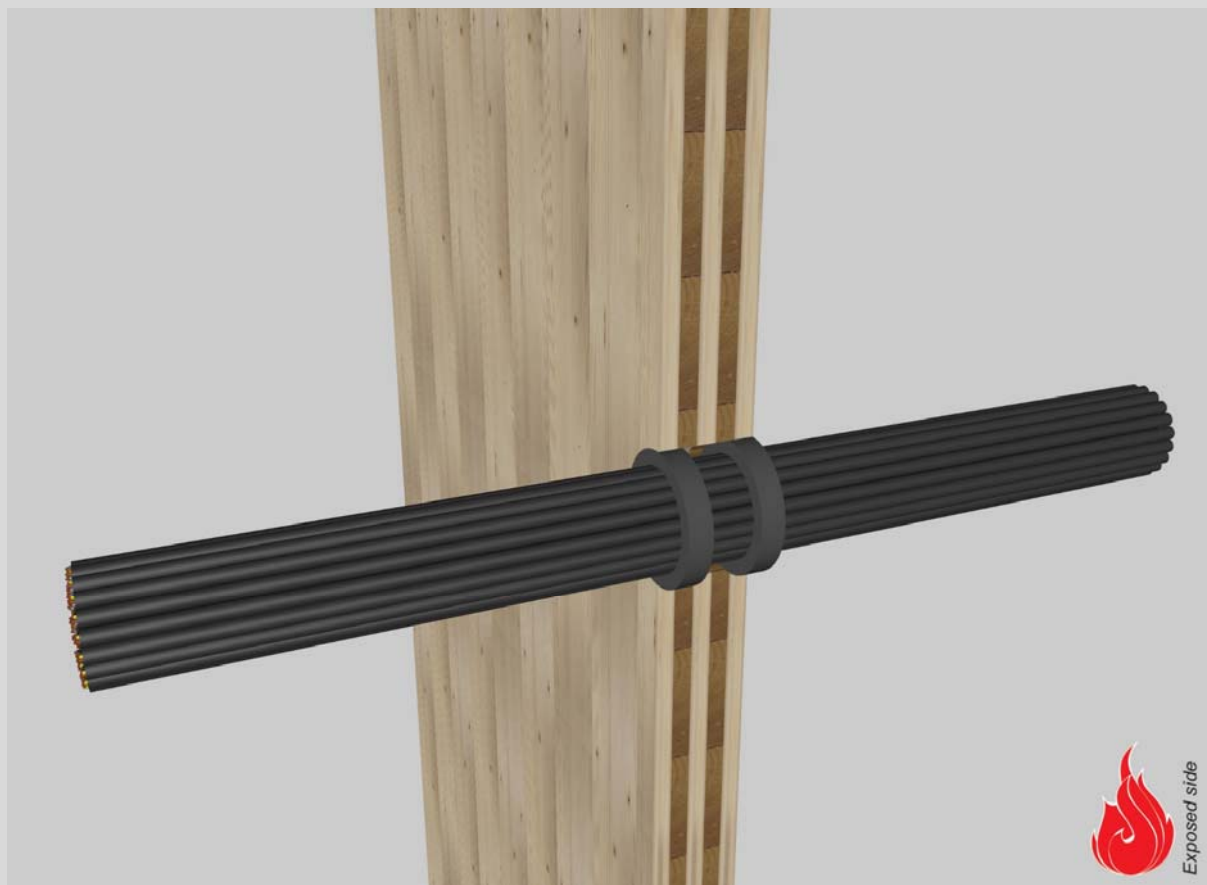
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other cable dØ** are allowed within group type and same conduit material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm

## Firesafe

fire resistance

EN 1366-3

27-17



## cables

### FT Graphite

|            | bundle  |                                    | cable specs <sup>1)</sup> |                       | assembly |                            | EI  | constructive element <sup>2)</sup> |          | Firesafe joint seal |               | application | backing | max. opening |
|------------|---------|------------------------------------|---------------------------|-----------------------|----------|----------------------------|----------------------------------------------------------------------------------------|------------------------------------|----------|---------------------|---------------|-------------|---------|--------------|
|            | dØ (mm) | group                              | conduit                   | Cu (mm <sup>2</sup> ) | width    | depth                      |                                                                                        | 1 or 2 sides                       | required | in construction     |               |             |         |              |
| max.       |         | max.                               |                           |                       |          |                            |                                                                                        |                                    |          |                     |               |             |         |              |
| up to Ø121 | Ø110    | group 1 -small sheathed ≤ Ø 16mm   | -                         | 8429                  | EI 90    | CLT walls ≥ 100 mm         | 15 mm                                                                                  | 25 mm                              | 2 sides  | -                   | Ø130          |             |         |              |
|            | Ø110    | group 1 -small sheathed ≤ Ø 16mm   | -                         | 8429                  | EI 90    | CLT floors ≥ 140 mm        | 15 mm                                                                                  | 25 mm                              | 2 sides  | -                   | Ø130          |             |         |              |
|            | Ø121    | <blank>                            | PVC conduit               | -                     | EI 90    | CLT walls ≥ 100 mm         | 15 mm                                                                                  | 25 mm                              | 2 sides  | -                   | Ø140          |             |         |              |
|            | Ø121    | <blank>                            | PVC conduit               | -                     | EI 90    | CLT floors ≥ 140 mm        | 15 mm                                                                                  | 25 mm                              | 2 sides  | -                   | Ø140          |             |         |              |
|            | Ø121    | group 1 - small sheathed ≤ Ø 21mm  | -                         | 9309                  | EI 120   | flexible walls ≥ 100 mm    | 30 mm                                                                                  | 25 mm                              | 2 sides  | 50 mm RW            | Ø170          |             |         |              |
|            | Ø121    | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *           | 730                   | EI 120   | flexible walls ≥ 100 mm    | 10 mm                                                                                  | 25 mm                              | 2 sides  | -                   | Ø110          |             |         |              |
|            | Ø121    | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit              | 621                   | EI 120   | flexible walls ≥ 100 mm    | 15 mm                                                                                  | 25 mm                              | 2 sides  | -                   | Ø102          |             |         |              |
|            | Ø121    | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit              | 621                   | EI 120   | flexible walls ≥ 100 mm    | 15 mm                                                                                  | 25 mm                              | 2 sides  | -                   | Ø102          |             |         |              |
|            | Ø121    | mix of group 1 + 2                 | hdPE conduit              | 621                   | EI 120   | flexible walls ≥ 100 mm    | 15 mm                                                                                  | 25 mm                              | 2 sides  | -                   | Ø102          |             |         |              |
|            | Ø121    | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *           | 487                   | EI 60    | shaft walls ≥ 75 mm        | 10 mm                                                                                  | 25 mm                              | 2 sides  | -                   | 300 x 1200 mm |             |         |              |
|            | Ø121    | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit              | 621                   | EI 120   | flexible ceilings ≥ 150 mm | 15 mm                                                                                  | 25 mm                              | 2 sides  | -                   | Ø102          |             |         |              |
|            | Ø121    | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit              | 621                   | EI 120   | flexible ceilings ≥ 150 mm | 15 mm                                                                                  | 25 mm                              | 2 sides  | -                   | Ø102          |             |         |              |
|            | Ø121    | mix of group 1 + 2                 | hdPE conduit              | 621                   | EI 120   | flexible ceilings ≥ 150 mm | 15 mm                                                                                  | 25 mm                              | 2 sides  | -                   | Ø102          |             |         |              |
|            | Ø121    | group 1 - small sheathed ≤ Ø 21mm  | PP-MD conduit *           | 487                   | EI 240   | rigid floors ≥ 150 mm      | -                                                                                      | 40 mm                              | 2 sides  | -                   | Ø110          |             |         |              |
|            | Ø121    | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit              | 621                   | EI 120   | rigid floors ≥ 150 mm      | 15 mm                                                                                  | 25 mm                              | 2 sides  | -                   | Ø102          |             |         |              |
|            | Ø121    | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit              | 621                   | EI 120   | rigid floors ≥ 150 mm      | 15 mm                                                                                  | 25 mm                              | 2 sides  | -                   | Ø102          |             |         |              |
|            | Ø121    | mix of group 1 + 2                 | hdPE conduit              | 621                   | EI 120   | rigid floors ≥ 150 mm      | 15 mm                                                                                  | 25 mm                              | 2 sides  | -                   | Ø102          |             |         |              |

in FT Board 2S 50 mm

\* Both rigid + corrugated conduits. 'eccentric to zero' position in opening is allowed.

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm!

## Notes:

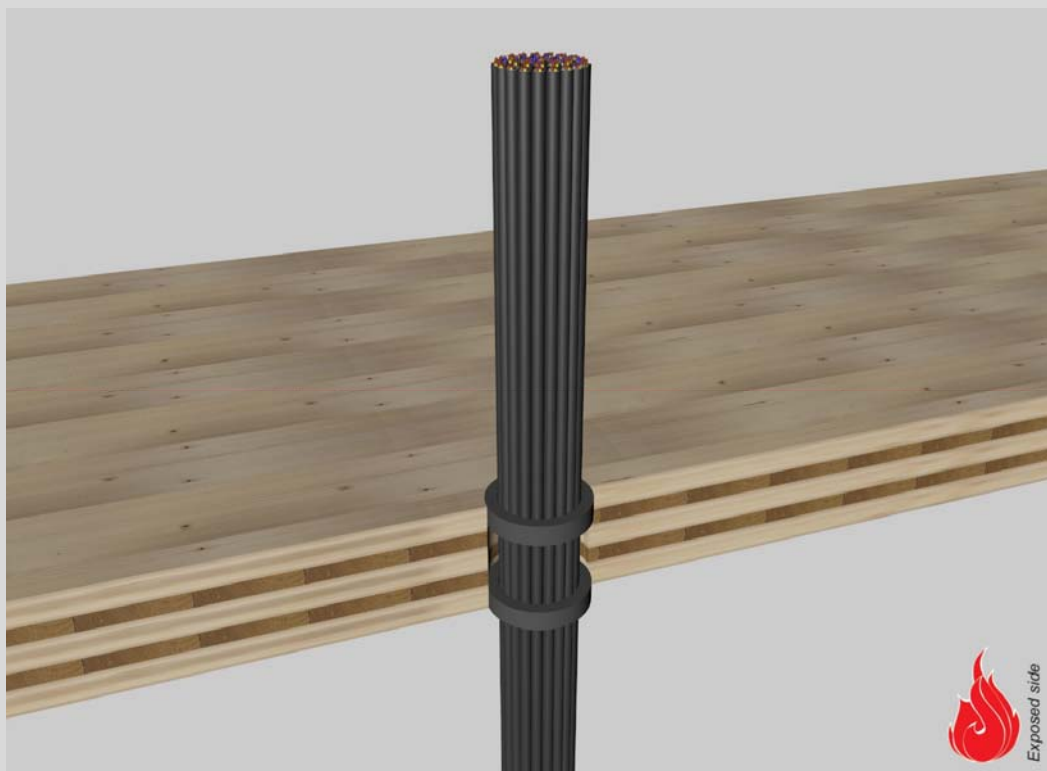
- installation instructions in TDS
- apply joint seal in opening, flush with wall/floor on 2 sides
- **other cable dØ** are allowed within group type and same conduit material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm

**Firesafe**

fire resistance

EN 1366-3

28-37



## cables

### FT Graphite

| bundle     |      | cable specs <sup>1)</sup>          |                 | assembly |                       |  | EI    |       | constructive element <sup>2)</sup> |          | Firesafe joint seal |       | application |              | backing |          | max. opening |                 |  |
|------------|------|------------------------------------|-----------------|----------|-----------------------|-------------------------------------------------------------------------------------|-------|-------|------------------------------------|----------|---------------------|-------|-------------|--------------|---------|----------|--------------|-----------------|--|
| dØ (mm)    |      | group                              |                 | conduit  | Cu (mm <sup>2</sup> ) |                                                                                     |       |       |                                    |          | width               | depth |             | 1 or 2 sides |         | required |              | in construction |  |
| max.       |      |                                    |                 | max.     |                       |                                                                                     |       |       |                                    |          |                     |       |             |              |         |          |              |                 |  |
| up to Ø121 | Ø110 | group 1 -small sheathed ≤ Ø 16mm   | -               | 8429     | EI 90                 | CLT walls ≥ 100 mm                                                                  | 15 mm | 25 mm | 2 sides                            | -        | Ø130                |       |             |              |         |          |              |                 |  |
|            | Ø110 | group 1 -small sheathed ≤ Ø 16mm   | -               | 8429     | EI 90                 | CLT floors ≥ 140 mm                                                                 | 15 mm | 25 mm | 2 sides                            | -        | Ø130                |       |             |              |         |          |              |                 |  |
|            | Ø121 | <blank>                            | PVC conduit     | -        | EI 90                 | CLT walls ≥ 100 mm                                                                  | 15 mm | 25 mm | 2 sides                            | -        | Ø140                |       |             |              |         |          |              |                 |  |
|            | Ø121 | <blank>                            | PVC conduit     | -        | EI 90                 | CLT floors ≥ 140 mm                                                                 | 15 mm | 25 mm | 2 sides                            | -        | Ø140                |       |             |              |         |          |              |                 |  |
|            | Ø121 | group 1 - small sheathed ≤ Ø 21mm  | -               | 9309     | EI 120                | flexible walls ≥ 100 mm                                                             | 30 mm | 25 mm | 2 sides                            | 50 mm RW | Ø170                |       |             |              |         |          |              |                 |  |
|            | Ø121 | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit * | 730      | EI 120                | flexible walls ≥ 100 mm                                                             | 10 mm | 25 mm | 2 sides                            | -        | Ø110                |       |             |              |         |          |              |                 |  |
|            | Ø121 | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit    | 621      | EI 120                | flexible walls ≥ 100 mm                                                             | 15 mm | 25 mm | 2 sides                            | -        | Ø102                |       |             |              |         |          |              |                 |  |
|            | Ø121 | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit    | 621      | EI 120                | flexible walls ≥ 100 mm                                                             | 15 mm | 25 mm | 2 sides                            | -        | Ø102                |       |             |              |         |          |              |                 |  |
|            | Ø121 | mix of group 1 + 2                 | hdPE conduit    | 621      | EI 120                | flexible walls ≥ 100 mm                                                             | 15 mm | 25 mm | 2 sides                            | -        | Ø102                |       |             |              |         |          |              |                 |  |
|            | Ø121 | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit * | 487      | EI 60                 | shaft walls ≥ 75 mm                                                                 | 10 mm | 25 mm | 2 sides                            | -        | 300 x 1200 mm       |       |             |              |         |          |              |                 |  |
|            | Ø121 | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit    | 621      | EI 120                | flexible ceilings ≥ 150 mm                                                          | 15 mm | 25 mm | 2 sides                            | -        | Ø102                |       |             |              |         |          |              |                 |  |
|            | Ø121 | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit    | 621      | EI 120                | flexible ceilings ≥ 150 mm                                                          | 15 mm | 25 mm | 2 sides                            | -        | Ø102                |       |             |              |         |          |              |                 |  |
|            | Ø121 | mix of group 1 + 2                 | hdPE conduit    | 621      | EI 120                | flexible ceilings ≥ 150 mm                                                          | 15 mm | 25 mm | 2 sides                            | -        | Ø102                |       |             |              |         |          |              |                 |  |
|            | Ø121 | group 1 - small sheathed ≤ Ø 21mm  | PP-MD conduit * | 487      | EI 240                | rigid floors ≥ 150 mm                                                               | -     | 40 mm | 2 sides                            | -        | Ø110                |       |             |              |         |          |              |                 |  |
|            | Ø121 | group 1 - small sheathed ≤ Ø 21mm  | hdPE conduit    | 621      | EI 120                | rigid floors ≥ 150 mm                                                               | 15 mm | 25 mm | 2 sides                            | -        | Ø102                |       |             |              |         |          |              |                 |  |
|            | Ø121 | group 2 - medium sheathed ≤ Ø 50mm | hdPE conduit    | 621      | EI 120                | rigid floors ≥ 150 mm                                                               | 15 mm | 25 mm | 2 sides                            | -        | Ø102                |       |             |              |         |          |              |                 |  |
|            | Ø121 | mix of group 1 + 2                 | hdPE conduit    | 621      | EI 120                | rigid floors ≥ 150 mm                                                               | 15 mm | 25 mm | 2 sides                            | -        | Ø102                |       |             |              |         |          |              |                 |  |

in FT Board 2S 50 mm

\* Both rigid + corrugated conduits. 'eccentric to zero' position in opening is allowed.

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm (wall) or ≤ 400mm (floor).

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm!

**Notes:**

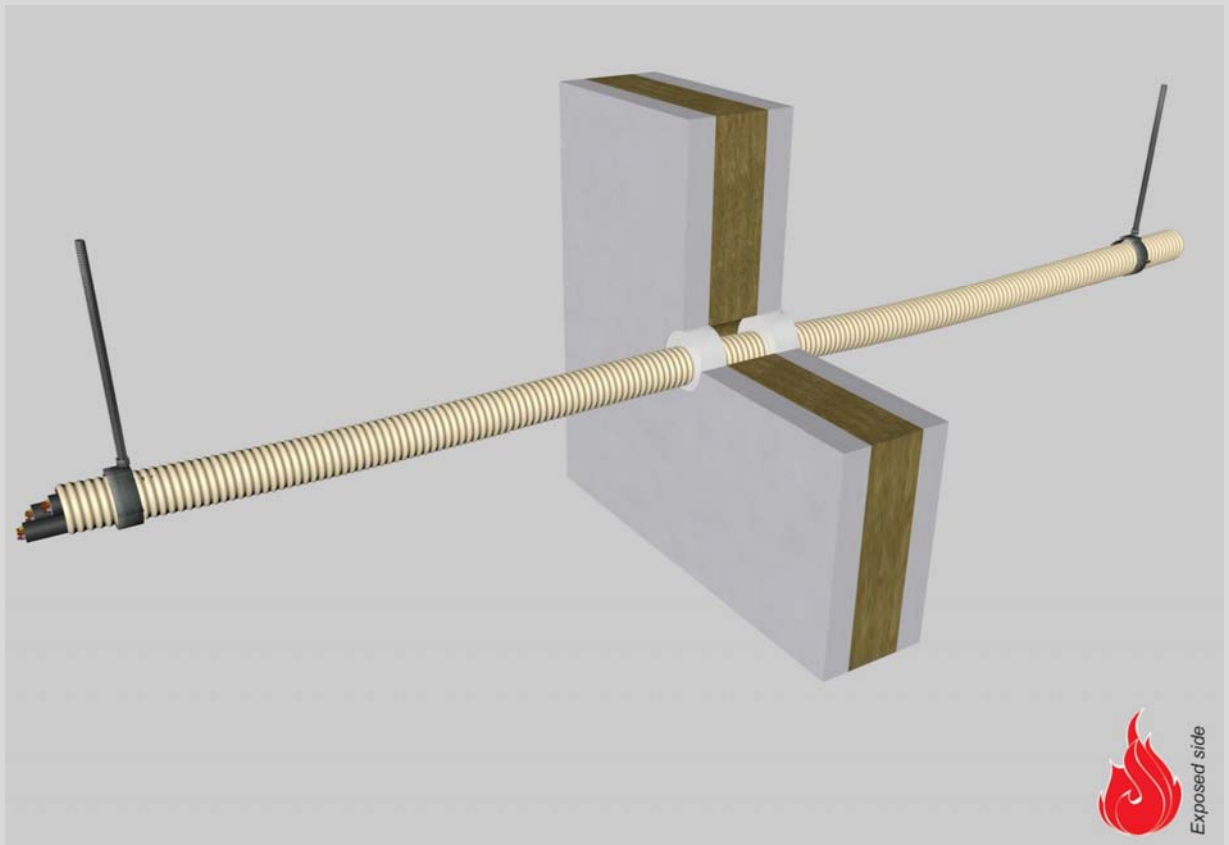
- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other cable dØ** are allowed within range and same conduit material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm

**principle detail**
**Firesafe**
**tested property**
**test method**
**service no.**

fire resistance

EN 1366-3

15-41



## PE/PVC pipes + cables in conduits

**FT Acrylic**

| bundle<br>dØ (mm) | cable specs <sup>1)</sup> |                                    | assembly<br>Cu (mm <sup>2</sup> ) | EI   | constructive element <sup>2)</sup> | Firesafe joint seal     |           | application<br>1 or 2 sides | backing<br>required | max. opening<br>in construction |            |
|-------------------|---------------------------|------------------------------------|-----------------------------------|------|------------------------------------|-------------------------|-----------|-----------------------------|---------------------|---------------------------------|------------|
|                   | group                     | conduit                            |                                   |      |                                    | width                   | depth     |                             |                     |                                 |            |
| max.              |                           |                                    |                                   |      |                                    |                         |           |                             |                     |                                 |            |
| up to Ø40         | Ø16                       | group 1 - small sheathed ≤ Ø 16mm  | -                                 | 208  | EI 120                             | flexible walls ≥ 100 mm | 10 mm     | 25 mm                       | 2 sides             | -                               | Ø32        |
|                   | Ø16                       | <blank>                            | PE conduit                        | -    | EI 120                             | flexible walls ≥ 100 mm | 8 mm bead |                             | 2 sides             | -                               | Ø18        |
|                   | Ø16                       | <blank>                            | PE conduit                        | -    | EI 120                             | flexible walls ≥ 100 mm | 10 mm     | 25 mm                       | 2 sides             | -                               | 450x200 mm |
|                   | Ø16                       | group 1 - small sheathed ≤ Ø 16mm  | PE conduit                        | 208  | EI 120                             | rigid walls ≥ 150 mm    | 8 mm bead |                             | 2 sides             | -                               | Ø16        |
|                   | Ø20                       | group 1 - small sheathed ≤ Ø 20mm  | PVC-U conduit *                   | 314  | EI 60                              | flexible walls ≥ 100 mm | 10 mm     | 25 mm                       | 2 sides             | -                               | Ø36        |
|                   | Ø31                       | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit                       | 767  | EI 240                             | rigid walls ≥ 150 mm    | 30 mm     | 15 mm                       | 2 sides             | RW                              | Ø85        |
|                   | Ø31                       | group 2 - medium sheathed ≤ Ø 31mm | PVC conduit                       | 767  | EI 240                             | rigid walls ≥ 150 mm    | 30 mm     | 15 mm                       | 2 sides             | RW                              | Ø85        |
|                   | Ø31                       | mix of group 1 + 2                 | PVC conduit                       | 767  | EI 240                             | rigid walls ≥ 150 mm    | 30 mm     | 15 mm                       | 2 sides             | RW                              | Ø85        |
|                   | Ø40                       | group 1 -small sheathed ≤ Ø 16mm   | PVC-U conduit                     | 197  | EI 90                              | CLT walls ≥ 100 mm      | 10 mm     | 25 mm                       | 2 sides             | -                               | Ø52        |
|                   | Ø40                       | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit *                     | 570  | EI 90                              | flexible walls ≥ 100 mm | 10 mm     | 25 mm                       | 2 sides             | -                               | Ø52        |
| up to Ø55         | Ø50                       | <blank>                            | PVC pipe                          | -    | EI 120                             | flexible walls ≥ 100 mm | 10 mm     | 25 mm                       | 2 sides             | -                               | Ø70        |
|                   | Ø55                       | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit *                     | 1056 | EI 180                             | rigid walls ≥ 150 mm    | 15 mm     | 25 mm                       | 2 sides             | -                               | Ø82        |
|                   | Ø55                       | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *                   | 1056 | EI 180                             | rigid walls ≥ 150 mm    | 15 mm     | 25 mm                       | 2 sides             | -                               | Ø82        |
|                   | Ø55                       | group 1 with mix of conduits       | PVC(-U) conduit *                 | 1056 | EI 180                             | rigid walls ≥ 150 mm    | 15 mm     | 25 mm                       | 2 sides             | -                               | Ø82        |
| up to Ø99         | Ø99                       | group 1 -small sheathed ≤ Ø 16mm   | -                                 | 7164 | EI 90                              | CLT walls ≥ 100 mm      | 10 mm     | 25 mm                       | 2 sides             | -                               | Ø110       |
|                   | Ø99                       | group 1 - small sheathed ≤ Ø 13mm  | -                                 | 5137 | EI 120                             | flexible walls ≥ 100 mm | 10 mm     | 25 mm                       | 2 sides             | -                               | Ø110       |

in FT Board 2S 50 mm

\* Both rigid + corrugated conduits. 'Eccentric to zero' position in opening is allowed.

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other cable dØ** are allowed within range and same conduit material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm

**principle detail**
**Firesafe**
**tested property**

fire resistance

**test method**

EN 1366-3

**service no.**

15-41r



## PE/PVC pipes + cables in conduits

# PE/PVC pipes + cables in conduits

bundle

dØ (mm)

cable specs <sup>1)</sup>

group      conduit

assembly

Cu (mm<sup>2</sup>)

EI



constructive element <sup>2)</sup>

FT Acrylic

Firesafe joint seal

width      depth

application

1 or 2 sides

backing

required

max. opening

in construction

max.

max.

|           |                                   |                                    |                   |       |                         |                         |           |         |         |     |            |
|-----------|-----------------------------------|------------------------------------|-------------------|-------|-------------------------|-------------------------|-----------|---------|---------|-----|------------|
| up to Ø40 | Ø16                               | group 1 -small sheathed ≤ Ø 16mm   | -                 | 208   | EI 120                  | flexible walls ≥ 100 mm | 10 mm     | 25 mm   | 2 sides | -   | Ø32        |
|           | Ø16                               | <blank>                            | PE conduit        | -     | EI 120                  | flexible walls ≥ 100 mm | 8 mm bead |         | 2 sides | -   | Ø18        |
|           | Ø16                               | <blank>                            | PE conduit        | -     | EI 120                  | flexible walls ≥ 100 mm | 10 mm     | 25 mm   | 2 sides | -   | 450x200 mm |
|           | Ø16                               | group 1 -small sheathed ≤ Ø 16mm   | PE conduit        | 208   | EI 120                  | rigid walls ≥ 150 mm    | 8 mm bead |         | 2 sides | -   | Ø16        |
|           | Ø20                               | group 1 - small sheathed ≤ Ø 20mm  | PVC-U conduit *   | 314   | EI 60                   | flexible walls ≥ 100 mm | 10 mm     | 25 mm   | 2 sides | -   | Ø36        |
|           | Ø31                               | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit       | 767   | EI 240                  | rigid walls ≥ 150 mm    | 30 mm     | 15 mm   | 2 sides | RW  | Ø85        |
|           | Ø31                               | group 2 - medium sheathed ≤ Ø 31mm | PVC conduit       | 767   | EI 240                  | rigid walls ≥ 150 mm    | 30 mm     | 15 mm   | 2 sides | RW  | Ø85        |
|           | Ø31                               | mix of group 1 + 2                 | PVC conduit       | 767   | EI 240                  | rigid walls ≥ 150 mm    | 30 mm     | 15 mm   | 2 sides | RW  | Ø85        |
|           | Ø40                               | group 1 -small sheathed ≤ Ø 16mm   | PVC-U conduit     | 197   | EI 90                   | CLT walls ≥ 100 mm      | 10 mm     | 25 mm   | 2 sides | -   | Ø52        |
| Ø40       | group 1 - small sheathed ≤ Ø 21mm | PVC conduit *                      | 570               | EI 90 | flexible walls ≥ 100 mm | 10 mm                   | 25 mm     | 2 sides | -       | Ø52 |            |
| up to Ø55 | Ø50                               | <blank>                            | PVC pipe          | -     | EI 120                  | flexible walls ≥ 100 mm | 10 mm     | 25 mm   | 2 sides | -   | Ø70        |
|           | Ø55                               | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit *     | 1056  | EI 180                  | rigid walls ≥ 150 mm    | 15 mm     | 25 mm   | 2 sides | -   | Ø82        |
|           | Ø55                               | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *   | 1056  | EI 180                  | rigid walls ≥ 150 mm    | 15 mm     | 25 mm   | 2 sides | -   | Ø82        |
|           | Ø55                               | group 1 with mix of conduits       | PVC(-U) conduit * | 1056  | EI 180                  | rigid walls ≥ 150 mm    | 15 mm     | 25 mm   | 2 sides | -   | Ø82        |
| up to Ø99 | Ø99                               | group 1 -small sheathed ≤ Ø 16mm   | -                 | 7164  | EI 90                   | CLT walls ≥ 100 mm      | 10 mm     | 25 mm   | 2 sides | -   | Ø110       |
|           | Ø99                               | group 1 - small sheathed ≤ Ø 13mm  | -                 | 5137  | EI 120                  | flexible walls ≥ 100 mm | 10 mm     | 25 mm   | 2 sides | -   | Ø110       |

in FT Board 2S 50 mm

\* Both rigid + corrugated conduits. 'Eccentric to zero' position in opening is allowed.

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other cable dØ** are allowed within range and same conduit material

**principle detail****Firesafe**

tested property

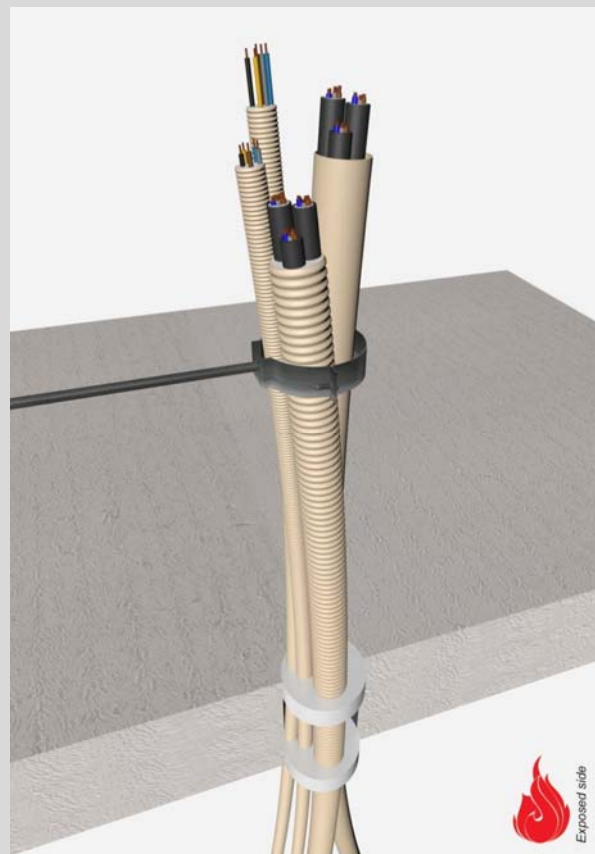
fire resistance

test method

EN 1366-3

service no.

17-4-2

**PE/PVC pipes + cables in conduits**

| bundle<br>dØ (mm) | cable specs <sup>1)</sup> |                                    | assembly<br>Cu (mm <sup>2</sup> ) | EI   | constructive element <sup>2)</sup> | Firesafe joint seal   |             | application<br>1 or 2 sides | backing<br>required | max. opening<br>in construction |
|-------------------|---------------------------|------------------------------------|-----------------------------------|------|------------------------------------|-----------------------|-------------|-----------------------------|---------------------|---------------------------------|
|                   | group                     | conduit                            |                                   |      |                                    | width                 | depth       |                             |                     |                                 |
| up to Ø40         | max. Ø16                  | group 1 - small sheathed ≤ Ø 16mm  | PE conduit                        | 208  | EI 120                             | rigid floors ≥ 150 mm | 8 mm bead   | 2 sides                     | -                   | Ø16                             |
|                   | Ø31                       | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit                       | 767  | EI 240                             | rigid floors ≥ 150 mm | 30 mm 15 mm | 2 sides                     | RW                  | Ø85                             |
|                   | Ø31                       | group 2 - medium sheathed ≤ Ø 31mm | PVC conduit                       | 767  | EI 240                             | rigid floors ≥ 150 mm | 30 mm 15 mm | 2 sides                     | RW                  | Ø85                             |
|                   | Ø31                       | mix of group 1 + 2                 | PVC conduit                       | 767  | EI 240                             | rigid walls ≥ 150 mm  | 30 mm 15 mm | 2 sides                     | RW                  | Ø85                             |
|                   | Ø40                       | group 1 - small sheathed ≤ Ø 16mm  | PVC-U conduit *                   | 197  | EI 90                              | CLT floors ≥ 140 mm   | 10 mm 25 mm | 2 sides                     | -                   | Ø52                             |
| up to Ø55         | Ø55                       | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit *                     | 1056 | EI 180                             | rigid floors ≥ 150 mm | 15 mm 25 mm | 2 sides                     | -                   | Ø82                             |
|                   | Ø55                       | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *                   | 1056 | EI 180                             | rigid floors ≥ 150 mm | 15 mm 25 mm | 2 sides                     | -                   | Ø82                             |
|                   | Ø55                       | group 1 with mix of conduits       | PVC(-U) conduit *                 | 1056 | EI 180                             | rigid floors ≥ 150 mm | 15 mm 25 mm | 2 sides                     | -                   | Ø82                             |
| up to Ø121        | Ø99                       | group 1 - small sheathed ≤ Ø 16mm  | -                                 | 7164 | EI 90                              | CLT floors ≥ 140 mm   | 10 mm 25 mm | 2 sides                     | -                   | Ø110                            |
|                   | Ø121                      | group 1 - small sheathed ≤ Ø 13mm  | -                                 | 8629 | EI 180                             | rigid floors ≥ 150 mm | 15 mm 25 mm | 2 sides                     | -                   | 600x700 mm                      |

in FT Board 2S 50 mm

\* Both rigid + corrugated conduits. 'Eccentric to zero' position in opening is allowed.

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other cable dØ** are allowed within range and same conduit material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm

**principle detail**
**Firesafe**
**tested property**

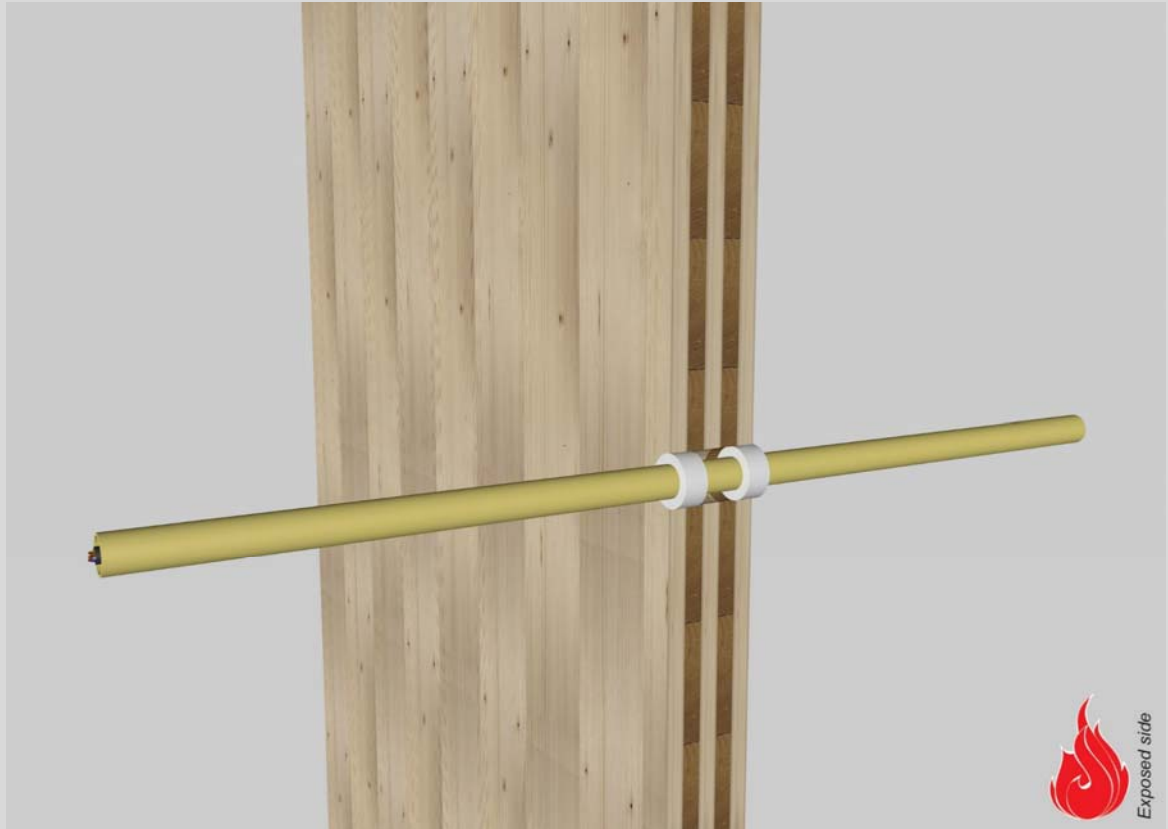
fire resistance

**test method**

EN 1366-3

**service no.**

27-3



## PE/PVC pipes + cables in conduits

**FT Acrylic**

|           | bundle  |                                    | cable specs <sup>1)</sup> |                       | assembly | EI                      | constructive element <sup>2)</sup> | Firesafe joint seal |           | application | backing  | max. opening |
|-----------|---------|------------------------------------|---------------------------|-----------------------|----------|-------------------------|------------------------------------|---------------------|-----------|-------------|----------|--------------|
|           | dØ (mm) | group                              | conduit                   | Cu (mm <sup>2</sup> ) |          |                         |                                    | width               | depth     |             | required |              |
|           | max.    |                                    |                           | max.                  |          |                         |                                    |                     |           |             |          |              |
| up to Ø40 | Ø16     | group 1 -small sheathed ≤ Ø 16mm   | -                         | 208                   | EI 120   | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -        | Ø32          |
|           | Ø16     | <blank>                            | PE conduit                | -                     | EI 120   | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -        | Ø18          |
|           | Ø16     | <blank>                            | PE conduit                | -                     | EI 120   | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -        | 450x200 mm   |
|           | Ø16     | group 1 -small sheathed ≤ Ø 16mm   | PE conduit                | 208                   | EI 120   | rigid walls ≥ 150 mm    | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -        | Ø16          |
|           | Ø20     | group 1 - small sheathed ≤ Ø 20mm  | PVC-U conduit *           | 314                   | EI 60    | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -        | Ø36          |
|           | Ø31     | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit               | 767                   | EI 240   | rigid walls ≥ 150 mm    | 30 mm                              | 15 mm               | 8 mm bead | 2 sides     | RW       | Ø85          |
|           | Ø31     | group 2 - medium sheathed ≤ Ø 31mm | PVC conduit               | 767                   | EI 240   | rigid walls ≥ 150 mm    | 30 mm                              | 15 mm               | 8 mm bead | 2 sides     | RW       | Ø85          |
|           | Ø31     | mix of group 1 + 2                 | PVC conduit               | 767                   | EI 240   | rigid walls ≥ 150 mm    | 30 mm                              | 15 mm               | 8 mm bead | 2 sides     | RW       | Ø85          |
|           | Ø40     | group 1 -small sheathed ≤ Ø 16mm   | PVC-U conduit             | 197                   | EI 90    | CLT walls ≥ 100 mm      | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -        | Ø52          |
| up to Ø55 | Ø40     | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit *             | 570                   | EI 90    | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -        | Ø52          |
|           | Ø50     | <blank>                            | PVC pipe                  | -                     | EI 120   | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -        | Ø70          |
|           | Ø55     | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit *             | 1056                  | EI 180   | rigid walls ≥ 150 mm    | 15 mm                              | 25 mm               | 8 mm bead | 2 sides     | -        | Ø82          |
|           | Ø55     | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *           | 1056                  | EI 180   | rigid walls ≥ 150 mm    | 15 mm                              | 25 mm               | 8 mm bead | 2 sides     | -        | Ø82          |
| up to Ø99 | Ø55     | group 1 with mix of conduits       | PVC(-U) conduit *         | 1056                  | EI 180   | rigid walls ≥ 150 mm    | 15 mm                              | 25 mm               | 8 mm bead | 2 sides     | -        | Ø82          |
|           | Ø99     | group 1 -small sheathed ≤ Ø 16mm   | -                         | 7164                  | EI 90    | CLT walls ≥ 100 mm      | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -        | Ø110         |
|           | Ø99     | group 1 - small sheathed ≤ Ø 13mm  | -                         | 5137                  | EI 120   | flexible walls ≥ 100 mm | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -        | Ø110         |

in FT Board 2S 50 mm

\* Both rigid + corrugated conduits. 'Eccentric to zero' position in opening is allowed.

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other cable dØ** are allowed within range and same conduit material

**principle detail**
**Firesafe**
**tested property**

fire resistance

**test method**

EN 1366-3

**service no.**

28-15



## PE/PVC pipes + cables in conduits

**FT Acrylic**

| bundle<br>dØ (mm) | cable specs <sup>1)</sup> |                                    | assembly<br>Cu (mm <sup>2</sup> ) | EI   | constructive element <sup>2)</sup> | Firesafe joint seal   |             | application<br>1 or 2 sides | backing<br>required | max. opening<br>in construction |
|-------------------|---------------------------|------------------------------------|-----------------------------------|------|------------------------------------|-----------------------|-------------|-----------------------------|---------------------|---------------------------------|
|                   | group                     | conduit                            |                                   |      |                                    | width                 | depth       |                             |                     |                                 |
| up to Ø40         | max. Ø16                  | group 1 - small sheathed ≤ Ø 16mm  | PE conduit                        | 208  | EI 120                             | rigid floors ≥ 150 mm | 8 mm bead   | 2 sides                     | -                   | Ø16                             |
|                   | Ø31                       | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit                       | 767  | EI 240                             | rigid floors ≥ 150 mm | 30 mm 15 mm | 2 sides                     | RW                  | Ø85                             |
|                   | Ø31                       | group 2 - medium sheathed ≤ Ø 31mm | PVC conduit                       | 767  | EI 240                             | rigid floors ≥ 150 mm | 30 mm 15 mm | 2 sides                     | RW                  | Ø85                             |
|                   | Ø31                       | mix of group 1 + 2                 | PVC conduit                       | 767  | EI 240                             | rigid walls ≥ 150 mm  | 30 mm 15 mm | 2 sides                     | RW                  | Ø85                             |
|                   | Ø40                       | group 1 - small sheathed ≤ Ø 16mm  | PVC-U conduit *                   | 197  | EI 90                              | CLT floors ≥ 140 mm   | 10 mm 25 mm | 2 sides                     | -                   | Ø52                             |
| up to Ø55         | Ø55                       | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit *                     | 1056 | EI 180                             | rigid floors ≥ 150 mm | 15 mm 25 mm | 2 sides                     | -                   | Ø82                             |
|                   | Ø55                       | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *                   | 1056 | EI 180                             | rigid floors ≥ 150 mm | 15 mm 25 mm | 2 sides                     | -                   | Ø82                             |
|                   | Ø55                       | group 1 with mix of conduits       | PVC(-U) conduit *                 | 1056 | EI 180                             | rigid floors ≥ 150 mm | 15 mm 25 mm | 2 sides                     | -                   | Ø82                             |
| up to Ø121        | Ø99                       | group 1 - small sheathed ≤ Ø 16mm  | -                                 | 7164 | EI 90                              | CLT floors ≥ 140 mm   | 10 mm 25 mm | 2 sides                     | -                   | Ø110                            |
|                   | Ø121                      | group 1 - small sheathed ≤ Ø 13mm  | -                                 | 8629 | EI 180                             | rigid floors ≥ 150 mm | 15 mm 25 mm | 2 sides                     | -                   | 600x700 mm                      |

in FT Board 2S 50 mm

\* Both rigid + corrugated conduits. 'Eccentric to zero' position in opening is allowed.

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with wall on 2 sides
- **other cable dØ** are allowed within range and same conduit material
- EI for flexible walls ≥100mm is also applicable for **rigid walls** ≥100mm

**principle detail**
**Firesafe**
**tested property**

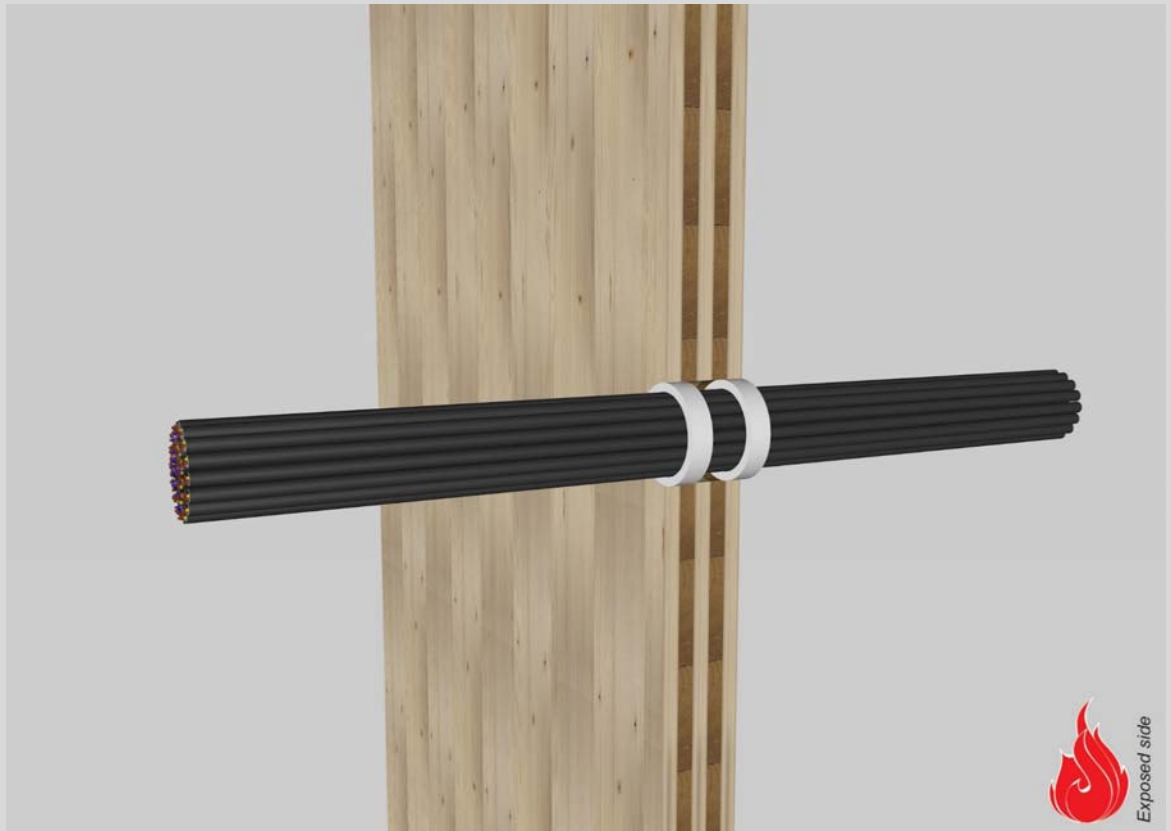
fire resistance

**test method**

EN 1366-3

**service no.**

27-4



## PE/PVC pipes + cables in conduits

**FT Acrylic**

|           | bundle  |                                    | cable specs <sup>1)</sup> |                       | assembly | EI  | constructive element <sup>2)</sup> | Firesafe joint seal |           | application | backing | max. opening |
|-----------|---------|------------------------------------|---------------------------|-----------------------|----------|----------------------------------------------------------------------------------------|------------------------------------|---------------------|-----------|-------------|---------|--------------|
|           | dØ (mm) | group                              | conduit                   | Cu (mm <sup>2</sup> ) |          |                                                                                        |                                    | width               | depth     |             |         |              |
| max.      |         |                                    |                           |                       |          |                                                                                        |                                    |                     |           |             |         |              |
| up to Ø40 | Ø16     | group 1 -small sheathed ≤ Ø 16mm   | -                         | 208                   | EI 120   | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -       | Ø32          |
|           | Ø16     | <blank>                            | PE conduit                | -                     | EI 120   | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -       | Ø18          |
|           | Ø16     | <blank>                            | PE conduit                | -                     | EI 120   | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -       | 450x200 mm   |
|           | Ø16     | group 1 -small sheathed ≤ Ø 16mm   | PE conduit                | 208                   | EI 120   | rigid walls ≥ 150 mm                                                                   | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -       | Ø16          |
|           | Ø20     | group 1 - small sheathed ≤ Ø 20mm  | PVC-U conduit *           | 314                   | EI 60    | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -       | Ø36          |
|           | Ø31     | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit               | 767                   | EI 240   | rigid walls ≥ 150 mm                                                                   | 30 mm                              | 15 mm               | 8 mm bead | 2 sides     | RW      | Ø85          |
|           | Ø31     | group 2 - medium sheathed ≤ Ø 31mm | PVC conduit               | 767                   | EI 240   | rigid walls ≥ 150 mm                                                                   | 30 mm                              | 15 mm               | 8 mm bead | 2 sides     | RW      | Ø85          |
|           | Ø31     | mix of group 1 + 2                 | PVC conduit               | 767                   | EI 240   | rigid walls ≥ 150 mm                                                                   | 30 mm                              | 15 mm               | 8 mm bead | 2 sides     | RW      | Ø85          |
| up to Ø55 | Ø40     | group 1 -small sheathed ≤ Ø 16mm   | PVC-U conduit             | 197                   | EI 90    | CLT walls ≥ 100 mm                                                                     | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -       | Ø52          |
|           | Ø40     | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit *             | 570                   | EI 90    | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -       | Ø52          |
|           | Ø50     | <blank>                            | PVC pipe                  | -                     | EI 120   | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -       | Ø70          |
|           | Ø55     | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit *             | 1056                  | EI 180   | rigid walls ≥ 150 mm                                                                   | 15 mm                              | 25 mm               | 8 mm bead | 2 sides     | -       | Ø82          |
| up to Ø99 | Ø55     | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *           | 1056                  | EI 180   | rigid walls ≥ 150 mm                                                                   | 15 mm                              | 25 mm               | 8 mm bead | 2 sides     | -       | Ø82          |
|           | Ø55     | group 1 with mix of conduits       | PVC(-U) conduit *         | 1056                  | EI 180   | rigid walls ≥ 150 mm                                                                   | 15 mm                              | 25 mm               | 8 mm bead | 2 sides     | -       | Ø82          |
|           | Ø99     | group 1 -small sheathed ≤ Ø 16mm   | -                         | 7164                  | EI 90    | CLT walls ≥ 100 mm                                                                     | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -       | Ø110         |
|           | Ø99     | group 1 - small sheathed ≤ Ø 13mm  | -                         | 5137                  | EI 120   | flexible walls ≥ 100 mm                                                                | 10 mm                              | 25 mm               | 8 mm bead | 2 sides     | -       | Ø110         |

in FT Board 2S 50 mm

\* Both rigid + corrugated conduits. 'Eccentric to zero' position in opening is allowed.

<sup>1)</sup> Penetration services must be supported; support distance ≤ 500mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period. EI for flexible walls ≥100mm is also applicable for rigid walls ≥100mm!

**Notes:**

- installation instructions in TDS
- apply joint seal in opening, flush with floor on 2 sides
- **other cable dØ** are allowed within range and same conduit material

**principle detail**
**Firesafe**
**tested property**

fire resistance

**test method**

EN 1366-3

**service no.**

28-16



## PE/PVC pipes + cables in conduits

**FT Acrylic**

| bundle<br>dØ (mm) | cable specs <sup>1)</sup> |                                    | assembly<br>Cu (mm <sup>2</sup> ) | EI   | constructive element <sup>2)</sup> | Firesafe joint seal   |             | application<br>1 or 2 sides | backing<br>required | max. opening<br>in construction |
|-------------------|---------------------------|------------------------------------|-----------------------------------|------|------------------------------------|-----------------------|-------------|-----------------------------|---------------------|---------------------------------|
|                   | group                     | conduit                            |                                   |      |                                    | width                 | depth       |                             |                     |                                 |
| up to Ø40         | max. Ø16                  | group 1 - small sheathed ≤ Ø 16mm  | PE conduit                        | 208  | EI 120                             | rigid floors ≥ 150 mm | 8 mm bead   | 2 sides                     | -                   | Ø16                             |
|                   | Ø31                       | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit                       | 767  | EI 240                             | rigid floors ≥ 150 mm | 30 mm 15 mm | 2 sides                     | RW                  | Ø85                             |
|                   | Ø31                       | group 2 - medium sheathed ≤ Ø 31mm | PVC conduit                       | 767  | EI 240                             | rigid floors ≥ 150 mm | 30 mm 15 mm | 2 sides                     | RW                  | Ø85                             |
|                   | Ø31                       | mix of group 1 + 2                 | PVC conduit                       | 767  | EI 240                             | rigid walls ≥ 150 mm  | 30 mm 15 mm | 2 sides                     | RW                  | Ø85                             |
|                   | Ø40                       | group 1 - small sheathed ≤ Ø 16mm  | PVC-U conduit *                   | 197  | EI 90                              | CLT floors ≥ 140 mm   | 10 mm 25 mm | 2 sides                     | -                   | Ø52                             |
| up to Ø55         | Ø55                       | group 1 - small sheathed ≤ Ø 21mm  | PVC conduit *                     | 1056 | EI 180                             | rigid floors ≥ 150 mm | 15 mm 25 mm | 2 sides                     | -                   | Ø82                             |
|                   | Ø55                       | group 1 - small sheathed ≤ Ø 21mm  | PVC-U conduit *                   | 1056 | EI 180                             | rigid floors ≥ 150 mm | 15 mm 25 mm | 2 sides                     | -                   | Ø82                             |
|                   | Ø55                       | group 1 with mix of conduits       | PVC(-U) conduit *                 | 1056 | EI 180                             | rigid floors ≥ 150 mm | 15 mm 25 mm | 2 sides                     | -                   | Ø82                             |
| up to Ø121        | Ø99                       | group 1 - small sheathed ≤ Ø 16mm  | -                                 | 7164 | EI 90                              | CLT floors ≥ 140 mm   | 10 mm 25 mm | 2 sides                     | -                   | Ø110                            |
|                   | Ø121                      | group 1 - small sheathed ≤ Ø 13mm  | -                                 | 8629 | EI 180                             | rigid floors ≥ 150 mm | 15 mm 25 mm | 2 sides                     | -                   | 600x700 mm                      |

in FT Board 2S 50 mm

\* Both rigid + corrugated conduits. 'Eccentric to zero' position in opening is allowed.

<sup>1)</sup> Penetration services must be supported; support distance ≤ 400mm.

<sup>2)</sup> Constructive element must be classified acc. EN 13501-2 for the required fire resistance period.

| joints                              |                                         |                                                          | acoustic performance acc. EN 10140-2 + ISO 717-1 |            |                 |            |                 |            |                      |            |                       |            |  |
|-------------------------------------|-----------------------------------------|----------------------------------------------------------|--------------------------------------------------|------------|-----------------|------------|-----------------|------------|----------------------|------------|-----------------------|------------|--|
|                                     |                                         |                                                          | acrylic mastic + paste                           |            | graphite mastic |            | silicone mastic |            | flexible joint strip |            | rockwool slab 50mm 2S |            |  |
| joint width    joint detail (w x d) |                                         |                                                          | on 1 side                                        | on 2 sides | on 1 side       | on 2 sides | on 1 side       | on 2 sides | on 1 side            | on 2 sides | on 1 side             | on 2 sides |  |
| with backing                        |                                         |                                                          |                                                  |            |                 |            |                 |            |                      |            |                       |            |  |
| 50mm                                | 50x15mm                                 | R <sub>S,w</sub><br>D <sub>n,e,w</sub><br>R <sub>w</sub> | 44 dB                                            | 53 dB      | 43 dB           | 53 dB      | 49 dB           | 53 dB      |                      |            |                       |            |  |
|                                     | + PU backing Ø 70mm                     |                                                          | 51 dB                                            | 60 dB      | 50 dB           | 60 dB      | 56 dB           | 60 dB      |                      |            |                       |            |  |
|                                     | 50x15mm                                 | R <sub>S,w</sub><br>D <sub>n,e,w</sub><br>R <sub>w</sub> | 31 dB                                            | 40 dB      | 30 dB           | 40 dB      | 36 dB           | 40 dB      |                      |            |                       |            |  |
|                                     | + rockwool backing 50 kg/m <sup>3</sup> |                                                          | 50 dB                                            | 51 dB      | 47 dB           | 52 dB      | 50 dB           | 52 dB      |                      |            |                       |            |  |
|                                     |                                         |                                                          | 57 dB                                            | 58 dB      | 54 dB           | 59 dB      | 57 dB           | 59 dB      |                      |            |                       |            |  |
|                                     |                                         |                                                          | 37 dB                                            | 38 dB      | 34 dB           | 39 dB      | 37 dB           | 39 dB      |                      |            |                       |            |  |
| no backing                          |                                         |                                                          |                                                  |            |                 |            |                 |            |                      |            |                       |            |  |
| 7mm                                 | 11x30mm                                 | R <sub>S,w</sub>                                         |                                                  |            |                 |            |                 |            | 47 dB                | 51 dB      |                       |            |  |
|                                     |                                         | D <sub>n,e,w</sub>                                       |                                                  |            |                 |            |                 |            | 54 dB                | 58 dB      |                       |            |  |
|                                     |                                         | R <sub>w</sub>                                           |                                                  |            |                 |            |                 |            | 26 dB                | 30 dB      |                       |            |  |
| 12mm                                | 11x30mm                                 | R <sub>S,w</sub>                                         |                                                  |            |                 |            |                 |            | 46 dB                | 50 dB      |                       |            |  |
|                                     |                                         | D <sub>n,e,w</sub>                                       |                                                  |            |                 |            |                 |            | 53 dB                | 57 dB      |                       |            |  |
|                                     |                                         | R <sub>w</sub>                                           |                                                  |            |                 |            |                 |            | 27 dB                | 31 dB      |                       |            |  |
| 15mm                                | 25x25mm                                 | R <sub>S,w</sub>                                         |                                                  |            |                 |            |                 |            | 45 dB                | 51 dB      |                       |            |  |
|                                     |                                         | D <sub>n,e,w</sub>                                       |                                                  |            |                 |            |                 |            | 52 dB                | 58 dB      |                       |            |  |
|                                     | 25x50mm                                 | R <sub>w</sub>                                           |                                                  |            |                 |            |                 |            | 27 dB                | 33 dB      |                       |            |  |
|                                     |                                         |                                                          |                                                  |            |                 |            |                 |            | 47 dB                | 50 dB      |                       |            |  |
| 25mm                                | 25x50mm                                 | R <sub>S,w</sub>                                         |                                                  |            |                 |            |                 |            | 54 dB                | 57 dB      |                       |            |  |
|                                     |                                         | D <sub>n,e,w</sub>                                       |                                                  |            |                 |            |                 |            | 29 dB                | 32 dB      |                       |            |  |
|                                     | 25x25mm                                 | R <sub>w</sub>                                           |                                                  |            |                 |            |                 |            | 40 dB                | 46 dB      |                       |            |  |
|                                     |                                         |                                                          |                                                  |            |                 |            |                 |            | 47 dB                | 53 dB      |                       |            |  |
| 30mm                                | 25x50mm                                 | R <sub>S,w</sub>                                         |                                                  |            |                 |            |                 |            | 24 dB                | 30 dB      |                       |            |  |
|                                     |                                         | D <sub>n,e,w</sub>                                       |                                                  |            |                 |            |                 |            | 44 dB                | 46 dB      |                       |            |  |
|                                     | 50x50mm                                 | R <sub>w</sub>                                           |                                                  |            |                 |            |                 |            | 51 dB                | 53 dB      |                       |            |  |
|                                     |                                         |                                                          |                                                  |            |                 |            |                 |            | 28 dB                | 30 dB      |                       |            |  |
| 50mm                                | 50x50mm                                 | R <sub>S,w</sub>                                         |                                                  |            |                 |            |                 |            | 44 dB                | 48 dB      |                       |            |  |
|                                     |                                         | D <sub>n,e,w</sub>                                       |                                                  |            |                 |            |                 |            | 51 dB                | 55 dB      |                       |            |  |
|                                     |                                         | R <sub>w</sub>                                           |                                                  |            |                 |            |                 |            | 29 dB                | 33 dB      |                       |            |  |
|                                     |                                         |                                                          |                                                  |            |                 |            |                 |            | 40 dB                | 43 dB      | 32 dB                 | 43 dB      |  |
|                                     |                                         |                                                          |                                                  |            |                 |            |                 |            | 47 dB                | 50 dB      | 39 dB                 | 50 dB      |  |
|                                     |                                         |                                                          |                                                  |            |                 |            |                 |            | 27 dB                | 30 dB      | 19 dB                 | 30 dB      |  |

2S = 2 sides coated with FT Coating

service penetrations

acoustic performance acc. EN 10140-2 + ISO 717-1

| product specs    |                                 |                | rockwool slab 50mm                  |              |                                    |                  |  |
|------------------|---------------------------------|----------------|-------------------------------------|--------------|------------------------------------|------------------|--|
|                  |                                 |                | FT Board 2S                         |              | FT Board 1S                        |                  |  |
|                  |                                 |                | on 1 side                           | on 2 sides   | on 1 side                          | on 2 sides       |  |
| empty opening    | FT Board 50mm                   | R <sub>w</sub> | 24(-2;-3) dB                        | 28(-1;-3) dB | 25(-2;-4) dB                       | 45(-3;-6) dB     |  |
|                  |                                 |                |                                     |              |                                    |                  |  |
| pipe penetration | FT Board 50mm<br>+ plastic pipe | R <sub>w</sub> |                                     |              |                                    | 43(-2;-5) dB     |  |
|                  |                                 |                |                                     |              |                                    | PVC pipe Ø 125mm |  |
|                  | FT Board 50mm<br>+ spiral pipe  | R <sub>w</sub> |                                     |              |                                    | 42(-1;-4) dB     |  |
|                  |                                 |                |                                     |              | spiral pipe Ø 125mmn               |                  |  |
|                  |                                 |                | 2S = 2 sides coated with FT Coating |              | 1S = 1 side coated with FT Coating |                  |  |

how-to-read

$$R_s = L_1 - L_2 + 10 \lg \left( \frac{S_n I}{A I_n} \right)$$

$$D_{n,e} = L_1 - L_2 + 10 \lg \left( \frac{A_0}{A} \right)$$

$$R = L_1 - L_2 + 10 \lg \left( \frac{S}{A} \right)$$

L<sub>1</sub> = energy average sound pressure level in source room  
L<sub>2</sub> = energy average sound pressure level in receiving room  
S<sub>n</sub> = reference area (S<sub>n</sub> = 1 m<sup>2</sup>)  
I = length of joint in used measurement set up ( L = 2,187m)  
A = equivalent absorption area in receiving room  
I<sub>n</sub> = reference length (I<sub>n</sub> = 1m)  
A<sub>0</sub> = reference absorption area (A<sub>0</sub> = 10m<sup>2</sup>)  
S = area of free test opening in which test element is installed (S = 0,109 m<sup>2</sup>)

L<sub>1</sub> = energy average sound pressure level in source room  
L<sub>2</sub> = energy average sound pressure level in receiving room  
S<sub>n</sub> = reference area (S<sub>n</sub> = 1 m<sup>2</sup>)  
I = length of joint in used measurement set up ( L = 2,187m)  
A = equivalent absorption area in receiving room  
I<sub>n</sub> = reference length (I<sub>n</sub> = 1m)  
A<sub>0</sub> = reference absorption area (A<sub>0</sub> = 10m<sup>2</sup>)  
S = area of free test opening in which test element is installed (S = 0,109 m<sup>2</sup>)