DNV·GL

Certificate No:
TAF000014F

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Class A and B Penetration

with type designation(s)
A-0 Class cable penetration through rectangular sleeve with GPG Marine Mortar sealing system

Issued to
Firesafe Energy AS
Lørenskog, Norway

is found to comply with
DNV GL rules for classification – Ships
DNV GL offshore standards
DNV GL statutory interpretations DNVGL-SI-0364 – SOLAS interpretations

Application :

Approved for use as cable penetration system in A-0 in steel bulkheads/decks.

This certificate is recognized by Transport Canada.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Issued at **Høvik** on **2019-04-26**

This Certificate is valid until **2024-04-25**.
DNV GL local station: **Oslo Maritime and CAP**

Approval Engineer: **Tessa Biever**

for **DNV GL**

Digitally Signed By: Schei-Nilsson, Mårten
Location: DNV GL Høvik, Norway

Mårten Schei-Nilsson
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Product description

'A-0 Class cable pentrations through rectangular sleeve with GPG Marine Mortar sealing system'

Penetration composed of a 10 mm thick rectangular steel sleeve symmetrically welded to steel bulkhead/deck.

All deck and bulkhead penetrations are sealed with GPG Marine Mortar (GPGM Mortar) which is a powder mainly consisting of plaster, perlite and glass fibre. To be mixed with water to obtain desired consistency (see datasheet for correct mixing ration depending on application). The density of GPGM Mortar is 701 kg/m^3.

See below table for penetration details:

Name	Sleeve length [mm]	Outer Sleeve Dimensions (w x l) [mm]	Filling	Use	Sleeve insulation	Remarks
OPH1	60	1020 x 70	Empty, but totally filled with GPGM Mortar	bulkhead	None	20 mm additional GPGM Mortar on both sleeve ends
OPV1	60	70 x 1020	Empty, but totally filled with GPGM Mortar	bulkhead	None	- 20 mm additional GPGM Mortar on both sleeve ends
CG42 CG44 CG46	60-90	240 x 532	Multi cable : Max. Ø52 mm	deck	None	- 20 mm additional GPGM Mortar on top of upper sleeve end - distance between cables is 16 mm in vertical direction - Max filling grade 35%
CG46	60	240 x 532	Empty, but totally filled with GPGM Mortar	deck	None	20 mm additional GPGM Mortar on top of upper sleeve end
CG70 CG71	60	240 x 532	Multi cable: Max. Ø52 mm AND Cable conduits: 4 cable conduits with length 330 mm (2 x Ø76 mm, Ø51 mm, Ø32 mm)	bulkhead	None	- 20 mm additional GPGM Mortar on both sleeve sides - distance between cables is 16 mm in vertical direction - distance between conduits is 25 mm in both horizontal and vertical direction - Max. filling grade 28%
CG71	60	240 x 532	Empty, but totally filled with GPGM Mortar	bulkhead	None	20 mm additional GPGM Mortar on both sleeve ends
CG71 CG74	60	240 x 532	2 x cable bundle Ø90 mm with cables of Ø10 mm	bulkhead	None	- 20 mm additional GPGM Mortar on both sleeve ends - Firesafe FT graphite 10 mm width and 25 mm depth is applied around each cable bundle - Distance between cable bundels is 76 in vertical direction - Max. filling grade 28%
CG83	90	240 x 532	Empty, but totally	bulkhead	None	20mm additional GPGM Mortar

			filled with GPGM Mortar			on both sleeve ends
CG83 CG85	90	240 x 532	Multi cable: Max. Ø52 mm AND Cable conduits: 4 cable conduits with length 330 mm (2 x Ø76 mm, Ø51 mm, Ø32 mm)	bulkhead	None	- 20 mm additional GPGM Mortar on both sleeve ends - distance between cables is 16 mm in vertical direction - distance between conduits is 25 mm in both horizontal and vertical direction - Max. filling grade 28%

For further details see drawings in the test reports listed under Type approval documentation below.

Application/Limitation

Approved for use as cable penetration system in A-0 steel bulkheads/decks. Other applications are subject to case-by-case approval.

Watertightness and gastightness is not covered in this certificate.

Each product is to be supplied with its manual for installation and maintenance.

Type Approval documentation

Certification in accordance with Class Programme DNVGL-CP-0338, September 2018.

Test report Nos.:
- 150072-06A (A-0, steel deck) dated 2017-12-18
- 150072-08A (A-0, steel bulkhead) dated 2018-09-14
- 150072-08B (A-0, steel bulkhead) dated 2018-09-14

All from RISE, Trondheim, Norway.

Tests carried out

Tested in according to IMO 2010 FTP Code part 3.

Marking of product

The product or packing is to be marked with name of manufacturer, type designation and fire technical rating.

Transport Canada Approval

Based on the procedures laid down in the Transport Canada Publication entitled "Approval Procedures for, Life Saving Equipment and Structural Fire Protection Products (TP 14612)", DNV GL confirms that the product/s listed in this certificate is/are in accordance with Transport Canada's requirements.

Periodical assessment

DNV GL's surveyor is to be given permission to perform Periodical Assessments at any time during the validity of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in Class Programme DNVGL-CP-0338, Section 4.