

TYPE APPROVAL CERTIFICATE

This is to certify:**That the FRP Grating**

with type designation(s)
1½" Mesh 1¼" x 6 GE-7

Issued to

ENMAC ENGENHARIA DE MATERIAIS COMPOSTOS LTDA
Arujá SP, Brazil

is found to comply with

DNV GL offshore standards

DNV GL rules for classification – Ships

DNV GL statutory interpretations DNVGL-SI-0364 – SOLAS interpretations

Application :

For use in locations according to enclosed Structural Fire Integrity Matrix.

Application is to be considered and accepted for each case/project.

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

This Certificate is valid until **2022-03-14**.

Issued at **Høvik** on **2017-03-15**

DNV GL local station: **Rio de Janeiro, SiO**

for **DNV GL**

Approval Engineer: **Synnøve Bolstad Eri**

Petter Langnes
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

" 1½" Mesh 1¼" x 6 GE-7 "

pultruded phenolic fiberglass reinforced plastic grating. The grating consists of 1½" (38 mm) high I-beams with round cross ties each 6" (152 mm). Spacing between I-beams is 1¼" (31.8 mm).

Weight [Kg/m²]: 18Kg/m²
Max unsupported span: 39¼" (1000 mm)

Smoke developed index: 10
Flame spread index : 0

Application/Limitation

The FRP grating is for use in locations according to the below Structural Fire Integrity Matrix (L2 and L3 rating). Note conditions (1), (2) and (3) on page 2/3.

Location	Service	1½" Mesh 1¼" x 6 GE-7
Machinery Spaces	Walkways or areas which may be used for escape, or access for fire fighting, emergency operation or rescue	NO Yes, if condition (1) is met
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	YES
Cargo Pump Rooms	All personnel walkways, catwalks, ladders, platforms or access areas	NO
Cargo Holds	Walkways or areas which may be used for escape, or access for fire fighting, emergency operation or rescue	NO
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	YES
Cargo Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	YES _{(2),(3)}
Fuel Oil Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	YES ₍₂₎
Ballast Water Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	YES
Cofferdams, void spaces, double bottoms, pipe tunnels, etc.	All personnel walkways, catwalks, ladders, platforms or access areas	YES
Accommodation, service, and control spaces	All personnel walkways, catwalks, ladders, platforms or access areas	NO
Lifeboat embarkation or temporary safe refuge stations in open deck areas	All personnel walkways, catwalks, ladders, platforms or access areas	YES
Open Decks or semi-enclosed areas	Walkways or areas which may be used for escape, or access for fire fighting, emergency operation or rescue	YES
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	YES
	Gangway for safe access to bow on tankers according to IMO MSC.62(67)	YES

- (1) The machinery space shall **not** contain any internal combustion machinery, other oil burning, oil heating or oil pumping units, fuel oil filling stations, or other potential hydrocarbon fire sources and shall **not** have more than 2.5 kg/m² of combustible storage.
- (2) Only if these spaces are normally **not** entered when underway.

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- (3) Gratings that are electrically conductive shall be required. Acceptance criteria for resistance per unit length and to earth is: $< 0,1 \text{ M } \Omega/\text{m}$ and $< 1 \text{ M } \Omega$ to earth.
Test Standard ASTM D257-91 (Ref. DNV TA 1-501-1 (Fibre reinforced Thermosetting Plastic Pipes))

The FRP grating is only evaluated in accordance with fire technical requirements. Other requirements such as strength etc. has to be evaluated in each case.

The grating shall not be installed in areas where it can be exposed to a hydrocarbon fire.

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

Type Approval documentation

Certification in accordance with Class Programme DNVGL-CP-0338, October 2015.

Test report no. 102732274SAT-001A dated 29 September 2016 from Intertek Testing Services NA Inc., Texas, USA. (ASTM E84-16)

Test report no. 102732274SAT-002 dated 24 October 2016 from Intertek Testing Services NA Inc., Texas, USA.

Tests carried out

Tested according to ASTM E84-16 and USCG Memorandum PFM 2-98 (E119).

Marking of product

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

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.