DNV·GL

Certificate No:
TAF00000KW

TYPE APPROVAL CERTIFICATE

This is to certify:

That the FRP Grating

with type designation(s)
PPH 1-1/2" I-60 and MPH 1-1/2" x 1-1/2" x 6" RM and PPH 2.0" I-60

Issued to
Chinagrate Composite Structures (Nantong) Co.,Ltd.
Nantong, China

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 :

Approved for use in locations according to enclosed Structural Fire Integrity Matrix.

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

Issued at **Hamburg** on **2017-05-03**
This Certificate is valid until **2022-05-02**.
DNV GL local station: **Nantong CMC**

Approval Engineer: **Timo Linn**

for **DNV GL**

Antje Fleischhauer
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.

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Product description
"PPH 1-1/2" I-60"
pultruded phenolic fiberglass reinforced plastic grating coated with a skid resistant coating on exposed side.
Max unsupported span is 1120 mm.

"MPH 1-1/2" x 1-1/2" x 6" RM"
moulded phenolic fiberglass reinforced plastic grating coated with a skid resistant coating on exposed side.
Max unsupported span is 1120 mm.

"PPH 2.0" I-60"
pultruded phenolic fiberglass reinforced plastic grating coated with a skid resistant coating on exposed side.
Max unsupported span is 1120 mm.

Tests results according to ASTM E84-04:

Product	Flame Spread Index	Smoke Developed Index
PPH 1-1/2" I-60	10	120
MPH 1-1/2" x 1-1/2" x 6" RM	10	20
PPH 2.0" I-60	0	63

Application/Limitation
For use in locations according to the below Structural Fire Integrity Matrix.

Structural Fire Integrity Matrix.

Location	**Service**	**PPH 1-1/2" I-60 and MPH 1-1/2" x 1-1/2" x 6" RM and PPH 2.0" I-60**
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. (See next page))
	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, if Conditions 2) and 3) are met. (See next page.)
Fuel Oil Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	YES, if Condition 2) is met. (See next page.)

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Location	**Service**	**PPH 1-1/2" I-60 and MPH 1-1/2" x 1-1/2" x 6" RM and PPH 2.0" I-60**
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

Condition 1) If machinery space does 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 has mot more than 2.5 kg/m^2 of combustible storage.

Condition 2) Only if these spaces are normally **not** entered when underway.

Condition 3) Gratings that are electrically conductive shall be required. Acceptance criteria for resistance per unit length and to earth is: < 0,1 M Ω/m and < 1 M Ω 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.

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

Type Approval documentation
Test report No's. 17170-124579 dated 02 June 2005, 17170-124581 dated 02 June 2005 and 17170-124582 dated 09 May 2005 from Omega Point Laboratories Inc., San Mateo, California.
Project No. 01.20684.15.305 dated 26 June 2015 and project No. 01.25555.04.188-150102 dated 09 July 2015 from Southwest Research Institiude, San Antonio Texas, USA.

Tests carried out
Tested according to ASTM E-84-04 and USCG Memorandum PFM 2-98.

Marking of product
The product 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 products listed in this certificate 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.