

TYPE APPROVAL CERTIFICATE

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

with type designation(s)
Nantongrate Molded/Pultruded Fiberglass grating

Issued to

Nantong Composite Material Co., Ltd.
Nantong Jiangsu, China

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

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.

Issued at **Gdynia** on **2018-04-18**

This Certificate is valid until **2023-04-17**.

DNV GL local station: **Nantong**

for **DNV GL**

Approval Engineer: **Fryderyk Hoga**

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Jaroslav Jablonski
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

"Nantongrate Molded/Pultruded Fiberglass grating"
This certificate cover the following types and sizes:

1. Nantongrate Molded Fiberglass gratings
 - a) Molded OFR-1.5" thick x 1.5" x 1.5" SM Grating (Orthophtalic Resin)
 - b) Molded OFR-2" thick x 2" x 2" SM Grating (Orthophtalic Resin)
 - c) Molded OFR-1" thick x 1.5" x 1.5" SM Grating (Orthophtalic Resin)
 - d) Molded IFR-1.5" thick x 1.5" x 1.5" SM Grating (Isophtalic Resin)
 - e) Molded IFR-1" thick x 1.5" x 1.5" SM Grating (Isophtalic Resin)
 - f) Molded IFR-2" thick x 2" x 2" SM Grating (Isophtalic Resin)
 - g) Molded VFR-1" thick x 1.5" x 1.5" SM Grating (Vinyl Ester Resin)
 - h) Molded VFR-1.5" thick x 1.5" x 1.5" SM Grating (Vinyl Ester Resin)
 - i) Molded VFR-2" thick x 2" x 2" SM Grating (Vinyl Ester Resin)
2. Nantongrate Pultruded Fiberglass gratings
 - a) Pultruded IFR-60% 1.5" thick Grating (Isophtalic Resin)
 - b) Pultruded VFR-60% 1.5" thick Grating (Vinyl Ester Resin)

Figure 1: Tests results according to ASTM E84-16:

No.	Product name (ref. test report)	Flame Spread Index	Smoke Developed Index
1a	Molded OFR-1.5" thick x 1.5" x 1.5" SM Grating (Orthophtalic Resin)	5	145
1b	Molded OFR-2" thick x 2" x 2" SM Grating (Orthophtalic Resin)	5	145
1c	Molded OFR-1" thick x 1.5" x 1.5" SM Grating (Orthophtalic Resin)	5	145
1g	Molded VFR-1" thick x 1.5" x 1.5" SM Grating (Vinyl Ester Resin)	5	200
1h	Molded VFR-1.5" thick x 1.5" x 1.5" SM Grating (Vinyl Ester Resin)	5	200
1i	Molded VFR-2" thick x 2" x 2" SM Grating (Vinyl Ester Resin)	5	200

Figure 2: Tests results according to ASTM E84-17:

No.	Product name (ref. test report)	Flame Spread Index	Smoke Developed Index
1d	Molded IFR-1.5" thick x 1.5" x 1.5" SM Grating (Isophtalic Resin)	5	120
1e	Molded IFR-1" thick x 1.5" x 1.5" SM Grating (Isophtalic Resin)	5	120
1f	Molded IFR-2" thick x 2" x 2" SM Grating (Isophtalic Resin)	5	120
2a	Pultruded IFR-60% 1.5" thick Grating (Isophtalic Resin)	15	250
2b	Pultruded VFR-60% 1.5" thick Grating (Vinyl Ester Resin)	20	190

Application/Limitation

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

Structural Fire Integrity Matrix.

Location	Service	Fire Integrity of all products as listed in Fig. 1 and Fig. 2
Machinery Spaces	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	NO
Cargo Pump Rooms	All personnel walkways, catwalks, ladders, platforms or access areas	NO
Cargo Holds	Walkways or areas which may be used for escape,	NO

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	or access for fire fighting, emergency operation or rescue	
	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 _(1,2)
Fuel Oil Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	YES ₍₁₎
Ballast Water Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	YES ₍₁₎
Cofferdams, void spaces, double bottoms, pipe tunnels, etc.	All personnel walkways, catwalks, ladders, platforms or access areas	YES ₍₁₎
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	NO
Open Decks or semi-enclosed areas	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
	Gangway for safe access to bow on tankers according to IMO MSC.62(67)	NO

(1) Only if these spaces are normally **not** entered when underway.

(2) Gratings that are electrically conductive shall be required. Acceptance criteria for resistance per unit length and to earth is: < 0.1 M Ω to earth. Test standard ASTM D257-91, ref. DNV GL-CP-0070 "Fibre reinforced thermosetting plastic piping systems - Non-metallic materials"

The 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 2017.

Test reports No:

- AJFS1706004044FF **(1a, 1b, 1c)** dated 30 August 2017
- AJFS1706004046FF **(1g, 1h, 1i)** dated 11 July 2017
- AJFS1710009321FF **(1d, 1e, 1f)** dated 18 December 2017
- AJFS1710009322FF **(2a)** dated 11 December 2017
- AJFS1710009323FF **(2b)** dated 11 November 2017

all from SGS-CSTC Standards Technical Services, Beijing, China.

Tests carried out

Tested according to ASTM E84-16 or ASTM E84-17.

Marking of product



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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.