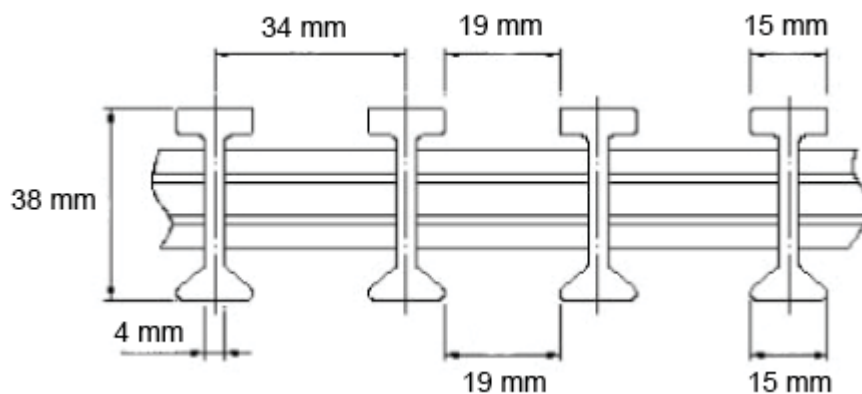


*Phenolic Grating  
Article 15513  
Document package*



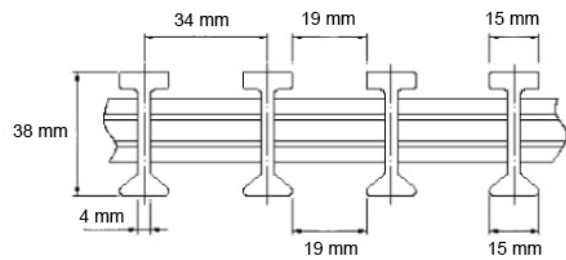
Stangeland Glassfiber Produkter AS  
Bedriftsvegen 33  
4353 Klepp Stasjon, Norway  
Telephone: +47 51 78 60 90  
[www.glassfiber.no](http://www.glassfiber.no)  
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# PRODUCT SHEET

Profile GRP Grating  
 Article no. 15513  
 Thickness 38 mm  
 Profile 34 mm  
 Panel 1,0 x 6,0 m  
 Surface: Applied grit



Panel size : 1000 x 6000 mm  
 Height : 38 mm  
 Opening : 34 mm  
 Open area : 55%  
 Weight : 15,7 kg/m<sup>2</sup>  
 Weight per plate : 94,2 kg  
 Surface : Applied grit  
 Colour : Black (RAL 9004)  
 Resin : Phenolic  
 Fire retardance : ASTM E84-05, Class 1  
 Flame spread: < 25  
 Working temperature : -40 °C / 60 °C  
 Electric properties : Conductive- EN 13463-1  
 EN 50014



SPAN (mm)	LOAD $\Delta U = \text{kN} / \text{m}^2$ , $\Delta C = \text{kN} / \text{m}$															SAFE LOAD kN
		3	5	8	10	13	15	20	25	39	50	100	150	200	250	
400	$\Delta U$	0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.7	1.4	2.1	2.1	3.5	504
	$\Delta C$	0.2	0.3	0.5	0.6	0.7	0.8	1.1	1.4	2.2	2.8	5.6	8.4	8.4	14.1	100
600	$\Delta U$	0.2	0.3	0.4	0.5	0.7	0.8	1.0	1.3	2.0	2.6	5.2	7.8	7.8	13.0	217
	$\Delta C$	0.4	0.7	1.1	1.4	1.8	2.1	2.8	3.5	5.4	7.0	13.9				66
800	$\Delta U$	0.4	0.7	1.2	1.5	1.9	2.2	2.9	3.7	5.7	7.4	14.7				124
	$\Delta C$	0.9	1.5	2.4	2.9	3.8	4.4	5.9	7.4	11.5	14.7					49
1000	$\Delta U$	1.0	1.7	2.7	3.4	4.4	5.1	6.8	8.6	13.3						78
	$\Delta C$	1.6	2.7	4.4	5.5	7.1	8.2	10.9	13.7							38
1200	$\Delta U$	2.1	3.5	5.6	7.0	9.1	10.5	14.0								50
	$\Delta C$	2.8	4.7	7.5	9.3	12.1	14.0									30
1400	$\Delta U$	3.9	6.5	10.4	12.9											36
	$\Delta C$	4.4	7.4	11.8	14.8											25
1600	$\Delta U$	6.6	11.0													27
	$\Delta C$	6.6	11.0													21

Deflection in mm as a function of load in kN at open span in mm





**Stangeland Glassfiber Produker AS**  
**Bedriftsvegen 33, 4353 Klepp stasjon, Norway**

**PandaDeck Phenolic Grating PPH55150G-Carbon Black**

Manufacturer:  
ChinaGrate Composite Structures (Nantong) Limited  
11 S. Tong Fu Road, NTETDZ  
Nantong, Jiangsu Province,  
People's Republic of China

DNV Nemko Presafe AS has reviewed this product's design and construction based on information given in Product sheet, PandaDeck Phenolic Grating PPH55150G with reference to the Directive 94/EC and the Guidelines on the Application of Directive 94/9/EC.

The conclusion is that this product does not have its own source of ignition and therefore it does not fall within the scope of Directive 94/9/EC.

The product does not have any moving parts, electrical circuits or other parts that can provide an effective ignition source under normal operation. Requirements of other EC Directives may apply to the product.

Oslo, 2016-04-06

Asle Kaastad  
Certification Manager



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. **F-20414**

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**

Manufactured by  
**Chinagrate Composite Structures (Nantong) Co.,Ltd.**  
**Nantong, China**

is found to comply with  
**Det Norske Veritas' Interpretation of SOLAS 1974 Convention as Amended**  
**Det Norske Veritas' Offshore Standards**  
**Det Norske Veritas' Rules for Classification of Ships**

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

This Certificate is valid until **2016-12-31**.

Issued at **Høvik** on **2013-04-03**

for **Det Norske Veritas AS**

DNV local station: **Nantong**

Approval Engineer: **Martin Gjelstad**

.....  
**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.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

**Product description**

“PPH 1-1/2" I-60”

pultruded phenolic fiberglass reinforced plastic grating coated with a skid resistant coating (from Changzhou Paint and Coating Industry Research Institute) 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 (from Changzhou Paint and Coating Industry Research Institute) 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

**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
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.)
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

(Table continues on next page.)

(Table continued from previous page.)

Location	Service	PPH 1-1/2" I-60 and MPH 1-1/2" x 1-1/2" x 6" RM
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 not more than 2.5 kg/m<sup>2</sup> 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**

Certification in accordance with Standard for Certification No. 1.2, Type Approval, April 2009.

Test report No's. 17170-124579 dated 02 June 2005, 17170-124581 dated 02 June 2005 and 17170-124582 dated 09 May 2005. All reports from Omega Point Laboratories Inc., San Mateo, California.

**Tests carried out**

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

**Marking of product**

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

**Certificate Retention Survey**

Det Norske Veritas' surveyor is to be given permission to perform Certification Retention Surveys at any time during the validity period of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in Standard for Certification No. 1.2 item 4.



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Fowler Associates, Inc.



# Resistance Tests for

EN 13463-1-2001

Non- electrical equipment for potentially  
explosive atmospheres

per

EN 50014:1997

Conducted for

ChinaGrate Composite Structures  
(Nantong) Limited

April 14, 2015

by

**Fowler Associates, Inc.**

**CONSULTING - TESTING LAB - TRAINING COURSES - FORENSICS - EXPERT WITNESS**

On-Line Trade Magazines - [RadJournal.com](http://RadJournal.com) & [ESDJournal.com](http://ESDJournal.com)

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## ESD Tests for Chinagrate Composite Structures (Nantong) Co., LTD

Material: Glass Reinforced Plastic; HS Code: 3925900

PPH55150-250 x 130mm G-Carbon Black

April 14, 2015

These tests were performed for EN 13463-1-2001

### Non-electrical equipment for potentially explosive atmospheres - Part 1: Basic method and requirements

#### 7.4.4 Equipment Group II

Group II equipment shall be so designed that under conditions of use, maintenance and cleaning, danger of ignition due to electrostatic charges is avoided. This requirement shall be satisfied by one of the following:

a) by suitable selection of the material so that the surface resistance of the enclosure, measured according

to 13.3.4.7 does not exceed 1 G Ohm at  $(23 \pm 2) ^\circ\text{C}$  and  $(50 \pm 5) \%$  relative humidity;

13.3.4.7 Surface resistivity test of non-conductive parts of the equipment relevant to the level of

protection

The test shall be made in accordance with 23.4.7.8 of EN 50014:1997.

#### Surface Resistance Per EN 50014:1997.

	@50% RH, 73 degrees F, 48 hours				@ 10 volts	
	Resistance in Ohms					
	1	2	3	4	5	6
Textured	6.37E+03	5.96E+03	6.03E+03	7.15E+03	7.67E+03	7.59E+03
Smooth	2.94E+03	3.39E+03	3.84E+03	3.48E+03	2.68E+03	2.85E+03
	<b>Max</b>	<b>Min</b>	<b>Average</b>	<b><math>\sigma</math></b>		
Textured	7.67E+03	5.96E+03	6.80E+03	7.73E+02		
Smooth	3.84E+03	2.68E+03	3.20E+03	4.44E+02		

#### Surface Resistivity Per EN 50014:1997.

	50% RH, 73 degrees F, 48 hours				@ 10 volts	
	Resistivity in Ohms/sq.					
	1	2	3	4	5	6
Textured	6.37E+04	5.96E+04	6.03E+04	7.15E+04	7.67E+04	7.59E+04
Smooth	2.94E+04	3.39E+04	3.84E+04	3.48E+04	2.68E+04	2.85E+04
	<b>Max</b>	<b>Min</b>	<b>Average</b>	<b><math>\sigma</math></b>		
Textured	7.67E+04	5.96E+04	6.80E+04	7.73E+03		
Smooth	3.84E+04	2.68E+04	3.20E+04	4.44E+03		

The average of these tests shows a resistance of 3-6 kOhms which is well below the 1 G Ohm level needed to pass the specifications.



## Fowler

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Moore, SC 29369

Tel: 864-574-6415 Email: sfowler@sfowler.com

*Stephen L. Fowler*

Stephen L. Fowler

The data and conclusions of this report are based upon the information and samples supplied to Fowler Associates for the tests described herein. Product users should make his or her own tests to determine the suitability of the information and conclusions herein stated or implied for their intended use, and shall assume all risk and liability in connection therein.



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