

TYPE APPROVAL CERTIFICATE

This is to certify:

That the FRP Grating

with type designation(s)
DURADEK, DURAGRID, DURAGRID PHENOLIC

Issued to

Strongwell Chatfield Division
Chatfield MN, United States

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 :

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 **2020-12-31**.

Issued at **Høvik** on **2016-10-03**

for **DNV GL**

DNV GL local station: **Houston**

Approval Engineer: **Tessa Biever**

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

"DURADEK"

pultruded fiberglass grating using a fire retardant vinyl ester resin or fire retardant polyester resin.

"DURAGRID"

custom pultruded fiberglass grating using a fire retardant vinyl ester or fire retardant polyester resin.

"DURAGRID PHENOLIC"

pultruded fiberglass grating using a phenolic resin.

Duragrid Phenolic Grating I6000, 1.5-in., A8667-OC

Duragrid Phenolic Grating I6000, 45-mm, A8667-OC

Duragrid Phenolic Grating I6000, 1.5-in., G33-JM

Max length of unsupported grating: 1120 mm

Smoke developed index: 800

Flame spread index : 0

Application/Limitation

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 FRP grating is for use in locations according to the below Structural Fire Integrity Matrix (L2 and L3 rating).

Structural Fire Integrity Matrix.

Location	Service	DURADEK	DURAGRID	DURAGRID PHENOLIC
Machinery Spaces	Walkways or areas which may be used for escape, or access for fire fighting, emergency operation or rescue	NO	NO	NO ₍₁₎
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	NO	NO	YES
Cargo Pump Rooms	All personnel walkways, catwalks, ladders, platforms or access areas	NO	NO	NO
Cargo Holds	Walkways or areas which may be used for escape, or access for fire fighting, emergency operation or rescue	NO	NO	NO
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	YES	YES	YES
Cargo Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	YES _{(2),(4)}	YES _{(2),(4)}	YES _{(2),(4)}
Fuel Oil Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	YES ₍₂₎	YES ₍₂₎	YES ₍₂₎
Ballast Water Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	YES ₍₂₎	YES ₍₂₎	YES
Cofferdams, void spaces, double bottoms, pipe tunnels, etc.	All personnel walkways, catwalks, ladders, platforms or access areas	YES ₍₂₎	YES ₍₂₎	YES
Accommodation, service, and control spaces	All personnel walkways, catwalks, ladders, platforms or access areas	NO	NO	NO
Lifeboat embarkation or temporary safe refuge	All personnel walkways, catwalks, ladders, platforms or access areas	NO	NO	YES

Job Id: **262.1-004139-5**
 Certificate No: **TAF00000EF**

stations in open deck areas				
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	NO	YES ₍₃₎
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	YES	YES	YES
	Gangway for safe access to bow on tankers according to IMO MSC.62(67)	NO	NO	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.
- (3) Platforms and access serving deck foam fire fighting systems require gratings of L2 integrity.
- (4) 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 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.

Product	Test Standard	Test report No.	Date	Tested by
Duradek & Duragrid (FRVE)	ASTM E84	100093535SAT-001, Rev. 1	12 th May 2010	Intertek, Elmendorf, Texas, USA
Duradek & Duragrid (FRPE)	ASTM E84	3152762SAT-001	28 th May 2008	Intertek, Elmendorf, Texas, USA
Duragrid Phenolic	ISO 5659	100-3267-3	6 th August 2009	VTEC
Duragrid Phenolic	ASTM E119 (USCG PFM 2-98-2)	01.14431.01.309	18 th February 2009	SwRI, Houston, Texas, USA
Duragrid Phenolic Grating I6000, 1.5-in., A8667-OC	ASTM E84	01.25555.04.184-100101	4 th November 2010	SwRI, Houston, Texas, USA
Duragrid Phenolic Grating I6000, 45-mm, A8667-OC	ASTM E84	01.25555.04.184-100102a	4 th November 2010	SwRI, Houston, Texas, USA
Duragrid Phenolic Grating I6000, 1.5-in., G33-JM	ASTM E84	01.25555.04.184-100103	4 th November 2010	SwRI, Houston, Texas, USA



Job Id: **262.1-004139-5**
Certificate No: **TAF00000EF**

Tests carried out

Tested according to ASTM E-84-05/10, USCG Memorandum PFM 2-98-2 and DNV GL TA program 471.53.

Marking of product

The product or packing is to be marked with name of manufacturer, 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.