FibrePH

GRP Phenolic Pultruded Grating

DESIGN | SUPPLY | FABRICATE | INSTALL

FIBREGRID

FiBREGRID

FibrePH

GRP Phenolic Pultruded Grating

FibrePH Phenolic Grating is an alternative to maintenance-intensive metallic grating for applications where conventional pultruded grating cannot be used.

FibreGrid's Phenolic Grating has the best combination of flame resistance and low smoke/toxic emissions in industrial pultruded GRP grating. It is able to withstand extended direct contact with flames without burning or incurring structural damage, providing a safe pathway for exit. This feature makes the grating ideal for offshore platforms, workboats, marine vessels, access and wellhead platforms, walkways, refineries and petroleum processing.

CHARACTERISTICS

- Extremely durable
- Impact resistant
- Anti slip surface
- Excellent flame resistance
- High corrosion resistance
- Low smoke and toxic fume emissions
- High strength-to-weight ratio
- Low maintenance
- Higher service temperature
- High temperature resistance

SUITABLE APPLICATIONS

- ✓ **Offshore platforms**
- ✓ **Workboats**
- ✓ **Marine vessels**
- ✓ **Access and wellhead platforms**
- ✓ **Walways and stairways**
- ✓ **Refineries and petroleum processing**

TECHNICAL DATA

Description	Flame resistant phenolic flooring system
Top finish:	Available in grit top and concave top
Stock colours:	Brown (other colours available subject to extended lead time)
Stock depths:	Made bespoke to order
Panel sizes:	Made bespoke to order
Chemical resistance:	See table overleaf
Service temperatures:	Up to 180˚C

TEST DATA & APPROVALS

Regulatory Information

FibreGrid's products are designed to comply with the regulations of many internationally recognised safety organisations. These products have undergone extensive independent testing and received numerous certifications, approvals and auhorisations including the following:

U.S. Coast Guard (USCG)

Pultruded Grating: Phenolic Resin - USCG PFM 2-98. Level 2 & 3 USCG Approval No. 164.040/2/2

Moulded Grating: Authorised for use where Fire Integrity is not a concern yet requires a flame spread index of less than or equal to 25 (ASTM E84)

(Marine Safety Manual, Volume II, Paragraph 5.C.6.d(2))

ISO 9001:2008 Certified Facilities

Certificate No: CERT-05835-2003-AQ-HOU-ANAB

ABS Type Approval

Pultruded Grating: Phenlic Resin Level 2 & 3

Ceritificate Number: 01-HS172578-3-DUP

Moulded Grating: ASTM E84 less than or equal to 25

Certificate Number: 01-HS34733-X

DNV GL Type Approval

FRP Grating: Certificate Number: TAF000003C

FIRE SAFETY

Test	Performance
ASTM E84	**Flame Spread Index:** UV Coated: 25 or less Non-UV Coated: 25 or less
ASTM D635 Horizontal Burning Test	The specimen meets the HB classification requirement because it did not burn past the 25mm reference mark.
UL 94 Flamabililty Test	Classification: 94V-0
ASTM D2863 Oxygen Index Test	The specimen did not ignite with the oxygen concentration set at 100%

SMOKE & TOXIC FUME EMISSIONS

FibreGrid's Phenolic Pultruded Grating generates significantly less smoke and toxic fumes than conventional grating when exposed to fire.

Test	Description	Performance	
		Max. DS Corrected	DS@4 Min
ASTM E662 (NFPA 268)	Non-Flaming Flaming	1.80 2.70	0.22 0.50
ASTM E800 Products of Combustion	Carbon Monoxide Carbon Dioxide Hydrogen Chloride Hydrogen Cyanide Hydrogen Fluoride Oxides of Nitrogen Sulfur Dioxide	300 ppm 5575 ppm None Detected None Detected None Detected None Detected None Detected	

CHEMICAL RESISTANCE

C - Constant Exposure S - Frequent Exposure I - Infrequent Exposure N - Not Recommended

Chemical Environment	% Concentration	Rating
Acetic Acid	50	I
Acetone	10	C
Alcohols	100	C
Alum	100	C
Benzene	100	C
Carbon Tetreachloride	100	C
Chlorinated Hydrocarbons	100	C
Chlorine Dioxide	100	C
Chlorobenzene	100	C
Chloroform	100	C
Chromic Acid	1-100	N
Crude Oil	100	C
Dichlorobenzene	100	C
Ethers	100	C
Formaldehyde	All	C

Chemical Environment	% Concentration	Rating
Fuel (gasoline, diesel)	100	C
Hydrochloric Acid	1-10	I
Hydrochloric Acid	11-37	I
Hydrofluoric Acid	1-100	N
Lime Slurry	Max	C
Methylene Chloride	100	C
Nickel Salts	Sat	C
Nitric Acid	1-100	N
Phenol	All	C
Phosphoric Acid	85	S
Sodium Hypochlorite	1-8	N
Sodium Hydroxide	All	N
Sulfuric Acid	1-30	I
Sulfuric Acid	35-98	N
Toluene	100	C
Trichloroethane	100	C
Water (fresh, salt, waste)	Max	S

UNIFORM LOAD TABLE

Uniform Load Table - Deflection In Millimetres												
Clear Span (mm)	Style	Uniform Load = kN/m²									Max Recommended Load (kN/m²)	Ultimate Load (kN/m²)
		3	5	10	15	20	30	50	75	100		
400	I6015	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.4	0.5	328	657
	I4015	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	0.4	492	985
600	I6015	<0.3	<0.3	0.4	0.6	0.7	1.1	1.8	2.7	3.6	179	358
	I4015	<0.3	<0.3	<0.3	<0.3	<0.3	0.4	0.6	0.9	1.2	268	537
800	I6015	0.4	0.7	1.3	1.9	2.6	3.9	6.5	9.7	-	110	220
	I4015	<0.3	0.4	0.8	1.2	1.6	2.5	4.1	6.1	8.1	165	331
1000	I6015	0.9	1.5	3.0	4.6	6.1	9.1	-	-	-	81	162
	I4015	0.6	1.0	2.1	3.2	4.2	6.4	10.6	-	-	122	244
1200	I6015	1.8	3.0	6.0	9.0	12.0	-	-	-	-	65	131
	I4015	1.2	2.0	4.0	6.0	8.1	12.1	-	-	-	98	196
1400	I6015	3.2	5.4	10.7	-	-	-	-	-	-	49	99
	I4015	2.1	3.5	7.0	10.5	-	-	-	-	-	74	148
1600	I6015	5.4	9.0	-	-	-	-	-	-	-	33	66
	I4015	3.6	6.0	11.8	-	-	-	-	-	-	50	99
1800	I6015	8.7	-	-	-	-	-	-	-	-	30	61
	I4015	5.8	9.7	-	-	-	-	-	-	-	46	91

1. The above gratings were tested in accordance with the procedure recommended by the Fiberglass Grating Manufacturers Council of the Composites Fabricators Association.

2. Deflections have been limited to approximately 12.7mm or Clear Span/100 as recommended by the Fiberglass Grating Manufacturers Council.

3. Walking loads, typically 2.4-3.1 kN/m² maximum are recommended for pedestrian traffic. Deflections for worker comfort are typically limited to the lesser of 9.5mm or CLEAR SPAN divided by 125, for a firmer feel, limit deflection to the lesser of 6.4mm or CLEAR SPAN divided by 200.

4. The designer should not exceed the MAX RECOMMENDED LOAD at any given span. MAX RECOMMENDED LOAD represents a 2.1 factor of safety on ULTIMATE CAPACITY.

5. ULTIMATE CAPACITY represents a complete and total failure of grating. Values are provided to illustrate the reserve strength of the grating at a given span and are NOT to be used for design. Functionality of grating is limited to MAX RECOMMENDED LOAD.

6. The allowable loads in this table are for STATIC LOAD CONDITIONS at ambient temperatures only. Allowable loads for impact or dynamic conditions should be a maximum of ONE-HALF of the values shown. Long term loads will result in added deflection due to creep in the material and will also require higher safety factors to ensure acceptable performance.

CONCENTRATED LINE LOAD TABLE

Concentrated Line Load Table - Deflection In Millimetres												
Clear Span (mm)	Style	Line Load = kN per m of Panel Width (kN/m of width)									Max Recommended Load (kN/m)	Ultimate Load (kN/m)
		0.7	1.5	3.0	5.0	10.0	15.0	20.0	25.0	30.0		
400	I6015	<0.3	<0.3	<0.3	<0.3	0.3	0.6	0.8	1.0	1.2	63	126
	I4015	<0.3	<0.3	<0.3	<0.3	0.4	0.6	0.8	1.0	1.1	95	190
600	I6015	<0.3	<0.3	0.4	0.6	1.1	1.7	2.2	2.8	3.3	54	108
	I4015	<0.3	<0.3	<0.3	0.3	0.7	1.1	1.5	1.9	2.3	81	163
800	I6015	<0.3	0.4	0.8	1.3	2.5	3.8	5.1	6.3	7.6	47	93
	I4015	<0.3	<0.3	0.5	0.8	1.7	2.5	3.4	4.2	5.1	70	140
1000	I6015	0.3	0.7	1.4	2.3	4.7	7.1	9.5	11.9	-	41	81
	I4015	<0.3	0.4	0.9	1.6	3.2	4.7	7.1	9.5	-	61	122
1200	I6015	0.5	1.1	2.3	3.9	7.9	11.9	-	-	-	36	72
	I4015	0.4	0.8	1.6	2.6	5.3	7.9	10.6	-	-	54	109
1400	I6015	0.8	1.8	3.7	6.1	12.3	-	-	-	-	33	66
	I4015	0.6	1.2	2.5	4.1	8.2	12.3	-	-	-	50	99
1600	I6015	1.3	2.7	5.5	9.1	-	-	-	-	-	30	61
	I4015	0.8	1.8	3.6	6.0	12.1	-	-	-	-	46	91
1800	I6015	1.8	3.9	7.8	-	-	-	-	-	-	27	55
	I4015	1.2	2.6	5.2	8.6	-	-	-	-	-	41	82

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6. The allowable loads in this table are for STATIC LOAD CONDITIONS at ambient temperatures only. Allowable loads for impact or dynamic conditions should be a maximum of ONE-HALF of the values shown. Long term loads will result in added deflection due to creep in the material and will also require higher safety factors to ensure acceptable performance.

STRUCTURAL FIRE INTEGRITY MATRIX

Location	Service	Fire Integrity
Service	Walkways or areas which may be used for escape, or access for firefighting, emergency operation or rescue	$L1_A$
	Fire integrity	L3
Cargo Pump Rooms	All personnel walkways, catwalks, ladders, platforms or access areas	L1
Cargo Holds	Walkways or areas which may be used for escape, or access for firefighting, emergency operation or rescue	L1
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	L0
Cargo Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	$L0_B$
Fuel Oil Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	L0
Ballast Water Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	L0
Cofferdams, Void Spaces, Double Bottoms, Pipe Tunnels etc.	All personnel walkways, catwalks, ladders, platforms or access areas	L0
Accomodation, Service and Control Spaces	All personnel walkways, catwalks, ladders, platforms or access areas	NOT PERMITTED
Lifeboat Embarkation or Temporary Safe Refuge Stations in Open Deck Areas	All personnel walkways, catwalks, ladders, platforms or access areas	L2
Open Decks or Semi-Enclosed Areas	Operational areas and access routes for deck foam firefighting systems on tank vessels	L2
	Walkways and areas that may be used for escape, or access for firefighting systems and AFFF hose reels, emergency operation, or rescue on MODUs and production platforms including safe access to tanker bows	$L2_C$
	Walkways or areas that may be used for escape or access for firefighting, emergency operation or rescue other than those used above	L3
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	L3
	Gangway for safe access to bow on tankers according to IMO MSC.62(67)	$L2_D$

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^2 of combustible storage, gratings of L3 integrity may be used in lieu of L1.

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"

3. Tested with furnace temperature curve according to ASTM E119 (i.e. not tested for Hydrocarbon or Jet fire exposure).

4. IMO 2010 FTP Code Part 5 and 2 rto be separately documented.

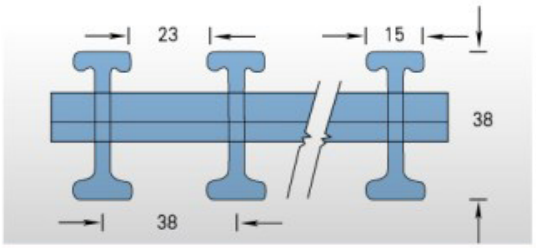
INDEPENDENT FIRE TEST

Independent Fire Exposure Test of pultruded grating as outlined in the U.S. Coast Guard Draft Memorandum: Policy File Memorandum on the use of Fiber Reinforced Plastic (FRP) Deck Grating (dated June of 2001).

The test consisted of exposing Safe-T-Span® pultruded phenolic grating to a 60-minute fire test at temperatures exceeding 926 degrees centigrade. The grating was tested at a clear span of 1118 mm and retained its structural integrity after 60 minutes in the furnace as evidenced by post-loading of 1.96 kN (greater than 4.5 kN/m²).

GRATING SPECIFICATION

*I—6015



Thickness(mm): 38

Open Area: 60%

Weight(kg/m²): 16.1

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