

Firewalk™ Pultruded Phenolic Grating

Product Brochure



High Performance Composite Solutions



Phenolic Grating Products



Introduction

Firewalk™ pultruded phenolic grating manufactured by Fibergrate Composite Structures is an alternative to maintenance-intensive metallic grating for applications where conventional pultruded grating cannot be used. Safe-T-Span Firewalk phenolic grating can withstand high temperatures and direct contact with flame while maintaining its structural integrity. This feature makes the grating and stair treads ideal for a wide range of offshore, marine, transportation and industrial applications. All Safe-T-Span Firewalk phenolic grating requiring ASTM F3059-18 approval is inspected independently at the production stage to ensure quality control standards are followed. Safe-T-Span Firewalk phenolic grating is available in a 1-1/2" depth, 1" bar with an open area between 40% and 60%.

Phenolic Pultruded Grating Benefits



Superior Fire Safety Characteristics:

Best combination of flame resistance and low smoke/toxic emissions in industrial pultruded FRP grating. Able to withstand extended direct contact with flame without burning or incurring structural damage, providing a safe pathway for exit.



Long Service Life:

FRP products provide outstanding durability and corrosion resistance in demanding applications, therefore providing improved product life over traditional materials.



Low Maintenance:

Corrosion resistant properties of FRP grating and products reduce or eliminate the need for sandblasting, scraping and painting. Products are easily cleaned with a high pressure washer.



High Strength to Weight Ratio:

Able to safely accommodate heavier weights over greater spans while being less than one-half the weight of steel grating.



High Corrosion Resistance:

Safe-T-Span Firewalk pultruded fiberglass gratings are known for their ability to provide corrosion resistance in the harshest environments.



Slip Resistance:

Safety is built-in with a grit top surface that provides outstanding adhesion and durability for safe footing, even in wet or oily conditions.



Low Install Cost:

Due to ease of fabrication and lightweight, FRP pultruded phenolic grating eliminates the need for heavy lifting equipment.



Phenolic Grating Applications

- Offshore Platforms
- Equipment Skids
- Workboats
- Marine Vessels
- Access & Wellhead Platforms
- Stairways
- Refineries
- Petroleum Processing

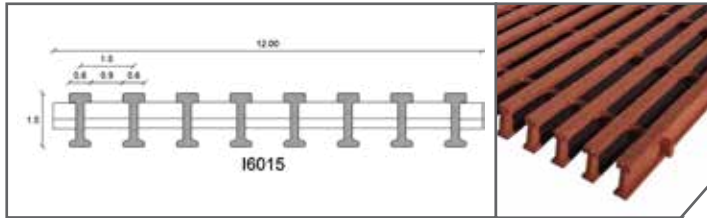


Product Selection and Details

Grating Details

1-1/2" Deep I6015P-FW

# of Bars/ Ft of Width	Load Bar Depth	Open Area	Load Bar Centers	Approximate Weight
8	1-1/2"	60%	1-1/2"	3.70 psf

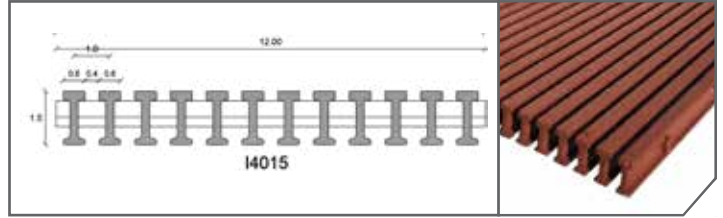


Section Properties per Ft of Width: $A = 3.23 \text{ IN}^2$ $I = 0.95 \text{ IN}^4$ $S = 1.23 \text{ IN}^3$
Average $EI = 5,870,707 \text{ lb} \cdot \text{in}^2$ (SPAN $\geq 30''$)

1-1/2" Deep I4015P-FW (ADA Compliant)



# of Bars/ Ft of Width	Load Bar Depth	Open Area	Load Bar Centers	Approximate Weight
12	1-1/2"	40%	1"	4.97 psf

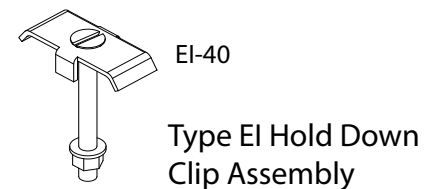
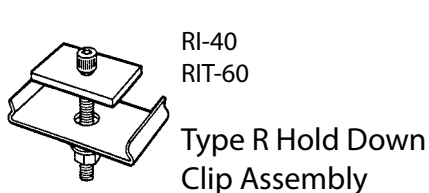


Section Properties per Ft of Width: $A = 4.85 \text{ IN}^2$ $I = 1.43 \text{ IN}^4$ $S = 1.85 \text{ IN}^3$
Average $EI = 8,574,398 \text{ lb} \cdot \text{in}^2$ (SPAN $\geq 30''$)

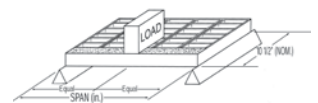
Series	Load Bar Spacing	Stocked Sizes		Load Bars/ Ft.	Wt./Sq. Ft.	Open Area
		Width	Length			
I6015P-FW	1-1/2"	3', 4'	10', 12', 20', 24'	8	3.70 lbs	60%
I4015P-FW	1"	3', 4'	10', 12', 20', 24'	12	4.97 lbs	40%

Clip Assemblies for Firewalk Phenolic Grating

Fibergate offers a number of 316 stainless steel clip assemblies for attaching panels of Safe-T-Span Firewalk pultruded phenolic grating to structural supports.



Firewalk Pultruded Phenolic Stair Treads



TREAD TYPE	Load (lbs.)	Span (in.) SPAN/150	30	36	42	48
			0.2	0.24	0.28	0.32
1-1/2" Deep I6015P-FW	250		0.05	0.07	0.10	0.13
	500		0.10	0.13	0.19	0.25
1-1/2" Deep I4015P-FW	250		0.04	0.06	0.07	0.10
	500		0.08	0.11	0.14	0.20

Test Data and Approvals

Performance Data

All tests were conducted on actual finished product.

Fire Safety

Safe-T-Span Firewalk pultruded phenolic grating meets or exceeds the following fire safety standards.

Test	Performance
ASTM F3059-18	Sections 8-16 - Pass. Section 17 - L2, L3, L0
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 Flamability Test	Classification: 94V-0

*Reports available upon request.



Smoke and Toxic Fume Emissions

Test	Description	Performance	
		Max. Ds corrected	Ds@4 Min
ASTM E662 (NFPA 268)	Non-Flaming Flaming	106 57.7	7 4.3
BSS 7239 Products of Combustion (with pilot flame)	Carbon Monoxide Carbon Dioxide Hydrogen Chloride Hydrogen Cyanide Hydrogen Fluoride Oxides of Nitrogen Sulfur Dioxide	40.5 ppm None Detected None Detected None Detected None Detected None Detected None Detected	

*Test reports are available from Fibergrate Composite Structures at (800) 527-4043.



Test Data and Approvals

Regulatory Information

Fibergrate's products are designed to comply with the regulations of many internationally recognized safety organizations. These products have undergone extensive independent testing and received numerous certifications, approvals and authorizations including the following:

ASTM F3059-18

- **Pultruded Grating:** Phenolic Resin - Level 0, 2, & 3
Certificate Number: Intertek No 5007443

ISO 9001:2015 Certified Facilities

- Certificate Number: CERT-05835-2003-AQ-HOU-ANAB

ABS Type Approval

- **Pultruded Grating:** Phenolic Resin Level 2 & 3 -
Certificate Number: 23-2442612-PDA

DNV GL Type Approval

- **FRP Grating:**
Certificate Number: TAF000003C/Pending



Chemical Resistance

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

Chemical Environment	% Concentration	Rating	Chemical Environment	% Concentration	Rating
Acetic Acid	50	I	Hydrochloric Acid	1-10	I
Acetone	100	C	Hydrochloric Acid	11-37	I
Alcohols	100	C	Hydrofluoric Acid	1-100	N
Alum	100	C	Lime Slurry	Max	C
Benzene	100	C	Methylene Chloride	100	C
Carbon Tetrachloride	100	C	Nickel Salts	Sat	C
Chlorinated Hydrocarbons	100	C	Nitric Acid	1-100	N
Chlorine Dioxide	100	C	Phenol	All	C
Chlorobenzene	100	C	Phosphoric Acid	85	S
Chloroform	100	C	Sodium Hypochlorite	1-8	N
Chromic Acid	1-100	N	Sodium Hydroxide	All	N
Crude Oil	100	C	Sulfuric Acid	1-30	I
Dichlorobenzene	100	C	Sulfuric Acid	35-98	N
Ethers	100	C	Toluene	100	C
Formaldehyde	All	C	Trichloroethane	100	C
Fuel (gasoline, diesel)	100	C	Water (fresh, salt, waste)	Max	S

Load Tables for I4015P-FW & I6015P-FW Grating

UNIFORM LOAD TABLE - Deflection in Inches									
Clear Span (in)	Style	UNIFORM LOAD = psf							Ultimate Load (psf)
		50	100	200	300	500	1000	2000	
30	I6015P-FW	0.01	0.02	0.03	0.05	0.08	0.17	0.33	7200
	I4015P-FW	0.01	0.01	0.02	0.04	0.06	0.12	0.24	10840
36	I6015P-FW	0.02	0.03	0.07	0.1	0.17	0.35	-	5105
	I4015P-FW	0.01	0.02	0.04	0.07	0.11	0.22	0.44	8020
42	I6015P-FW	0.03	0.06	0.13	0.19	0.32	-	-	4095
	I4015P-FW	0.02	0.04	0.08	0.12	0.2	0.39	-	5715
48	I6015P-FW	0.05	0.11	0.22	0.33	-	-	-	3255
	I4015P-FW	0.03	0.07	0.13	0.2	0.33	-	-	4565
54	I6015P-FW	0.08	0.18	0.35	-	-	-	-	2425
	I4015P-FW	0.05	0.1	0.21	0.31	-	-	-	3415
60	I6015P-FW	0.12	0.27	-	-	-	-	-	2050
	I4015P-FW	0.08	0.16	0.32	0.48	-	-	-	2845
66	I6015P-FW	0.17	0.39	-	-	-	-	-	1800
	I4015P-FW	0.11	0.23	0.46	-	-	-	-	2233
72	I6015P-FW	0.24	-	-	-	-	-	-	1235
	I4015P-FW	0.16	0.32	-	-	-	-	-	1685

The deflection values listed were derived from results from testing according to the ACMA FRP Composites Grating Manual.

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 1/2"
3. 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 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.

For applications at elevated temperatures, consult the factory. The designer is further referenced to ASCE Structural Plastics Design Manual.

CONCENTRATED LINE LOAD TABLE - Deflection in Inches									
Clear Span (in)	Style	LINE LOAD = Lbs per Foot of Panel Width (lb/ft of width)							Ultimate Load (psf)
		50	100	200	300	500	1000	2000	
30	I6015P-FW	0.01	0.02	0.03	0.04	0.07	0.12	0.22	9000
	I4015P-FW	0.01	0.01	0.02	0.03	0.05	0.09	0.16	13550
36	I6015P-FW	0.01	0.03	0.04	0.06	0.1	0.18	0.35	7660
	I4015P-FW	0.01	0.02	0.04	0.05	0.08	0.14	0.25	12030
42	I6015P-FW	0.01	0.03	0.06	0.08	0.13	0.26	-	7165
	I4015P-FW	0.01	0.02	0.04	0.06	0.1	0.19	0.36	10000
48	I6015P-FW	0.02	0.04	0.08	0.12	0.2	0.38	-	6515
	I4015P-FW	0.02	0.04	0.06	0.09	0.14	0.27	-	9135
54	I6015P-FW	0.03	0.05	0.11	0.17	0.27	-	-	5455
	I4015P-FW	0.03	0.05	0.09	0.13	0.21	0.39	-	7690
60	I6015P-FW	0.04	0.08	0.15	0.23	0.37	-	-	5130
	I4015P-FW	0.03	0.06	0.11	0.16	0.26	-	-	7115
66	I6015P-FW	0.05	0.1	0.2	0.29	0.49	-	-	4960
	I4015P-FW	0.04	0.07	0.14	0.21	0.34	-	-	6140
72	I6015P-FW	0.06	0.12	0.25	0.37	-	-	-	3714
	I4015P-FW	0.04	0.08	0.17	0.26	0.43	-	-	5060

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Phenolic Projects

Fibergrate's Phenolic Grating

Fibergrate has provided USCG approved pultruded phenolic grating to the market for more than a decade and has participated in a number of large projects requiring a product with the strenuous flame and smoke indexes found in phenolics. Both of Fibergrate's ISO 9001-2015 certified manufacturing facilities are also certified to provide Coast Guard approved phenolic products. Phenolics are heavily used in the offshore market, and Fibergrate has successfully supplied Safe-T-Span® phenolic gratings to Shell, Chevron Texaco, Unocal, Saudi Aramco, Woodside, BP, Norsk Hydro, Pemex, El Paso Energy, Exxon Mobil and Conoco Phillips. Fibergrate has supplied over 300,000 square feet of grating for high profile projects such as Shell's NaKika and Bonga, the Enfield FPSO and BP's Azerbaijan.

Shell NaKika

Shell's NaKika Semi Submersible Drilling and Production Platform located in the Gulf of Mexico required 160,000 square feet of Fibergrate's I6015P coated phenolic pultruded grating. Phenolic grating and treads were used throughout the platform, including the internal maintenance spaces within the hull to the apron surrounding the pedestal cranes. During the final commissioning of the platform, while at a fabrication yard in Texas, Fibergrate's inspection of the installed gratings showed an estimated weight savings amounting to approximately 1,000 tons! This savings was achieved by the use of Fibergrate's I6015P grating, over typical 1-1/4" galvanized gratings.



Chevron Tahiti and Blind Faith

Fibergrate successfully supplied 40,000 square feet of USCG approved Safe-T-Span® pultruded I6015P UV coated phenolic grating, fabricated per Chevron drawings, for both the Tahiti and Blind Faith offshore platforms. The grating was installed throughout the structure, including the crew's living quarters. These projects further confirm Fibergrate's commitment as a valued and trusted vendor to the offshore oil and gas industry.

Structural Fire Integrity Matrix

Matrix from ASTM F3059-18 Table 1 Structural Fire Integrity Requirements

Location	Service	Fire Integrity
Service	Walkways or areas which may be used for escape, or access for fire fighting, 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 fire fighting, 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
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
Accommodation, 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
	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

^A 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 5.5 LB/FT² (2.5 kg/m²) of combustible storage, gratings of L3 structural fire integrity may be used in lieu of L1.

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