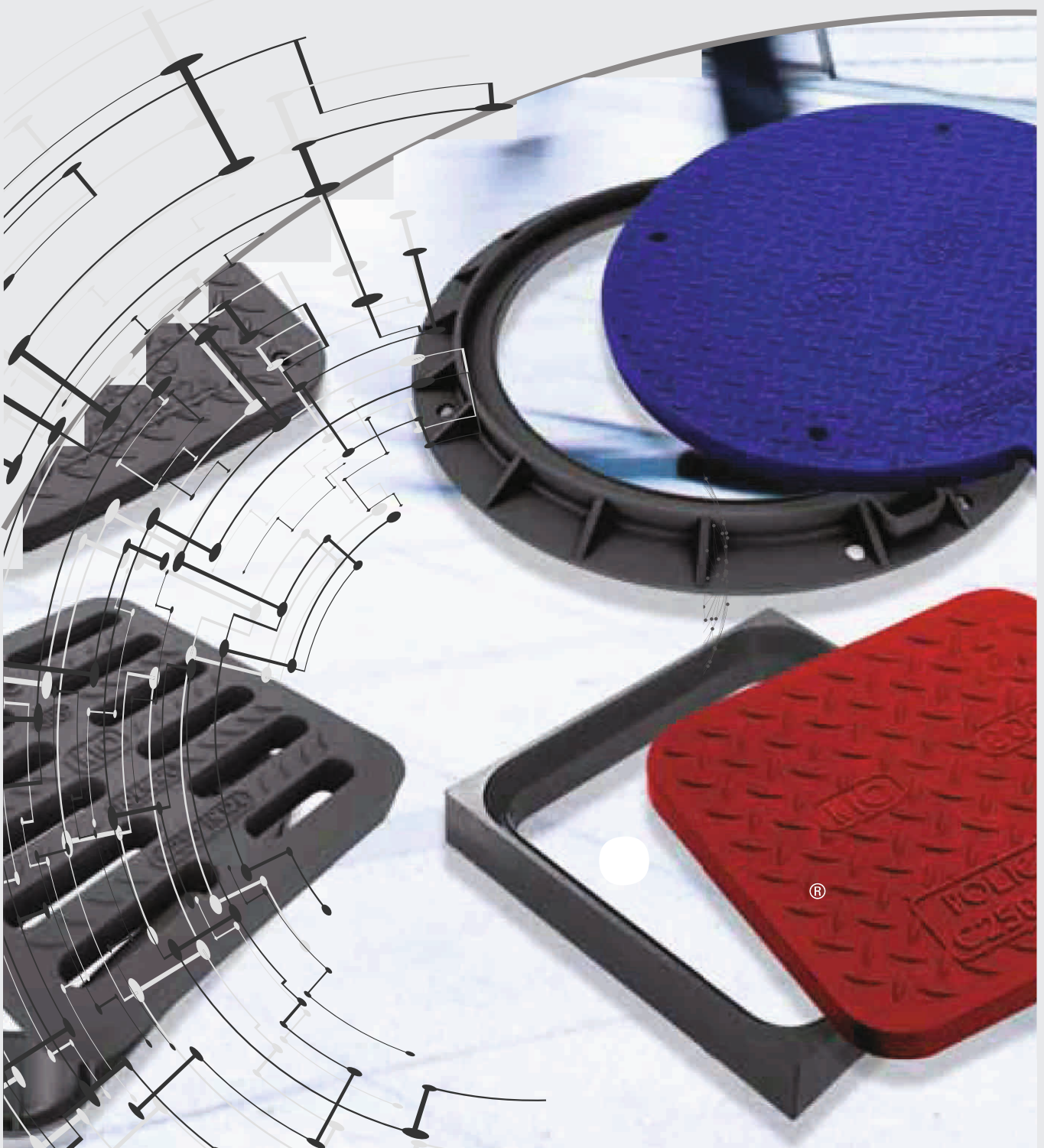


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FRP MANHOLE COVER





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FRP Manhole Cover - Easy, Durable and Lightweight Solution

Introducing our high-quality Fiberglass-reinforced plastic (FRP) manhole covers are a popular choice for a variety of applications, including commercial, industrial, and municipal. FRP manhole covers are lightweight, strong, and durable, and they can withstand a variety of harsh environmental conditions. Such in areas where corrosion resistance is important, as near the ocean or in areas with high humidity.

Megacity Engineering: Your Trusted Manufacturer of FRP Manhole Covers

Welcome to Megacity Engineering, the leading provider of high-quality FRP (Fiber Reinforced Polymer) manhole covers. With our commitment to innovation, durability, and safety, we offer a comprehensive range of FRP manhole covers that are designed to meet the demanding needs of various industries and applications.

Why Choose Megacity's FRP Manhole Covers?

Superior Strength and Durability:

Our FRP manhole covers are engineered using advanced composite materials that include fiberglass, resin, and fillers, resulting in exceptional strength and durability. They can withstand heavy loads, resist cracking and deformation, and provide long-lasting performance even in harsh environments.

Lightweight Design:

Compared to traditional materials like cast iron or concrete, our FRP manhole covers are significantly lighter. This lightweight design makes them easier to handle during installation, maintenance, and inspections, reducing the risk of injuries and ensuring hassle-free operations.

Corrosion and Chemical Resistance:

FRP manhole covers are inherently resistant to corrosion, rust, UV rays, and chemical exposure. They are perfect for installations in areas prone to moisture, chemicals, or corrosive substances, ensuring a reliable and maintenance-free solution that stands the test of time.

Anti-Theft Features:

We understand the importance of security, which is why our FRP manhole covers come equipped with anti-theft features. These features include locking systems, tamper-proof designs, and customization options to prevent unauthorized access and ensure the safety of your infrastructure.



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Versatility and Customization:

Our FRP manhole covers are available in various sizes, load-bearing capacities, and configurations to suit different requirements. Whether you need covers for pedestrian areas, roadways, airports, or industrial sites, we have the right solution for you. We also offer customization options, allowing you to add logos, markings, or specific colours to match your branding or regulatory needs.

Safety and Accessibility:

Our FRP manhole covers are designed with safety in mind. They feature non-slip surface textures to prevent accidents caused by slips and falls. Additionally, they meet or exceed industry standards for load-bearing capacity and structural integrity, ensuring safe access for maintenance workers and pedestrians.

Environmentally Friendly:

As advocates for sustainability, our FRP manhole covers are an eco-friendly alternative to traditional materials. They are recyclable, contribute to reduced carbon emissions during production, and have a longer lifespan, minimizing the need for frequent replacements and reducing waste.

Compliance and Standards:

Our FRP manhole covers comply with international standards and regulations, including load ratings such as EN 124, AASHTO M306, and AS3996. They undergo rigorous testing and quality control measures to ensure they meet the highest industry standards, providing you with peace of mind and assurance of product quality.

Types of FRP Manhole Covers:

There are a variety of different types of FRP manhole covers available, including:

- Round manhole covers
- Square manhole covers
- Rectangular manhole covers
- Full-floor manhole covers
- Grating manhole covers

Applications of FRP Manhole Covers:

FRP manhole covers are used in a variety of applications, including:

- Sewage systems
- Stormwater systems
- Utilities
- Transportation
- Industrial applications



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Additional Information:

- FRP manhole covers are typically made from a composite material that includes fiber glass, resin, and fillers.
- The weight of an FRP manhole cover will vary depending on the size and thickness of the cover.
- The load capacity of an FRP manhole cover will also vary depending on the size and thickness of the cover.
- FRP manhole covers are available in a variety of colors, including gray, black, and white.

Conclusion:

FRP manhole covers are a versatile and durable option for a variety of applications. They are lightweight, strong, and resistant to corrosion, chemicals, and UV rays. FRP manhole covers require very little maintenance, making them a cost-effective choice in the long run.

At Megacity Engineering, we are committed to delivering reliable, high-performance FRP manhole covers that surpass your expectations. Whether you need standard solutions or custom-designed covers, our team of experts is ready to assist you in finding the perfect fit for your specific requirements.

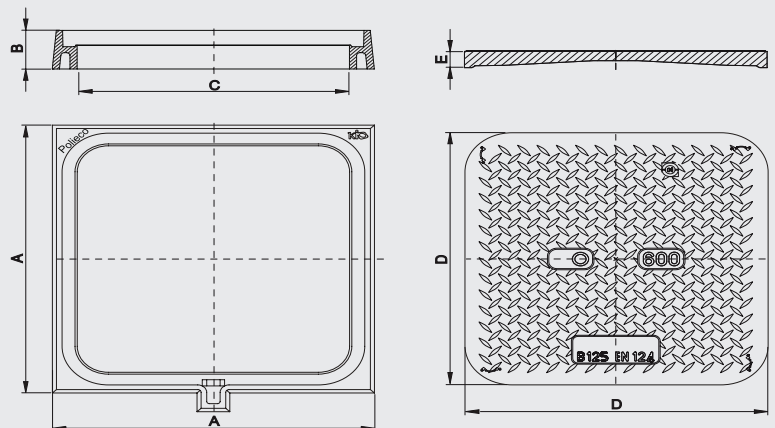
FRP / GRP Gratings

B125 square
flat frame



Frame for installation with self-locking pavers and natural stones

Drawing and the information only for general presentation purposes.



Description	A x A (mm)	B (mm)	C x C (mm)	D x D (mm)	E (mm)
KIO 400 B125	360 x 360	52	305 x 305	335 x 335	22
KIO 500 B125	470 x 470	58	400 x 400	443 x 443	24
KIO 600 B125	570 x 570	60	502 x 502	543 x 543	26

- Optional locking system in composite material
- Optional personalisation (name or service type)

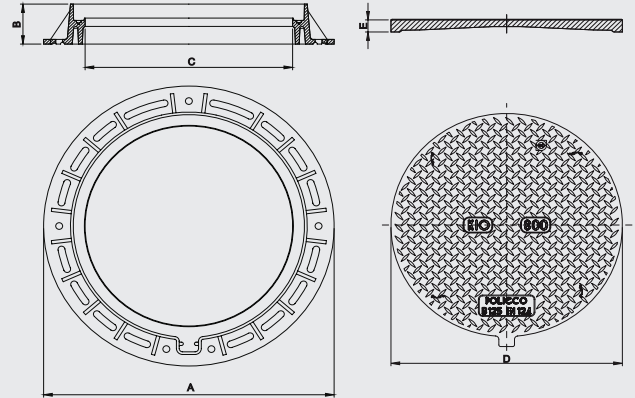
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FRP / GRP Gratings

B125 Ø 800
round

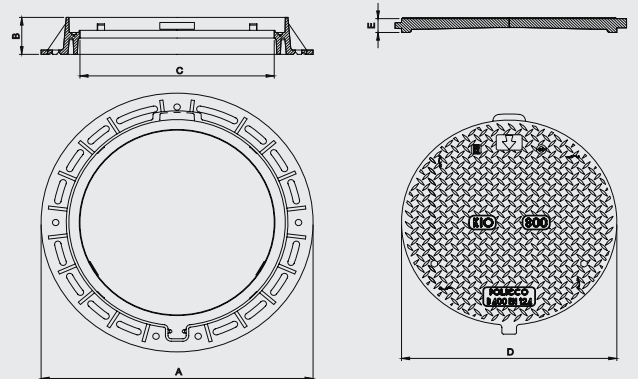


Description	A x A (mm)	B (mm)	C x C (mm)	D x D (mm)	E (mm)
KIO 800 B125	Ø 840	101	Ø 600	Ø 665	30

D400 Ø 800 round
automatic locking system



Drawing and the information only for general presentation purposes.



Description	A x A (mm)	B (mm)	C x C (mm)	D x D (mm)	E (mm)
KIO 800 D400	Ø 840	120	Ø 600	Ø 665	45



Customisation

covers can be personalised with a company name, service type or other information as required. Our products can also be produced in a range of colours.



The locking system is available for classes B125 and C250 covers. A simple screwdriver or a special wrench can be used for the locking system.

FRP / GRP Gratings



> **SOLID AND RESISTANT TO DEFORMATION AND STRENGTH**



> **ENVIRONMENTAL PROTECTION QUALITIES**



> **LIGHTNESS AND HANDINESS**



> **CAN BE CUSTOMISED**



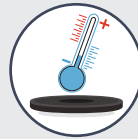
> **ELECTRIC INSULATING**



> **THEFT PREVENTION**



> **NOISE REDUCTION**



> **RESISTANT TO TEMPERATURE FLUCTUATIONS**



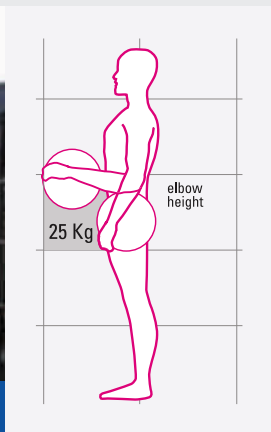
> **RESISTANCE TO CORROSION**



> **PERMEABLE TO ELECTROMAGNETIC WAVES**



Lightness & handiness



TOTAL WEIGHT OF COVER + FRAME

B125	Grey cast iron (kg)	Ductile cast iron (kg)	Composite material (kg)
300 x 300	9,00	7,00	1,70
400 x 400	15,00	12,80	3,50
500 x 500	26,00	18,20	6,80
600 x 600	40,00	29,40	10,50
700 x 700	56,00	38,80	15,50
C250	Grey cast iron (kg)	Ductile cast iron (kg)	Composite material (kg)
400 x 400	23,00	25,00	5,00
500 x 500	39,00	33,00	10,30
600 x 600	57,00	45,00	16,20
700 x 700	74,00	61,00	22,40



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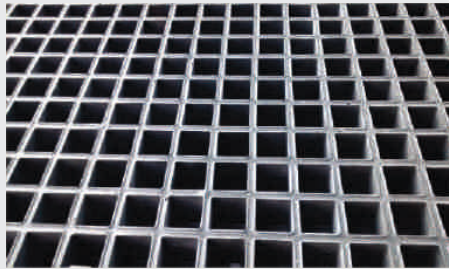
FRP / GRP Gratings

Ferrograte's Fiberglass / Glass fiber reinforced plastic gratings are manufactured by interlacing unsaturated polyester or phenolic resin matrix with fiberglass roving as reinforcing material. Gratings produced by this technique yield a product having excellent corrosion resistance. Ferrograte FRP gratings are also light weight compared to conventional gratings.

Types of FRP gratings

1

Molded



2

Pultruded

Resin types

Resin type	Resin base	Description	Corrosion resistance	Max Temp
IFR-25	Isophthalic Polyester	Industrial grade corrosion resistance and Fire retardant	Very good	65° C
IFR-10	Isophthalic Polyester	Industrial grade corrosion resistance and high Fire retardant	Very good	65° C
IFGR-30	Isophthalic Polyester	Food grade corrosion resistance and Fire retardant	Very good	65° C
VEFR-25	Vinyl Ester	Superior corrosion resistance and Fire retardant	Excellent	82° C
VEFR-10	Vinyl Ester	Superior corrosion resistance and Fire retardant	Excellent	82° C
MP-5	Phenolic Resin	Low smoke and superior Fire retardant	Very good	150° C



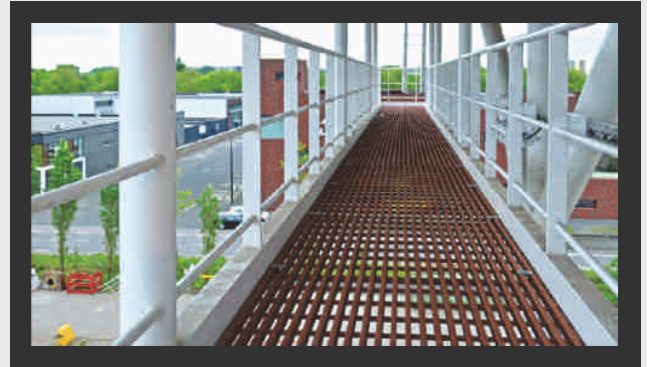
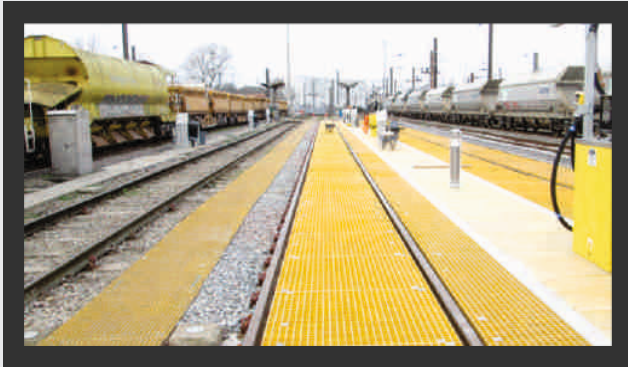
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Field Applications

Ferrograte FRP gratings are widely used as Platforms, Walkways, Material racks, Staircase, Trench covers, Fences and Decking in various fields such as :

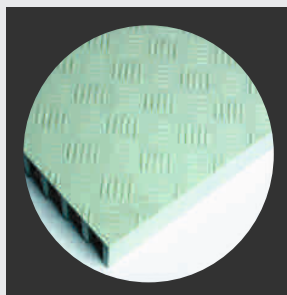
- | | | | |
|--------------------------|---------------------------|--------------------------|-------------------------|
| ■ Petrochemical industry | ■ Textile dyeing industry | ■ Water treatment plant | ■ Paper & Pulp industry |
| ■ Power industry | ■ Mining & Minerals | ■ Sewage treatment plant | ■ Shipbuilding |
| ■ Aerospace | ■ Chemical industry | ■ Food & Beverages | ■ Pharmaceuticals |
| ■ Oil & Gas industry | ■ Leather industry | ■ Water theme parks | ■ Automotive industry |



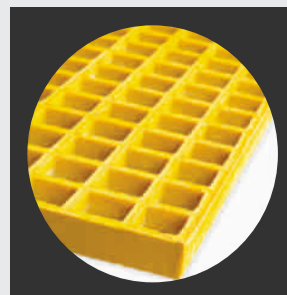
Surface finish



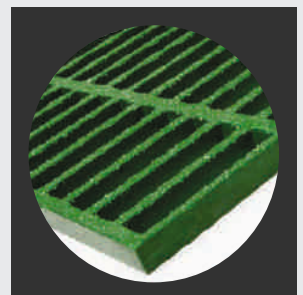
Gritted Solid Top



Chequered Plate



Concave Meniscus



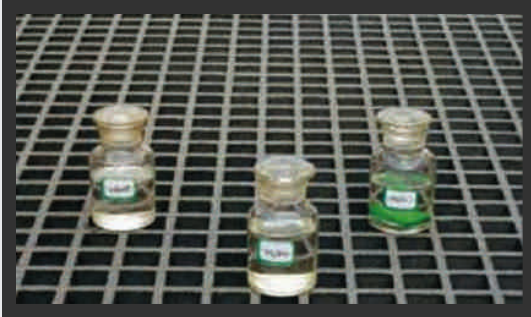
Embedded Grit



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FRP / GRP Gratings



Corrosion Resistance

Ferrograte FRP gratings offer superior corrosion resistance. It can effectively resist the corrosion of acids, alkali, organic solvents and salts. FRP gratings don't rust when contacted by chemicals because no electrochemical action could occur over the grating. It serves as an ideal substitute for metal, wood or concrete.

FRP gratings are a low density composite of resin and fiberglass. Their density is only 1/4th of steel, 2/3rd of aluminum but almost as strong as ordinary steel. It is also light in weight and allows easy transportation and hassle-free installation.

Strength-weight ratio

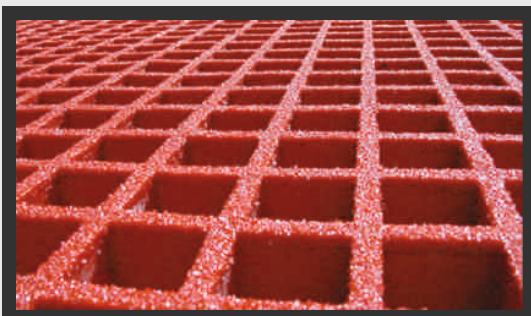
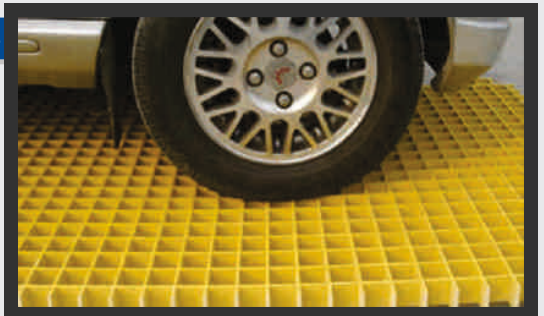


Fire Retardant

All Ferrograte FRP gratings are designed to exhibit a minimum of Class 1 flame spread rating in accordance with ASTM E-84. Our FRP gratings are available in variety of resins offering an array of flame spread rating and smoke densities from as low as 5 in flame spread rating and 5 in smoke density.

Impact resistance

FRP gratings have a high impact strength allowing repeated bending without any permanent deformation. Its moderate elasticity allows people to feel comfortable when standing over the gratings for a long period of time.

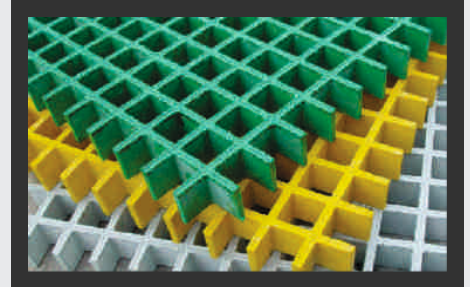


Anti-slip / UV protection

FRP gratings offer superior slip resistance compared to conventional steel gratings. They are available in either concave meniscus surface or gritted surface. Both the types provide excellent anti-slip function. It decreases the risk of slipping accidents. Also, FRP gratings are not affected by the Sun's harmful ultra-violet rays.

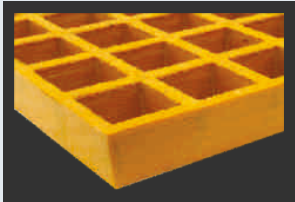
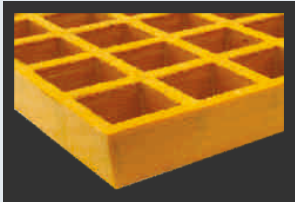
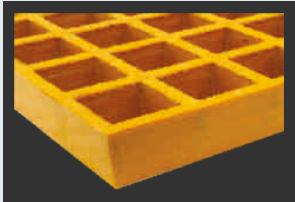
FRP Molded Gratings

Ferrograte FRP Molded gratings are manufactured by thermally curing reinforcing glassfibers and polyester resin in a single mold and are cast integrally by heating and compressing. It is composed of certain number of symmetrical lattices with loading properties in both length and width directions.



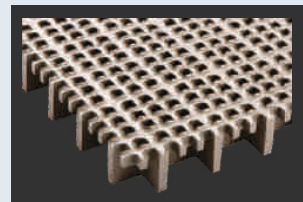
Grating Selection Table

SQUARE MESH

Mesh Size (mm)	Height (mm)	Bar Thickness (Top / Bottom)	Weight (kg/m ²)	Open Rate (%)	Picture
38x38	13	6.0/5.0	6.0	78	
	14	6.0/5.0	6.5	78	
	20	6.0/5.0	9.8	65	
	25	6.5/5.0	12.3	68	
	30	6.5/5.0	14.6	68	
	38	7.0/5.0	19.5	68	
	50	11.0/9.0 HD	42	56	
	60	10.5/9.0 HD	50.4	54	
	70	11.5/9.0 HD	58.8	49	
40 X 40	25	7.0/5.0	12.3	67	
	30	7.0/5.0	14.6	67	
	38	7.0/5.0	19.2	67	
	40	7.0/5.0	19.5	67	
83 X 83	25	7.0/5.0	5.8	84	
	38	7.0/5.0	9.5	84	
	40	7.0/5.0	10.7	84	

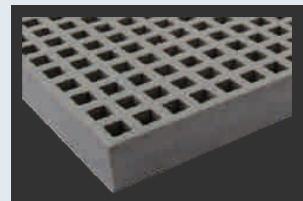
MICRO MESH

Mesh Size (mm)	Height (mm)	Bar Thickness (Top / Bottom)	Weight (kg/m ²)	Open Rate (%)
13X13 / 40X40	25	6.5/4.5/5.0	17.8	30
	30	6.5/4.5/5.0	18.8	30
	38	7.0/5.0	23.8	30



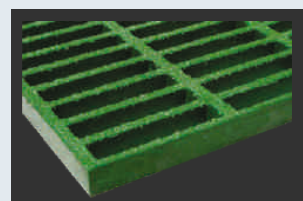
MINI MESH

Mesh Size (mm)	Height (mm)	Bar Thickness (Top / Bottom)	Weight (kg/m ²)	Open Rate (%)
19X19 / 38X38	25	6.5/5.0	16.8	30
	30	6.5/5.0	19.1	30
	38	6.5/5.0	23.5	30
26.X26 / 52X52	30	7.0/6.0	15.3	60
	38	6.0/5.0	19.5	60



RECTANGULAR MESH

Mesh Size (mm)	Height (mm)	Bar Thickness (Top / Bottom)	Weight (kg/m ²)	Open Rate (%)
25 X 100	25	7.0/5.5	13.0	67
	25	7.0/5.0	13.8	67
	25	9.5/8.0	19.5	52
	30	7.0/5.5	15.6	67
	38	8.0/6.0	22.5	62
	38	15.0/5.0	21.0	62
38 X 100	38	8.0/6.0	16.4	65
	50	8.0/5.0	15.3	62





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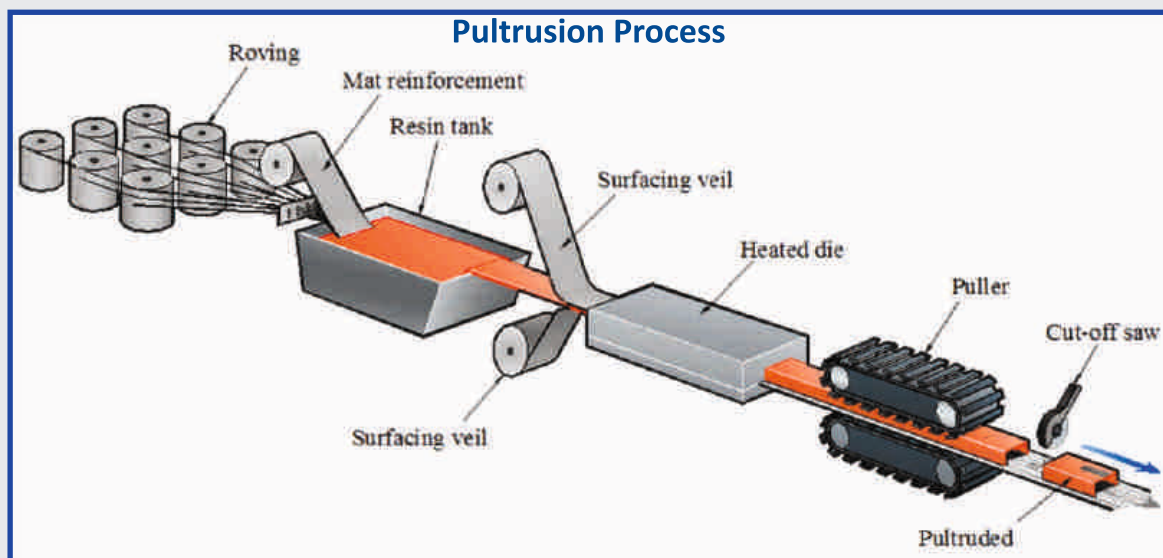
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FRP Pultruded Gratings

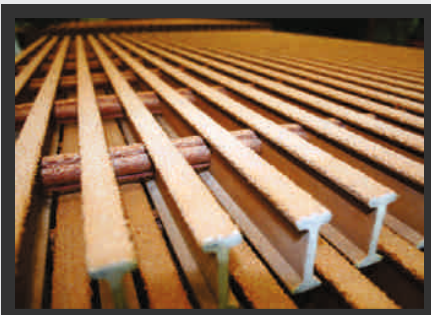
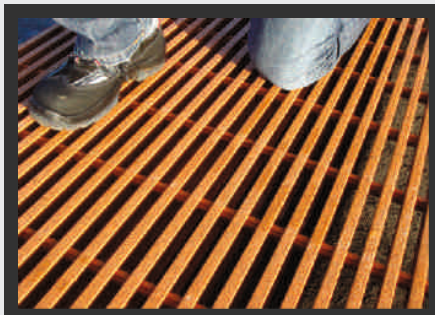
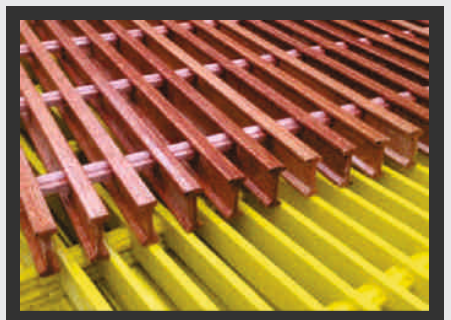
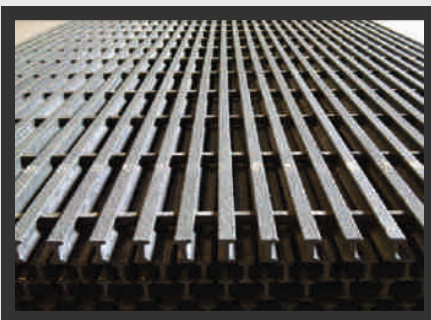
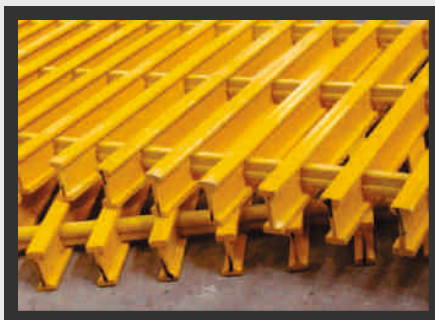
Ferrograte FRP Pultruded gratings are made by assembling FRP pultrusions which are manufactured with a high percentage of glass fiber roving soaked with resin and finally designed to desired shapes by heating and pultrusion.

Pultrusion is a continuous process in which the glass fibers, glass matting and a synthetic surface veil are literally “pulled” simultaneously through a polyester or vinyl ester resin bath. The desired geometric shape is formed as they are pulled through a heated steel die and as the composite hardens.

Pultruded gratings are light weight, strong, chemical and UV resistant with less maintenance. Pultruded gratings are well suited for highly corrosive environments and offers very high load bearing capacity.

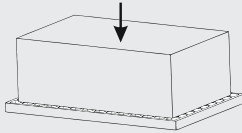


Pultruded Gratings



FRP Molded Gratings

Deflection sheet for uniformly distributed load (mm)



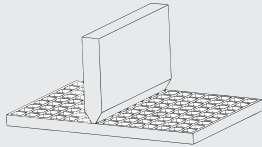
Testing principle : Measuring the deflection values of a specified testing sample with different uniform loads at different spans



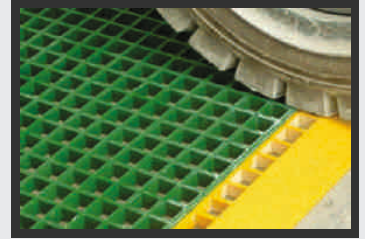
Span mm	Mesh Size mm	Height mm	Uniform load (kg/m ²)						
			200	400	600	800	1200	1600	2000
457	38.1x38.1	25	0.55	1.10	1.64	2.18	3.27	4.35	5.45
	19x19/38x38	25	0.40	0.80	1.20	1.59	2.38	3.17	3.96
	25.4x101.6	25	0.33	0.65	0.98	1.30	1.95	2.60	3.26
	38.1x38.1	30	0.31	0.63	0.94	1.25	1.87	2.49	3.11
	40x40 (Top 20x20)	30	0.24	0.48	0.72	0.96	1.44	1.92	2.40
	38.1x38.1	38	0.14	0.28	0.42	0.57	0.85	1.13	1.41
	38.1x101.6 (bearing bars to run length direction)	38	0.20	0.40	0.60	0.80	1.20	1.60	2.00
	40x40 (Top 20x20)	38	0.13	0.26	0.39	0.55	0.82	1.10	1.37
	38.1x38.1 (9/11.5)	50	/	0.14	0.20	0.27	0.40	0.53	0.67
	38.1x38.1 (5.8/9)	60	/	0.15	0.21	0.29	0.43	0.57	0.71
	38.1x38.1 (9/12)	60	/	0.10	0.15	0.20	0.30	0.41	0.51
610	38.1x38.1	25	1.18	2.35	3.53	4.70	7.05	9.40	11.75
	19x19/38x38	25	0.98	1.95	2.92	3.90	5.84	7.79	9.73
	25.4x101.6	25	0.91	1.83	2.74	3.65	5.47	7.30	9.11
	38.1x38.1	30	0.71	1.41	2.12	2.83	4.25	5.65	7.07
	40x40 (Top 20x20)	30	0.54	1.08	1.63	2.17	3.25	4.34	5.42
	38.1x38.1	38	0.31	0.62	0.93	1.24	1.87	2.49	3.11
	38.1x101.6 (bearing bars to run length direction)	38	0.45	0.91	1.36	1.82	2.72	3.63	4.54
	40x40 (Top 20x20)	38	0.29	0.57	0.85	1.13	1.70	2.27	2.83
	38.1x38.1 (9/11.5)	50	0.14	0.28	0.42	0.56	0.84	1.12	1.41
	38.1x38.1 (5.8/9)	60	0.15	0.30	0.45	0.60	0.90	1.20	1.50
	38.1x38.1 (9/12)	60	0.12	0.23	0.35	0.46	0.70	0.93	1.16
914	38.1x38.1	25	6.10	12.19	18.29	/	/	/	/
	19x19/38x38	25	5.45	10.89	16.33	/	/	/	/
	25.4x101.6	25	4.76	9.53	14.29	19.05	/	/	/
	38.1x38.1	30	3.53	7.06	10.59	14.12	/	/	/
	40x40 (Top 20x20)	30	3.04	6.09	9.14	12.18	18.28	24.38	/
	38.1x38.1	38	1.54	3.07	4.61	6.14	9.22	12.29	15.36
	38.1x101.6 (bearing bars to run length direction)	38	2.15	4.30	6.45	8.60	12.91	17.20	21.50
	40x40 (Top 20x20)	38	1.33	2.65	3.98	5.30	7.95	10.60	13.25
	38.1x38.1 (9/11.5)	50	0.44	0.89	1.33	1.78	2.67	3.56	4.45
	38.1x38.1 (5.8/9)	60	0.47	0.94	1.41	1.89	2.83	3.77	4.71
	38.1x38.1 (9/12)	60	0.31	0.62	0.93	1.24	1.87	2.49	3.11
1219	38.1x38.1	38	4.69	9.38	14.06	18.77	/	/	/
	25.4x158.4 (bearing bars to run length direction)	38	3.34	6.68	10.02	13.37	20.05	/	/
	38.1x101.6 (bearing bars to run length direction)	38	6.59	13.18	19.78	/	/	/	/
	40x40 (Top 20x20)	38	4.16	8.30	12.46	16.62	/	/	/
	38.1x38.1 (9/11.5)	50	1.37	2.73	4.10	5.47	8.21	10.94	13.68
	38.1x38.1 (5.8/9)	60	1.61	3.22	4.82	6.43	9.64	12.86	16.08
	38.1x38.1 (9/12)	60	0.96	1.91	2.87	3.83	5.74	7.65	9.57

FRP Molded Gratings

Deflection sheet for concentrated line load (mm)



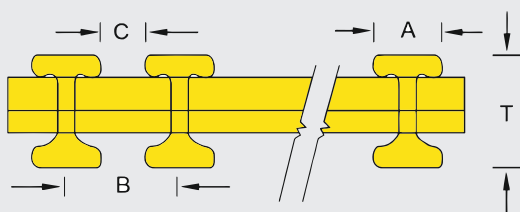
Testing principle : Measuring the deflection values of a specified testing sample with different concentrated line loads at different spans



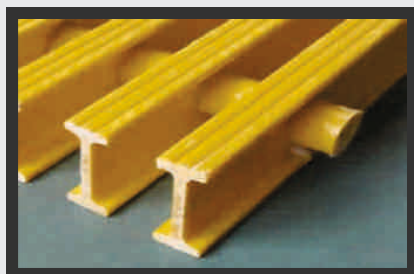
Span mm	Mesh Size mm	Height mm	Concentrated line load (kg/300mm)						
			100	200	400	600	800	1000	1500
457	38.1x38.1	25	1.83	3.66	7.31	10.97	/	/	/
	19x19/38x38	25	1.61	3.23	6.44	9.67	/	/	/
	25.4x101.6	25	1.42	2.84	5.68	8.53	/	/	/
	38.1x38.1	30	1.23	2.47	4.93	7.40	/	/	/
	20x20/40x40	30	1.13	2.25	4.49	4.15	5.54	6.93	10.39
	38.1x38.1	38	0.69	1.38	2.77	6.74	8.99	/	/
	38.1x101.6 (bearing bars to run length direction)	38	0.79	1.58	3.15	4.73	6.31	7.88	11.82
	20x20/40x40	38	0.62	1.24	2.49	3.72	4.97	6.20	9.30
	38.1x38.1 (9/11.5)	50	0.26	0.51	1.02	1.54	2.05	2.56	3.84
	38.1x38.1 (5.8/9)	60	0.27	0.54	1.08	1.62	2.16	2.70	4.04
	38.1x38.1 (9/12)	60	0.18	0.36	0.72	1.08	1.43	1.79	2.69
610	38.1x38.1	25	4.24	8.47	16.95	/	/	/	/
	19x19/38x38	25	3.91	7.82	15.65	/	/	/	/
	25.4x101.6	25	3.40	6.78	13.56	/	/	/	/
	38.1x38.1	30	3.18	6.35	12.75	/	/	/	/
	20x20/40x40	30	2.65	5.31	10.61	15.92	/	/	/
	38.1x38.1	38	1.62	3.24	6.47	9.71	12.95	/	/
	38.1x101.6 (bearing bars to run length direction)	38	1.91	3.81	7.63	11.44	15.25	/	/
	20x20/40x40	38	1.45	2.90	5.81	8.71	11.62	/	/
	38.1x38.1 (9/11.5)	50	0.38	0.77	1.54	2.31	3.08	3.85	5.77
	38.1x38.1 (5.8/9)	60	0.50	0.98	1.95	2.91	3.88	4.85	7.38
	38.1x38.1 (9/12)	60	0.27	0.54	1.07	1.61	2.14	2.68	4.01
914	38.1x38.1	25	14.74	/	/	/	/	/	/
	19x19/38x38	25	13.44	/	/	/	/	/	/
	25.4x101.6	25	13.06	/	/	/	/	/	/
	38.1x38.1	30	9.14	18.28	/	/	/	/	/
	20x20/40x40	30	7.95	15.90	/	/	/	/	/
	38.1x38.1	38	5.38	10.75	21.50	/	/	/	/
	38.1x101.6 (bearing bars to run length direction)	38	6.09	12.19	24.37	/	/	/	/
	20x20/40x40	38	4.81	9.62	19.24	/	/	/	/
	38.1x38.1 (9/11.5)	50	1.00	1.99	3.96	5.94	7.92	9.89	14.84
	38.1x38.1 (5.8/9)	60	1.14	2.28	4.57	6.85	9.14	11.43	17.14
	38.1x38.1 (9/12)	60	0.76	1.52	3.05	4.57	6.09	7.62	11.42
1219	38.1x38.1	38	10.33	20.68	/	/	/	/	/
	38.1x101.6 (bearing bars to run length direction)	38	10.88	21.78	/	/	/	/	/
	20x20/40x40	38	10.16	20.33	/	/	/	/	/
	38.1x38.1 (9/12)	50	3.69	7.39	14.78	22.20	/	/	/
	38.1x38.1 (5.8/9)	60	3.87	7.74	15.48	23.24	/	/	/
	38.1x38.1 (9/12)	60	2.59	5.19	10.37	15.58	20.77	/	/

FRP Pultruded Gratings

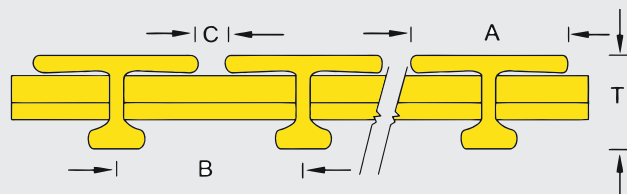
Grating Selection Table



I - Type



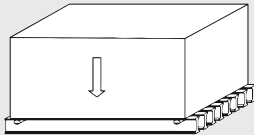
T - Type



Type	Height (mm) (T)	Top edge width (mm) (A)	Space between (mm) (B)	Clearance width (mm) (C)	Open area (%)	Estimated weight (kg/m ²)
I-4010	25	15	25	10	40	17.1
I-5010	25	15	30	15	50	14.2
I-6010A	25	15	38	23	60	11.2
I-6010B	25	8	19.8	11.8	60	12.2
I-4015	38	15	25	10	40	22
I-5015	38	15	30	15	50	19.1
I-6015	38	15	38	23	60	16.2
I-4012	30	15	25	10	40	18.8
I-5012	30	15	30	15	50	15.7
I-6012	30	15	38	23	60	12.6
I-40125	32	15	25	10	40	19.8
I-50125	32	15	30	15	50	17.4
I-60125	32	15	38	23	60	13.5
I-4020	50	15	25	10	40	28.5
I-5020	50	15	30	15	50	24.2
I-6020	50	15	38	23	60	20.1
T-1210	25	38	43.4	5.4	12	14.5
T-1810	25	38	50.8	9.5	18	13.8
T-2510	25	38	50.8	12.7	25	12.3
T-3310	25	41.3	19.7	61	33	11.2
T-3810	25	38	61	23	38	10.2
T-1215	38	38	43.3	5.2	12	19.6
T-2515	38	38	50.8	12.7	25	16.7
T-3815	38	38	61	23	38	14.2
T-3320	50	25.4	38.1	12.7	33	20.3
T-5020	50	25.4	50.8	25.4	50	15.7

FRP Pultruded Gratings

Deflection sheet for uniformly distributed load (mm)



Testing principle : Measuring the deflection values of a specified testing sample with different uniform loads at different spans



Span mm	Type	Uniform load (kg/m ²)						
		400	800	1200	1600	2000	2500	3000
457	I-40-25	0.12	0.23	0.34	0.45	0.56	0.70	0.84
	I-50-25	0.14	0.27	0.41	0.54	0.68	0.84	1.01
	I-60-25	0.17	0.34	0.51	0.68	0.84	1.05	1.27
	I-40-30	/	0.15	0.23	0.30	0.38	0.47	0.56
	I-50-30	/	0.18	0.27	0.36	0.45	0.56	0.68
	I-60-30	0.12	0.23	0.34	0.45	0.56	0.70	0.85
	I-40-38	/	/	0.12	0.16	0.20	0.25	0.30
	I-50-38	/	/	0.15	0.20	0.24	0.30	0.36
610	I-60-38	/	0.12	0.18	0.24	0.30	0.38	0.46
	I-40-25	0.36	0.71	1.06	1.42	1.77	2.22	2.66
	I-50-25	0.43	0.85	1.28	1.70	2.12	2.66	3.19
	I-60-25	0.53	1.06	1.60	2.13	2.66	3.32	3.98
	I-40-30	0.24	0.47	0.71	0.95	1.18	1.48	1.77
	I-50-30	0.28	0.57	0.85	1.13	1.42	1.77	2.13
	I-60-30	0.36	0.71	1.06	1.42	1.77	2.22	2.33
	I-40-38	0.13	0.25	0.38	0.51	0.63	0.79	0.95
	I-50-38	0.15	0.30	0.46	0.61	0.76	0.95	1.14
	I-60-38	0.19	0.38	0.57	0.76	0.95	1.19	1.42
914	I-33-50	0.12	0.23	0.35	0.46	0.58	0.72	0.87
	I-50-50	0.14	0.26	0.40	0.53	0.66	0.83	1.00
	I-50-25	1.62	3.23	4.84	6.46	8.08	10.09	12.11
	I-50-25	1.94	3.88	5.82	7.76	9.70	12.12	14.54
	I-60-25	2.42	4.84	7.26	9.69	12.11	15.13	18.16
	I-40-30	1.08	2.15	3.23	4.31	5.38	6.73	8.07
	I-50-30	1.29	2.59	3.88	5.17	6.46	8.08	9.70
	I-60-30	1.61	3.23	4.84	6.46	8.07	10.09	12.11
	I-40-38	0.58	1.15	1.73	2.31	2.88	3.61	4.33
	I-50-38	0.70	1.38	2.08	2.77	3.46	4.33	5.20
	I-60-38	0.87	1.73	2.60	3.46	4.32	5.40	6.49
	T-33-50	0.36	0.72	1.08	1.44	1.80	2.25	2.70
1219	T-50-50	0.48	0.96	1.44	1.92	2.40	3.00	3.60
	T-33-76	0.12	0.24	0.36	0.48	0.60	0.75	0.90
	I-50-76	0.16	0.32	0.48	0.64	0.80	1.00	1.20
	I-40-25	5.08	10.17	15.25	20.33	/	/	/
	I-50-25	6.10	12.20	18.30	24.40	/	/	/
	I-60-25	7.63	15.25	22.88	/	/	/	/
	I-40-30	3.39	6.78	10.17	13.56	16.95	21.18	/
	I-50-30	4.07	8.13	12.20	16.27	20.34	/	/
	I-60-30	5.08	10.17	15.25	20.33	/	/	/
	I-40-38	1.82	3.63	5.44	7.26	9.08	11.35	13.62
	I-50-38	2.18	4.36	6.54	8.71	10.89	13.62	16.34
	I-60-38	2.72	5.45	8.17	10.89	13.62	17.02	20.42
	T-33-50	1.08	2.18	3.27	4.36	5.46	6.82	8.19
	T-50-50	1.45	2.91	4.36	5.82	7.27	9.09	10.91
	T-33-79	0.36	0.73	1.09	1.45	1.82	2.27	2.73
	T-50-76	0.49	0.97	1.46	1.94	2.43	3.03	3.64



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FRP / GRP Ladders

Ferrograte FRP ladders are found throughout the world in a wide variety of applications and industries where safety, low maintenance costs, long life and easy installation is essential.

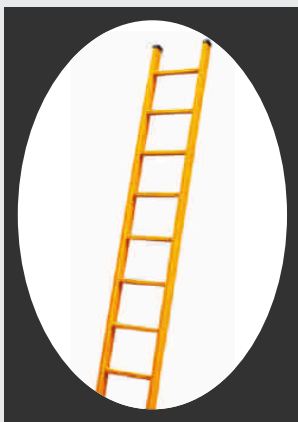
Unlike conventional ladders, fiberglass ladders are reliable, corrosion resistant, fire retardant, light weight, strong, durable, safe and easy to install. They are also maintenance free.

The most common categories of FRP ladders include :

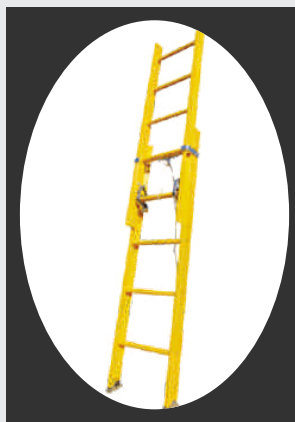
1. **Straight ladders** : We offer wide range of straight FRP ladders in modular kits for hassle-free installation. Ladders are available in standard heights with splicing kits for longer lengths as per the customer's requirement.
2. **Cage ladders** : Our caged FRP ladders are also supplied in handy modular kits for easy installation. Ladders are available in standard heights with splicing kits for longer lengths. Optional safety cage kits are designed with pre-drilled hoops for easy attachment.

Apart from these two types, we also supply various other types of FRP Ladders as displayed below :

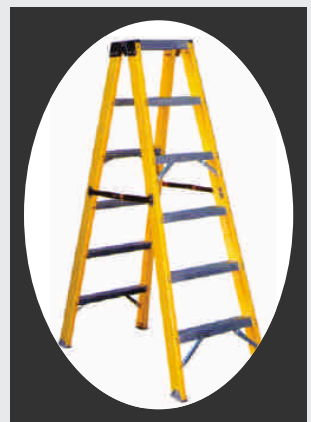
Types of FRP Ladders



Straight ladder



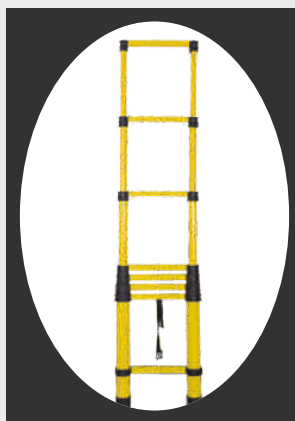
Sliding ladder



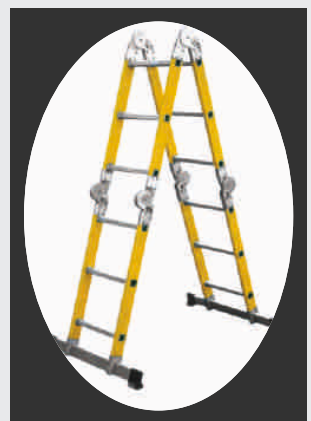
A-type ladder



Cage ladder



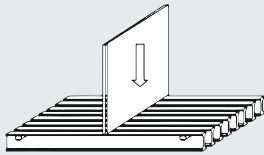
Telescopic ladder



Multipurpose ladder

FRP Pultruded Gratings

Deflection sheet for concentrated line load (mm)



Testing principle : Measuring the deflection values of a specified testing sample with different concentrated line loads at different spans



Span mm	Type	Concentrated line load (kg/300mm)							
		100	200	400	600	800	1200	1600	2000
457	I-40-25	0.39	0.76	1.52	2.27	3.03	4.54	6.05	7.56
	I-50-25	0.45	0.91	1.82	2.72	3.63	5.44	7.25	9.07
	I-60-25	0.57	1.14	2.27	3.40	4.54	6.80	9.07	11.34
	I-40-30	0.30	0.61	1.21	1.82	2.42	3.63	4.84	6.05
	I-50-30	0.36	0.73	1.45	2.18	2.90	4.35	5.80	7.26
	I-60-30	0.46	0.91	1.82	2.73	3.64	5.46	7.28	9.10
	I-40-38	0.15	0.28	0.55	0.81	1.09	1.63	2.17	2.70
	I-50-38	0.17	0.34	0.65	0.98	1.30	1.95	2.60	3.25
	I-60-38	0.20	0.41	0.81	1.22	1.62	2.43	3.25	4.05
610	I-40-25	0.80	1.60	3.20	4.81	6.39	9.55	12.75	/
	I-50-25	0.96	1.91	3.83	5.74	7.66	11.48	/	/
	I-60-25	1.20	2.40	4.79	7.18	9.57	14.35	/	/
	I-40-30	0.58	1.17	2.34	3.51	4.68	7.01	9.35	11.69
	I-50-30	0.70	1.40	2.80	4.21	5.61	8.41	11.22	/
	I-60-30	0.88	1.75	3.51	5.29	7.02	10.50	14.02	/
	I-40-38	0.31	0.60	1.20	1.80	2.40	3.59	4.78	5.97
	I-50-38	0.37	0.72	1.43	2.15	2.86	4.30	5.73	7.16
	I-60-38	0.45	0.90	1.80	2.69	3.58	5.37	7.16	8.95
	T-33-50	0.18	0.37	0.73	1.10	1.70	2.20	2.94	3.68
	T-50-50	0.25	0.50	1.00	1.50	2.00	3.00	4.00	5.00
914	I-40-25	2.54	5.08	10.16	15.24	20.31	/	/	/
	I-50-25	3.05	6.09	12.19	18.28	/	/	/	/
	I-60-25	3.81	7.62	15.23	22.85	/	/	/	/
	I-40-30	1.70	3.39	6.77	10.16	13.54	20.31	/	/
	I-50-30	2.03	4.06	8.13	12.19	16.25	24.37	/	/
	I-60-30	2.54	5.08	10.16	15.23	20.31	/	/	/
	I-40-38	0.91	1.81	3.63	5.44	7.25	10.88	14.51	18.13
	I-50-38	1.09	2.18	4.35	6.53	8.70	13.06	17.41	21.76
	I-60-38	1.36	2.72	5.44	8.16	10.88	16.32	21.76	/
	T-33-50	0.58	1.16	2.32	3.48	4.64	6.96	9.28	11.60
	T-50-50	0.77	1.55	3.09	4.64	6.19	9.28	12.37	15.47
	T-33-76	0.19	0.39	0.77	1.16	1.55	2.32	3.09	3.87
	T-50-76	0.26	0.52	1.03	1.55	2.06	3.09	4.12	5.16
1219	I-40-25	5.35	10.70	21.40	/	/	/	/	/
	I-50-25	6.42	12.80	25.68	/	/	/	/	/
	I-60-25	8.13	16.27	32.53	/	/	/	/	/
	I-40-30	3.59	7.18	14.35	21.53	/	/	/	/
	I-50-30	4.28	8.56	17.12	25.68	/	/	/	/
	I-60-30	5.35	10.70	21.40	/	/	/	/	/
	I-40-38	1.91	3.82	7.65	11.47	15.30	22.95	/	/
	I-50-38	2.30	4.60	9.20	13.81	18.42	27.62	/	/
	I-60-38	2.87	5.74	11.48	17.22	22.96	/	/	/
	T-33-50	1.15	2.30	4.60	6.90	9.20	13.81	18.42	23.02
	T-50-50	1.53	3.07	6.14	9.21	12.28	18.42	24.55	/
	T-33-76	0.38	0.77	1.53	2.30	3.07	4.60	6.14	7.67
	T-50-76	0.51	1.02	2.05	3.07	4.09	6.14	8.18	10.23



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FRP / GRP Handrails

Ferrograte FRP Handrails are assembled using FRP pultrusions, SMC connectors and stainless-steel fasteners. They have extraordinary mechanical properties like high corrosion resistance, impact resistance, light weight, easy to install and easy to maintain.

Ferrograte offers two types of handrail systems : square tube handrail and round tube handrail system. The various components of a handrail system are - vertical post, top rail, mid rail, toe plate, base plate and connectors. Our handrails can be customized according to the customer's requirement.

Type of FRP Handrails

SQUARE TUBE HANDRAILS - Our pultruded square tube guardrail system includes everything that is needed to install OSHA and IBC compliant horizontal and inclined railing systems with either two or three rails. We also provide specialty picketed guardrail systems.

ROUND TUBE HANDRAILS - Our round tube UV-coated guardrail solution was designed as a more durable alternative to standard steel and aluminum round railings. These type of handrails are used in various applications where safety and ergonomics play a major concern. Round rails eliminate the flat surfaces of square tube systems which can become a resting place for tools and other equipment, creating potentially hazardous situations for dropping/falling objects. The rounded railings eliminate sharp edges, providing a more comfortable grip for end-users. In addition, the overall appearance of the system is more aesthetically pleasing than the square tube alternative because all fasteners are hidden which provides a smooth and clean look. We also provide customized round tube guardrail systems based upon the customer's requirement.





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FRP / Pultruded Gratings

As the name implies, FRP Pultruded structures are manufactured by using continuous pultrusion process. The process of drawing fiberglass mat roving through a resin bath yields almost all profile shapes which are most commonly used in structural constructions.

Our wide range of pultruded profiles can be assembled to form an entire structure made out of FRP. The production range starts from a 50x50 square shaped section up to a large 200x200 H shaped section. They are rigid, light weight, corrosion resistant, reliable and highly safe.



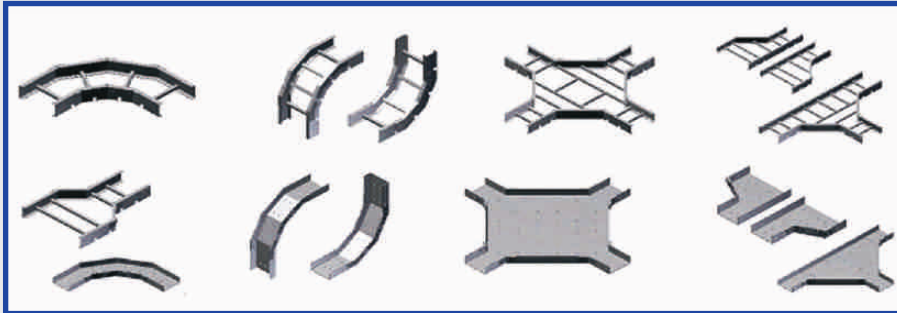
FRP / Cable Management System

Standards

- IS 6746-1994 Specs for unsaturated polyester resin system
- NEMA FG-1 1984-1993 for low pressure fiber reinforced plastic cable tray systems
- Loading characteristics IS 6746 Appendix K/UL 94 Flame retardant (Low flammability)

Fittings and Accessories

Ferrograte cable tray systems are supplied with complete fittings and accessories like tees, cross, reducers etc. Some of the fittings are listed below.



Grating Clamps

Ferrograte manufactures and supplies the Grating fixing clamps in :

- Mild Steel, Hot dip Galvanized finish - Suitable for fixing Mild Steel Galvanized Gratings
- Stainless Steel ANSI 304 or 316 Clamp - Suitable for fixing SS, Aluminum and FRP/GRP Gratings

We have designed an universal grating clamp, which is suitable to fix gratings from 25mm up to 60mm depth and suitable for variety of pitches.

Our Grating clamp comprises of :

- Pressed clamp plate (Bottom plate)
- M Type Saddle clip
- M8 x 70mm bolt and nut





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FRP / Cable Management System

Ferrogate FRP cable tray systems are ideal for locations where metallic systems get corroded easily. Our FRP cable trays meet the stringent fire retardant requirements with good electrical insulation and low thermal conductivity.

Resin Selection

Resin type	Resin base	Description	Flame spread rating ASTM E84
Type IFR	Isophthalic Polyester	Industrial Grade corrosion resistance & fire retardant	Class 1, 25 or less
Type I	Isophthalic Polyester	Industrial Grade corrosion resistance in acidic environment	Non fire retardant
Type V	Vinyl Ester	Superior corrosion resistance & fire retardant	Class 1, 25 or less

Types Available

Perforated type cable tray system

Width (mm)	Height (mm)	Thickness (mm)	Length (mm)	Resin Type
50	25 / 30 / 50 / 100	2mm to 4mm	3000	Polyester / Vinyl Ester
75				
100				
150				
225				
300				
450				
600				

Ladder type cable tray system

Width (mm)	Height (mm)	Thickness (mm)	Length (mm)	Resin Type
150	50 / 75 / 100 / 150 / 200	2mm to 4mm	3000	Polyester / Vinyl Ester
300				
450				
600				
750				
900				



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Our Projects



Mineral company, Tuticorin, India



Solar plant, Bosch, India



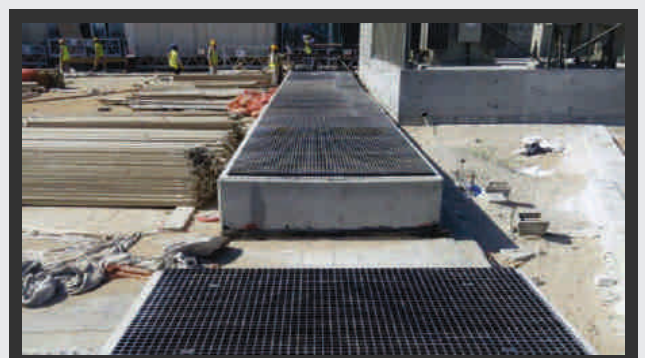
Marina Mall, Dubai, UAE



Tuas Desalination Plant, Singapore



Barka IWP Project, Oman



Oberoi Hotel, Ajman, UAE



Ghubra Water Power Plant, Oman

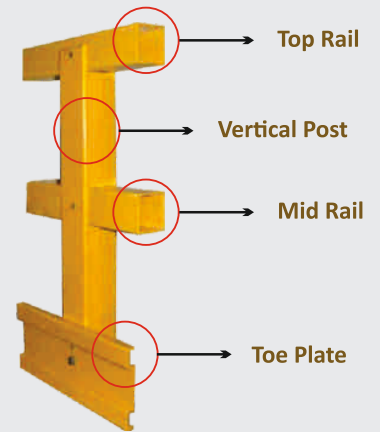


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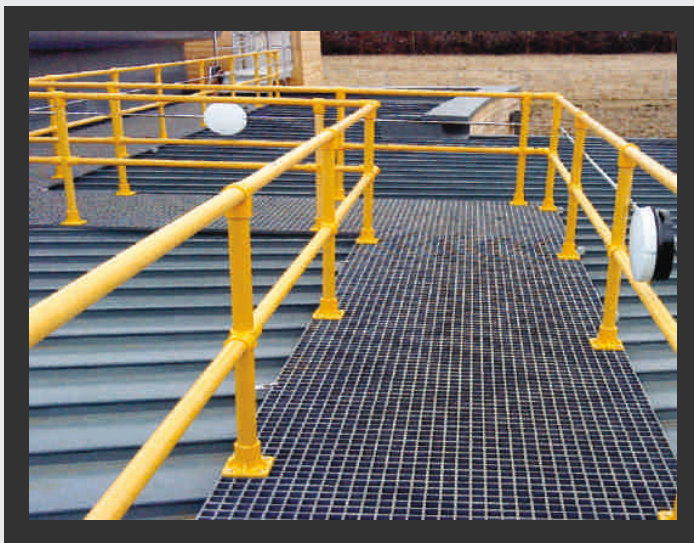
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FRP / GRP Handrails

FRP Square tube handrail system

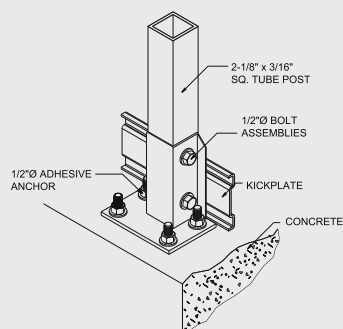


FRP Round tube handrail system

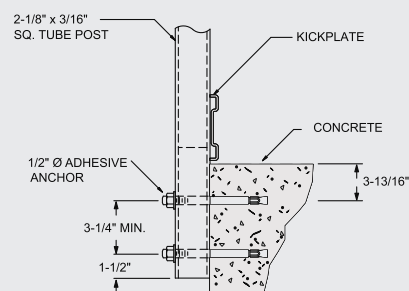


Installation of Handrails

Top Mounted Handrail



Side Mounted Handrail



Ergonomic Top rail



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Other FRP Products

FRP for Construction works



FRP Sectional water tank



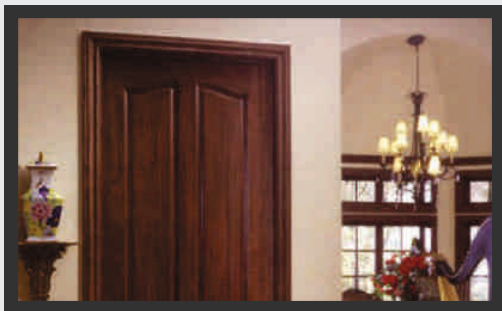
FRP Embedded angle



FRP Stair tread



FPR rebars



FRP doors



FRP Manhole cover



FRP gutters