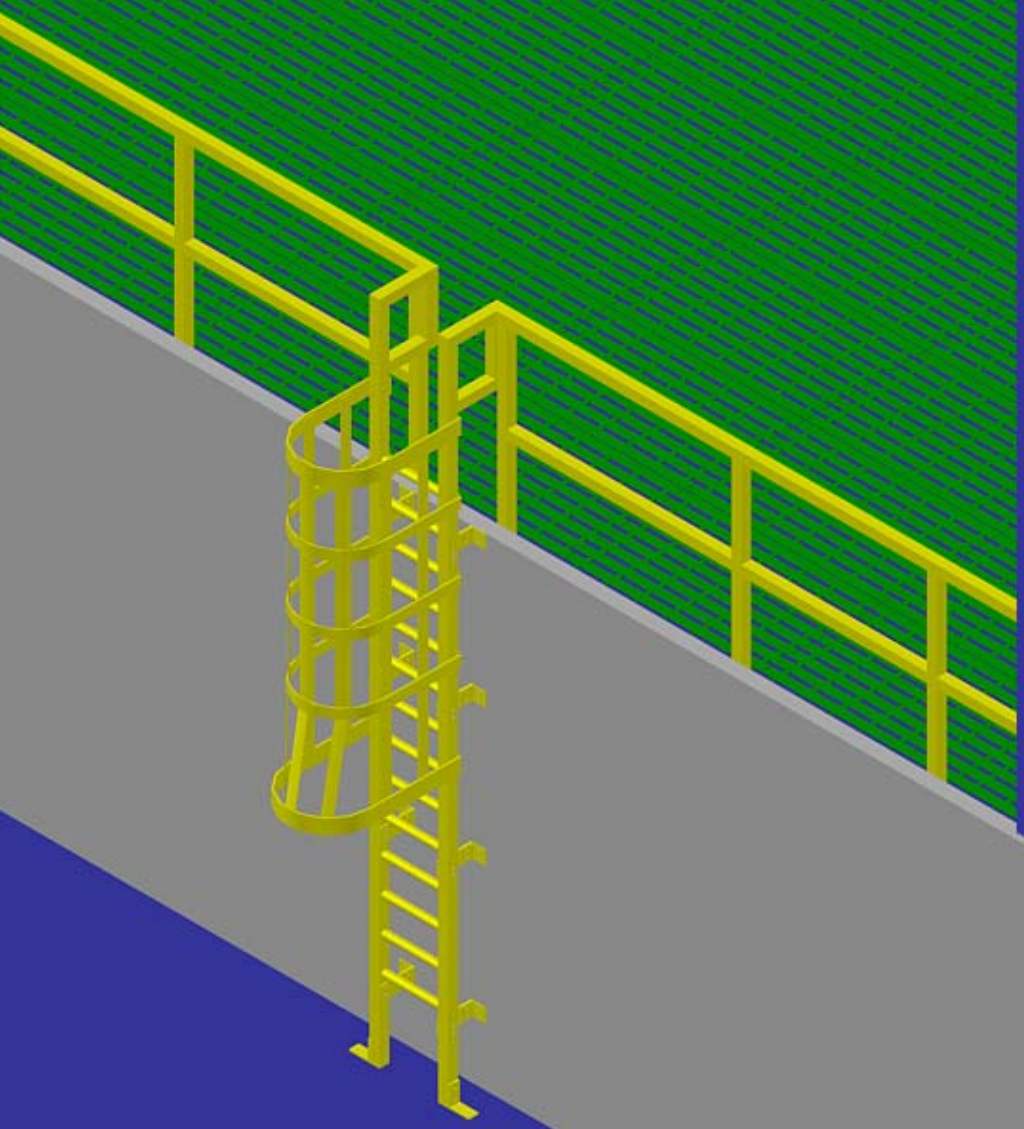
Fiberglass Molded & Pultruded Gratings

Fiberglass Handrails

Fiberglass Cat Ladders

Fiberglass Decking

MinGrate
MinRail
MinLadder
MinPlank



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Power Plastic Rubber Co Ltd (PPR) designs, engineers, and fabricates complete fiberglass structures that incorporate several fiberglass products. PPR has the capability to engineer and fabricate structures that range from tank loading and walkway platforms to handrails and ladders. Designs fully utilize the unique strengths and economies of fiberglass reinforced polymer (FRP) structural shapes. Combining advanced design concepts, automated fabrication, and specialized technical assistance MinGrate provides corrosion resistant FRP structures with life cycle cost advantages over protected metal structures.

All MinGrate®, MinRail & MinLadder fiberglass products are available as individual components or incomplete systems fabricated and designed on state-of-the-art CAD equipment. Buyers and specifiers also receive the benefits of assistance from Mins' highly competent and experienced sales and service personnel.

Application for FRP materials

MinGrate® FRP products deliver values to various industries including:

Chemical	Food & Beverage
Pulp & Paper	Water & Wastewater Treatment
Refining	Metal Treatment
Mining	Electronics
Marine & Offshore	Fertilizer

Typical Uses for MinGrate@ Grating

Walkways	Catwalks
Stairs	Platforms
Trench covers	Ramps
Assembly lines	Flooring

Resin Systems / Corrosion Protection

PPR'S fiberglass gratings and products are furnished in four fire retardant resin systems, each providing a different level of corrosion protection.

Vinyl ester (V) products provide the highest level of corrosion protection and demonstrate better retention of structural properties at elevated temperatures.

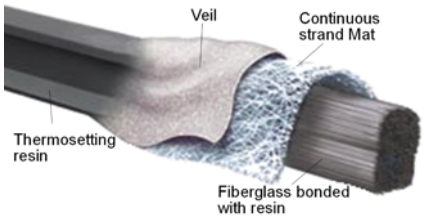
Isophthalic polyester (I) is a premium grade resin providing outstanding corrosion resistance for splash and spill exposures in moderate temperature conditions. Polyester materials are typically lower in cost than vinyl ester products.

Phenolic (P) materials offering superior resistance to high temperature with low smoke and toxic fume emission. The nonflammable nature of phenolic enable phenolic grating to withstand higher temperatures than traditional FRP products for extended periods of time without major structural damage.

Orthophthalic polyester (O) materials have fair corrosion resistance and are the lowest cost, but are the least recommended for extremely corrosive conditions

Resin Type	Resin base	Description	Corrosion Resistance	Flame Spread Rating ASTM E84	Standard Colors
VEFR-25	Vinyl Ester	Superior Corrosion Resistance and Fire Retardant	Excellent	Class 1, 25 or less	Dark Gray, Orange
VEFR-10	Vinyl Ester	Superior Corrosion Resistance and Enhanced Fire Retardant	Excellent	Class 1, 10 or less	Dark Gray
IFR-25	Isophthalic Polyesater	Industrial Grade Corrosion Resistance and Fire Retardant	Very Good	Class 1, 25 or less	Dark Gray, Green
IFR-10	Isophthalic Polyesater	Industrial Grade Corrosion Resistance and Extra Fire Retardant	Very Good	Class 1, 10 or less	Custom
IFGR-30	Isophthalic Polyesater	Food Grade Corrosion Resistance and Fire Retardant	Very Good	Class 1, 30 or less	Light Gray and Light Green
OFR-25	Orthophthalic polyester	Moderate Corrosion Resistance and Fire Retardant	Moderate	Class 1, 25 or less	Green, Yellow, Light Gray, Dark Gray
MP-5	Phenolic	Low Smoke and Superior Fire Resistance	Very Good	Class 1, 5 or less	Reddish Brown, Phenolic Painting of the grating can be performed to obtain a gray or red finish
O-CR	Orthophthalic polyester	Moderate Corrosion Resistance	Moderate	No.	Green, Yellow Light Gray, Dark Gray

Pultruded profiles for grating, handrail and ladder produced by the pultrusion process are a composite of fiberglass reinforcements (fiberglass roving and strand mat) and a thermosetting resin system as well as a synthetic surface veil to enhance protection against ultraviolet ray exposure and corrosion resistance. It also provides unequaled strength and corrosion resistance.



The densely packed core of fiberglass roving gives the profiles strength and stiffness in the longitudinal direction while the continuous strand mat provides strength in the transverse direction and prevents chipping, cracking and lineal fracturing.

Fire Resistance

MinGrate® fiberglass grating & other FRP products — A Class 1 flame spread rating of 25 or less when tested in accordance with ASTM E-84.

Slip Resistance

For molded grating the concave shaped top surface provides very good and durable slip resis-tance. Incorporating grit particles in the top surfaces of MinGrate® grating develops enhanced slip resistant surfaces particularly in oily environments. For conditions with unusually high abrasion, a gritted top surface is available for pultruded MinGrate® sections and molded gratings. The slip resistant benefit of fiber-glass grating offers excellent protection against slips and falls.

Impact Resistance

No permanent deformation on MinGrate® gratings. Once the object is removed, gratings will fully recover to the original state but metallic gratings which may remain deformation and need to replace.

Non-Conductive

FRP grating is ideally suitable for electrical hazardous areas for platform, flooring, fence, etc. due to the non-conductive properties.

UV Protection

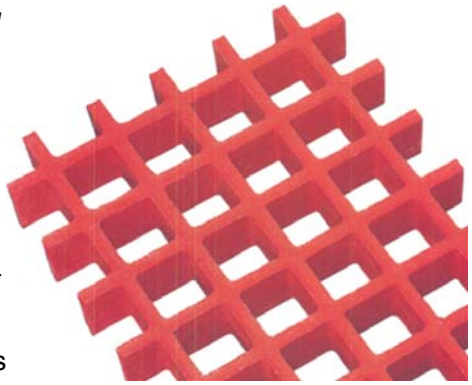
For extended service life in exterior applications, both molded, pultruded grating and profiles are manufactured with UV inhibitors in the resin system.

In-Use Maintenance (Cleaning)

MinGrate® FRP grating is generally maintenance free. Periodic cleaning to remove build up of debris and foreign materials is recommended and can be accomplished usually with water, detergents and high pressure sprays. For food grade applications, MinGrate® can handle the abuse from frequent cleanings required by the process, Attachments connecting grating to supports

MinGrate® Range

Molded Grating

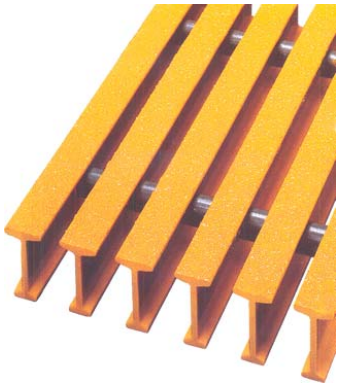


The interwoven square mesh construction for MinGrate® molded grating results in bi-directional strength. This design, in some cases, eliminates the need for extra structural supports at cut edges that can be required for rectangular mesh construction.

This can be particularly important in complex process areas that have a large number of openings and penetrations.

Pultruded Grating

A thermosetting resin system is produced by the pultrusion process, manufacturing many of the outstanding characteristics of the gratings.



The higher glass to resin ratio of pultruded grating results in sections with higher structural properties than molded sections of similar depth and weight. Because of longer span capability, support structures can be reduced, resulting in lower total cost when using pultruded grating instead of molded. To significantly reduce scrap and thereby lower cost, pultruded gratings can be manufactured in custom lengths and widths for large projects.

Molded or Pultruded Grating

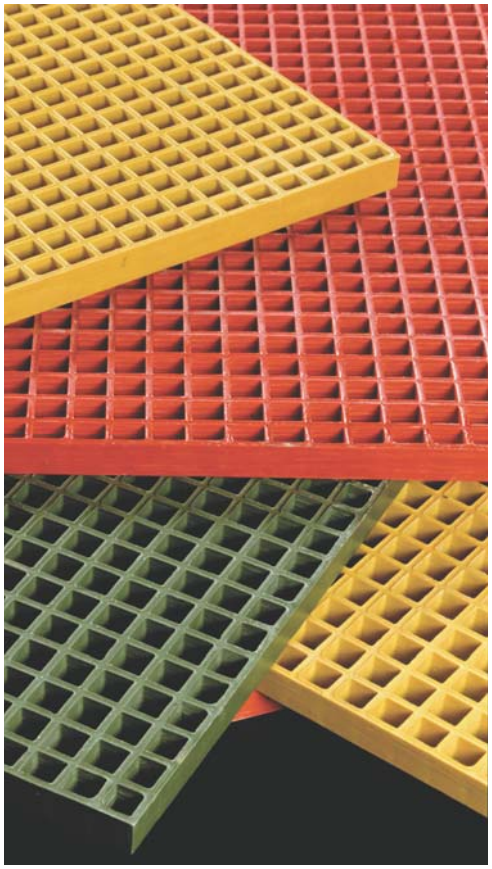
	Molded	Pultruded
Corrosion Protection	Excellent	Good
Light weight VS. steel	Excellent	Excellent
Load/Span Capacity	Good	Excellent
Unidirectional loads	Good	Excellent
Bidirectional loads	Excellent	Fair
Impact resistance	Excellent	Good
Range of sizes	Good	Excellent
Ease of layout & installation	Excellent	Good
Open area flooring	Excellent	Excellent

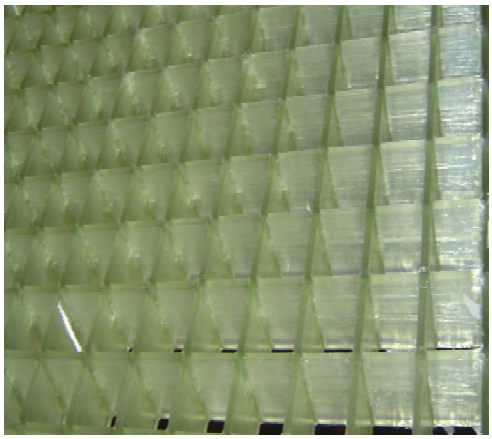
These comparisons are for general guidelines only. Please contact Gentle Glory discuss regarding specific applications

MinGrate® Molded Grating

MinGrate® molded fiberglass grating is a one-piece, reinforced FRP grating, available in various meshes and manufactured by interweaving continuous, thoroughly wetted, fiberglass strand with thermosetting resin systems. Standard panels are available in four resin systems, Isophthalic Polyester (I), Vinyl Ester (V), Orthophthalic (O), Phenolic (P).

MinGrate® molded grating is widely used for floor systems, walkways, work platforms, stairs, ramps, trench covers & catwalks and has been successfully used in many industries – including food processing, beverage, chemical processing, water & wastewater treatment, metal finishing, pulp/paper, transportation, pharmaceutical, textile, oil / gas & mining / smelting, refining.

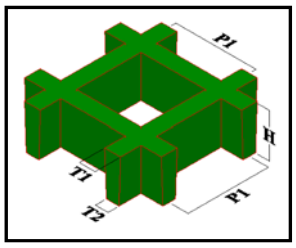




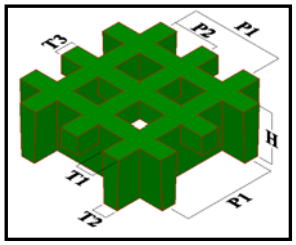
Features and Advantages	
CORROSION RESISTANCE	For highly aggressive environments, MinGrate vinyl-ester resin system (VEFR) is recommended. Unlike metal grating, it does not rust and never needs painting. Combined with superior corrosion resistance, mean that MinGrate is a long-lasting, maintenance-free product.
SAFETY	The top surface of MinGrate Molded Grating is meniscus (concave) to provide outstanding skid resistant, with optional grit top surface to have betterment in anti-skid, especially for wet environment.
FIRE RETARDANCY	MinGrate Molded Grating is available in eight standard resin systems, in which six of them meet the Class 1 flame spread rating of 25 or less, per ASTM E-84.
LOW MAINTENANCE	Never rusts – never needs painting. And it's very easy to clean
EASE OF FABRICATION	It is easy to cut with ordinary hand tools, using a masonry, carbide tip blade or diamond edge. (it is similar to working with wood or plastic.)

MinGrate® Molded Grating

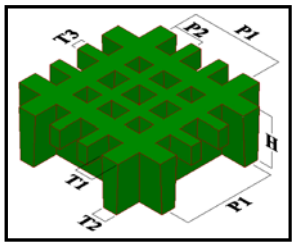
Specification of Molded Grating



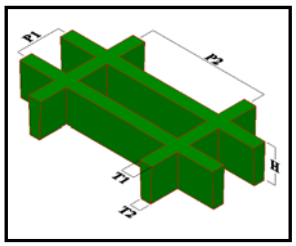
Type	Height	Mesh		Bar Thickness (mm)			Max. Panel		Open Area	kg/m²
		P1	P2	T1	T2	T3	Width	Length		
MS-05015	12.7	38.1		5.8	5		1219	3962	78%	6.02
MS-05020	12.7	50.8		7	6		1219	3658	82%	5.82
MS-08015	20.6	38.1		6	5		1219	3962	65%	9.79
MS-10015	25.4	38.1		6.4	5		1219	3962	68%	12.28
MS-10020	25.4	50.8		7.5	6		1219	3658	80%	11.69
MS-11815	30.2	38.1		6.5	5		1219	3962	68%	14.58
MS-11815H	30.2	38.1		10.5	9		1219	3658	58%	25.00
MS-15015	38.1	38.1		7	5		1524	3962	68%	19.52
MS-20015	50.8	38.1		11	9		1219	3962	56%	41.98
MS-20020	50.8	50.8		8	6		1524	3962	78%	23.68
MS-23815	60.3	38.1		11.5	9		1219	3962	54%	50.40



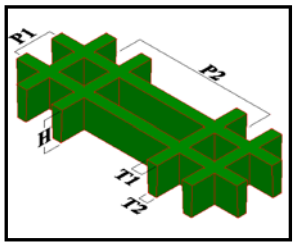
Type	Height	Mesh		Bar Thickness (mm)			Max. Panel		Open Area	kg/m²
		P1	P2	T1	T2	T3	Width	Length		
MD-10015	25.4	38.1	19.1	6.5	5	6.5	1219	3962	40%	16.78
MD-118157	30.2	39.5	19.8	6.5	5	6.5	1219	3962	42%	18.01
MD-15015	38.1	38.1	19.1	7	5	7	1524	3962	40%	23.49
MD-20020	50.8	50.8	25.4	8	6	8	1524	3962	55%	28.48



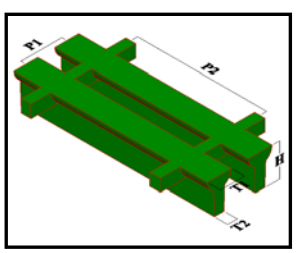
Type	Height	Mesh		Bar Thickness (mm)			Max. Panel		Open Area	kg/m²
		P1	P2	T1	T2	T3	Width	Length		
MT-11805	30.2	38.1	12.7	7.5	6	4.5	1219	3962	30%	22.02



Type	Height	Mesh		Bar Thickness (mm)			Max. Panel		Open Area	kg/m²
		P1	P2	T1	T2	T3	Width	Length		
MR-1001040-1	25.4	25.4	101.6	7	5.5		914	3048	67%	13.01
MR-1001040-2	25.4	25.4	101.6	9.5	8		1219	3658	52%	19.52
MR-1181040	30.2	25.4	101.6	7	5.5		914	3048	67%	15.61
MR-1501020	38.1	25.4	50.8	11	9		1219	3658	48%	30.29
MR-1501040	38.1	25.4	101.6	8	6		1219	3658	62%	22.51
MR-1501060	38.1	25.4	152.4	8.5	6		1219	3658	63%	22.51
MR-1501540	38.1	38.1	101.6	8	6		1219	3658	65%	16.39
MR-1501560	38.1	38.1	152.4	8	6		1219	3658	67%	15.90
MR-2001020	50.8	25.4	50.8	12.2	9		1219	3658	48%	41.00

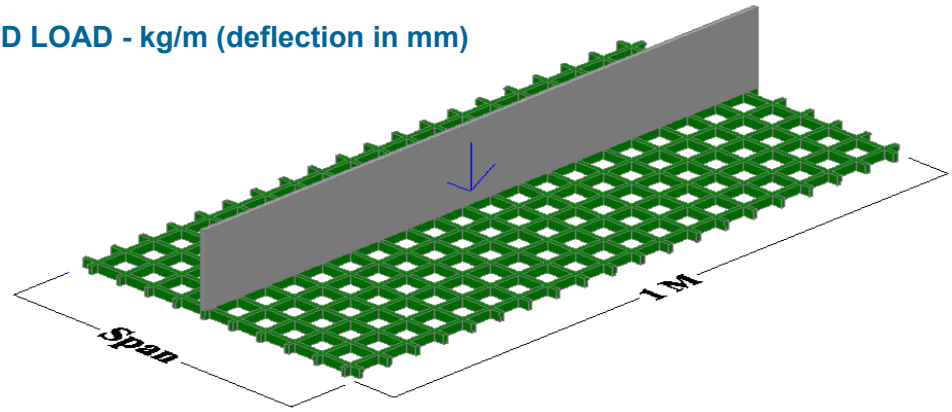


Type	Height	Mesh		Bar Thickness (mm)			Max. Panel		Open Area	kg/m²
		P1	P2	T1	T2	T3	Width	Length		
MRT-1501060	38.1	25.4	152.4	7	5		559	3048	56%	23.00
MRT-1501560	38.1	38.1	152.4	7	5		584	3658	56%	16.98



Type	Height	Mesh		Bar Thickness (mm)			Max. Panel		Open Area	kg/m²
		P1	P2	T1	T2	T3	Width	Length		
MRP-1501040	38.1	25.4	101.6	15	5		1219	3658	46%	20.99
MRP-1501560	38.1	38.1	152.4	15	8		1219	3658	60%	18.59
MRP-2001540	50.8	38.1	101.6	8	5		1219	3658	62%	15.31

CONCENTRATED LOAD - kg/m (deflection in mm)



MS-10015

SPAN \ Def	kg/m					
	75	150	300	450	600	750
450	0.559	1.146	2.159	3.073	4.115	4.75
600	0.864	1.702	3.505	5.156	6.706	8.179
900	2.896	5.918	12.116	18.44	--	--
1200	5.715	11.633	--	--	--	--

MS-15015

SPAN \ Def	kg/m					
	75	150	300	450	600	750
300	0.279	0.356	0.483	0.61	0.762	0.889
600	0.356	0.66	1.245	1.85	2.464	3.073
900	0.864	1.803	3.683	5.563	7.417	9.296
1200	2.261	4.749	9.677	14.63	19.583	--

MS-20020

SPAN \ Def	kg/m					
	75	150	300	450	600	750
300	0.279	0.305	0.406	0.483	0.636	1.041
600	0.356	0.508	0.813	1.128	1.753	3.327
900	0.508	1.118	2.235	3.2	5.156	10.058
1200	0.914	1.93	3.937	5.918	9.957	--

MR-1001040-1

SPAN \ Def	kg/m					
	75	150	300	450	600	750
300	0.33	0.483	0.737	0.991	1.27	1.52
600	0.864	1.727	3.454	5.182	6.909	8.636
750	1.397	2.718	5.105	7.163	9.55	11.938
900	2.413	4.724	8.814	12.369	16.51	20.625

MS-11815

SPAN \ Def	kg/m					
	75	150	300	450	750	1500
300	<0.254	<0.254	0.254	0.508	0.762	1.524
450	0.254	0.508	1.016	1.524	2.54	--
600	0.508	1.27	2.286	3.556	5.842	--
750	1.27	2.54	4.826	7.366	12.446	--
900	1.778	3.81	7.62	11.43	--	--

MS-08015

SPAN \ Def	kg/m				
	75	150	300	450	750
300	0.254	0.508	1.016	1.524	2.54
450	0.762	1.524	3.302	4.826	8.128
600	1.778	3.81	7.62	11.176	--
750	2.794	5588	11.43	--	--
900	5.334	10.668	--	--	--

MR-1501020

SPAN \ Def	kg/m					
	300	750	1500	3000	4500	6000
300	<.25	<.25	0.254	0.762	1.016	1.524
450	<.25	0.508	1.016	1.778	2.794	3.81
600	0.508	1.016	2.286	4.318	6.604	8.636
750	0.762	2.032	4.318	8.636	--	--
900	1.524	3.556	7.112	--	--	--
1050	2.286	5.588	11.176	--	--	--

MR-2001020

SPAN \ Def	kg/m					
	300	750	1500	3000	4500	6000
300	<.25	<.25	0.254	0.508	0.508	0.762
450	<.25	0.254	0.508	1.016	1.524	2.032
600	0.254	0.508	1.27	2.286	3.556	4.826
750	0.508	1.27	2.286	4.572	7.112	9.398
900	0.762	20.32	4.064	8.128	12.912	--
1050	1.27	3.302	6.35	12.7	--	--

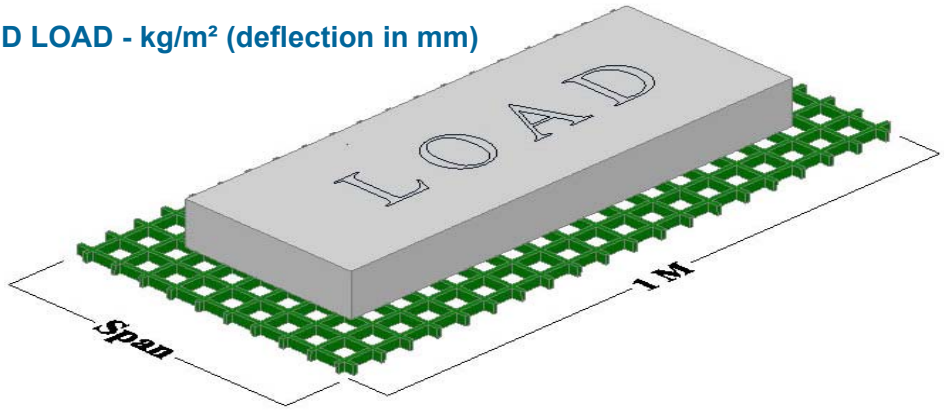
MR-1001040-2

SPAN \ Def	kg/m					
	75	150	300	450	600	750
300	<0.254	0.254	0.762	1.016	1.27	1.524
450	0.508	0.762	1.778	2.54	3.302	4.318
600	0.762	1.778	3.556	5.08	6.858	--
750	1.524	3.048	6.096	9.144	11.938	--
900	2.286	4.826	9.65	--	--	--
1050	3.556	7.112	--	--	--	--
1200	5.08	10.16	--	--	--	--

MR-1501060

SPAN \ Def	kg/m					
	150	300	450	750	1000	1500
300	0.33	0.6096	0.889	1.4224	1.9812	2.4638
450	0.5588	0.9652	1.3208	1.9812	2.7178	3.3528
600	0.7874	1.3208	1.8034	2.794	4.0132	5.1054
750	1.0668	1.9558	2.8194	4.572	6.5532	8.4328
900	2.0828	2.8956	4.6228	6.477	9.3218	12.09
1050	2.4384	4.3434	6.477	10.744	--	--
1200	2.9464	5.7658	8.5598	--	--	--

UNIFORM DISTRIBUTED LOAD - kg/m² (deflection in mm)



MS-10015

SPAN \ Def	kg/m²					
	240	480	980	1450	2450	3650
450	0.66	1.092	1.93	2.769	4.47	6.579
600	1.118	2.108	4.14	6.172	10.211	15.265
750	2.667	5.387	10.82	16.28	--	--
900	5.537	11.176	21.717	--	--	--

MS-15015

SPAN \ Def	kg/m²					
	240	480	980	1450	2450	3650
300	0.254	0.305	0.381	0.457	0.635	0.838
600	0.432	0.813	1.549	2.311	3.8354	5.74
900	1.702	3.454	6.959	10.465	17.475	--
1200	5.969	12.167	24.511	--	--	--

MS-20020

SPAN \ Def	kg/m²					
	240	480	980	1450	2450	3650
300	0.254	0.279	0.33	0.381	0.483	0.737
600	0.381	0.584	0.965	1.372	2.134	4.115
900	1.194	2.108	3.937	5.766	9.449	18.593
1200	2.413	4.928	9.957	14.961	--	--

MR-1001040-1

SPAN \ Def	kg/m²					
	240	480	980	1450	2450	3650
300	0.279	0.381	0.533	0.711	1.041	--
600	0.914	1.854	3.683	5.537	9.22	--
900	3.632	6.6	12.572	18.542	--	--
1050	8.007	14.884	--	--	--	--

MS-11815

SPAN \ Def	kg/m²					
	350	500	750	1000	1500	2500
300	<.254	<.254	<.254	<.254	<.254	0.508
450	0.254	0.508	0.762	1.016	1.524	2.286
600	1.016	1.524	2.286	2.794	4.318	7.366
750	2.54	3.81	5.842	7.62	11.684	--
900	4.572	7.112	10.668	--	--	--

MS-08015

SPAN \ Def	kg/m²					
	350	500	750	1000	1050	2500
300	<0.254	0.254	0.508	0.508	1.016	1.524
450	1.016	1.524	2.286	3.048	4.572	7.62
600	3.084	4.572	7.112	9.398	--	--
750	5.842	8.89	--	--	--	--
900	--	--	--	--	--	--

MR-1501020

SPAN \ Def	kg/m²					
	1000	2000	2500	3000	3500	4000
300	<.25	<.25	<.25	<.25	<.25	<.25
450	<.25	0.254	0.508	0.508	0.508	0.762
600	0.508	1.016	1.27	1.524	2.032	2.286
750	1.27	2.794	3.302	4.064	4572	5.334
900	2.54	5.334	6.604	7.874	9.398	10.66
1050	4.826	9.906	12.192	--	--	--

MR-2001020

SPAN \ Def	kg/m²					
	1000	2000	2500	3000	3500	4000
300	<.25	<.25	<.25	<.25	<.25	<.25
450	<.25	0.254	0.254	0.254	0.254	0.208
600	0.254	0.508	0.762	1.016	1.016	1.27
750	0.762	1.524	1.778	2.286	2.54	2.794
900	1.524	3.048	3.81	4.572	5.33	6.096
1050	2.794	5.588	7.112	8.382	9.906	11.176

MR-1001040-2

SPAN \ Def	kg/m²					
	250	350	500	750	1000	1500
300	<0.254	<0.254	<0.254	0.254	0.508	0.508
450	0.508	0.508	0.752	1.27	1.524	2.286
600	1.016	1.27	2.032	3.302	4.318	6.35
750	2.286	3.048	4.572	7.112	9.398	--
900	4.572	5.842	8.89	--	--	--
1050	7.874	10.16	--	--	--	--
1200	12.7	--	--	--	--	--

MR-1501060

SPAN \ Def	kg/m²					
	250	350	500	750	1500	2500
300	0.0762	0.127	0.1524	0.2286	0.4826	0.7874
450	0.1778	0.254	0.33	0.508	0.9906	1.651
600	0.33	0.508	0.6858	1.016	2.032	3.3782
750	0.685	1.016	1.3716	2.0574	4.0894	7.3406
900	1.2192	1.8288	2.4384	3.6322	7.2898	12.141
1050	2.3622	3.556	4.9784	7.0612	--	--
1200	3.6068	5.4356	7.239	10.846	--	--

MinGrate® Pultruded Grating

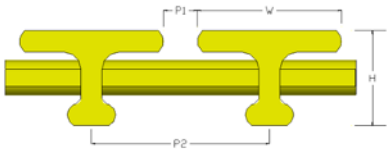
MinGrate® Pultruded Grating are in three types - **T-Sections, I-Sections & HD Series** available are resin systems Isophthalic Polyester (I), Vinyl Ester (V), Orthophthalic (O), Phenolic (P).

T-sections provide maximum surface area underfoot thus the most comfortable walking surface to prevent catching high heels and an excellent surface for two wheel moving equipment. These designs are excellent for areas with high traffic and light hand trucks or wheeled carts.

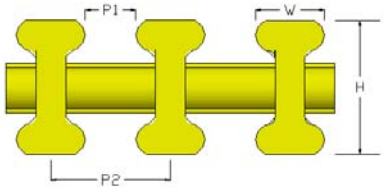
I-Sections are provided for applications where a close match to a steel or aluminum profile or to an existing installation is needed I–Section with bonded rod crossbars (without locking assembly) are suitable for use in low pedestrian traffic areas.

Heavy Duty (HD) solid bar grating is designed to take heavy wheel traffic such as forklifts, tow motors and truck traffic.

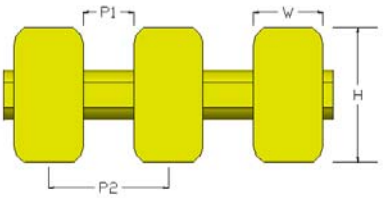
Maximum panel size: 1524 x 6096mm
Standard colors: Light Gray, Dark Gray, Yellow, Green.
Standard cross bar spacing: 152mm on center or optional 305mm.
Custom lengths, colors, bar spacing, and finishes are available.



Type	Height	W	P1	P2	Open Area	3 cores Interlocking Rod kg/m²
T-1018	25.4	41.3	9.5	50.8	18%	13.80
T-1033	25.4	41.3	19.7	61	33%	11.20
T-1012	25.4	38.1	5.1	43.2	12%	14.48
T-1025	25.4	38.1	12.7	50.8	25%	12.28
T-1038	25.4	38.1	22.9	61	38%	10.18
T-1512	38.1	38.1	5.1	43.2	12%	19.62
T-1525	38.1	38.1	12.7	50.8	25%	16.68
T-1538	38.1	38.1	22.9	61	38%	14.19
T-1550	38.1	25.4	25.4	50.8	50%	10.32
T-2033	50.8	25.4	12.7	38.1	33%	20.26
T-2050	50.8	25.4	25.4	50.8	50%	15.66

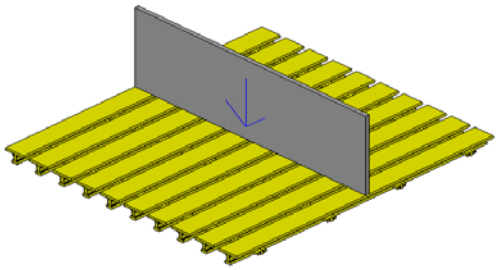


Type	Height	W	P1	P2	Open Area	CD Interlocking Rod kg/m²	3 cores Interlocking Rod kg/m²
I-1040	25.4	15.2	10.2	25.4	40%	15.61	17.08
I-1050	25.4	15.2	15.2	30.5	50%	12.72	14.19
I-1060	25.4	15.2	22.9	38.1	60%	9.69	11.20
I-12540	31.8	15.2	10.2	25.4	40%	18.35	19.82
I-12550	31.8	15.2	15.2	30.5	50%	15.90	17.42
I-12560	31.8	15.2	22.9	38.1	60%	11.99	13.50
I-12540	31.8	15.2	10.2	25.4	40%	20.99	22.02
I-1540	38.1	15.2	10.2	25.4	40%	21.04	22.02
I-1550	38.1	15.2	15.2	30.5	50%	18.10	19.08
I-1560	38.1	15.2	22.9	38.1	60%	15.51	16.10



Type	Height	W	P1	P2	Open Area	3 cores Interlocking Rod lb/ft²
HD-2040	50.8	15.2	10.2	25.4	40%	70.36
HD-2050	50.8	15.2	15.2	30.5	50%	52.25
HD-2060	50.8	15.2	22.9	38.1	60%	43.50

CONCENTRATED LOAD - kg/m (deflection in mm)



T-1018

Span \ Def	kg/m					
	300	500	800	1500	2000	2500
400	0.4	0.67	1.07	2	2.67	3.34
600	1.24	2.06	3.3	8.25	--	--
800	2.76	4.59	7.35	13.78	--	--
1000	5.16	8.6	13.76	--	--	--

T-1012

Span \ Def	kg/m					
	150	300	450	750	1500	3000
450	0.254	0.508	0.762	1.27	2.286	4.826
600	0.508	1.016	1.524	2.286	4.826	9.652
900	1.524	3.048	4.826	7.874	--	--
1200	3.556	7.366	10.92	--	--	--

T-1038

Span \ Def	kg/m					
	300	450	750	1500	3000	5950
450	0.711	1.02	1.727	3.454	6.91	--
600	1.549	2.34	3.886	7.747	--	--
900	4.826	7.21	--	--	--	--
1200	10.77	--	--	--	--	--

T-1525

Span \ Def	kg/m					
	150	300	450	750	1500	3000
450	<0.254	0.254	0.254	0.508	1.016	2.286
600	0.254	0.508	0.508	1.016	2.032	4.064
900	0.508	1.27	1.778	3.048	6.35	12.45
1200	1.524	2.794	4.318	7.112	--	--

T-2033

Span \ Def	kg/m					
	300	450	750	1500	3000	5950
600	--	0.25	0.51	1.02	1.78	3.3
900	0.51	0.76	1.27	2.29	4.57	9.4
1200	1.02	1.52	2.29	4.83	9.91	19.56
1500	1.78	2.79	4.57	9.14	18.3	36.58

T-3310

Span \ Def	kg/m					
	300	450	750	1500	3000	5950
450	0.584	0.86	1.448	2.87	5.74	--
600	1.27	1.93	3.226	6.452	--	--
900	4.013	5.99	10.06	--	--	--
1200	8.992	--	--	--	--	--

T-1025

Span \ Def	kg/m					
	150	300	450	750	1500	3000
450	0.254	0.508	0.762	1.27	2.794	5.588
600	0.508	1.016	1.778	2.794	5.588	11.43
900	1.778	3.556	5.588	9.144	--	--
1200	2.032	4.318	8.382	12.7	--	--

T-1512

Span \ Def	kg/m					
	150	300	450	750	1500	3000
450	<0.254	0.254	0.254	0.508	1.016	1.778
600	<0.254	0.254	0.508	0.762	1.778	3.556
900	0.508	1.016	1.524	2.794	5.334	10.67
1200	1.27	2.54	3.555	6.096	12.19	--

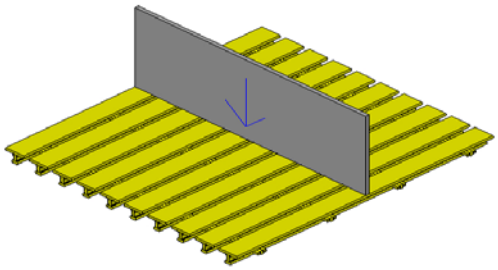
T-1538

Span \ Def	kg/m					
	150	300	450	750	1500	3000
450	0.254	0.254	0.508	0.762	1.27	2.54
600	0.254	0.508	0.762	1.27	2.286	4.826
900	0.762	1524	2.286	3.81	7.62	--
1200	1.778	3.302	5.08	8.382	--	--

T-2050

Span \ Def	kg/m					
	300	450	750	1500	3000	5950
600	0.25	0.51	0.76	1.27	2.29	4.57
900	0.76	1.27	1.78	3.3	6.1	12.19
1200	1.52	2.29	3.56	6.6	13.5	27.18
1500	2.54	3.81	6.35	12.45	24.6	49.53

CONCENTRATED LOAD - kg/m (deflection in mm)



I-1040

Span \ Def	kg/m					
	300	450	750	1500	3000	5950
450	--	--	1.02	2.03	4.06	7.62
600	--	--	2.54	4.57	8.89	17.53
900	2.8	4.06	6.6	13.46	26.9	53.85
1200	5.84	8.89	14.73	29.46	59.2	118.1

I-1050

Span \ Def	kg/m					
	300	450	750	1500	3000	5950
450	--	--	1.02	2.03	4.06	7.62
600	--	--	2.54	4.83	9.4	18.8
900	2.54	4.06	6.86	13.46	27.2	54.1
1200	7.37	10.9	18.92	36.58	73.2	146.1

I-1060

Span \ Def	kg/m					
	300	450	750	1500	3000	5950
450	--	--	1.52	2.54	4.83	9.65
600	--	--	3.05	5.59	11.2	22.1
900	3.3	4.83	7.87	15.75	31.5	62.99
1200	7.87	11.7	19.3	38.61	77.5	154.7

I-12540

Span \ Def	kg/m					
	300	450	750	1500	3000	5950
450	--	--	1.02	2.03	4.06	7.62
600	--	--	2.54	4.83	9.4	18.8
900	2.54	4.06	6.86	13.46	27.2	54.1
1200	7.37	10.9	18.92	36.58	73.2	146.05

I-1540

Span \ Def	kg/m					
	300	450	750	1500	3000	5950
450	--	0.25	0.51	0.76	1.52	2.79
600	0.51	0.51	1.02	1.78	3.05	5.84
900	1.02	1.27	2.29	4.32	8.38	16.76
1200	2.03	2.79	4.57	9.4	19.1	37.85

I-1550

Span \ Def	kg/m					
	300	450	750	1500	3000	5950
450	--	0.25	0.51	1.02	1.78	3.3
600	0.51	0.51	1.02	1.78	3.56	6.86
900	1.02	1.52	2.54	5.08	9.91	20.07
1200	2.29	3.56	5.84	11.94	23.4	46.99

I-1560

Span \ Def	kg/m					
	300	450	750	1500	3000	5950
450	--	0.25	0.51	0.76	2.03	3.81
600	0.51	0.76	1.02	2.29	4.32	8.38
900	1.27	2.03	3.3	6.1	12.5	25.15
1200	2.79	4.32	7.11	14.22	28.5	56.90

HD-2040

Span \ Def	kg/m								
	150	300	450	750	1500	3000	4500	6000	7500
600	0.034	0.068	0.085	0.153	0.306	0.596	0.902	1.191	1.498
750	0.051	0.102	0.170	0.272	0.545	1.089	1.634	2.195	2.740
900	0.085	0.187	0.272	0.460	0.919	1.838	2.740	3.659	4.578
1200	0.221	0.426	0.772	1.072	2.144	4.289	6.433	8.577	10.721

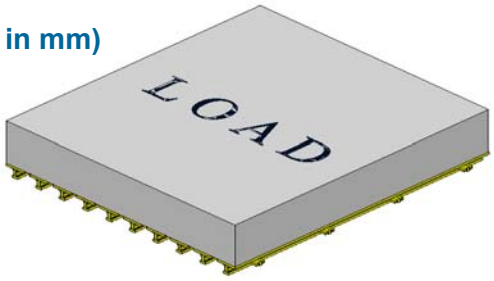
HD-2050

Span \ Def	kg/m								
	150	300	450	750	1500	3000	4500	6000	7500
600	0.041	0.081	0.102	0.183	0.366	0.711	1.077	1.423	1.788
750	0.061	0.122	0.203	0.325	0.650	1.301	1.951	2.621	3.272
900	0.102	0.224	0.325	0.549	1.097	2.195	3.272	4.369	5.466
1200	0.264	0.508	0.772	1.280	2.560	5.121	7.681	10.241	12.802

HD-2060

Span \ Def	kg/m								
	150	300	450	750	1500	3000	4500	6000	7500
600	0.051	0.102	0.127	0.229	0.457	0.889	1.346	1.779	2.235
750	0.076	0.152	0.254	0.405	0.813	1.626	2.438	3.277	4.090
900	0.127	0.279	0.406	0.686	1.372	2.743	4.089	5.462	6.833
1200	0.330	0.635	0.965	1.600	3.200	6.401	9.601	12.802	16.003

UNIFORM DISTRIBUTED LOAD - kg/m² (deflection in mm)



T-1018

Span \ Def	kg/m²					
	300	500	800	1500	2000	2500
400	0.1	0.17	0.27	0.5	0.67	0.83
600	0.46	0.77	1.24	2.32	3.1	3.87
800	1.38	2.3	3.67	6.89	9.18	11.48
1000	3.22	5.37	8.6	--	--	--

T-1033

Span \ Def	kg/m²					
	1000	1900	3900	7000	9500	19500
450	0.56	1.069	2.134	4.039	5.23	--
600	1.63	3.226	6.542	12.12	--	--
900	7.52	15.04	--	--	--	--
1200	--	--	--	--	--	--

T-1012

Span \ Def	kg/m²					
	450	950	1450	2400	4850	9500
450	<0.254	0.254	0.762	1.016	2.286	4.572
600	0.508	1.27	1.778	3.048	6.096	12.92
900	2.794	5.842	8.89	--	--	--
1200	9.144	--	--	--	--	--

T-1025

Span \ Def	kg/m²					
	450	950	1450	2400	4850	9500
450	0.254	0.508	762	1.27	2.54	5.08
600	0.762	1.524	2.032	3.556	7.112	--
900	3.556	6.858	10.41	--	--	--
1200	10.67	--	--	--	--	--

T-1038

Span \ Def	kg/m²					
	1000	1900	3900	7000	9500	19500
450	0.66	1.295	2.616	5.004	6.53	--
600	1.96	3.886	7.772	--	--	--
900	9.02	--	--	--	--	--

T-1512

Span \ Def	kg/m²					
	450	950	1450	2400	4850	9500
450	<0.254	0.254	0.254	0.508	1.016	1.778
600	0.254	0.508	0.762	1.016	2.286	4.318
900	1.016	2.032	3.048	5.08	10.16	--
1200	3.048	6.096	9.144	--	--	--

T-1525

Span \ Def	kg/m²					
	450	950	1450	2400	4850	9500
450	<0.254	0.254	0.254	0.508	1.016	2.032
600	0.254	0.508	0.762	1.27	2.54	5.08
900	1.27	2.286	3.556	5.842	11.68	--
1200	3.556	7.112	10.67	--	--	--

T-1538

Span \ Def	kg/m²					
	450	950	1450	2400	4850	9500
450	<0.254	0.254	0.254	0.508	1.27	2.54
600	0.254	0.508	1.01	1.524	3.048	6.096
900	1.524	2.794	4.318	7.112	--	--
1200	4.318	8.382	12.7	--	--	--

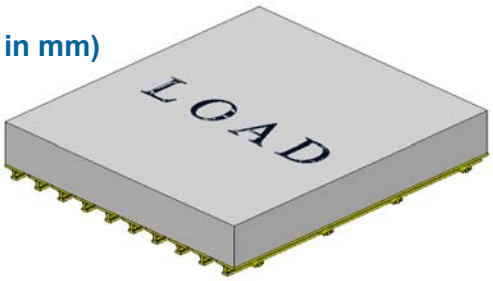
T-2033

Span \ Def	kg/m²					
	1000	1900	3900	7000	9500	19500
600	0.25	0.51	0.76	1.52	2.03	4.06
900	0.76	1.52	3.05	5.59	7.73	14.99
1200	2.29	4.57	9.4	--	--	--
1500	5	9.91	--	--	--	--

T-2050

Span \ Def	kg/m²					
	1000	1900	3900	7000	9500	19500
600	0.51	0.76	1.27	2.29	3.05	6.35
900	1.02	2.03	3.81	6.86	9.4	--
1200	3.3	6.35	12.45	--	--	--
1500	6.86	13.46	--	--	--	--

UNIFORM DISTRIBUTED LOAD - kg/m² (deflection in mm)



I-1040

Def / Span	kg/m²					
	1000	1900	3900	7000	9500	19500
450	0.25	0.76	1.27	2.29	3.05	6.1
600	1.01	1.27	3.56	6.86	8.89	--
900	4.57	8.38	16.26	--	--	--
1200	14.48	--	--	--	--	--

I-1050

Def / Span	kg/m²					
	1000	1900	3900	7000	9500	19500
450	0.51	0.76	1.27	2.54	3.302	6.6
600	1.27	2.29	4.06	5.08	7.26	15.24
900	4.83	8.89	17.27	--	--	--
1200	16.51	--	--	--	--	--

I-1060

Def / Span	kg/m²					
	1000	1900	3900	7000	9500	19500
450	0.51	0.76	1.52	2.79	3.81	7.37
600	1.27	2.29	4.57	8.38	11.18	--
900	5.84	10.92	--	--	--	--
1200	17.78	--	--	--	--	--

I-12540

Def / Span	kg/m ²					
	1000	1500	2500	5000	10000	15000
600	0.550	0.820	1.370	2.730	5.470	8.200
800	1.630	2.450	4.080	8.170	--	--
1000	3.860	5.790	9.640	--	--	--
1200	7.740	11.620	--	--	--	--

I-1540

Def / Span	kg/m ²					
	1000	1900	3900	7000	9500	19500
450	0.51	0.76	1.52	2.79	3.81	7.37
600	1.27	2.29	4.57	8.38	11.18	--
900	5.84	10.92	--	--	--	--
1200	17.78	--	--	--	--	--

I-1550

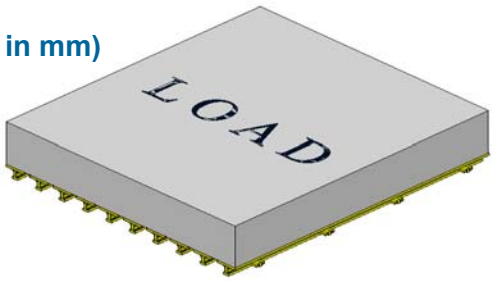
Def / Span	kg/m ²					
	1000	1900	3900	7000	9500	19500
450	0.25	0.51	0.76	1.27	1.778	3.56
600	0.51	0.76	1.52	3.05	4.06	8.13
900	1.78	3.3	6.1	11.7	15.49	--
1200	5.59	10.69	--	--	--	--

I-1560

Def / Span	kg/m ²					
	1000	1900	3900	7000	9500	19500
450	0.25	0.25	0.76	1.27	1.78	3.56
600	0.51	1.02	1.789	3.3	4.57	8.89
900	2.29	4.06	7.87	14.7	--	--
1200	6.6	12.95	--	--	--	--

MinGrate® Pultruded Grating

UNIFORM DISTRIBUTED LOAD - kg/m² (deflection in mm)



HD-2040

Def / Span	kg/m²								
	450	950	1450	2450	4850	9800	14500	19500	24400
600	0.034	0.068	0.119	0.187	0.374	0.749	1.123	1.498	1.855
750	0.085	0.170	0.255	0.426	0.851	1.702	2.570	3.421	4.272
900	0.170	0.340	0.511	0.851	1.719	3.438	5.139	6.858	8.577
1200	0.545	1.072	1.617	2.689	5.361	10.721	--	--	--

HD-2050

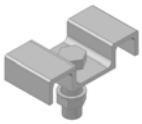
Def / Span	kg/m ²								
	450	950	1450	2450	4850	9800	14500	19500	24400
600	0.041	0.081	0.142	0.224	0.447	0.894	1.341	1.788	2.215
750	0.102	0.203	0.305	0.508	1.016	2.033	3.068	4.084	5.100
900	0.203	0.406	0.610	1.016	2.052	4.105	6.137	8.189	10.241
1200	0.650	1.280	1.930	3.211	6.401	12.802	--	--	--

HD-2060

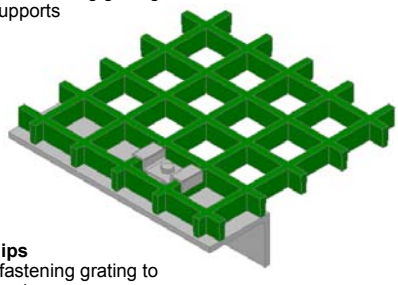
Def / Span	kg/m ²								
	450	950	1450	2450	4850	9800	14500	19500	24400
600	0.051	0.102	0.178	0.279	0.559	1.118	1.676	2.235	2.769
750	0.127	0.254	0.381	0.635	1.270	2.550	3.835	5.105	6.375
900	0.254	0.508	0.762	1.270	2.565	5.131	7.671	10.236	12.802
1200	0.813	1.600	2.413	4.013	8.001	16.003	--	--	--

Fixing Accessories

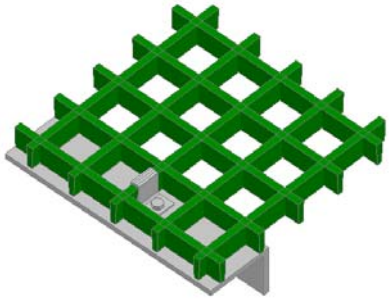
Molded Grating



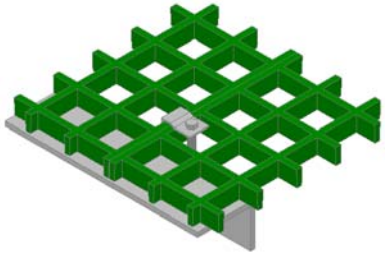
M Clips
For attaching grating to supports



L Clips
For fastening grating to supports

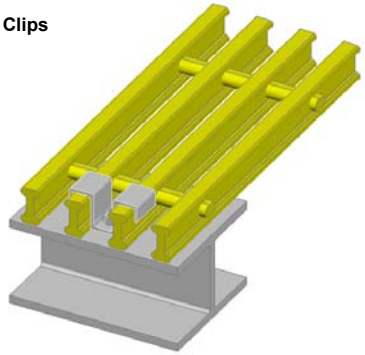


C Clips
For joining two unsupported edges if needed.

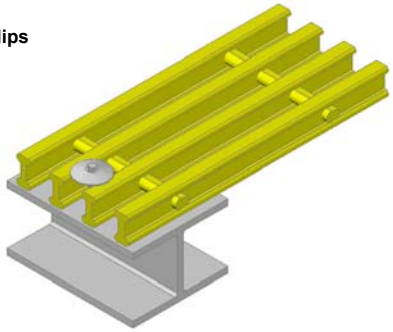


Pultruded Grating

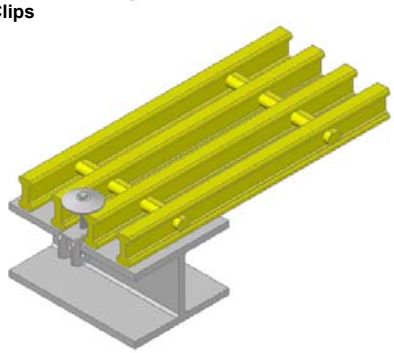
M Clips



W Clips

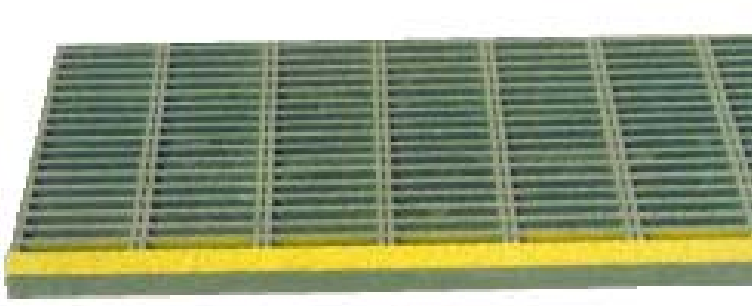


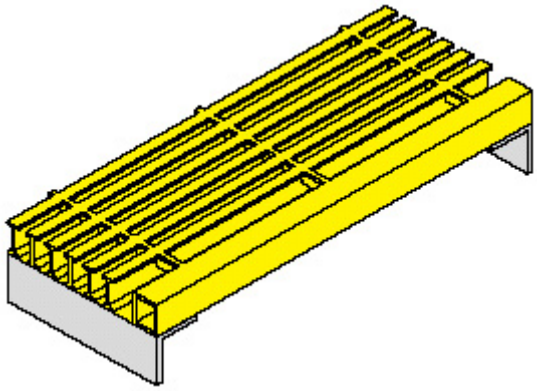
GW Clips



MinTread® fiberglass stair treads deliver safety and long lasting durability. Manufactured with premium polyester or Vinyl Ester (V) resin, MinTreads® provide outstanding protection against corrosion and reliable structural performance. The important safety benefits are addressed with slip resistant surfaces, non-conductivity, and low flame spread.

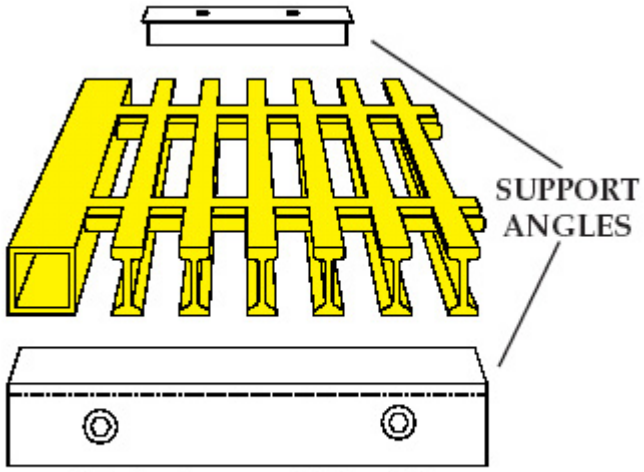
The most vulnerable point of a stair tread is the nosing. For greater durability, MinTread® nosings are high strength, heavy bars with slip resistant, gritted surface. With high structural properties, the heavy bar nosing provides greater stiffness and is more durable than a molded nosing.





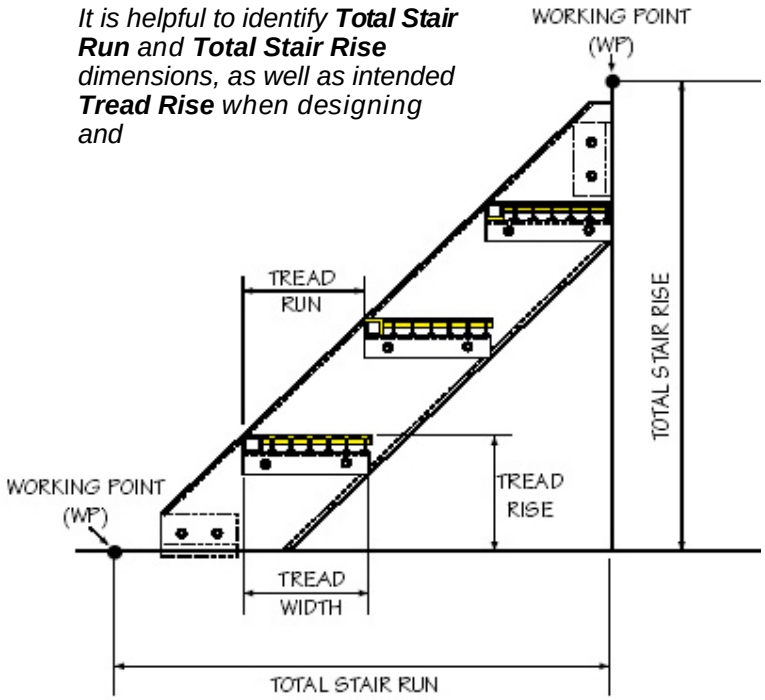
MinTreads are offered in pultruded and molded sections, each with the heavy bar nosing. The pultruded parts are stronger with greater span capability Both sections provide outstanding protection against corrosion

Stair Tread Assembly



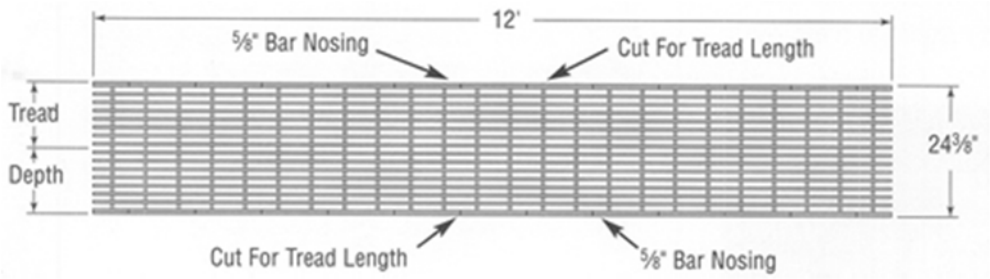
Stair treads are available with optional support angles

*It is helpful to identify **Total Stair Run** and **Total Stair Rise** dimensions, as well as intended **Tread Rise** when designing and*



Pultruded Stair Treads

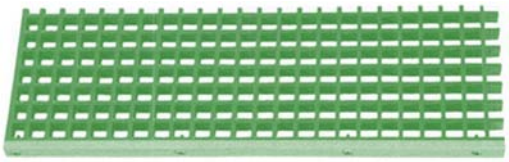
.Up to 1219mm clear spans
.Skid resistant yellow bar nosings
.Skid resistant, gritted entire top surface



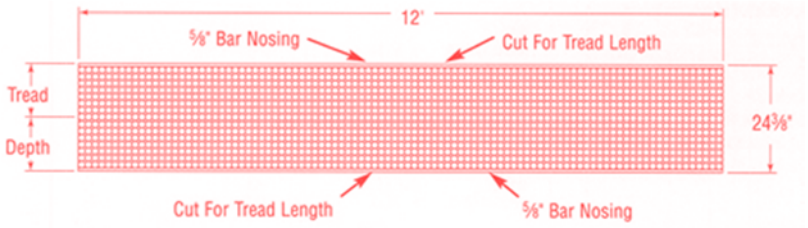
Panel Cutting Options	
Qty	Tread Length (mm)
12	610
8	762
2	610
8	914
6	1067
6	1219

	I-1060		I-1560		T-1538	
SPAN (mm)	114 kg	227 kg	114 kg	227 kg	114 kg	227 kg
457	0.74	1.75	0.25	0.48	0.23	0.46
610	1.98	3.73	0.48	0.97	0.46	0.91
762	3.48		0.97	1.93	0.69	1.37
914	5.49		1.45	2.67	0.91	2.06
1067			2.18	4.34	1.37	2.74
1219			3.15	6.27	2.06	4.11

Molded Stair Treads



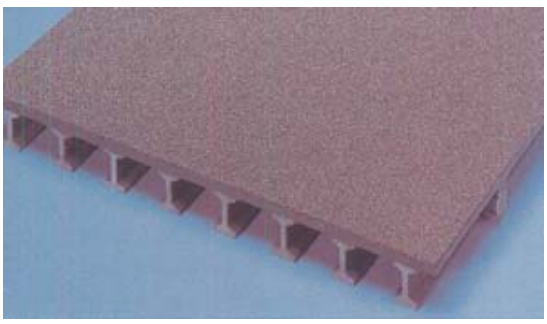
MinTreads are also in molded sections, each with the heavy bar nosing.



MinTread MS-1515 *Molded Stair Treads*

MinPlate / Covered Grating

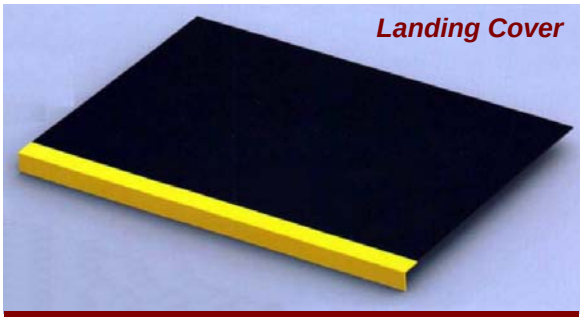
MinPlate is a premium quality FRP flat sheet provided in 3.2mm, 6.4mm and 9.5mm thicknesses. The top surface can be smooth or have a gritted slip resistant surface. For covered grating applications, 3.2mm or 6.4mm. MinPlate is laminated to MinGrate molded and pultruded gratings to form a flat and corrosion resistant working surface. These materials are used for applications, where free passage of light and air is not desired nor drainage a requirement as in pit covers where reduction of corrosive vapors is needed.



MinTread® Cover

MinTread Covers are fabricated by multiple layers of fibreglass reinforcement with specially formulated resins resulting in a solid composite panel with a carbon and the unique special hard wearing grit, embedded in to the 3mm thick fibreglass substrate, provides an excellent slip resistant surface. The grit particles form pinnacles which minimize the surface contact of the foot in order to increase the slip resistance intensively. Contrarily, traditional standard steel checker-plate steps have much larger foot contact points which greatly increase the possibility of slips.

MinTread Landing Cover simply fit over your existing substrate to instantly improve stair safety with strong slip resistance. The Nosing is in contrasting color to the rest of the tread that make the step edge to be easily identified when ascending and descending.



MinTread *Landing Cover Dimensions*
Nosing: 55x55mm, Thickness: 4mm,
Width: Up to 2400mm, Depth: Up to 1200mm

MinTread *Cover Dimensions*
Nosing: 55x55mm, Thickness: 3mm,
Width: Up to 2400mm, Depth: Up to 1200mm

Application

- Sewage Treatment Plant
- Restaurant
- Food Processing Plant
- Theme and Amusing Parks
- Schools and College
- Stadiums
- Playgrounds
- Railway Stations, etc.,

Advantages

Durability

MinTread Covers & Landing Covers are a high quality composite of glass woven matting impregnated with isophthalic (as standard) polyester resin. The energy absorption and flexibility of the product, ensures its long life, even in the busiest of environments.

Slip Resistant

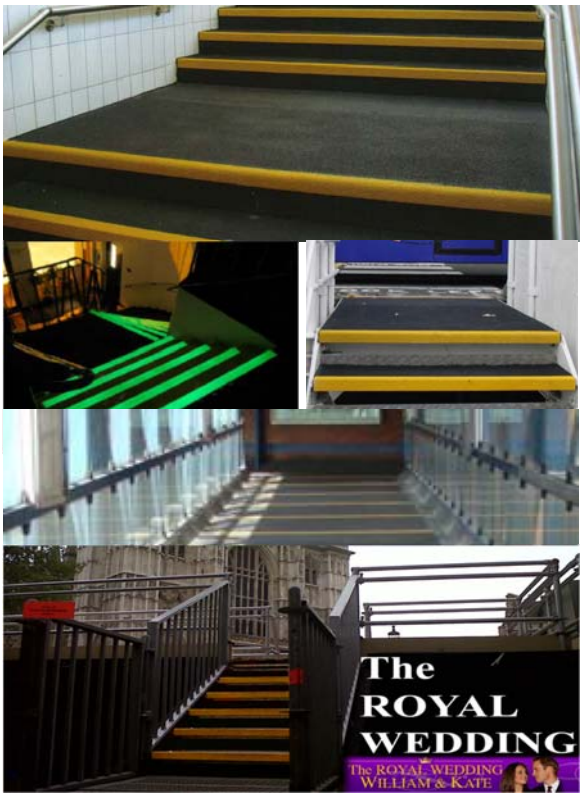
A compound of a special formula of grit is added in the final layer of laminate providing an excellent slip resistant and hard wearing surface.

Corrosion Resistant

MinTread Covers & Landing Covers Resistant to a wide range of chemicals and is perfectly suited for use even in the harshest of environments. Chemical resistance guides are available on request.

Simple to install

The versatility of ***MinTread*** Covers allows it to be applied to almost any surface such as concrete, steel or wood. The fact that it is supplied as a finished product means that it can be walked on straight away thus keeping disruption to a minimum.



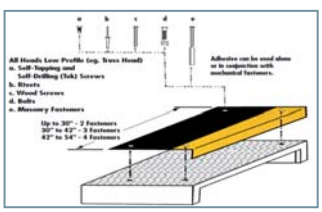
MinPlate

MinPlate is **ANTI-SKID for flooring**, which is produced in 2.4m x 1.2m long sheets is ideal for walkways, ramps, gangways, factory floors and many more applications.

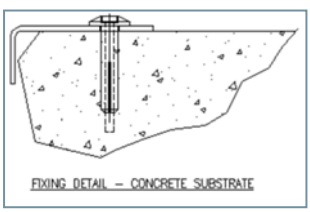
MinPlate, like the ***MinTread Cover*** also has a silicone and carbon grit chemically bonded to the top surface. This gives **strong slip resistance even in wet or oily conditions**. The product is very quick and easy to install and fits over the existing substrate.

Installation

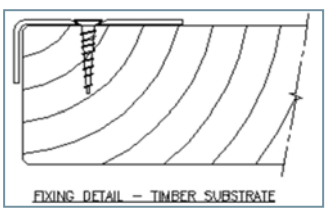
Step cover installation over
Diamond / Checker metal plate,
Concrete or wood



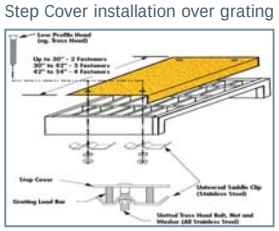
M8x30 Anchor Bolt



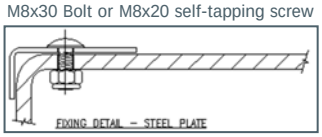
M8x35 countersunk screw



Step Cover installation over grating



M8x30 Bolt or M8x20 self-tapping screw



MinPlank®

MinPlank® *is an interlocking system designed for easy installation, with EPDM Gasket if for airtight, to construct a continuous and high strength solid surface for decking or flooring. It is devised to substitute stainless steel, steel, aluminum or wood planks to be used in the environment with corrosion to lower the cost for maintenance or enhance the safe conditions.*

Features

- Corrosion Resistant
- High Strength and Light Weight
- UV Protection
- Low in Conductivity
- Interlocking System
- Easy to Install and Maintain
- Gasketed for Tight Seal
- Odor Control

Application

MinPlank® is designed to fit more than the types of applications below

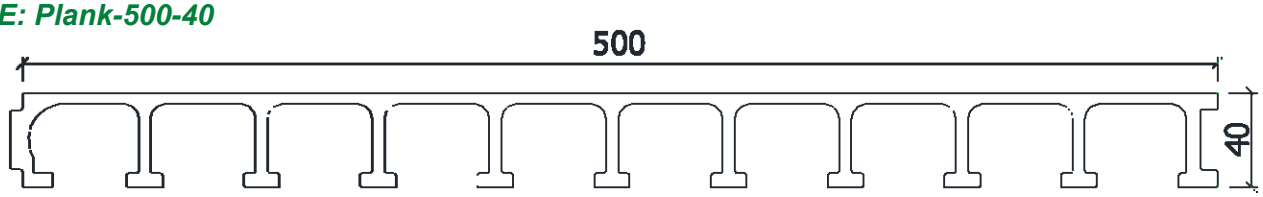
- Flooring
- Covers or Covers for Odor Control
- Walkways for Dock or Roof
- Wall panels for cellular.
- UV Screen or Algae Barrier

Materials

Fiberglass reinforced plastic (FRP) structural components shall be manufactured by pultrusion process.

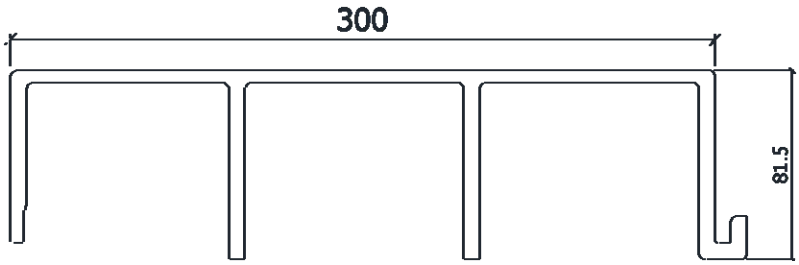
1. Glass fiber reinforcements shall be minimum 50% of the material weight.
2. Materials shall be fire retardant with flame spread rating of 25 or less per ASTM E84.
3. The Resin is UV inhibited includes a surface veil on all exposed surfaces which is conducive to corrosion and UV protection. The resin types are available for choices of vinyl ester, isophthalic polyester or orthophthalic polyester.
4. The grit system for MinPlank® is a type of silicon fine grit bonded to the surface with epoxy resin which is recommended for light pedestrian traffic only. Other types of grit available upon request which may be more appropriate for the application you need.

TYPE: Plank-500-40



Clear Span													
	500	600	700	800	900	1000	1200	1400	1600	1800	2000	2200	2400
U	100	63	44	32	22	14	7	4.2	2.8	2	1.5	1.1	0.8
D	2.06	2.46	3.00	3.58	3.83	3.64	3.67	4.01	4.51	5.12	5.82	6.22	6.39
$C_{(m)}$	32	22	16	12	8	6	4.2	3.1	2.4	1.9	1.5	1.2	1
D	1.52	1.8	2.08	2.33	2.21	2.28	2.75	3.23	3.73	4.2	4.55	4.85	5.24

TYPE: Plank-300-80

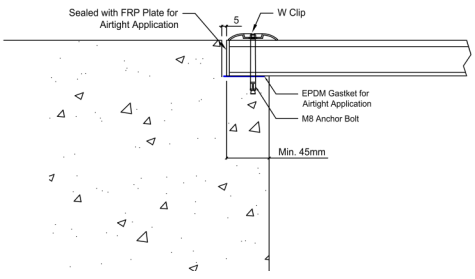


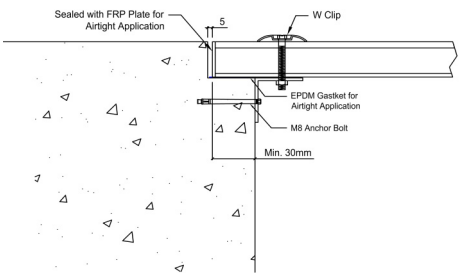
Clear Span													
	500	600	700	800	900	1000	1200	1400	1600	1800	2000	2200	2400
U	250	159	110	81	57	37	18	10.8	7.2	5.1	3.7	2.6	1.9
D	1.74	1.98	2.27	2.63	2.80	2.65	2.51	2.69	2.98	3.32	3.62	3.69	3.79
$C_{(m)}$	60	42	31	24	16.9	14	10	7.3	5.6	4.4	3.6	3	2.5
D	0.69	0.84	0.98	1.14	1.14	1.3	1.6	1.85	2.12	2.37	2.66	2.95	3.2

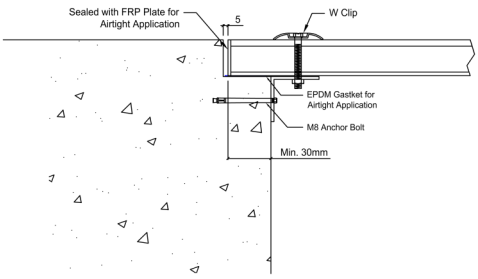
U = uniform distributed load kN/m²
D = deflection in mm

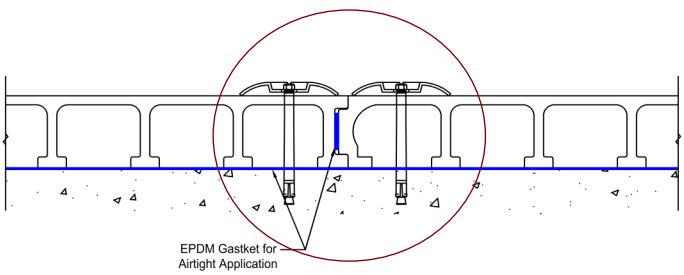
C= concentrated load, kN/m of grating width at mid-span
Safety Factor 0.9 is applied

Typical Installation







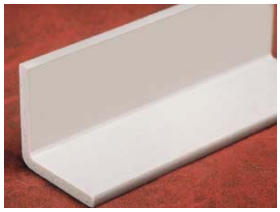


FRP Pultruded Profile

The many inherent features of fiberglass can be used to an engineer's advantange in fabricated structures. Today, fiberglass fabricated structures are solving problems in a wide variety of markets and applications. Some of these features include:

- Corrosion Resistant
- Nonconductive—Thermally and Electrically
- Nonmagnetic—Electromagnetic Transparency
- Lightweight — Weighs 80% less than Steel
- High Strength
- Dimensional Stability
- Low Maintenance
- Easy Assembly

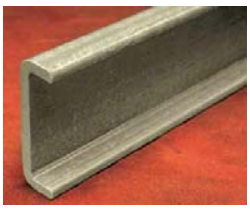
Equal Angle



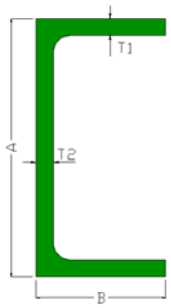
Round Tube

Wide Flange Beam

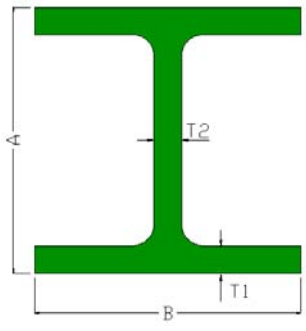
Channel



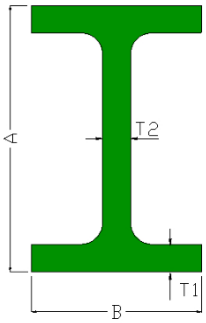
Square Tube



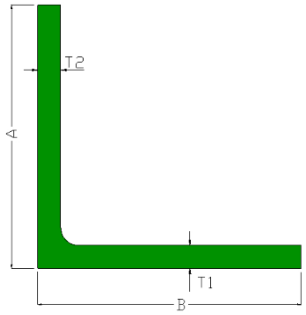
CHANNEL	Dimension (mm)				
Type	A	B	T1	T2	kg/m
C50-14-32	50.8	14.3	3.2	3.2	0.37
C76-22-64	76.2	22.2	6.4	6.4	1.15
C76-38-64	76.2	38.1	6.4	6.4	1.54
C102-44-48	101.6	44.5	4.8	4.8	0.86
C152-41-64	152.4	41.3	6.4	6.4	2.50
C152-43-95	152.4	42.9	9.5	9.5	3.80
C203-56-95	203.2	55.6	9.5	9.5	5.08
C254-70-32	254	69.8	3.2	3.2	2.09
C254-70-127	254	69.8	12.7	12.7	8.20



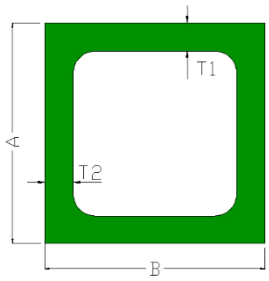
H BEAM	Dimension				
Type	A	B	T1	T2	lb/ft
HB76-64	76.2	76.2	6.4	6.4	2.52
HB102-64	101.6	101.6	6.4	6.4	3.31
HB152-64	152.4	152.4	6.4	6.4	5.25
HB152-95	152.4	152.4	9.5	9.5	7.63
HB203-95	203.2	203.2	9.5	9.5	10.39
HB203-127	203.2	203.2	12.7	12.7	13.75
HB305-127	304.8	304.8	12.7	12.7	20.38



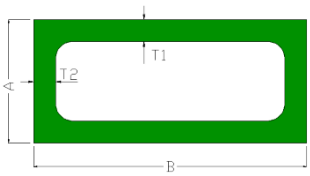
I BEAM	Dimension (mm)				
Type	A	B	T1	T2	kg/m
IB100-50-64	101.6	50.8	6.4	6.4	2.21
IB152-76-64	152.4	76.2	6.4	6.4	3.44
IB152-76-95	152.4	76.2	9.5	9.5	5.05
IB203-102-95	203.2	101.6	9.5	9.5	6.87
IB203-102-127	203.2	101.6	12.7	12.7	8.98
IB152-125-95	152.4	125.4	9.5	9.5	7.37
IB254-127-95	254	127	9.5	9.5	8.60
IB254-127-127	254	127	12.7	12.7	11.29



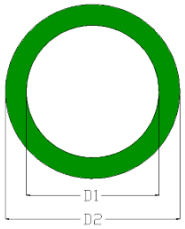
ANGLE	Dimension (mm)				
Type	A	B	T1	T2	kg/m
AGL38-48	38.1	38.1	4.8	4.8	0.61
AGL38-64	38.1	38.1	6.4	6.4	0.81
AGL50-64	50.8	50.8	6.4	6.4	1.09
AGL76-64	76.2	76.2	6.4	6.4	1.68
AGL76-95	76.2	76.2	9.5	9.5	2.47
AGL76-127	76.2	76.2	12.7	12.7	3.38
AGL102-95	101.6	101.6	9.5	9.5	3.44
AGL102-127	101.6	101.6	12.7	12.7	4.26
AGL152-127	152.4	152.4	12.7	12.7	6.90



SQUARE TUBE	Dimension (mm)				
Type	B	A	T1	T2	kg/m
SHS25-28	25.4	25.4	2.8	2.8	0.43
SHS25-32	25.4	25.4	3.2	3.2	0.48
SHS32-64	38.1	38.1	6.4	6.4	1.01
SHS38-32	38.1	38.1	3.2	3.2	0.75
SHS38-64	38.1	38.1	6.4	6.4	1.46
SHS44-32	44.5	44.5	3.2	3.2	0.95
SHS50-32	50.8	50.8	3.2	3.2	1.10
SHS50-64	50.8	50.8	6.4	6.4	2.09
SHS54-48	54	54	4.8	4.8	1.70
SHS64-64	63.5	63.5	6.4	6.4	2.67
SHS76-64	76.2	76.2	6.4	6.4	3.28
SHS102-64	101.6	101.6	6.4	6.4	4.59

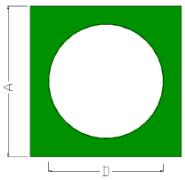


RECTANGULAR TUBE	Dimension (mm)				
Type	A	B	T1	T2	kg/m
RHS50-25-30	25.4	50.8	3	3	0.79
RHS50-25-64	25.4	50.8	6.4	6.4	1.51
RHS52-32-50	32	52	5	5	1.41

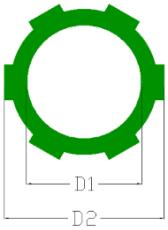


ROUND TUBE Type	Dimension (mm) D1	D2	kg/m
RHS19-5	14.3	19.1	0.27
RHS25-6	19.1	25.4	0.37
RHS32-5	27	31.8	0.40
RHS32-7	25.4	31.8	0.48
RHS32-10	22.2	31.8	0.69
RHS38-16	31.8	38.1	0.67
RHS38-13	25.4	38.1	1.18
RHS42-6	34.9	41.3	0.70
RHS42-10	31.2	41.3	1.40
RHS50-6	44.5	50.8	0.89
RHS50-12	38.1	50.8	1.67
RHS64-7	57.2	63.5	1.06
RHS64-14	50.8	63.5	2.13
RHS76-64	63.5	76.2	2.53
RHS101-13	87.3	101.6	3.91

Items of FRP Profile listed in the tables are our main standard profiles, which are generally stocked in 6.1M length, except if those stipulated. We also can produce tailor-made in mould making and profile manufacture.

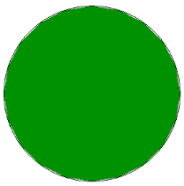


SQUAR TUBE W/ ROUND HOLE Type	Dimension (mm) A	D	kg/m
SRHS	25.4	19.1	0.55



FLUTED TUBE Type	Dimension (mm) D1	D2	T	kg/m
FHS32-25-32	25.4	31.8	3.2	0.66
FHS32-19-64	19.1	31.8	6.4	1.11
FHS45-28-85	28.0	45.0	8.5	1.86
FHS45-32-64	31.8	44.5	6.4	1.65

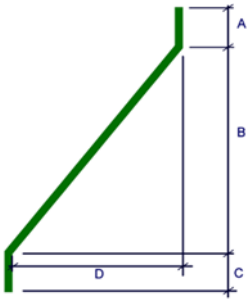
SQUARE BAR Type	Dimension (mm) Side	Side	kg/m
SB25	25.4	25.4	1.30
SB32	31.8	31.8	1.95
SB38	63.5	38.1	2.73



ROD Type	Diameter (mm)	kg/m
ROD64	6.4	0.06
ROD79	7.9	0.09
ROD95	9.5	0.15
ROD127	12.7	0.25
ROD159	15.9	0.40
ROD190	19.1	0.58
ROD206	20.6	0.67
ROD222	22.2	0.79
ROD254	25.4	0.88
ROD318	31.8	1.64
ROD381	31.8	2.27
ROD508	50.8	3.80
ROD635	63.5	5.86

STRIP Type	Dimension (mm) W	T	kg/m
STP64-32	63.5	3.2	0.34
STP102-32	101.6	3.2	0.55
STP64-48	63.5	4.8	0.51
STP102-48	4.8	4.8	0.82
STP102-64	101.6	6.4	1.09
STP152-64	152.4	6.4	1.64
STP229-64	228.6	6.4	2.45
STP76-95	76.2	9.5	1.22
STP152-95	152.4	9.5	2.45
STP50-127	50.8	12.7	1.09

Sheet Type	Dimension (mm) W	L	T	kg/m
SHT32	1219	2438	3.2	2.10
SHT48	1219	2438	4.8	2.55
SHT64	1219	2438	6.4	3.49
SHT95	1219	2438	9.5	5.26
SHT127	1219	2438	12.7	6.96
SHT159	1219	2438	15.9	8.63
SHT190	1219	2438	19.1	10.33
SHT250	1219	2438	25.4	13.81



	A	B	C	D
Louvre Blade	32mm	166mm	32mm	137mm

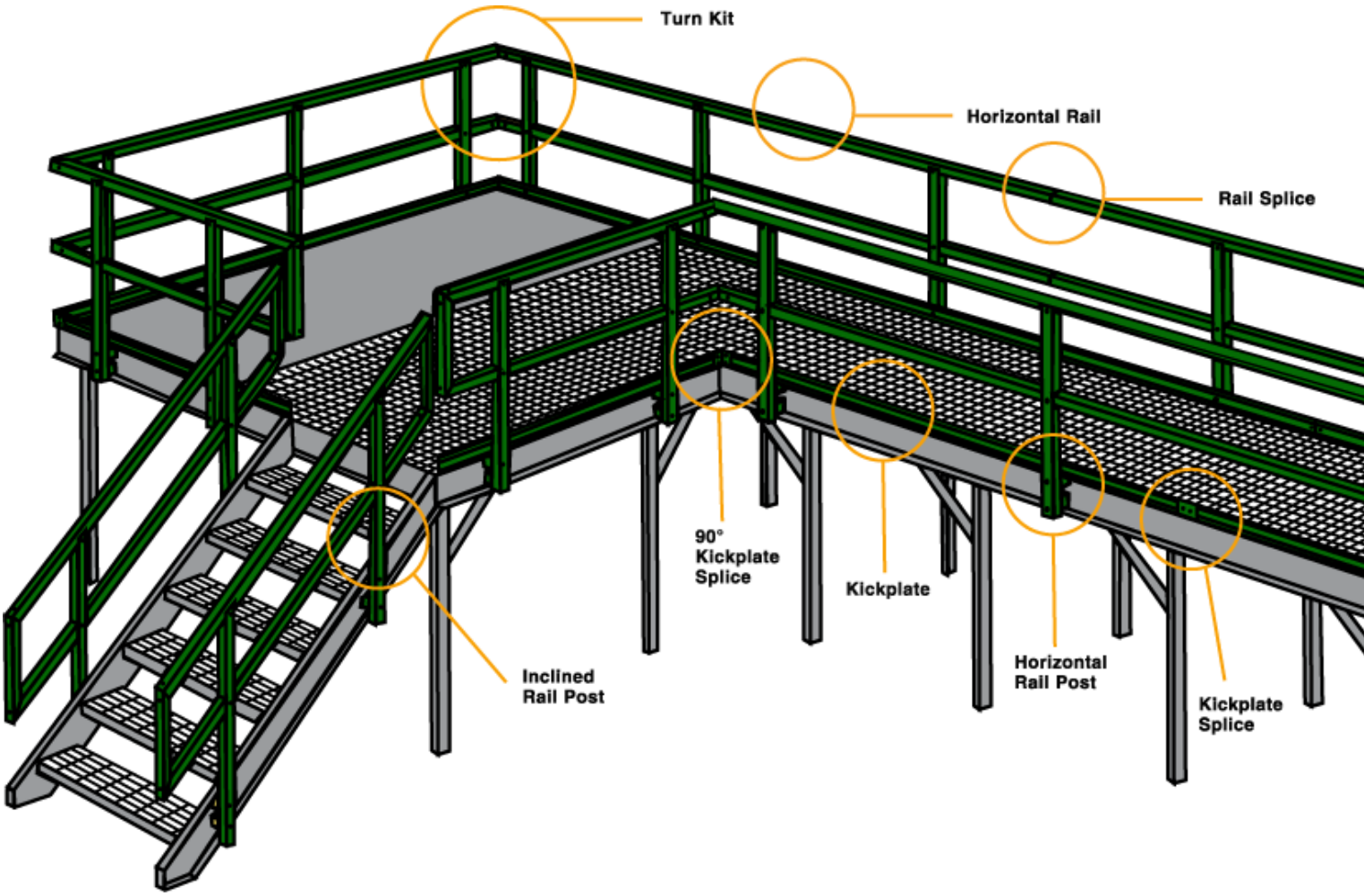
MinRail

MinRail FRP handrails are for stair rails, platform/walkway handrails and guardrails. MinRail system is assembled from pultruded fiberglass profiles and connectors. The railing systems are particularly suitable for corrosive environments like those found in industrial, chemical and wastewater treatment plants as well as commercial structures with urban and salt air corrosion.

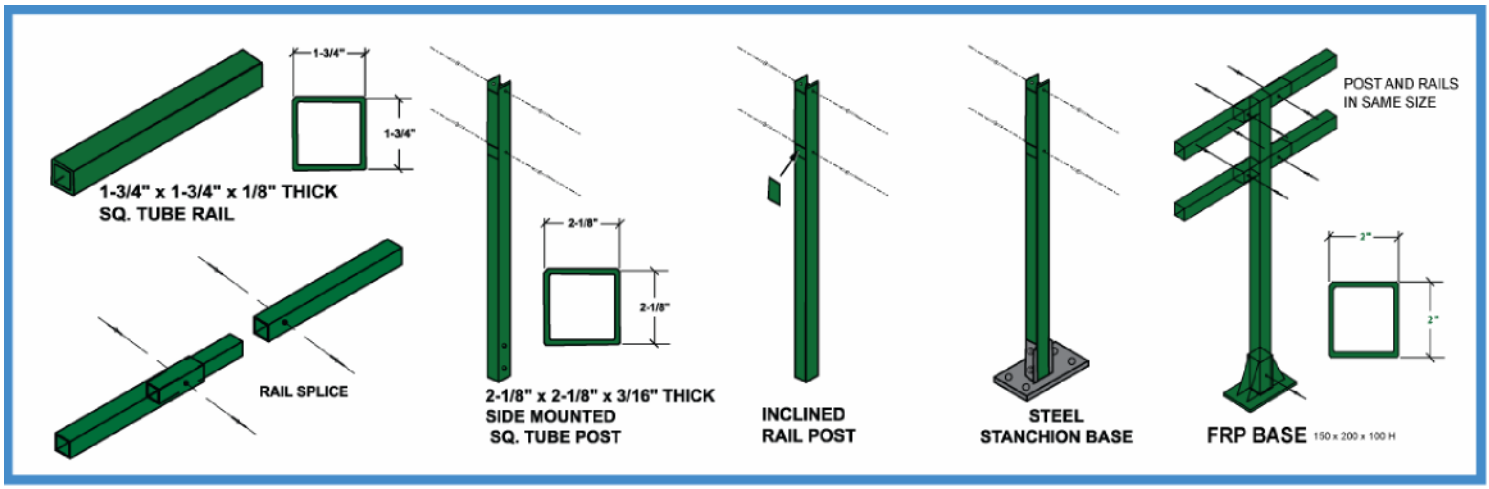
Simple Assembly — MinRail are produced in lightweight standard profiles that include both post and rail. Systems can be fabricated and installed on site with simple tools.

Internal Jointing — All jointing fit flush, resulting in a pleasing and streamlined appearance. The internal connections allow the construction of continuous handrail systems without special fittings.

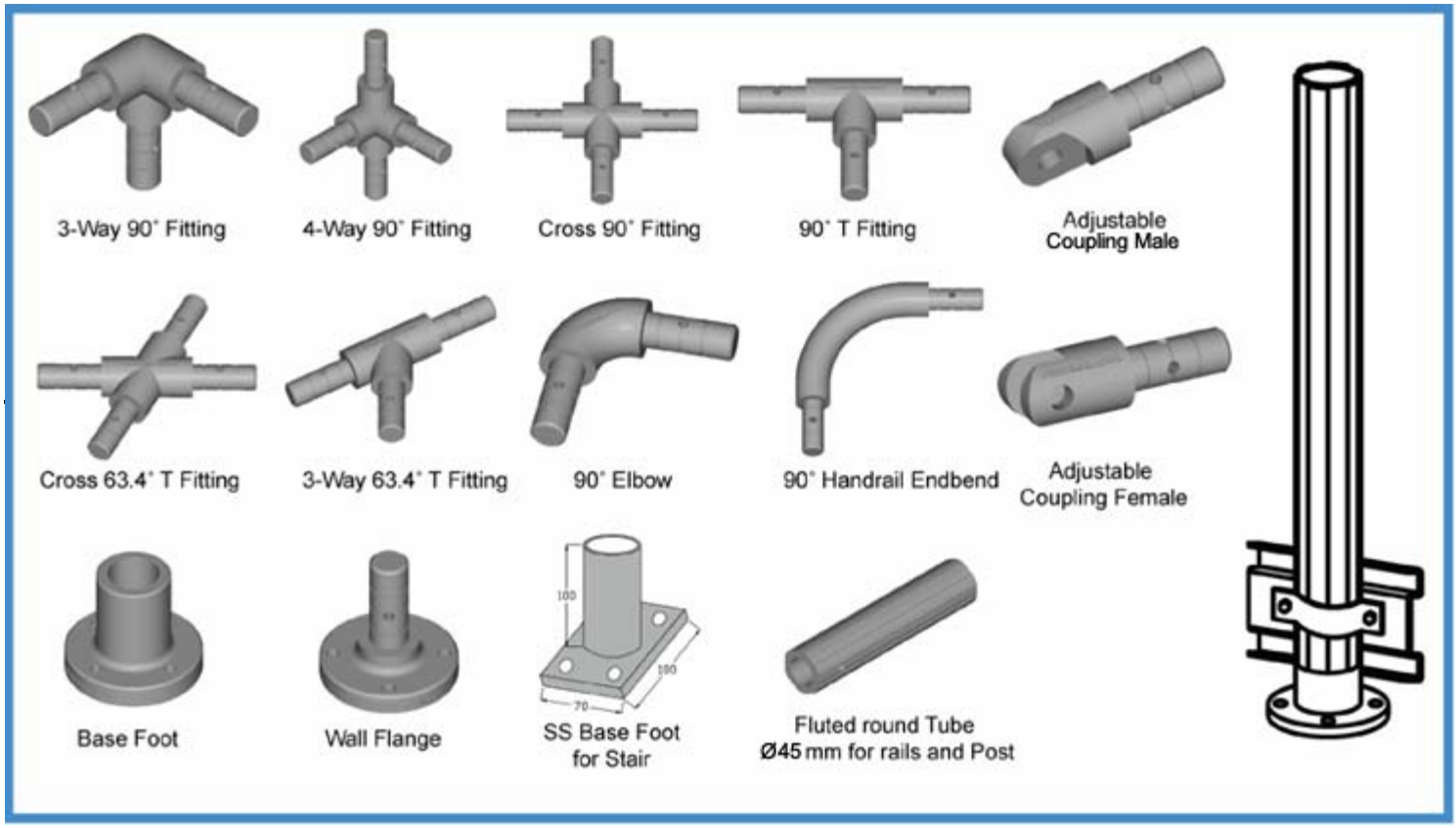
Cost Effective — Fiberglass components are designed as easy-to-assemble to lower the cost for labor and maintenance.



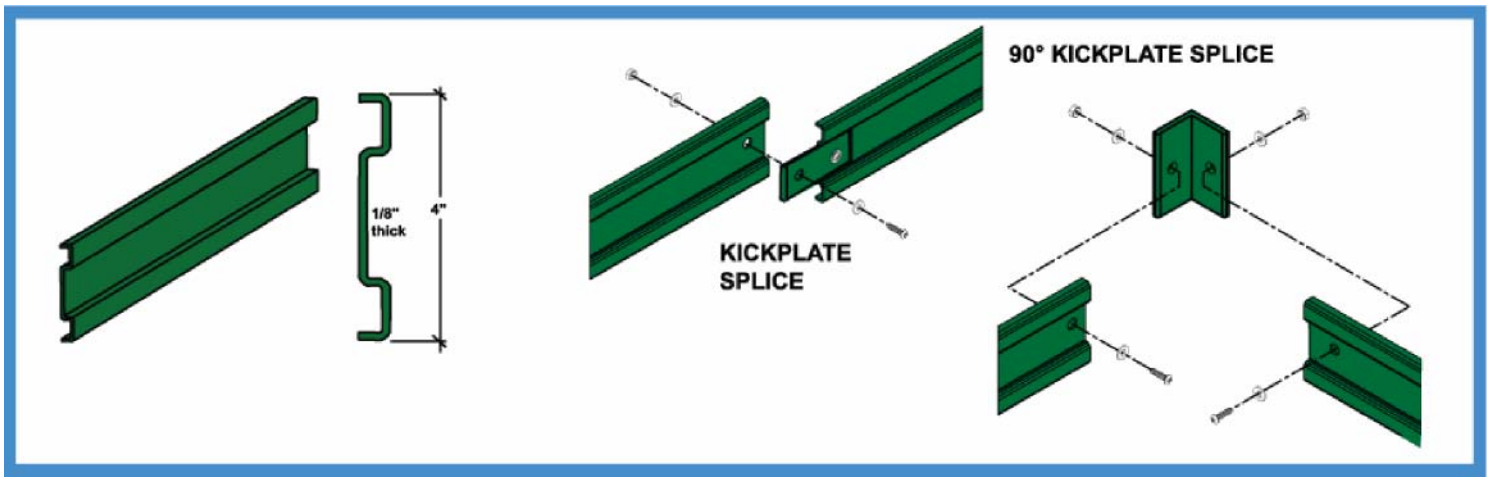
MinRail Square Rails Components



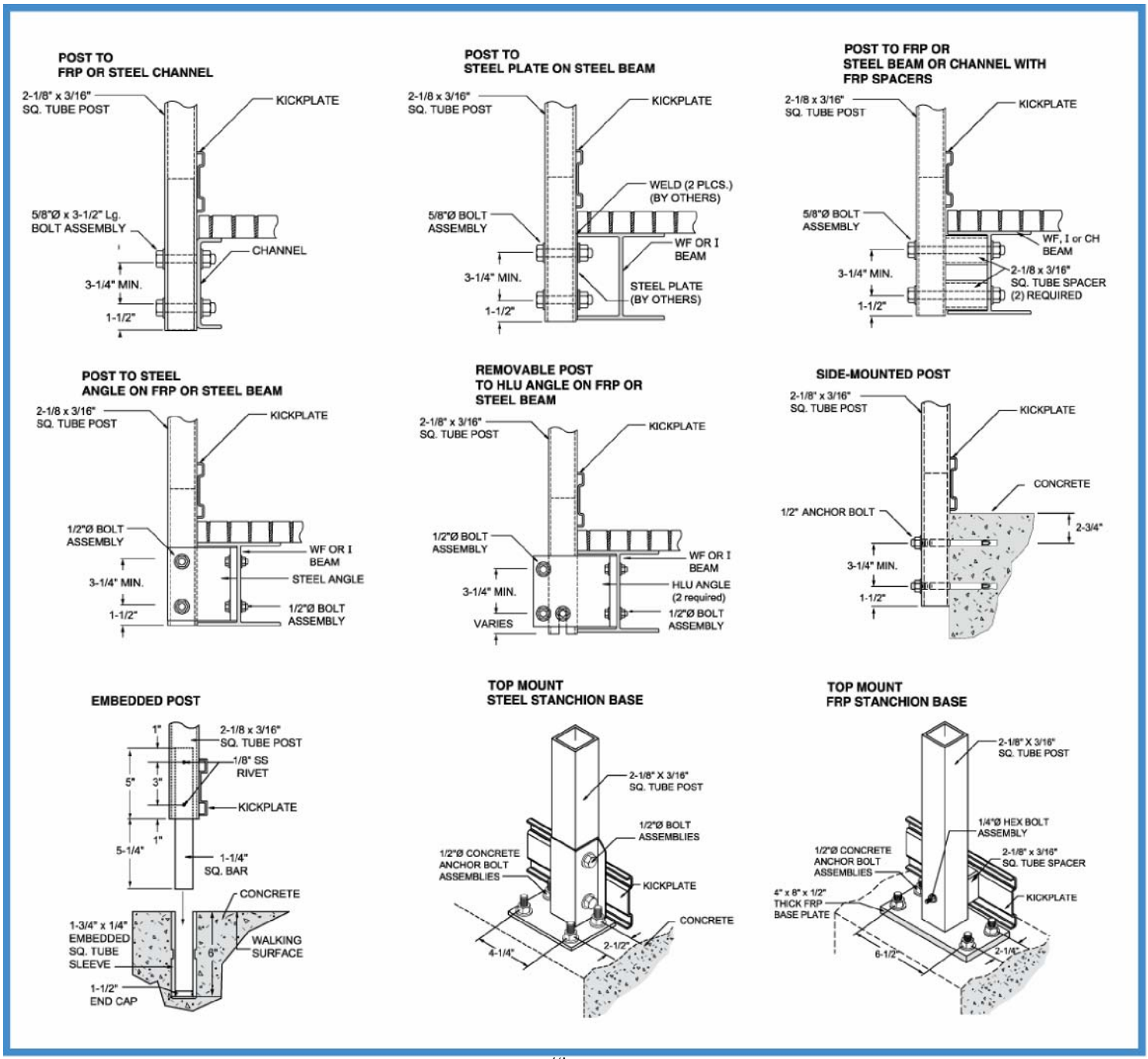
MinRail Square Rails Components



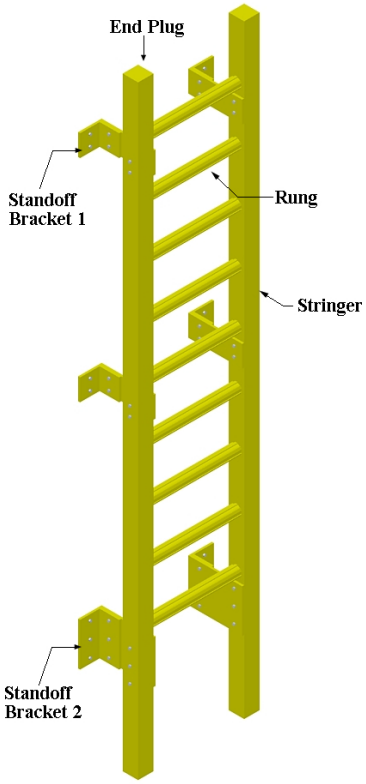
Kick Plate and Splice



Post Installation Methods

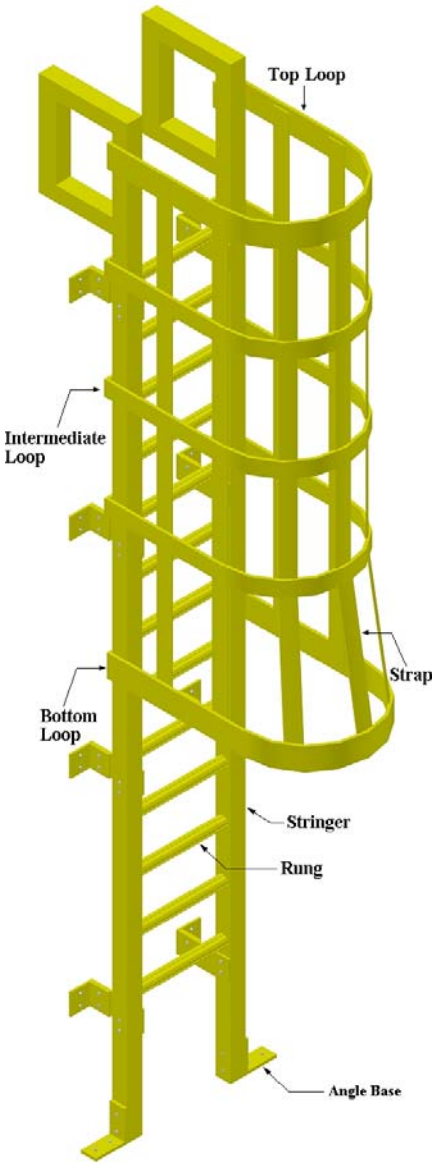


Ladder and Cage Systems



Specification

Stringer	50.8 x 6.4mm SHS
Rung	31.8mm Flute Tube
Intermediate Loop	50.8 x 6.4mm Strip
Top and Bottom Loop	76 x 6.4mm Strip
Strap	50.8 x 48mm Strip
Standoff Bracket 1	101.6 x 9.5 (T) x 100mm (L) Angle 101.6 x 254 x 0.5 (T) Plate
Standoff Bracket 2	101.6 x 9.5(T) x 200mm (L) Angle 200 x 254 x 9.5mm (T) Plate
Base Angle	76 x 12.7 x 50.8mm Angle
End Plug	Molded End Cap

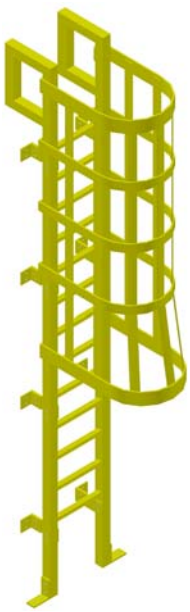


Standard Designs

Type: FM
(Floor Mount)

Type: WM
(Wall Mount)

Type: WMR
(Wall Mount w/Return)



Type: CWR
(Cage w/Return)

Type: CSW
(Side Walk Cage)

Remark: Any combination of the above designs and tailor-made per the drawings provided are available.

Chemical Resistance Guide

This chemical resistance guide is based on extensive experience and knowledge of composites in chemical service. Since actual in-use conditions can differ from referenced conditions and can vary during the usable life of the grating, this guide is intended for general reference use only. The end user is responsible for testing and determining final product suitability.

Chemical Environment	Operating Temperature, ˚C					Chemical Environment	Operating Temperature, ˚C				
	Molded			Pultruded			Molded			Pultruded	
	Vinyl Ester (V)	Isophthalic Polyester (I)	Orthophthalic Polyester (O)	Vinyl Ester (V)	Isophthalic Polyester (I)		Vinyl Ester (V)	Isophthalic Polyester (I)	Orthophthalic Polyester (O)	Vinyl Ester (V)	Isophthalic Polyester (I)
Acetic Acid, 50%	82	66	60	82	66	Lithium Chloride	82	66	60	82	66
Acetone	Amb(1)	Amb(2)	NR	Amb(2)	NR	Magnesium Carbonate	71	49		71	Amb
Alcohol	49	49(2)		49(2)	49(2)	Magnesium Chloride	82	66	60	82	66
Aluminum Chloride	82	66	60	82	66	Magnesium Hydroxide	82	NR	NR	60	NR
Aluminum Hydroxide	49	Amb	NR	49	Amb	Magnesium Nitrate	82	49		71	Amb
Aluminum Nitrate	60	49		60	38	Magnesium Sulfate	71	66		71	49
Aluminum Sulfate	71	66		71	49	Mercuric Chloride	82	66		82	66
Ammonium Chloride	82	66		71	49	Methyl Ethyl Ketone	NR	NR	NR	NR	NR
Ammonium Hydroxide, 5%	82	NR	NR	60	NR	Mineral Oil	82	66		82	66
Ammonium Nitrate, 50%	82	49		71	49	Nickel Chloride	82	60		82	49
Ammonium Nitrate, Saturated	82	38		71	38	Nitric Acid, 5%	49	38	NR	49	38
Ammonium Persulfate, 25%	49	NR	NR	49	NR	Phenol,10%	Amb(1)	NR	NR	Amb(2)	NR
Ammonium Phosphate	82	49	NR	66	Amb	Phosphoric Acid, 85%	t80	60		82	60(1)
Ammonium Sulfate	82	49		71	49	Phosphoric Acid, Vapor	71	49		71	49
Barium Chloride	82	66	49	82	66	Potassium Aluminum Sulfate	82	66		82	66
Barium Sulfate	82	66		82	66	Potassium 8icarbonate	49	Amb		43	Amb(1)
Benzene	60(2)	49(2)		Amb(2)	NR	Potassium Carbonate, 10%	43	Amb(2)	NR	43	NR
8iack Liquor (Pulp Process)	82	49(2)	NR	71(2)	NR	Potassium Chloride	82	66	60	82	66
Bleach Liquor (Pulp Process)	82	Amb(2)	NR	71(2)	NR	Potassium Hydroxide, 10%	49	Amb(2)	NR	49(1)	NR
Brine (Sodium Chloride)	82	66	60	82	66	Potassium Nitrate	82	66		82	66
Calcium Carbonate	82	49		71	49	Potassium Sulfate	82	66		82	66
Calcium Hydroxide, 25%	82	66(1)		82(1)	66(2)	Propylene Glycol	82	66		82	66
Calcium Hypocholrite	82	66(2)	NR	82(2)	NR	Sodium Acetate	82	66		82	66
Calcium Nitrate	82	66		82	66	Sodium Benzoate	60	49		49	Amb
Calcium Sulfate	82	66		82	66	Sodium Bisulfate	82	66		82	66
Carbonic Acid	66	Amb		49	Amb	Sodium Borate	82	66		82	66
Carbon Tetrachloride	Amb	Amb(2)	NR	Amb(2)	NR	Sodium Bromide	82	66		82	66
Chlorine Dioxide	60	Amb	NR	49	NR	Sodium Carbonate, 10%	60	Amb(2)		49	NR
Chlorine, Wet Gas	82	NR	NR	NR	NR	Sodium Chloride	82	66	60	82	66
Chlorine Water	49	49(2)	NR	49(2)	NR	Sodium Cyanide	82	Amb		71	Amb(2)
Chromic Acid, 10%	49	Amb(2)	NR	Amb(2)	NR	Sodium Dichromate	82	49		71	Amb
Chromium Sulfate	60	Amb		60(2)	Amb	Sodium Diphosphate	82	66		71	49
Citric Acid	82	66	60	82	66	Sodium Hydroxide, 10%	82	NR	NR	NR	NR
Copper Chloride	82	66	60	82	66	Sodium Hypocholorite, 51/4%	49	38(1)		43(1)	Amb(1)
Copper Cyanide Plating	49	Amb(1)		49(1)	Amb(2)	Sodium Nitrate	82	66		82	66
Copper Nitrate	82	66		82	66	Sodium Sulfate	82	66		82	66
Crude Oil, Sour	82	66	Amb	82	66	Soy Oil	82	66		71	49
Ethylene Glycol	82	66		82	66	Stearic Acid	77	66		71	49
Fatty Acids	82	66		82	66	Styrene	NR	NR	NR	NR	NR
Ferric Chloride	82	66	Amb	82	66	Sulfite Liquor	71	38		71	Amb
Ferric Sulfate	82	66		82	66	Sulfur Dioxide, Gas - wet	82	66(1)		82	66(1)
Formaldehyde, 35%	66	66(2)	NR	66(1)	66(2)	Sulfur Trioxide, Gas - wet	49	NR	NR	Amb	NR
Formic Acid, 25%	38	38(1)	NR	38(1)	38(2)	Sulfuric Acid, 25%	82	66(1)		82(1)	66(2)
Fuel (Aviation, Diesel, Gasoline)	38	38		38	38	Tartaric Acid	82	66		71	49
Glycerine	82	66	60	82	66	Toluene	49(1)	49(2)	NR	49(2)	NR
Green Liquor (Pulp Process)	82	NR	NR	82(2)	NR	Trisodium Phosphate, 50%	82	66(2)		82(2)	NR
Hydraulic Fluid	60	NR	NR	60	NR	Urea, 35%	43	Amb	NR	43	NR
Hydrobromic Acid, 45%	82	66(1)		82(2)	NR	Vinegar	82	66		71	66
Hydrochloric Acid,15%	82	66(1)		82(1)	66(1)	Water, Fresh, Salt, Distilled	82	66	60	82	66
Hydrofluoric Acid, 20%	24(1)	NR	NR	NR	NR	White Liquor (Pulp Process)	82	66(2)	NR	82(1)	NR
Kerosene	82	60		71	49	Zinc Chloride (Plating)	24	24(1)	NR	24(1)	NR
Lactic Acid	82	54		71	49	Zinc Nitrate	82	66		82	66
Lead Acetate	82	Amb		71	Amb	Zinc Salt	82	66	60	82	66
lime	82	66	60	82	66	Zinc Sulfate	82	66		82	66
Linseed Oil	82	66		82	66						

(1) Splash and spill exposure only
(2) Infrequent splash and spill exposure with spills immediately cleaned up.

Amb -Ambient or room temperature exposure
NR -Not recommended for these conditions

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