LEADERGRATE
GRP PRODUCTS

Fabricated by
المستقبل
AL MUSTAQBAL FIBERGLASS IND.

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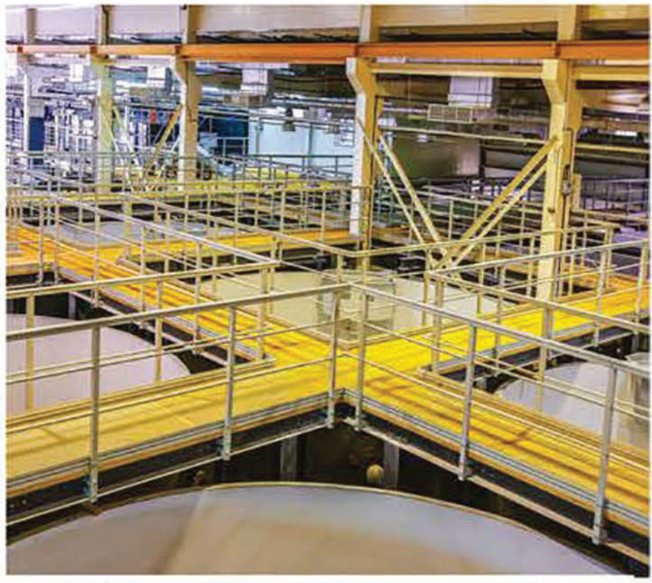
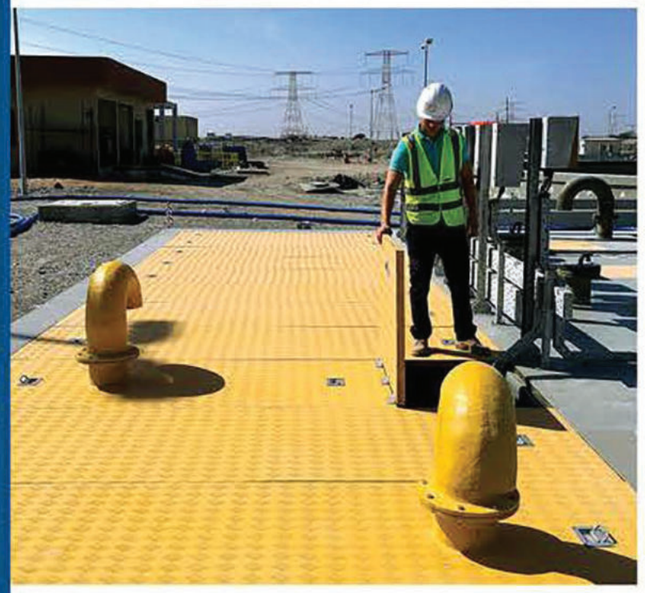
TÜVRheinland CERTIFIED
Management System
ISO 9001:2015
ISO 14001:2015
ISO 45001:2018
www.tuv.com
ID 9000009273

FIBERGLASS INDUSTRIAL PRODUCTS

IN WATER & WASTE WATER INDUSTRIES





CONTENT

INTRODUCTION

Al Mustaqbal LLC was incorporated in UAE with the intention of providing both the local and overseas market with a cost effective solution to the various corrosion problems, which cannot be solved easily by the traditional materials like Steel, Stainless steel, Aluminium, wood etc.
Our engineering team develops new products and services for our customers through a balanced assimilation of 12 years of experience in the Gulf region, our investments in new techniques and innovative design technology.

Our commitment towards providing exceptional products and services, whether it applies and viewed by millions of people each year or an application that is buried well below the earth's surface, our Standard Structural FRP line and Custom Pultruded Profiles meet or exceed client's expectation in terms of quality and pricing, coupled with the workmanship of our skilled workforce in maintaining cost efficiency, has given us the competitive edge and the challenges in the markets.

Customers demand and deserve high quality product, it is our responsibility to give them what they want. Our Engineers always seek out a better way and understanding with client's requirements / specifications.

We will achieve this by:

- Knowing who our Customers are and what they want – through open communication.
- Serving a good example as a company that diversified its expertise to reach new markets and demonstrated its receptivity to customer needs.
- Understanding the requirements of our jobs and the systems that support us.
- Maintaining a constant focus on quality with full dedication, commitment and teamwork.
- Furnish high quality products on time, and at the most reasonable cost.
- Enhance proper performance at the application level and ongoing improvement in process efficiency.
- To be aggressive in our attitude towards quality and service, because we believe that quality is not just another goal, it is our basic strategy for continued existence and future expansion.

GENERAL INFORMATION

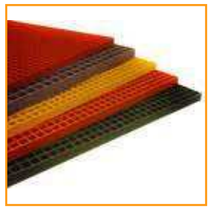
AL Mustaqbal molded and pultruded grating are developed for corrosive applications where light weight, impact resistant, corrosion resistant and slip resistant grating is a must. The molded grating is a combination of glass rovings strategically positioned within thermoset resins to form a one-piece, high resin content product. The pultruded grating is an assembled grating from pultruded bearing bars, manufactured by the " PULTRUSION PROCESS " to form a high glass content product.

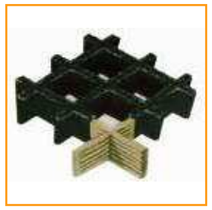
Quality Manufactured Product

Al Mustaqbal is an ISO 9001 certified company. The gratings are manufactured complying to ASTM & BS standards. Every panel of grating is subjected to a number of quality assurance inspections ensuring void free panels, full wet-out of the glass rovings, consistent non skid features. Complete traceability of resin batches and the glass utilized in every panel is maintained and can be provided as needed. Chemical resistant tests, and load capacity are routinely performed.

Molded Grating

Manufacturing process is open heated molding. Continuous glass fibers are placed in the mold in alternating layers and completely wetted out with resin. This continuous process produces an integral, one piece construction which provides excellent corrosion resistance as well as bi-directional strength. When the weaving process is completed, the mold is heated to cure the panel. The mold will receive the grit before the part is cured. After curing the part is extracted from the mold. Many types of mesh sizes and panel sizes can be obtained as per different molds design.



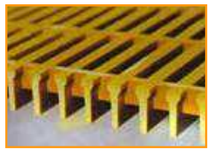


Pultruded Grating

Pultrusion is a continuous molding process using fiber reinforcements with thermosetting resin matrices. Pre-selected reinforcement materials, such as fiberglass roving, mat, woven fabrics are drawn through a resin bath in which all material is thoroughly impregnated with a liquid thermosetting resin. Typical resins include polyester, vinylester and phenolics. The wet out fiber is formed to the desired geometric shape and pulled into a heated steel die. Once inside the die, the resin cure is initiated by controlling elevated temperatures. The laminate solidifies in the exact cavity shape of the die and is continuously pulled by the pultrusion machine.

Moltruded Grating

Moltruded grating has been designed to combine the one piece construction of molded grating with the unidirectional stiffness of pultruded grating.



IMPORTANT FEATURES

1 Corrosion Resistant

Unlike conventional metals, Al Mustaqbal products eliminate the rusting and corrosion problems associated with traditional materials. The corrosion resistance is achieved by the choice of the resin and is enhanced by adding chemical resistant veil to the external surface of the pultruded profiles. Additionally, special UV inhibitors included in the formulation provide extra protection from the effects of weathering.

2 Light Weight

At only 12 kgs/m2 for 25 mm thick grating and 18kgs/m2 for 38mm thick grating, Al Mustaqbal grating is very easy to install, to remove and lift without the help of heavy lifting equipment. Fiberglass grating weighs 1/3 the weight of steel grating, resulting in lower installations cost.

3 High Stiffness

Our Grating are manufactured using a proprietary method enabling a high percentage of glass rovings to be introduced into the grating. Possessing a higher glass content results in a stiffer fiberglass grating. The glass content for molded grating can vary between 25-38% and can be increased to 43% in special cases. The Pultruded grating possesses approximately 65 % of Glass content by weight giving it the very high strength to weight ratio. Load bearing bar capacity can be tailored to the application by modifying the glass content, fiber orientation and combination of mat and roving reinforcement. The grating platform can be designed with live load starting from 250 kgs/m2, 500 kgs/m2 , 1000 kgs/m2, 1500 kgs/m2 up to a maximum load 40 tons/m2.

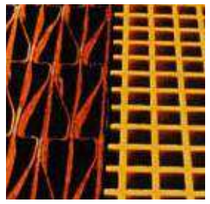
4 UV Resistant & Durability

Our products are suitable for 100% humidity and temp > 100 °C and UV resistant by adding UV inhibitor in the resin and a synthetic veil to the external layer of pultruded products, hence creating a resin rich surface.

IMPORTANT FEATURES

5 Fire Retardant

All AL Mustaqbal Molded and pultruded are designed to exhibit a minimum of a class 1 flame spread rating when tested in accordance with ASTM-E 84 flame spread rating tunnel test. Our grating are available in a variety of resins offering an array of flame spread ratings and smoke densities. it meets the self-extinguishing requirements of ASTM-D635.



6 Maintenance Free

Al Mustaqbal grating requires no scraping, sandblasting or painting

7 Electrically and thermally non conductive

Because our system are non-metallic, electro magnetic and radio wave frequencies are completely unaffected.

8 A variety of color choices

The standard color is safety yellow, but any system can be custom ordered to your specific color requirements.

9 Impact Resistant

Al Mustaqbal grating is very flexible and may be repeatedly deflected without causing Permanent deformationv. High energy absorption and flexibility of Al Mustaqbal grating make it impact resistant.

AREAS OF APPLICATION

AL MUSTAQBAL grating / cover systems are designed to accommodate a wide variety of applications, such as :

- District cooling plants
- Stairs, flooring, platforms, catwalks
- Industrial & municipal Waste Water Facilities
- Desalination and RO plants
- Chemical plants
- Petrochemical Plants and Refineries (offshore, onshore)
- Marine industry / Shipyard
- Power Plant
- Recreational Water park & Swimming pool
- Walkway, trench covers
- Abattoirs
- Beverage & Food Process Plant
- Service Underground Tunnels / Metro / Railroad
- Residential Building / Malls & Shops – Interior Design, Exterior Architectural
- Zoos and Aquarium
- Pickling and Galvanizing Plants
- Decking and Pontoons
- Carwash
- Cellular communications

AREAS OF APPL CAT ON

INDUSTRIAL & MUNICIPAL WASTE WATER FACILITIES

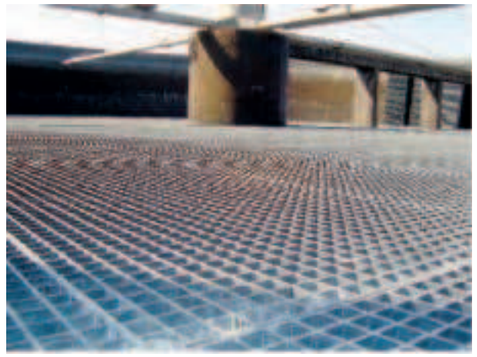
GRP flat chequered covers , design 5 KN/m2

GRP safety handrail

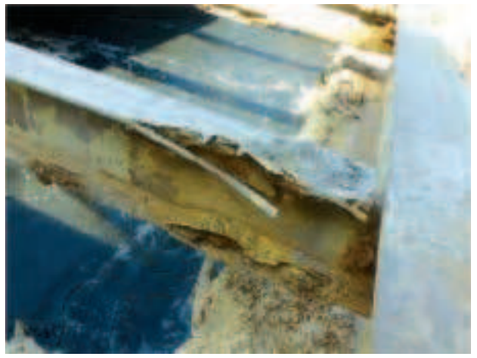
GRP drain grating and cover at Chlorine plant

GRP covers at
Sludge drying beds

GRP service platform for
Odor control scrubber



GRP molded grating raised platform
inside Bio trickling filter tanks



Corrosion of Steel beams at WWTP

AREAS OF APPLICATION

INDUSTRIAL & MUNICIPAL WASTE WATER FACILITIES

GRP self supporting curved covers , design 2.5 KN/m2

GRP sealed covers for OCU

GRP walkway on Concrete wall
`of WWTP in Riyadh

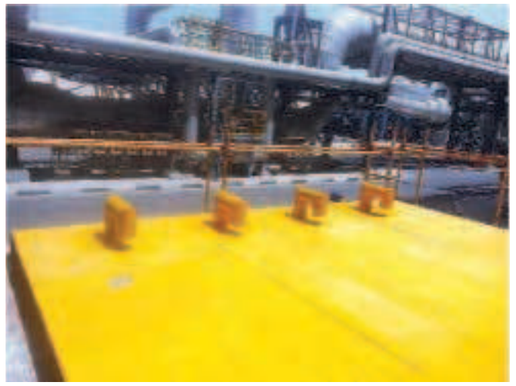
GRP walkway WWTP Riyadh

GRP walkway WWTP Riyadh

GRP Walkway WWTP Riyadh

AREAS OF APPL CAT ON

SWRO & DESALINATION PLANT - UAE



GRP Flat covers for pit in Desalination plant

GRP roof sealed cover for Potable Water tank

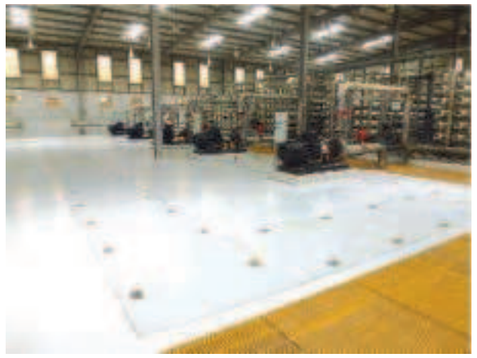
RO Plant at Al Qaffay Island
(400m2 Molded Grating)

Jebel Ali- Desalination Plant
(GRP Safety Ladder outfall area)

AREAS OF APPLICATION

SWRO & DESALINATION PLANT - KSA

GRP molded grating SM 50x50
over pipes trench Design 5 KN/m2



GRP closed chequered cover over Cable trench,
Design 5 KN/m2

GRP Caged pultruded ladder

GRP Pultrurded Heavy duty grating over pipe trench,
3 tons Forklift

GRP gratings in RO building

testing Pultruded grating with 3T forklift

AREAS OF APPLICATION

POWER PLANTS & SUBSTATIONS - UAE

GRP grating fencing
3m High at Qusais Substation

GRP grating fencing 3m High at Aweer Substation

DISTRICT COOLING PLANT - UAE

GRP Walkway at Emicool DCP
at motor city

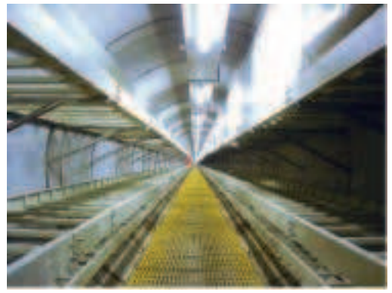
GRP column for High rise platform
at Emicool DCP at DIP

GRP service platform at Emicool DCP at DIP

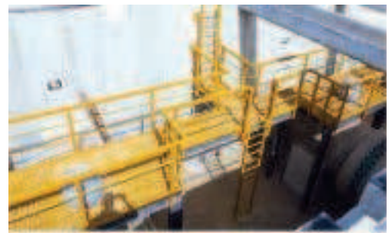
GRP Staircase tower at DCP UAE

INFRASTRUCTURE PROJECTS - UAE

GRP U/G Caged Pultruded ladder
w/ Resting platform
for Irrigation tanks at Dubai Parks



GRP pultruded walkway 5 KN/m2 for
Under Sea Service tunnel at Palm Jumeirah



GRP U/G service platform
for Valve chambers at Emirates Road

GRP Traffic drain grating

MINING AND ALUMINUM SMELTERS - UAE

GRP Non conductive mobile maintenance platform

GRP access staircase in Smelter

AREAS OF
APPL CAT ON

AQUACULTURE (HATCHERIES & FISH FARMS) in UAE

GRP drain grating in Hatchery

GRP 4 m High grating platforms over fish tanks

GRP staircase

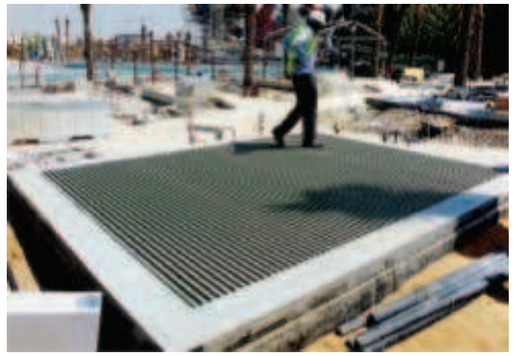
GRP handrail w/2 middle rail & kickplate

GRP Access to Biofilters tanks

GRP column & beams
supports over fish tanks

AREAS OF APPLICATION

THEME PARK , SPORT & LEISURE



GRP Pultruded grating over pump room at YAS Water Park

GRP Raised grating
for water fountain at DUBAI PARK

GRP Pultruded wave pool grating at Dubai Park

GRP security fence at Swimming pool Hall
at Sport city Dubai

GRP Manhole covers Class A15
at YAS water park

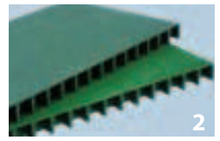
GRP recessed Manhole cover
`at parking area at YAS Water Park

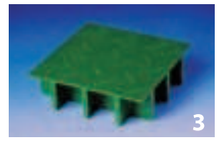
CHOICE OF RAW MATERIAL

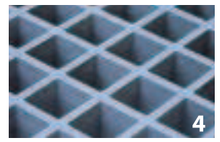
RESIN TYPE	CORROSION	FLAME SPREAD RATING ASTM E84	MAX. OPER. TEMP
Type MP-5 , Phenolic	Used in confined spaces, subways, offshore, oil fields where the fire resistance and low smoke and low toxic fumes is the premium concern.	Class 1 , 5 or less	180 °C
Type VEFR-10 , Vinylester	Provides the most chemical resistance in the industry, it is primarily used in petrochemical, waste water, mining and plating application where the product is in direct contact with harsh chemical and sewage.	Class 1 10 or less	110 °C
Type VEFR-25 , Vinylester	Provides the most chemical resistance in the industry, it is primarily used in petrochemical, waste water, mining and plating application where the product is in direct contact with harsh chemical and sewage.	Class 1 25 or less	110 °C
Type FG-30 Isophtalic	Food Grade corrosion resistance and fire Retardant.	Class 1 30 or less	105 °C
Type IFR-10, Isophtalic	Provides intermediate level of chemical resistance where the product is subject to splash and spill contact with harsh chemicals, sea water.	Class 1 10 or less	85 °C
Type IFR-25 , Isophtalic	Provides intermediate level of chemical resistance where the product is subject to splash and spill contact with harsh chemicals, sea water.	Class 1 25 or less	85 °C
Type CFR-25 Orthophtalic	Moderate corrosion resistance and fire retardant for normal application.	Class 1 25 or less	60 °C

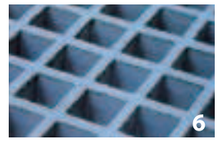
CHOICE OF SURFACE

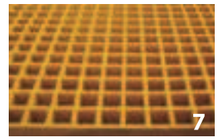
SN	TYPE OF COVER	SURFACE FINISH	ADVANTAGES / APPLICATIONS
1	Closed	Smooth	For architectural and interiors applications
2	Closed	Gritted	Ramps - In wet weather
3	Closed	Diamond	Used for pit covers / manhole covers where corrosion and odor control are problems for waste water treatment facilities
4	Open	Smooth	For architectural and interiors applications
5	Open	Concave surface	Standard surface after extraction from the mould, provide excellent slip resistance
6	Open	Sprayed grit surface	Provides additional slip resistance to the concave surface
7	Open	Embedded grit surface	Provides the highest anti-slip properties since grit are embedded in the grating before curing (oil Rigs, offshore)
8	Open	Mini mesh Surface	The smaller opening prevents objects as small as ½" (13 mm) from falling through

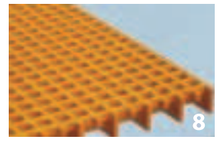












CHEMICAL RESISTANCE GUIDE

CHEMICAL ENVIRONMENT	TYPE VINYLESTER		TYPE ISOPHTALIC	
	% Concentration	Max Oper. Temp /C	% Concentration	Max Oper. Temp /C
Acetic Acid	50	82	50	52
Aluminum Hydroxide	100	77	100	71
Ammonium Chloride	All	88	All	77
Ammonium Hydroxide	28	38	28	N/R
Ammonium Bicarbonate	50	65	15	52
Ammonium sulfate	All	93	All	77
Benzene	N/R	N/R	N/R	N/R
Benzoic Acid	Sat	93	Sat	66
Borax	Sat	93	Sat	77
Calcium Carbonate	All	82	Sat	77
Calcium Nitrate	All	93	All	82
Carbon Tetrachloride	100	24	N/R	N/R
Chlorine , Dry Gas	--	77	--	60
Chlorine Water	Sat	82	Sat	27
Chromic Acid	10	49	5	21
Citric Acid	All	93	All	77
Copper Chloride	All	93	All	77
Copper Cyanide	All	93	All	77
Copper Nitrate	All	93	All	77
Ethanol	50	32	50	24
Ethylene Glycol	100	93	100	32
Ferric Chloride	All	93	All	77
Ferrous Chloride	All	93	All	77
Formaldehyde	All	38	50	24
Gasoline	100	65	100	27
Glucose	100	93	100	77
Glycerine	100	93	100	66
Hydrobromic Acid	50	49	50	49
Hydrochloric Acid	37	38	37	24
Hydrogen Peroxide	30	38	5	38
Latic Acid	All	93	All	77
Lithium Chloride	Sat	93	Sat	66

CHEMICAL RESISTANCE GUIDE

CHEMICAL ENVIRONMENT	TYPE VINYLESTER		TYPE ISOPHTALIC	
	% Concentration	Max Oper. Temp /C	% Concentration	Max Oper. Temp /C
Magnesium Chloride	All	93	All	77
Magnesium Nitrate	All	82	All	66
Magnesium Sulfate	All	88	All	77
Mercuric Chloride	100	88	All	66
Mercurous Chloride	All	82	All	60
Nickel Chloride	All	93	All	77
Nickel Sulfate	All	93	20	77
Nitric Acid	20	38	All	21
Oxalic Acid	All	96	N/R	24
Perchloric Acid	30	27	100	N/R
Phosphoric Acid	100	93	All	49
Potassium Chloride	All	93	All	77
Potassium Dichromate	All	93	All	77
Potassium Nitrate	All	93	All	77
Potassium Sulfate	All	93	All	77
Propylene Glycol	All	93	All	77
Sodium Acetate	All	93	All	71
Sodium Bisulfate	All	93	All	77
Sodium Bromide	All	93	All	77
Sodium Cyanide	All	93	All	77
Sodium Hydroxide	25	66	N/R	N/R
Sodium Nitrate	All	93	All	77
Sodium Sulfate	All	93	All	77
Stannic Chloride	All	88	All	71
Sulfuric Acid	75	38	25	24
Tartaric Acid	All	93	All	77
Vinegar	100	93	100	77
Water , Distilled	100	82	100	77
Zinc Nitrate	All	93	All	77
Zinc Sulfate	All	93	All	77

* ALL: All Concentrations * SAT: Saturated Solution * N/R: Not Recommended
* All the corrosion resistance data listed above is for general information only. Please refer to resin manufacturer test data for more details.

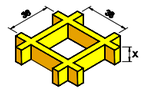
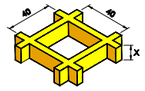
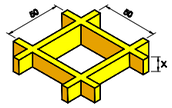
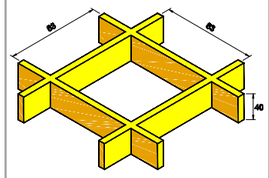
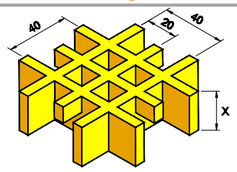
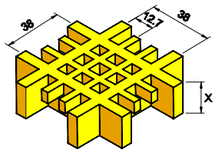
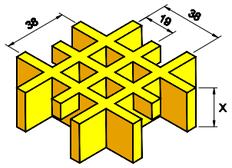
CHOICE OF GRATING

The following table is included as a guide to help in choosing the best grating for a particular application:

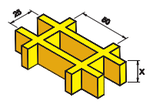
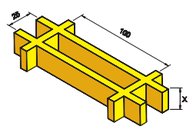
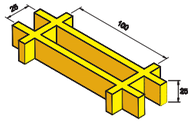
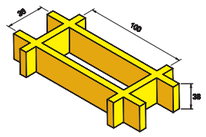
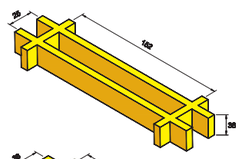
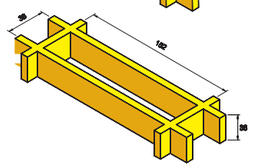
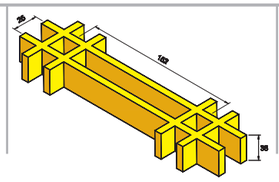
Al Mustaqbal Molded Grating vs Pultruded Grating & Moltruded Grating

	MOLDED GRATING	PULTRUDED GRATING	MOLTRUDED GRATING
Chemical resistance	Excellent	Good	Excellent
Strength / Stiffness	Good	Excellent	Very Good
Impact Strength	Excellent	Average	Good
Open Area (air flow, light penetration, drainage)	Excellent	Average	Excellent
Single Direction Span	Average	Excellent	Excellent
Bi-Direction Span	Excellent	Not recommended	Not recommended
Pipe Penetration	Excellent	Average	Average
Ease of lay-out and installation	Excellent	Average	Excellent

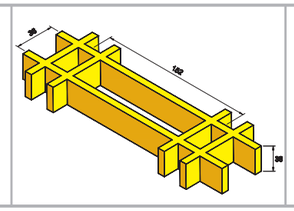
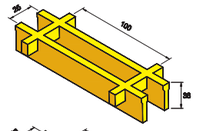
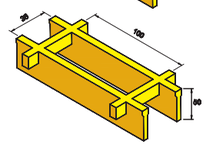
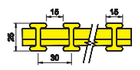
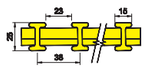
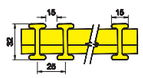
CHOICE OF MESH (PART1)

SN	CODE	SKETCH	DEPTH MM	OPEN AREA %	WEIGHT KG/ M²
Square Mesh Grating					
1	LG 38 SMG		13, 20, 25, 30, 38, 50, 60	78%, 65% 68%, 68% 68%, 56% 54%	6.0 , 9.8 , 12.3 ,14.6 , 19.5, 42.0 ,50.4
2	LG 40 SMG		25 ,30 ,40	67%	12.0 , 14.5 , 19.2
3	LG 50 SMG		13 ,25 , 50	82%, 80% 78%	5.8 , 11.7 , 23.7
4	LG 83 SMG		40	84%	9.5
Square Mini Mesh Grating					
5	LG 20x20 SMMG		14 ,30 ,40	42%	10.5 , 18.0 , 23.7
6	LG 12.7x12.7 SMMG		30	30%	22.0
7	LG 19x19 SMMG		25 , 38	40%	16.8 , 23.5

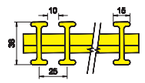
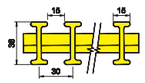
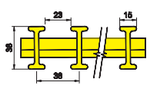
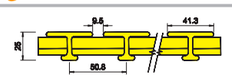
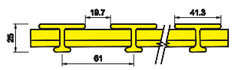
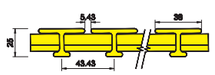
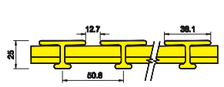
CHOICE OF MESH (PART2)

SN	CODE	SKETCH	DEPTH MM	OPEN AREA %	WEIGHT KG/ M^2
Rectangular Mesh Grating					
8	LG 25x50 RMG		38 , 50	48%	30.3 , 41.0
9	LG 25x100 RMG		25 , 30 ,38	67%,67% 62%	13.0 , 15.6 ,22.5
10	LG 25x100 RMG -HD		25	52%	19.5
11	LG 38x100 RMG		38	65%	16.4
12	LG 25x152 RMG		38	63%	22.50
13	LG 38x152 RMG		38	67%	15.92
Stair Tread					
14	LG 25x152 RMG		38	56%	23.02

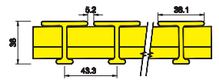
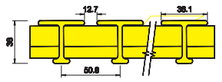
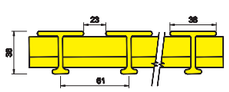
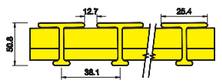
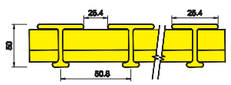
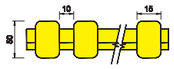
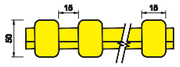
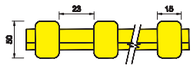
CHOICE OF MESH (PART3)

SN	CODE	SKETCH	DEPTH MM	OPEN AREA %	WEIGHT KG/ M^2
Stair Tread					
15	LG 38x152 RMG		38	65%	17.0
Moltruded Grating					
16	LG 25x100 MG		38	46%	21.0
17	LG 38x 100 MG		50	62%	15.3
Pultruded I Grating					
18	LG I-4025		25	40%	17.1
19	LG I-5025		25	50%	14.2
20	LG I-6025		25	60 %	11.2
21	LG I-4032		32	40 %	19.83

CHOICE OF MESH (PART4)

SN	CODE	SKETCH	DEPTH MM	OPEN AREA %	WEIGHT KG/ M^2
Pultruded I Grating					
22	LG I-4038		38	40%	22.01
23	LG I-5038		38	50 %	19.1
24	LG I-6038		38	60 %	16.1
Pultruded T Grating					
25	LG T-1825		25	18%	13.8
27	LG T-3325		25	33 %	11.2
28	LG T-1225		25	12%	14.5
29	LG T-2525		25	25%	12.3

CHOICE OF MESH (PART5)

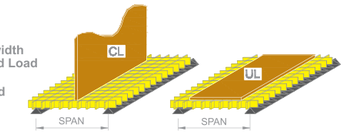
SN	CODE	SKETCH	DEPTH MM	OPEN AREA %	WEIGHT KG/ M^2
Pultruded T Grating					
30	LG T-1238		38	12%	19.6
31	LG T-2538		38	25%	16.7
32	LG T-3838		38	38%	14.2
33	LG T-3350		50	33%	20.27
34	LG T-5050		50	50%	15.66
Pultruded heavy Duty Grating					
35	LG HD-4050		50	40 %	70.37
36	LG HD-5050		50	50 %	52.24
37	LG HD-6050		50	60 %	43.50

LOAD / DEFLECTION TABLE

A. Molded Industrial Grating

Load Data

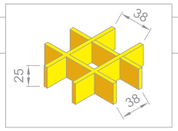
CL is Concentrated Load kG/m of width
ΔCL is Deflection under Concentrated Load
UL is Uniform Load kG/m2
ΔUL is Deflection under Uniform Load



LG 38 SMG, 25mm Thk.

SPAN MM		300	350	400	450	500	600	800	1000	SAFE LOAD, 5:1 SAFETY FACTOR	DEFLECTION	E X 10^10 N/SQm
400	ΔUL	< 0.37	< 0.45	0.52	0.59	0.65	0.75	1.02	1.28	3800	4.95	1.34
	ΔCL	<1.56	< 1.82	2.05	2.32	2.60	3.13	4.17	5.21	800	4.17	
600	ΔUL	1.92	2.23	2.56	2.88	3.20	3.82	5.10	6.38	1900	12.16	1.38
	ΔCL	5.10	5.98	6.83	7.66	8.52	10.24	13.66	17.05	600	10.24	
800	ΔUL	5.98	6.98	7.95	8.98	9.97	11.95	15.94		1000	19.95	1.4
	ΔCL	11.97	13.96	15.95	17.95					400	15.96	
1000	ΔUL	14.38	16.80							600	28.81	1.42
	ΔCL									300	23.04	

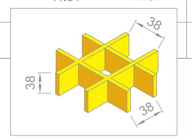
NOTE: The designer should not exceed the SAFE LOAD at any given span.
The safe load represent a 5:1 factor of safety on ultimate capacity.



LG 38 SMG, 38mm Thk.

SPAN MM		300	350	400	450	500	600	800	1000	SAFE LOAD, 5:1 SAFETY FACTOR	DEFLECTION	E X 10^10 N/SQm
400	ΔUL	< 0.12	< 0.17	< 0.17	< 0.22	< 0.22	0.27	0.35	0.48	5800	2.78	1
	ΔCL	< 0.57	< 0.65	< 0.77	0.84	0.96	1.15	1.53	1.90	1700	3.26	
600	ΔUL	0.60	0.74	0.82	0.95	1.05	1.26	1.66	2.11	3900	8.22	1.15
	ΔCL	< 1.67	1.97	2.25	2.51	2.80	3.35	4.50	5.62	1200	6.75	
800	ΔUL	1.80	2.10	2.39	2.72	3.02	3.62	4.83	6.01	2200	13.27	1.27
	ΔCL	3.62	4.22	4.83	5.42	6.01	7.24	9.62	12.07	900	10.86	
1000	ΔUL	4.30	5.02	5.76	6.48	7.20	8.61	11.51	14.37	1400	20.15	1.3
	ΔCL	6.90	8.06	9.20	10.34	11.49	13.82			700	16.12	
1200	ΔUL	8.56	9.97	11.41	12.84	14.24	17.09			800	22.82	1.36
	ΔCL	11.40	13.31	15.19	17.09					500	19.02	

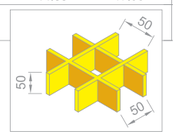
NOTE: The designer should not exceed the SAFE LOAD at any given span.
The safe load represent a 5:1 factor of safety on ultimate capacity.



LG 50 SMG, 50mm Thk.

SPAN MM		300	350	400	450	500	600	800	1000	SAFE LOAD, 5:1 SAFETY FACTOR	DEFLECTION	E X 10^10 N/SQm
400	ΔUL	< 0.06	< 0.10	< 0.11	< 0.10	< 0.12	< 0.16	< 0.20	0.25	5600	1.53	0.93
	ΔCL	< 0.33	< 0.38	< 0.43	< 0.49	< 0.53	0.65	0.87	1.09	2200	2.41	
600	ΔUL	< 0.31	< 0.35	0.42	0.47	0.52	0.62	0.83	1.04	4700	4.88	1.24
	ΔCL	< 0.81	< 0.97	1.11	1.25	1.38	1.65	2.20	2.75	1400	3.88	
800	ΔUL	0.87	1.02	1.14	1.29	1.45	1.74	2.32	2.90	2800	8.14	1.4
	ΔCL	< 1.74	2.01	2.32	2.62	2.90	3.47	4.65	5.81	1100	6.39	
1000	ΔUL	2.03	2.36	2.68	3.02	3.38	4.05	5.40	6.76	1800	12.16	1.47
	ΔCL	3.22	3.78	4.32	4.86	5.40	6.49	8.65	10.80	900	9.73	
1200	ΔUL	4.04	4.69	5.38	6.06	6.73	8.06	10.77	13.46	1300	17.50	1.53
	ΔCL	5.38	6.28	7.16	8.06	8.95	10.77	14.35	17.95	400	7.18	
1400	ΔUL	7.26	8.49	9.72	10.94	12.15	14.58			900	21.87	1.57
	ΔCL	8.33	9.72	11.09	12.48	13.87	16.65			300	8.33	

NOTE: The designer should not exceed the SAFE LOAD at any given span.
The safe load represent a 5:1 factor of safety on ultimate capacity.

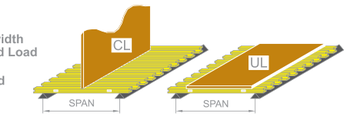


LOAD / DEFLECTION TABLE

B. Pultruded Industrial Grating

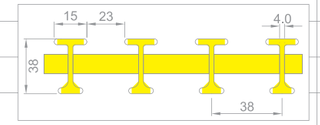
Load Data

CL is Concentrated Load kG/m of width
ΔCL is Deflection under Concentrated Load
UL is Uniform Load kG/m2
ΔUL is Deflection under Uniform Load



LG I - 6038

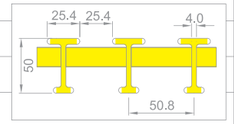
SPAN MM		300	500	800	1000	1300	1500	2000	2500	3900	5000	10000	15000	20000	25000	SAFE LOAD, 2:1 SAFETY FACTOR	DEFLECTION	E X 10^10 N/SQm
400	ΔUL	0.03	0.05	0.06	0.10	0.13	0.15	0.17	0.22	0.38	0.48	0.97	1.45	1.91	2.42	48936	4.73	2.72
	ΔCL	0.10	0.19	0.31	0.37	0.50	0.56	0.77	0.97	1.51	1.93	3.85	5.80	7.74	9.64	9734	3.77	
600	ΔUL	0.14	0.21	0.35	0.46	0.60	0.69	0.92	1.12	1.77	2.27	4.58	6.85	9.15	11.44	21068	9.64	2.91
	ΔCL	0.37	0.61	0.98	1.20	1.57	1.81	2.42	3.05	4.76	6.10	12.21				6400	7.81	
800	ΔUL	0.41	0.67	1.10	1.38	1.79	2.06	2.75	3.42	5.36	6.88	13.74				12001	16.51	3.06
	ΔCL	0.80	1.36	2.20	2.75	3.58	4.11	5.50	6.88	10.71	13.74					4800	13.21	
1000	ΔUL	0.99	1.64	2.60	3.26	4.27	4.93	6.57	8.21	12.81						7534	24.74	3.13
	ΔCL	1.56	2.63	4.20	5.25	6.81	7.86	10.51	13.11							3734	19.61	
1200	ΔUL	2.00	3.30	5.33	6.66	8.66	9.99	13.30								4867	32.41	3.20
	ΔCL	2.66	4.44	7.10	8.88	11.54	13.31									2933	26.05	
1400	ΔUL	3.62	6.07	9.70	12.15	15.77										3534	42.92	3.25
	ΔCL	4.16	6.94	11.11	13.88											2467	34.25	
1600	ΔUL	6.18	10.30													2600	53.55	3.27
	ΔCL	6.18	10.30													2067	42.57	
1800	ΔUL	9.84														2000	65.59	3.29
	ΔCL	8.72	14.57													1800	52.47	



NOTE: When a 500 kG per square meter uniform load is placed upon a 1200 simple span, it will produce a deflection of 3.30mm at midspan.
When a 1500 kG per square meter uniform load is placed upon a 1200 simple span, it will produce a deflection of 9.99mm at midspan.
The designer should not exceed the SAFE LOAD at any given span. The safe load represent a 2:1 factor of safety on ultimate capacity

LG T - 5050

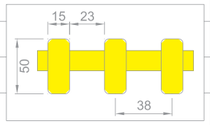
SPAN MM		300	500	800	1000	1300	1500	2000	2500	3900	5000	10000	15000	20000	25000	SAFE LOAD, 2:1 SAFETY FACTOR	DEFLECTION	E X 10^10 N/SQm
600	ΔUL	0.08	0.12	0.22	0.25	0.35	0.40	0.54	0.68	1.05	1.35	2.70	4.05	5.40	6.73	27100	7.32	2.73
	ΔCL	0.22	0.36	0.56	0.72	0.92	1.08	1.44	1.80	2.80	3.60	7.20	10.80	14.39		8200	5.91	
800	ΔUL	0.23	0.40	0.65	0.82	1.06	1.20	1.65	2.04	3.19	4.08	8.16	12.27			15700	12.84	2.85
	ΔCL	0.49	0.82	1.31	1.64	2.11	2.45	3.27	4.07	6.38	8.18					6300	10.31	
1000	ΔUL	0.58	0.97	1.56	1.95	2.53	2.92	3.90	4.87	7.60	9.74					10000	19.49	2.92
	ΔCL	0.94	1.55	2.47	3.12	4.05	4.68	6.25	7.80	12.16	15.57					5000	15.59	
1200	ΔUL	1.17	1.98	3.17	3.95	5.15	5.94	7.90	9.90	15.43						6700	26.53	2.98
	ΔCL	1.58	2.64	4.20	5.28	6.84	7.92	10.56	13.20							4100	21.65	
1400	ΔUL	2.15	3.55	5.73	7.17	9.32	10.75	14.32								5100	36.56	3.05
	ΔCL	2.46	4.10	6.55	8.17	10.65	12.27									3600	29.49	
1600	ΔUL	3.61	6.02	9.62	12.03	15.64										3900	46.92	3.10
	ΔCL	3.61	6.02	9.62	12.03	15.64										3100	37.30	
1800	ΔUL	5.69	9.48	15.17												3100	58.79	3.15
	ΔCL	5.04	8.40	13.47												2700	45.52	
2000	ΔUL	8.54	14.23													2500	71.14	3.20
	ΔCL	6.83	11.38													2500	56.91	



NOTE: When a 500 kG per square meter uniform load is placed upon a 1200 simple span, it will produce a deflection of 1.98mm at midspan.
When a 1500 kG per square meter uniform load is placed upon a 1200 simple span, it will produce a deflection of 5.94mm at midspan.
The designer should not exceed the SAFE LOAD at any given span. The safe load represent a 2:1 factor of safety on ultimate capacity

LG HD - 6050

SPAN MM		500	1000	1500	2500	5000	10000	15000	20000	25000	30000	35000	40000	SAFE LOAD, 2:1 SAFETY FACTOR	DEFLECTION	E X 10^10 N/SQm
600	ΔUL	0.05	0.11	0.15	0.27	0.55	1.10	1.65	2.17	2.72	3.27	3.84	4.37	102100	11.20	3.52
	ΔCL	0.13	0.26	0.44	0.71	1.45	2.90	4.37	5.85	7.32	8.76	10.24	11.70	31100	9.10	
800	ΔUL	1.16	0.32	0.48	0.80	1.61	3.21	4.82	6.40	8.01	9.64	11.22	12.85	59300	19.05	3.80
	ΔCL	0.30	0.62	0.96	1.60	3.21	6.42	9.64	12.85					23700	15.23	
1000	ΔUL	0.38	0.76	1.15	1.91	3.82	7.62	11.46	15.28					37900	28.96	3.90
	ΔCL	0.60	1.20	1.81	3.05	6.10	12.23							18900	23.11	
1200	ΔUL	0.79	1.55	2.36	3.93	7.86	15.72							25500	40.10	3.93
	ΔCL	1.05	2.10	3.12	5.22	10.48								15500	32.50	
1400	ΔUL	1.45	2.90	4.36	7.26	14.51								19300	56.08	3.94
	ΔCL	1.66	3.32	4.98	8.30									13500	44.83	
1600	ΔUL	2.47	4.93	7.40	12.33									14800	73.00	3.96
	ΔCL	2.47	4.93	7.40	12.33									11800	58.20	
1800	ΔUL	3.91	7.86	11.77										11700	91.97	3.98
	ΔCL	3.49	6.99	10.48										10500	73.37	
2000	ΔUL	5.98	11.95											9600	114.73	3.99
	ΔCL	4.76	9.56	14.34										9500	90.83	



NOTE: When a 500 kG per square meter uniform load is placed upon a 1200 simple span, it will produce a deflection of 0.79mm at midspan.
When a 1500 kG per square meter uniform load is placed upon a 1200 simple span, it will produce a deflection of 2.36mm at midspan.
The designer should not exceed the SAFE LOAD at any given span. The safe load represent a 2:1 factor of safety on ultimate capacity

STAIR TREADS

Al Mustaqbal fiberglass stair treads are offered in two varieties :

The Molded Tread
&
The PutltrudedTread

Our stair treads are cut from the Panels measuring 565x3050 mm. The mesh of the Molded Tread is 25x150 mm with double bearing bars at the 150 mm intervals so that any stair tread with a length that is a multiple of 150 mm is always banded. Our Stair Treads meet OSHA safety code standards, are closed on all sides, with gritted surface and a solid black color nosing.

Alternatively, Molded Tread is manufactured from regular 38 thick, 38x38 Square mesh grating with a fabricated structural nosing.

The Pultruded Tread

The Molded Tread

CLOSED FLOORING SYSTEM

A. FRP Dome Cover System

Our GRP Dome cover system are designed for areas where self-supporting system is required. The dome shape of the cover eliminate the necessity for any supports. The covers are generally designed for pedestrian concentric load 125 kgs. The covers are designed with maximum weight of 70 kgs per piece and stainless steel lifting handles for easy handling.

Application

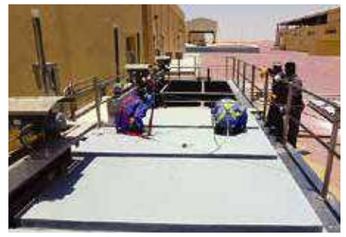
- Odor control plant .
- Sewage treatment plant
- Tank Roof covers .
- DAF Covers in RO Plant

B. FRP Closed grating cover system.

Our GRP flooring panels are designed to cover trenches, areas where it is necessary to prevent leakage of vapors and the dripping of liquid underneath.
The thickness of the closing layer can may vary from 3 mm to 8 mm according to the requirement. The panels can be produced in sandwich type, providing approximately 30% higher stiffness value than of open mesh grating. Our covers are supplied with SS 316 handles embedded type.

Application

- Pit covers in odor control plant.
- Sewage treatment plant
- Cable trench covers
- Tank Access covers
- Manhole access cover
- Food processing facilities
- Ramps



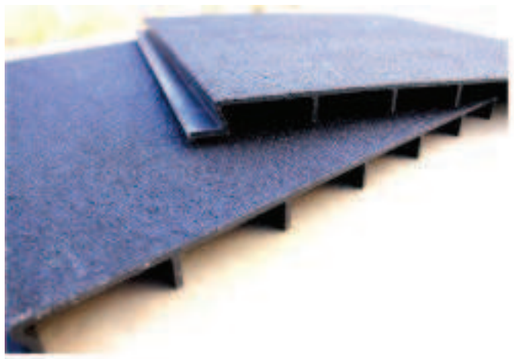
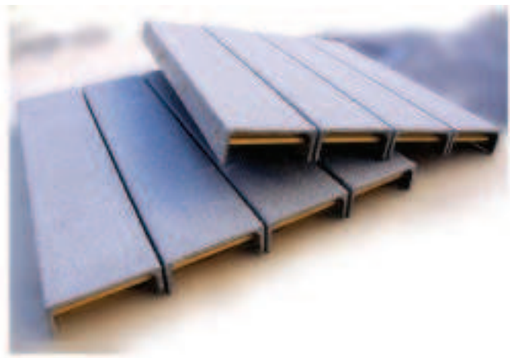
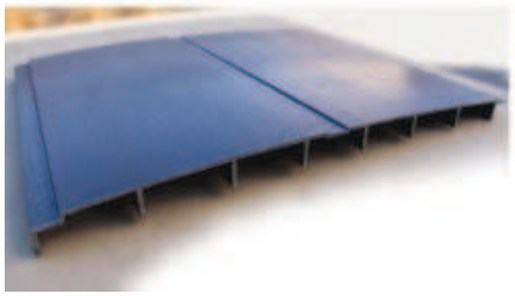
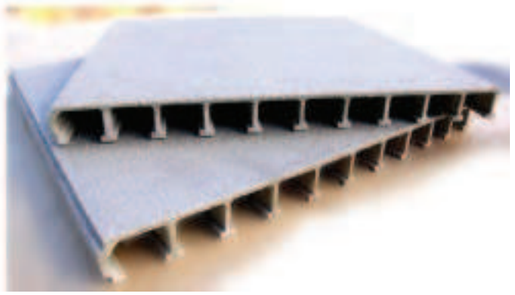
CLOSED FLOORING SYSTEM

C. FRP Decking System.

Our GRP plank is of a high strength system design to interlock or overlap to form a continuous solid surface. Designed to replace wood or other less versatile surfaces such as; steel or aluminum. GRP Decking is a strong and non corrosive surface providing a long term solution for applications such as:

Application

- Boat docks
- Bridge decks
- Filter media support
- Hatch cover
- Cooling tower decking
- Odor control covers
- Wind walls
- Roofing walkways

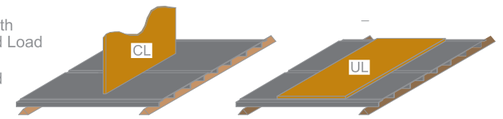





CLOSED FLOORING SYSTEM

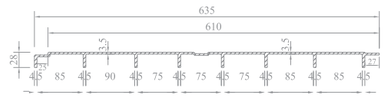
C1. PULTRUDED INDUSTRIAL DECK :

Load Data

CL is Concentrated Load kG/m of width
ΔCL is Deflection under Concentrated Load
UL is Uniform Load kG/m2
ΔUL is Deflection under Uniform Load

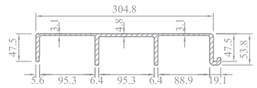


LG IND. DECK-24"



SPAN MM		(uL= 120) (cL= 40)	(uL= 240) (cL= 75)	(uL= 290) (cL= 90)	(uL= 360) (cL= 110)	(uL= 480) (cL= 150)	(uL= 960) (cL= 300)	(uL= 1440) (cL= 440)
610	ΔUL	.35	.75	.90	1.10	1.50	3.05	4.55
	ΔCL	.32	.60	.75	.90	1.25	2.45	3.65
914	ΔUL	1.60	3.5	3.85	4.80	6.40	—	—
	ΔCL	.80	1.65	2.05	2.55	3.40	6.85	—
1219	ΔUL	5.45	10.90	—	—	—	—	—
	ΔCL	1.85	3.75	5.25	6.55	8.70	—	—

LG IND. DECK-12"



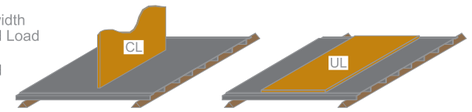
SPAN MM		(uL= 240) (cL= 75)	(uL= 480) (cL= 150)	(uL= 960) (cL= 300)	(uL= 1440) (cL= 440)	(uL= 2400) (cL= 730)	(uL= 4790) (cl= 1460)
610	ΔUL	.155	.305	.610	.915	1.525	3.050
	ΔCL	.100	.205	.405	.610	1.015	2.034
762	ΔUL	.305	.610	1.245	1.855	3.100	6.225
	ΔCL	.180	.355	.685	1.040	1.725	3.455
914	ΔUL	.585	1.145	2.310	3.455	5.765	11.505
	ΔCL	.280	.560	1.090	1.650	2.770	5.514
1067	ΔUL	.990	1.980	3.964	5.945	9.880	—
	ΔCL	.400	.840	1.675	2.490	4.165	8.330
1219	ΔUL	1.600	3.200	6.400	9.600	16.030	—
	ΔCL	.610	1.195	2.390	3.605	5.995	11.990
1375	ΔUL	2.465	4.955	9.880	14.835	—	—
	ΔCL	.840	1.675	3.325	5.005	8.330	16.665
1524	ΔUL	3.660	7.340	14.655	—	—	—
	ΔCL	1.120	2.235	4.495	6.730	11.228	—
1676	ΔUL	5.260	10.515	21.030	—	—	—
	ΔCL	1.475	2.945	5.895	8.840	14.730	—
1829	ΔUL	7.315	14.655	29.310	—	—	—
	ΔCL	1.905	3.787	7.570	11.355	18.950	—

CLOSED FLOORING SYSTEM

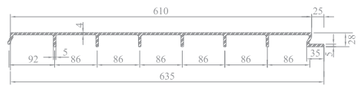
C2. PULTRUDED ARCHITECTURAL DECK :

Load Data

CL is Concentrated Load kG/m of width
ΔCL is Deflection under Concentrated Load
UL is Uniform Load kG/m2
ΔUL is Deflection under Uniform Load



LG ARCHDECK-24"



CONNECTION - TYPE INTERLOCKING SYSTEM

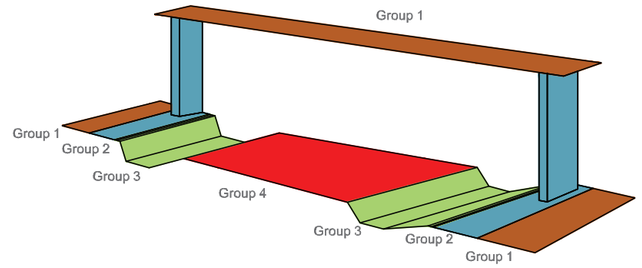
SPAN MM		(uL= 240) (cL= 75)	(uL= 480) (cL= 150)	(uL= 720) (cL= 220)	(uL= 960) (cL= 300)	(uL= 1200) (cL= 365)	(uL= 1440) (cl= 440)	(uL= 1680) (cl= 515)
610	ΔUL	.483	.660	.865	1.040	1.220	1.374	1.854
	ΔCL	.405	.560	.710	.865	1.015	1.145	1.550
762	ΔUL	.813	1.040	1.425	1.755	2.060	2.440	2.970
	ΔCL	.535	.688	.940	1.170	1.370	1.625	1.983
914	ΔUL	1.194	1.650	2.285	2.925	3.565	4.295	5.260
	ΔCL	.663	.915	1.270	1.628	1.983	2.390	2.920
1067	ΔUL	1.702	2.567	3.685	4.855	6.080	7.310	8.636
	ΔCL	.813	1.220	1.754	2.310	2.895	3.483	4.117
1220	ΔUL	2.440	4.015	5.920	7.865	9.933	11.767	
	ΔCL	1.015	1.677	2.465	3.279	4.140	4.900	
1372	ΔUL	3.505	6.250	9.399	12.620	15.910		
	ΔCL	1.297	2.313	3.482	4.675	5.895		

SPAN MM		(uL= 1915) (cL= 585)	(uL= 2155) (cL= 660)	(uL= 2395) (cL= 730)	(uL= 2635) (cL= 805)	(uL= 2875) (cL= 880)	(uL= 3115) (cl= 950)
610	ΔUL	2.032	2.184	2.388	2.540	2.717	2.870
	ΔCL	1.705	1.830	1.980	2.110	2.260	2.390
762	ΔUL	3.315	3.660	3.937	4.190	4.547	
	ΔCL	2.210	2.440	2.615	2.795	3.025	
914	ΔUL	5.766	6.400				
	ΔCL	3.203	3.555				
1067	ΔUL	9.271					
	ΔCL	4.422					

MANHOLE COVER SYSTEM

Our manhole covers have been designed and produced to replace the traditional Cast iron / Ductile iron covers, Aluminum and GI chequered plate covers. We produce different types of covers for various applications, from light duty sealed covers to heavy duty covers which meets the requirement of BS EN 124 -1994 and EN 20105-A03: 100.

Our covers are made 100 % from composite material.



A15 Group 1
Pedestrian and pedal cyclist areas only.

B125 Group 2
Footways, Pedestrian areas, car parks and parking decks.

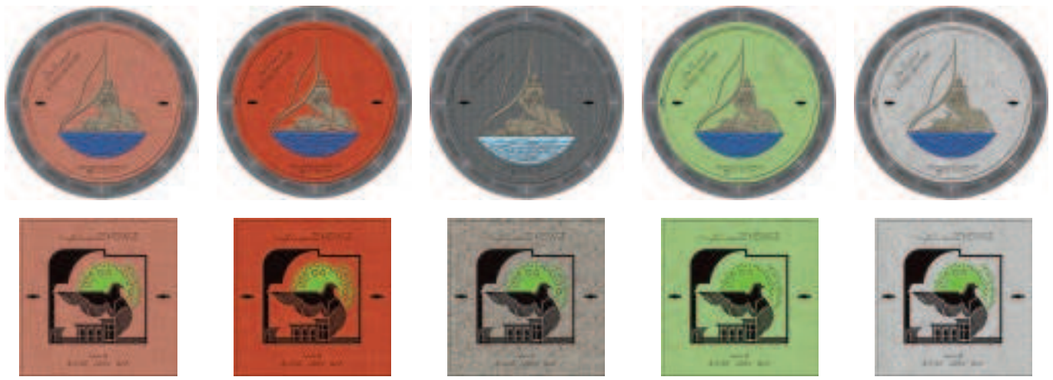
C250 Group 3
Gully tops installed in kerbside channels of roads which when measured from kerb edge extend to a maximum of 0.5m into the carriegeway and a maximum of 0.2m into footway.

D400 Group 4
Carriegeways (including pedestrian streets), hardshoulders and parking areas for all types of road vehicles.

Advantages of our covers :

- **Long service life**
- **Do not corrode**
- **Anti- slip surface**
- **Fire retardant if required**
- **UV resistant**
- **Free maintenance , no painting is required**
- **High strength / weight ratio**
- **Easily replaceable**
- **Can be sealed type preventing water, sand from entering the manhole**
- **Do not require internal sealing tray**
- **Can be designed with lock system**
- **Can be easily lifted by one person**

* Many designs can be provided upon client request to suit the application and the project requirement

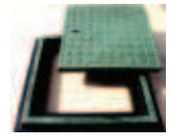
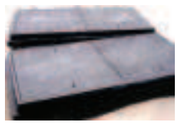
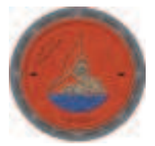


A. GRP LIGHT DUTY COVERS

CODE	OPENING MM	DESCRIPTION	ACCESSORIES	APPLICATION	COLOR	PHOTO
CGLD -FF	W x L	GRP Flat closed grating cover in 2 pieces	4 x SS 316 embedded handles	Fire fighting pit (750 kgs/m^2)	Red	
CGLD -EO	W x L	GRP Flat closed hinged grating cover	SS 316 hinges + embedded lifting handle	Electrical pit outdoor application (750 kgs/m^2)	Yellow / Grey	
CGLD -EI	W x L	GRP Flat closed hinged grating cover	SS 316 hinges + slot hole lifting handles	Electrical pit indoor application (750 kgs/m^2)	Yellow / Grey	
CGLD -WR	W x L	GRP closed hinged sealed cover	SS 316 hinges, Lifting handles + internal SS wind support	Potable water Reservoir (125 kgs/m^2)	Grey	

B. GRP MEDIUM/HEAVY DUTY COVERS

The GRP Cold Pressed Manhole Cover are made using fiberglass raw material at ambient temperature and medium pressure (100 tons) using a hydraulic press machine.

CODE	CLASSIFICATION	OPTION	FRAME			COVER			PHOTO
	BS EN 124-1994	FEATURES	OD MM	COD MM	H MM	OD MM	T MM	W KG	
CP-300x300	B 125	Lifting tool Sealant	480x480	300x300	60	365x365	30	19	
CP-300x300	C 250	Lifting tool Sealant	480x480	300x300	80	365x365	40	25	
CP-600x600	B 125	Lifting tool sealant	782x782	600x600	80	666x666	40	60	
CP-600x600	C 250	Lifting tool sealant	782x782	600x600	100	666x666	50	70	
CP-800x8000	B 125	Lifting tool sealant	1000x1000	800x800	80	870x870	40	120	
CP-800x8000	C 250	Lifting tool sealant	1000x1000	800x800	100	870x870	50	158	
CP-1000x1000	B 125	Lifting tool sealant	1200x1200	1000x1000	80	530x1060 (two pieces)	40	90	
CP-1000x1000	C 250	Lifting tool sealant	1200x1200	1000x1000	100	530x1060 (two pieces)	50	110	
CP- 600	B 125	Lifting tool sealant	781	Ø 600	80	662	30	52	
CP- 600	C 250	Lifting tool sealant	808	Ø 600	100	662	50	69	
CP- 800	B 125	Lifting tool sealant	1000	Ø800	80	865	30	92	
CP- 800	C 250	Lifting tool sealant	1000	Ø 800	100	865	50	120	

Note: OD (Outside Diameter/Dimension), COD (Clear Opening Diameter/Dimension), H (Height), W (Weight), T (Thickness).

C. GRP MEDIUM/HEAVY DUTY COVERS

The GRP Hot Press Manhole Cover are made using SMC (Sheet Molding Compound) at high temperature 140 degrees and high pressure (500 to 1000 tons) using a hydraulic press machine.

CODE	CLASSI-FICATION	OPTION	FRAME				COVER			PHOTO
	BS EN 124-1994	FEATURES	OD MM	COD MM	H MM	W KG	OD MM	T MM	W KG	
SMC-RC 600x600x90	A 15		722x722	600x600	90	2.6	680x680	81	8	
SMC-600x60	B 125	Lock System	Ø 760	Ø 600	60	5	Ø660	40	14.0	
SMC-600x60	C 250	Lock System	Ø 760	Ø 600	60	5	Ø660	40	21.0	
SMC-600x65	C 250	Lock System Water Tight	Ø 780	Ø 600	65	7.5	Ø708	30	24.0	
SMC-650x60	B 125	Lock System	Ø 806	Ø 650	60	6	Ø700	40	16.0	
SMC-650x60	C 250	Lock System	Ø 806	Ø 650	60	6	Ø700	40	24.0	
SMC-800x100	B 125	Lock System Water Tight	Ø 975	Ø 800	100	15	Ø880	30	32.5	
SMC-800x100	C 250	Lock System Water Tight	Ø 1060	Ø 800	100	15	Ø880	30	43.5	
SMC-600x600x60	B 125	Lock System	760x760	600x600	60	6.7	644x644	35	17.5	
SMC-600x600x60	C 250	Lock System	760x760	600x600	60	6.7	644x644	35	24.8	

Note: OD (Outside Diameter/Dimension), COD (Clear Opening Diameter/Dimension), H (Height), W (Weight), T (Thickness).

GRP SUPPORT SYSTEM

Al Mustaqbal offers a wide range of structural components for supporting the Grating or covers platforms .

- GRP Reverse angle anchored in the concrete wall.
- GRP Y angle embedded in the concrete.
- GRP Seating L shape angle fixed in concrete notch.
- Thermoplastic adjustable legs.
- GRP Stationary pedestal.
- GRP Pultruded Beams.
- GRP Pultruded Columns.

Al Mustaqbal use the pultrusion process to produce the structural profiles taking in consideration the following factors :

Effect of temperature: The result of higher temperature on structural fiberglass is a reduction in modulus of elasticity and thus lowering of the allowable stresses. The retention of Modulus of Elasticity and ultimate stress are considered in the design. Vinyl ester resin are better in elevated temperatures than polyester resins.

Deflections: Unlike steel, due to fiberglass Low shear modulus, the total deflection of a fiberglass beam is actually comprised of two components:

- Flexural Deflection
- Shear Deflection

Effect of corrosion: The environment dictates the type of resin to be used, and the different resins possess different structural properties. In essence, the use of a polyester resin in designing a fiberglass structure will have lower allowable stresses and higher deflections than would the use of a vinyelster resin in the same environment.

Effect of weathering: Fiberglass will undergo some decay and change of appearance due to prolonged exposure to outdoor weathering. A condition called "Fiber blooming" will occur on the surface. the use of UV stabilizers in the resin and surface veils, synthetic type enhances weather ability and corrosion resistance by adding resin thickness to the surface of the product.
The optimum method of maintaining surface appearance during outdoor exposure is to apply a coating to the surface. Two-component, UV stabilized urethanes work very well with this application.

GRP SUPPORT SYSTEM

GRP I Beam & column

GRP cantilever system

GRP column support

Thermoplastic Pedestal

GRP H Beam structure

GRP Beam & column

GRP PLATFORMS AND STAIRCASES

Our GRP Platforms are designed for various applications like District cooling plants, Sewage treatment pant, Power plant and Desalination plants. They replace the traditional steel epoxy painted or HDG platforms , which proved to be have very short service life in such high corrosive environment. The structure is completely designed with GRP components like columns, beams, bracing and even FRP Bolts if required.

We offer a dedicated product design and engineering capabilities :

- **Structural design drawings**
- **2D & 3 D modeling**
- **Live load testing**
- **Third party testing**
- **Third party structural design and design calculation**

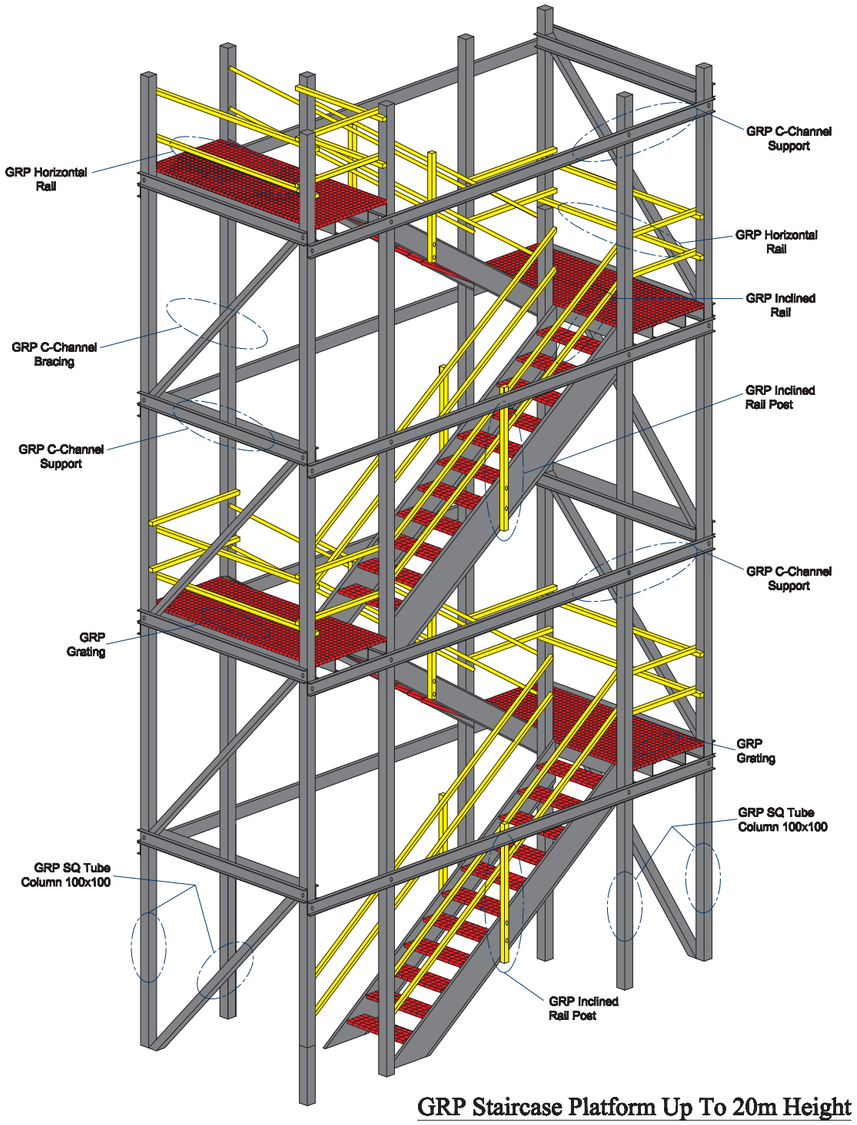
The following structures are designed and supplied by us :

- **GRP Staircase towers , walkways and platforms**
- **GRP foot Bridges , road Bridges**
- **GRP Spiral stairs on steel / concrete tower**
- **GRP Step stool**
- **GRP Cross over bridge**
- **GRP Support for Pipe**
- **GRP Bio – Media support structure**
- **GRP Skid for chemical equipment**
- **GRP Tower ladder**

GRP SOLUTIONS

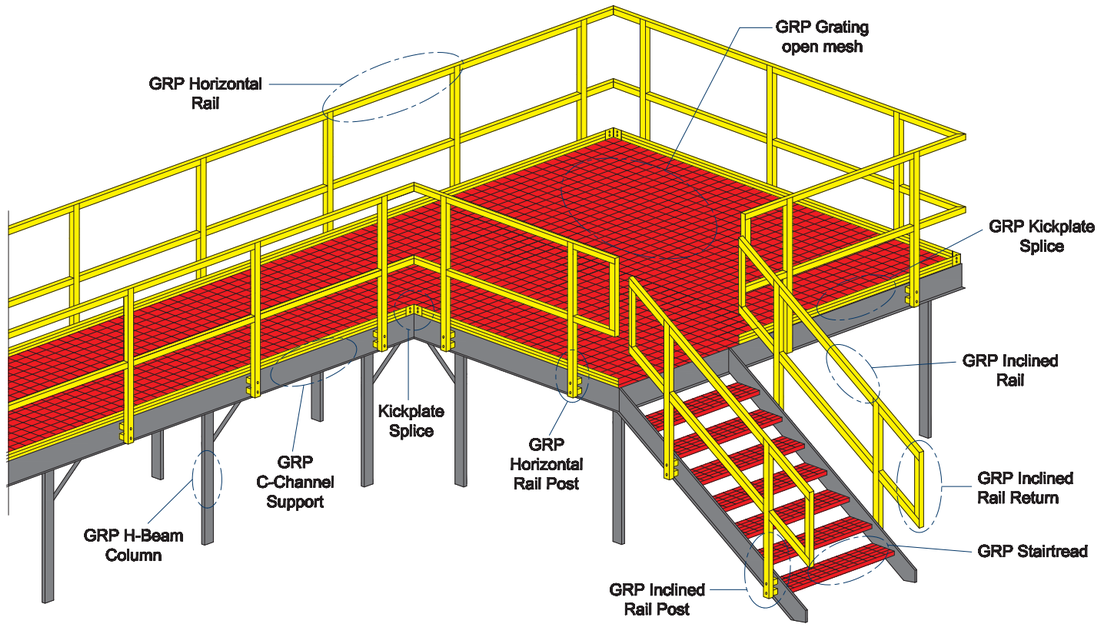
Using the latest Autocad and modeling software, our specialist design team can produce 3D models and technical fabrication drawings using GRP Pultruded products as a base for every project.

Our team are capable of taking concept design and produce detailed GRP Solutions.



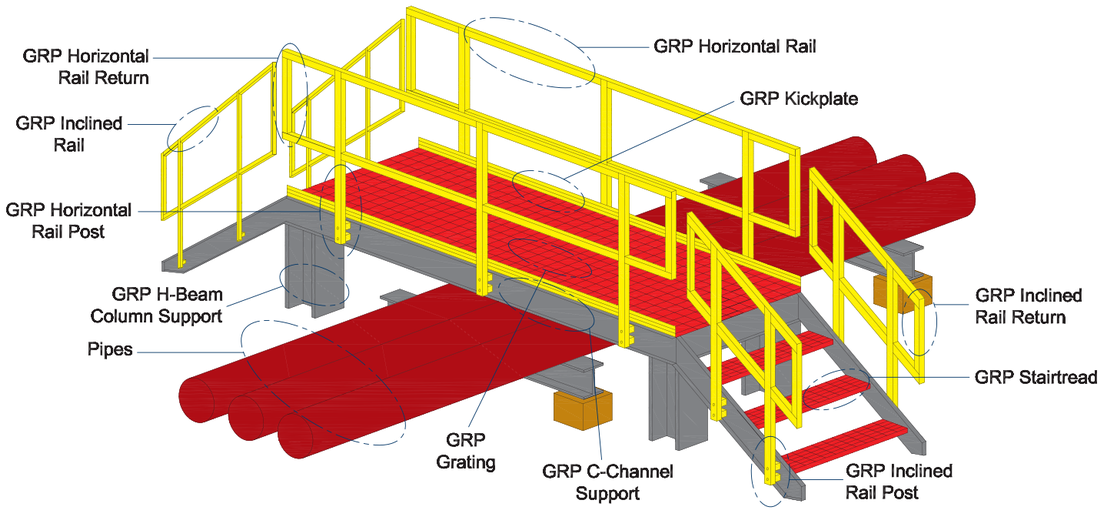
GRP Staircase Platform Up To 20m Height

GRP SOLUTIONS



GRP Service Platform - Mezannine type

GRP SOLUTIONS

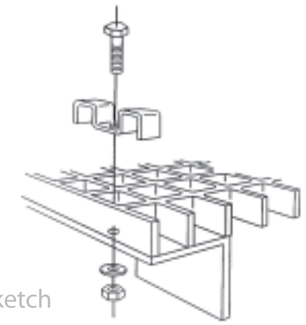
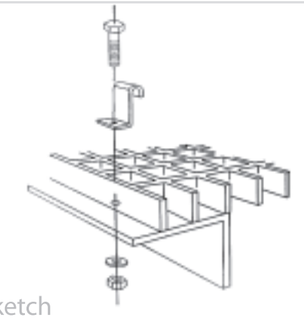
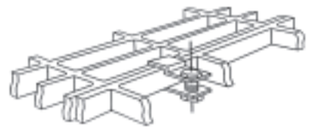


GRP Cross Over Platform

INSTALLATION ACCESSORIES

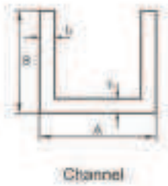
Wherever possible, provide for a minimum of 40-50 mm of bearing support at all grating support points. Holddown clips should be used at the rate of one clip for every 0.5 m^2 of grating minimum, or at least 4 clips for any square or rectangular piece, or at least 3 for triangular piece.

GRATING HOLD DOWN CLIPS FOR MOLDED PRODUCTS

M Type	Sketch
	
L Type	Sketch
	
C type	Sketch
	

PULTRUDED PROFILE

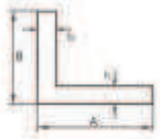
View	Types	Dimensions(mm)	Weight (kg/m)
	Channel	A B t_1 t_2	
	C32	32X18X2.4X2.4	0.42
	C38	38X25X4.8X4.8	0.69
	C59	59X25X4.0X4.0	0.47
	C64	64X19X2.4X2.4	0.37
	C50	50X14X3.2X3.2	0.37
	C67	67X25X4.0X4.0	0.72
	C70	71X25X3.2X3.2	0.61
	C76A	76X22X6.4X6.4	1.15
	C76B	76X25X4.8X4.8	1.03
	C76C	76X38X6.4X6.4	1.53
	C102	102X27X3.2X3.2	0.86
	C25	25X29X6.4X6.4	1.65
	C102	102X44X4.8X4.8	1.73
	C127	127X35X6.4X6.4	2.09
	C152A	152X41X6.4X6.4	2.50
	C152B	152X43X9.5X9.5	3.81
	C178A	178X44X4.8X4.8	2.03
	C178B	178X50X6.4X6.4	2.98
	C203A	203X56X6.4X6.4	3.46
	C203B	203X56X9.5X9.5	5.08
	C254A	254X57X2.4X2.4	1.58
	C254B	254X70X3.2X3.2	2.12
	C254C	254X70X12.7X12.7	8.20
	C610A	610X76X6.4X6.4	8.36
	C610B	610X102X12.7X12.7	16.23
	Square Tube	A B t_1 t_2	
	ST25A	25X25X2.8X2.8	0.43
	ST25B	25X25X3.2X3.2	0.48
	ST32	32X32X6.4X6.4	1.01
	ST38A	38X38X3.2X3.2	0.75
	ST38B	38X38X6.4X6.4	1.46
	ST44A	44X44X3.2X3.2	0.95
	ST44B	44X44X6.4X6.4	1.77
	ST50A	50X50X3.2X3.2	1.10
	ST50B	50X50X6.4X6.4	2.09
	ST54	54X54X4.8X4.8	1.70
	ST64	64X64X6.4X6.4	2.67
	ST76	76X76X6.4X6.4	3.28
	ST102	102X102X6.4X6.4	4.59
	Flat Tube	A B t_1 t_2	
	FT32	32X14X3X3	0.470
	FT40	40X25X3X3	0.690
	FT50	50X25X3X3	0.770
	FT52	52X32X5X5	1.44
	FT52S	52X32X3.5X3.5	1.02
	FT65	65X30X3.1X3.1	1.09
	FT80	80X36X5X8	2.4
	FT100	100X22X5.5X5.0	2.45
	FT150	150X75X4.75X4.75	3.98
	FT180	180X70X5.5X5.5	4.56
	Equal Angle	A B t_1 t_2	
	L25A	25X25X3.2X3.2	0.25
	L25B	25X25X6.4X6.4	0.48
	L29	29X29X3.2X3.2	0.28
	L38A	38X38X3.2X3.2	0.42
	L38B	38X38X4.8X4.8	0.61
	L38C	38X38X6.4X6.4	0.75
	L50A	50X50X3.2X3.2	0.55
	L50B	50X50X4.8X4.8	0.83
	L50C	50X50X6.4X6.4	1.09
	L76A	76X76X3.2X3.2	0.78
	L76B	76X76X4.8X4.8	1.16
	L76C	76X76X6.4X6.4	1.68
	L76D	76X76X9.5X9.5	2.47
	L102A	102X102X6.4X6.4	2.30
	L102B	102X102X9.5X9.5	3.44
	L102C	102X102X12.7X12.7	4.26
	L152A	152X152X6.4X6.4	3.50
	L152B	152X152X9.5X9.5	5.13
	L152C	152X152X12.7X12.7	6.91
	H Beam	A B t_1 t_2	
	HB76	76X76X6.4X6.4	2.52
	HB102	102X102X6.4X6.4	3.31
	HB152A	152X152X6.4X6.4	5.25
	HB152B	152X152X9.5X9.5	7.64
	HB203A	203X203X9.5X9.5	10.39
	HB203B	203X203X12.7X12.7	13.75
	HB254A	254X254X9.5X9.5	13.08
	HB254B	254X254X12.7X12.7	17.34
	HB305	305X305X12.7X12.7	20.38
	I Beam	A B t_1 t_2	
	IB38	38X76X6.4X6.4	1.65
	IB50	50X102X6.4X6.4	2.21
	IB76A	76X152X6.4X6.4	3.44
	IB76B	76X152X9.5X9.5	5.05
	IB102A	102X203X9.5X9.5	6.87
	IB102B	102X203X12.7X12.7	8.98
	IB125	125X152X9.5X9.5	7.57
	IB127A	127X254X9.5X9.5	8.61
	IB127B	127X254X12.7X12.7	11.29
	IB152	152X305X12.7X12.7	13.77



Channel

Square Tube

Flat Tube



Equal Angle

H Beam

I Beam

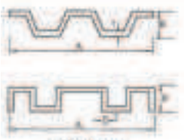
PULTRUDED PROFILE

View	Types	Dimensions(mm)	Weight (kg/m)
	Round Tube	D_1 D_2	
	RT19	14X19	0.27
	RT25	19X25	0.37
	RT32	27X32	0.40
	RT32	25X32	0.48
	RT32	22X32	0.69
	RT38	32X38	0.67
	RT38	25X38	1.18
	RT42	36X42	0.70
	RT42	32X42	1.40
	RT50	44X50	0.89
	RT50	38X50	1.67
	RT64	57X64	1.06
	RT64	50X64	2.13
	RT76	64X76	2.53
	RT101	88X101	3.90
		D_1 D_2	
	RHST25	19X25	0.55
		D_1 D_2	
	CT32	25X32X3.5	
	CT45	28X45X8.5	
	CT42	32X42X5	
	Kick Plate	A B t	
		100X14X3	1.1
	Y Shaped Angle	A B t	
		25X38X6.4	1.49
		38X38X6.4	1.64
		50X38X6.4	1.79
	High Strength Deck Panel	A B t	
		305X47.5X6.4	7.4


Round Tube


Square Tube with Round Holes


Club Rung Tubes


Kick Plate


Y Shaped Angle


High Strength Deck Panel

	Flat Panels	Thickness X Width X Length in Stock	
	FP32	3.2X1220X2438	2.10
	FP48	4.8X1220X2438	2.55
	FP64	6.4X1220X2438	3.49
	FP95	9.5X1220X2438	5.27
	FP127	12.7X1220X2438	6.97
	FP159	15.9X1220X2438	8.63
	FP19	19X1220X2438	10.34
	FP25	25X1220X2438	13.81
	Flat Strips	Thickness X Width	
	FS32A	3.2X64	0.34
	FS32B	3.2X102	0.55
	FS48A	4.8X64	0.51
	FS48B	4.8X102	0.82
	FS64A	6.4X102	1.09
	FS64B	6.4X152	1.64
	FS64C	6.4X229	2.44
	FS95A	9.5X76	1.22
	FS95B	9.5X152	2.44
	FS127	12.7X50	1.09
	Solid Square Rod	Side X Side	
	SSR254	25.4X25.4	1.30
	SSR32	32X32	1.95
	SSR38	38X38	2.73
	Solid Round Rod	Diameter	
	SRR64	6.4	0.06
	SRR79	7.9	0.09
	SRR95	9.5	0.15
	SRR127	12.7	0.25
	SRR159	15.9	0.40
	SRR19	19	0.58
	SRR206	20.6	0.67
	SRR222	22.2	0.79
	SRR254	25.4	0.88
	SRR318	31.8	1.66
	SRR381	38.1	2.26
	SRR508	50.8	3.81
	SRR635	63.5	5.86


Flat Panels

Flat Strips

Solid Square Rod


Solid Round Rod

Items included in the table are mainly our standard profiles, which are generally stocked in 6.1 meter length, except if otherwise stipulated. Our company can do customarily in mould making and profile manufacture.

REFERENCE LIST

CLIENT	YEAR	PROJECT	PRODUCT	APPLICATION	QTY
AVIATION ENG PROJECTS - DUBAI	2017	Al Maktoum Intl Airport Passenger terminal	GRP mini mesh grating	Ablution Area	100 m2
DUBAI MUNICIPALITY	2017	DS126/2 irrigation main jebel Ali	GRP service grating platform W/ladder	Irrigation water	250 m2
PUNTA CATALINA - DOMINICAN REPUBLIC	2017	2x360 MW Coal Fire powerplant	GRP lockable Roof covers	Sea water	26 Nos
RAKWA	2017	Al Filayah STP upgrade at RAK	GRP covers , ladders , handrails	waste water	450 m2
DUBAI PARKS	2016	Legoland water park	GRP pultruded grating 25 mm	Wave pool grating	150 m2
DUBAI PARKS	2016	Bollywood theme park	GRP Raised grating mini mesh	water fountain	450 m2
MERAAS	2015	Fish farm Jebel Ali	GRP service grating platforms & staircases	Sea water for Aquaculture	1500 m2
DUBAI MUNICIPALITY	2015	DS161/2 Pumping station	GRP service platform & Ladders	Waste water Valves Chambers	27 Sets
Crown prince court - UAE	2014	Water Park at al Mina palace	GRP recessed manhole covers, grating, channels	Water	50 m2
Ministry of public works - UAE	2014	Sheikh Khalifa bin zayed hospital & health care center Ajman	GRP channel with heavy duty grating	Traffic load	14 Lm
Ministry of water & Electricity - KSA	2014	Maraba water treatment plant expansion - KSA	GRP grating, chequered plate, ladders, MH covers	Water & chemicals	1,000 m2
Al Bustan Co. Its - KSA	2013	Al Bustan II utility complex –Riyadh , KSA	GRP service platforms with ladders	Sewage	200 m2
RTA - UAE	2013	Al Sofouh Transit project – Dubai , UAE	GRP grating platforms	Power & low voltage chamber	250 m2
Kivuwatt - Rwanda	2013	Kivuwatt phase 1 Gas Extraction facility - Rwanda	GRP grating	Steel tower staircases, pipe racks	750 m2
Dubai Municipality - UAE	2013	Jebel Ali sewage treatment plant	GRP sealed covers for odor control unit	Inlet chambers	100 m2
Dubai Municipality - UAE	2013	Bio-filters at Al Aweer Sewage treatment plant in Dubai	GRP heavy duty grating with beams & columns	8 tons/m2 media, sewage	6,000 m2
Aldar - UAE	2012	Yas Island water park - UAE	GRP grating, manhole covers	Water, pump rooms	2000 m2
Emicool - UAE	2012	District cooling plants in Dubai investment park	GRP service platforms, with column supports	Cooling towers	80 m2
Dubai Municipality - UAE	2011	DS 180 House Connections & Miscellaneous at Hatta	GRP sealed covers platforms	500 Kgs/m2 , sewage trap & sump chamber	2 nos
DEWA - UAE	2011	Jebel Ali Power Plant " M ", 2000 MW	GRP Grating, covers, ladders	750 kgs/m2 Sewage, chemicals plants	400 m2

COMPLETED PROJECTS

INDUSTRIAL PROJECTS

Palm Jumeirah Service Tunnel

Jebel Ali, 2000 MW power plant Phase M

Jebel Ali, 140 MIGD Desalination plant Phase M

YAS ISLAND Water Park - Abu Dhabi, UAE

District Cooling Plant - Dubai, UAE

Ras Laffan Common Cooling Water System

Fujeirah Sewage Treatment Plant

Al Aweer Sewage Treatment Plant - Dubai, UAE