

*High Strength-To-Weight Ratio*

*Corrosion Resistant*

*Long Service Life*

*Maintenance Free*

*Impact Resistant*

*Non-Conductive*

*Anti Slip*



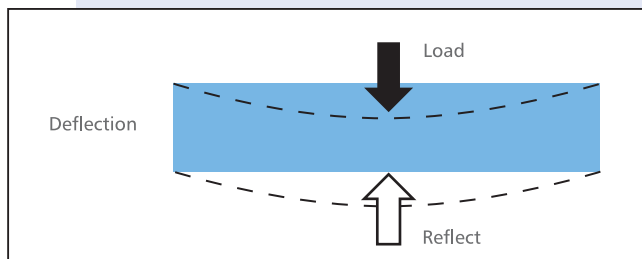
**FRP PULTRUDED & MOULDED GRATING**

## Materials and Manufacturing Process

Fibreglass strands



**FRP** (Fibre-glass Reinforced Plastic) is a combination of fibreglass reinforcements and thermosetting resins. This special millennium product has been used widely all over the world since it was introduced. FRP is set to be the material of the future.



**PULTRUSION** is a continuous process where by glass fiber (Roving) is initially pulled through a liquid resin bath and a heated shaping die at the exit of the line where the resin is solidifies to form solid parts of different profiles in accordance with the shape of the die. (Refer page 3)

The continuous process gives added resistance to tension, compression and bending. It also provides a higher strength and it creates a reinforced structure system capable of taking the load according to the Recommended Load Deflection Table. (Refer page 5)

### RESIN FORMULATION

The resin formulation used in fibreglass grating provides superior resistance to the effects of corrosion and ultraviolet exposure. Our uniquely formulated resin is responsible for the grating's fire retardant characteristics. Our pultruded grating is offered in three resin formulations in order to best match the requirements of the specific application, namely;

#### Vinylester (VE)

Developed for reliable performance in the harshest chemical environment, the most chemically-resistance recommended today, offering outstanding resistance to a wide range of highly corrosive environments, ranging from caustic to strong acidic.

Thickness available: 25mm / 38mm / 50mm

#### Isophathalic Resin (ISO)

An economy polyester grating, it outperforms a number of competitive fibreglass products and meets the requirements for corrosion resistance found in all industrial and offshore applications.

Thickness available: 25mm / 38mm / 50mm

#### Isophathalic Fire Retardant (IFR)

Designed for industrial and chemical processing applications where fire retardancy is required. This isophathatic polyester resin formulation offers a flame spread and smoke rating conform to ASTM E-84 Class A and BS 476 Part 7 Class 1.

Thickness available: 25mm / 38mm / 50mm

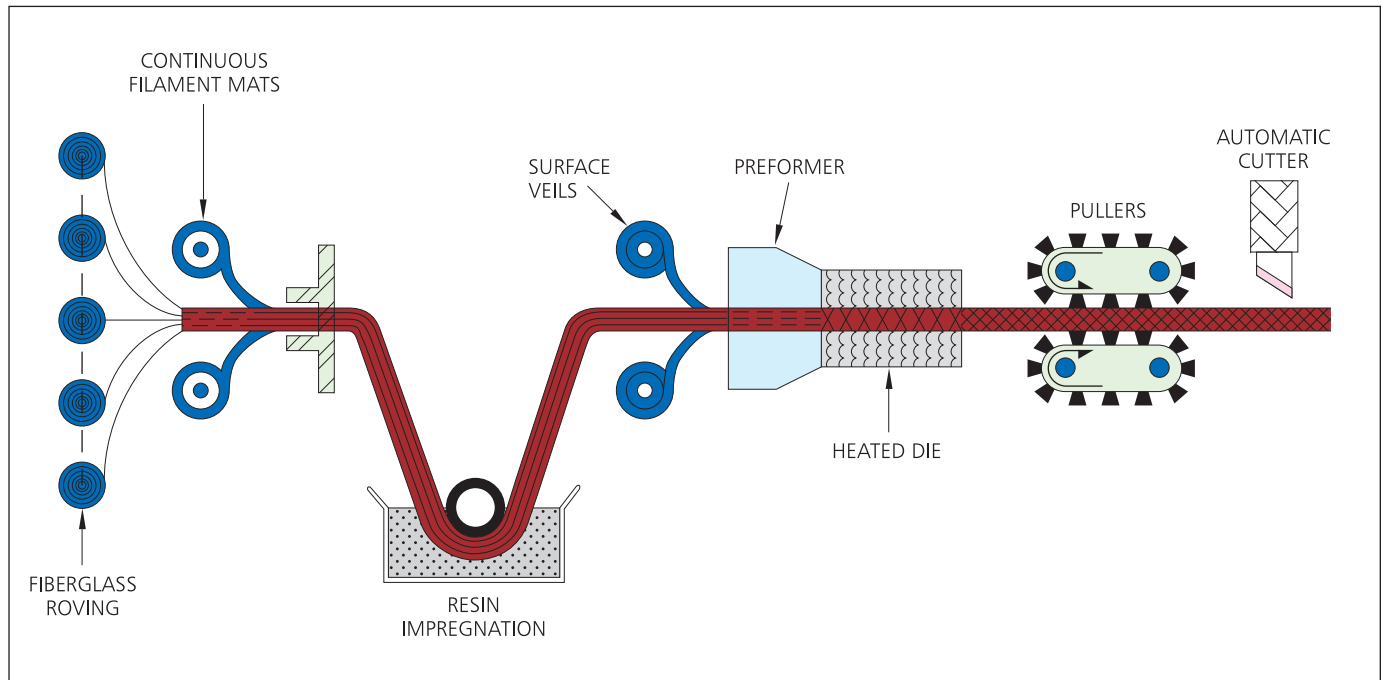
## Benefits of ARGOS FRP Pultruded and Moulded Grating

- **Corrosion Resistance**  
No rusting, peeling or flaking, even under the most aggressive conditions in any part of the world.
- **Lightweight and Durable**  
Light weight of FRP ease handling and cutting, reduce size of platform structure.
- **Cost Effective**  
Extremely long life compared to metal and others plastic, “ with no maintenance required. ”
- **High Strength and Stiffness**  
High glass content and continuous reinforcement, pultruded FRP products give extremely high strength and stiffness compared to other engineering plastic.
- **High Impact Resistance & Elastic**  
Returns to original position without any permanent deflection or distortion with allowable loads.
- **Superior Weatherability**  
Our integral UV protection system gives long term protection against UV attack.
- **Non-Conductive & Non-Interfering**  
Complies to international electrical safety specification and transparent to radio waves and is non magnetic.
- **Low Thermal Conductivity & Expansion Rate**  
Will not transfer heat, and no problem of expansion under heat.
- **Fire Retardant**  
Fire retardant quality is available with compliance to ASTM-E84 and BS 476 standards.



## FRP Pultrusion Process

### CONTINUOUS PULTRUSION



### PULTRUSION PROCESS

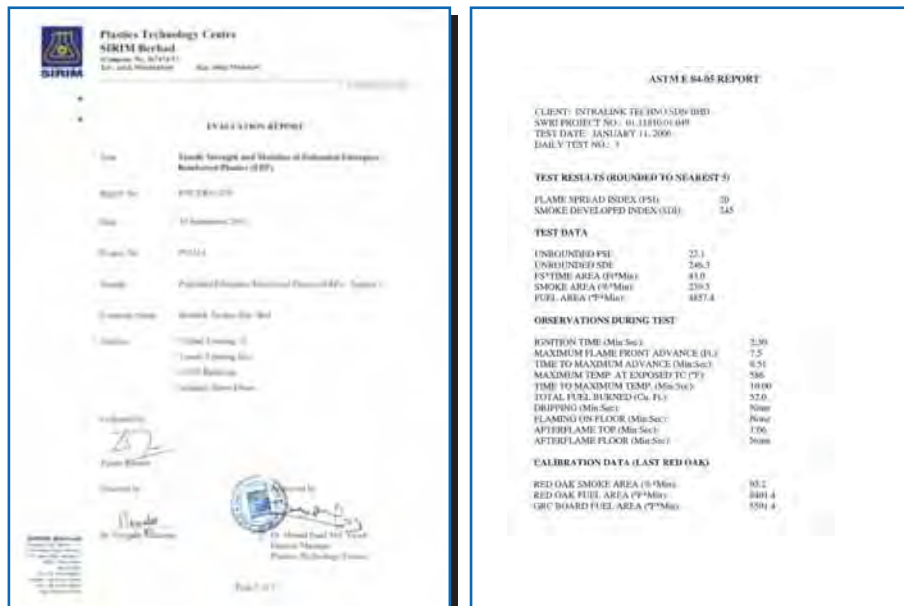
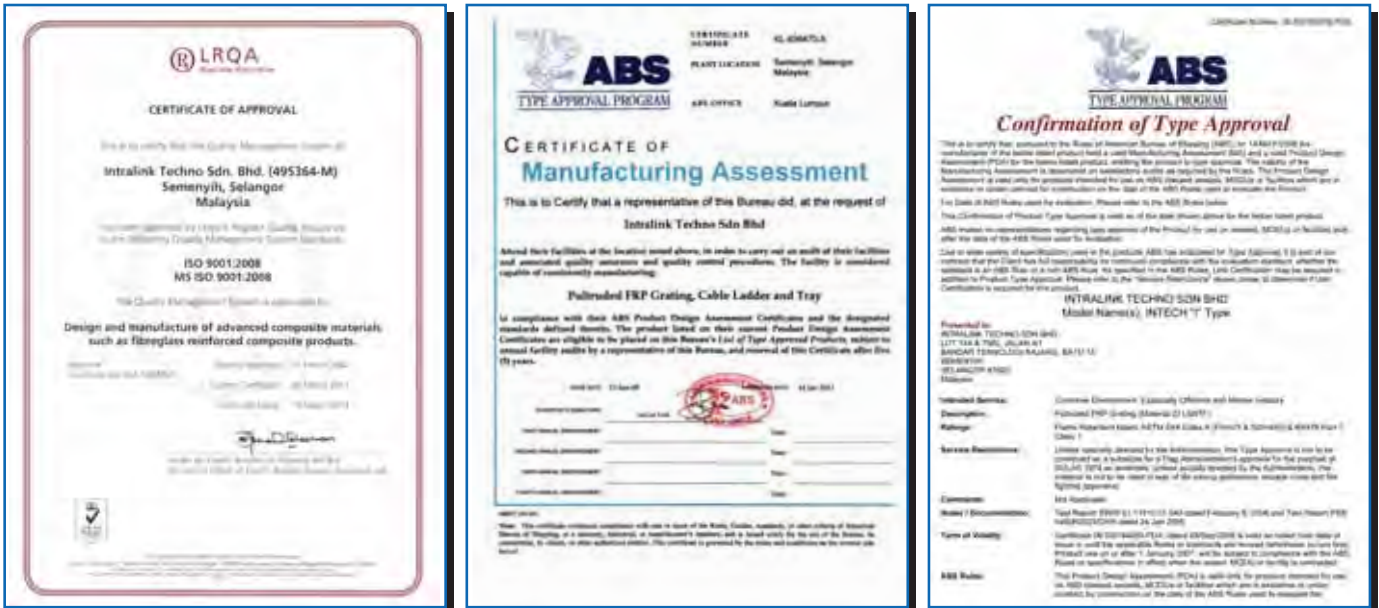
Pultrusion is a continuous moulding process producing products of uniform cross section such as I beams, Channel, Flat bar, Rods, Hollow Sections etc. The process utilises glass fiber, resin, filler, peroxide and release agent. The glass reinforcement are drawn into a resin impregnation zone where the glass substrate is thoroughly impregnated with the resin mixture. The wet fibrous material will be pulled through a preformer into a heated die. The shape of the end product is determined by the configuration of the die and the resin is polymerised. This continuous and uniform method ensure consistency throughout the entire products length eliminating weak spots.



## Standards and Certification

**ARGOS FRP** partners with premium manufacturers such as (INTECH) Intralink Techno SDN BHD (Malaysia) for most of the Fibreglass supplies. INTECH's dedication towards excellent quality is reflected in all its FRP products that have been tested to comply with major international standards such as the ASTM, BS, NEMA and UL. The company's focus has always been to provide excellent products and services that not only meet customers' requirements but surpass their expectations.

Certification that stand as testimony of this commitment over the years include those conducted by following independent testing inspection organisation:



## Awards And Recognition



MITI INDUSTRIAL EXCELLENCE AWARD 2012

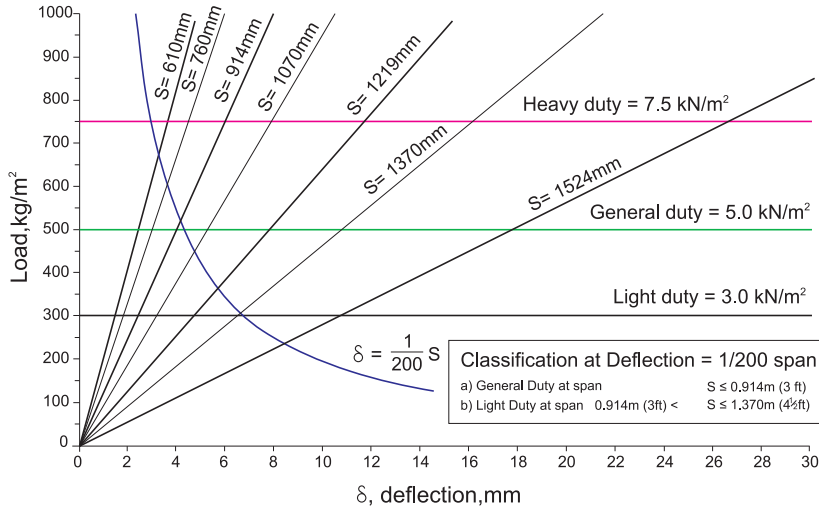
E50 2011

THE SMEs  
BEST BRAND 2011

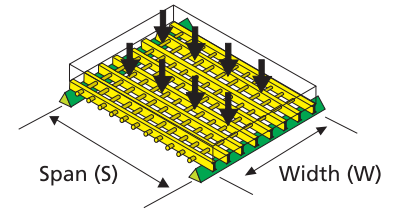
AFRPPMGRG

## Profile and Technical Data - 25mm (H) Grating

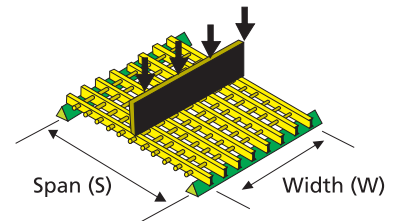
**Loading & Support Selection Chart for Uniform Load (25mm HT grating)**



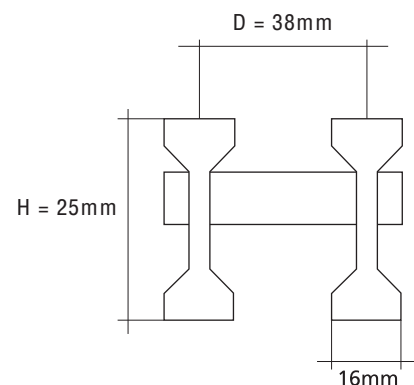
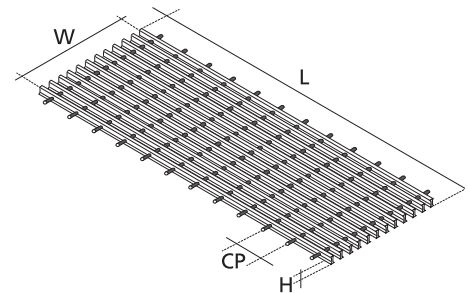
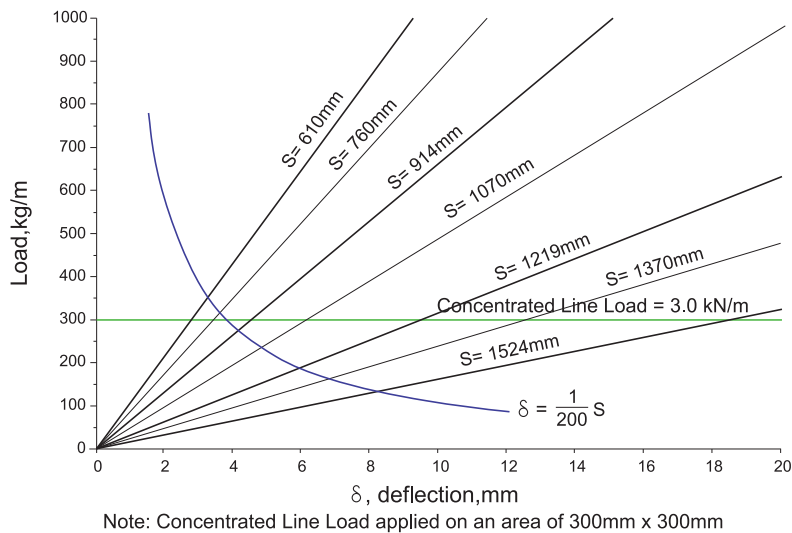
Uniform Load, kg/m<sup>2</sup>



Concentrated Line Load, kg/m



**Loading & Support Selection Chart for Concentrated Line Load (25mm HT grating)**



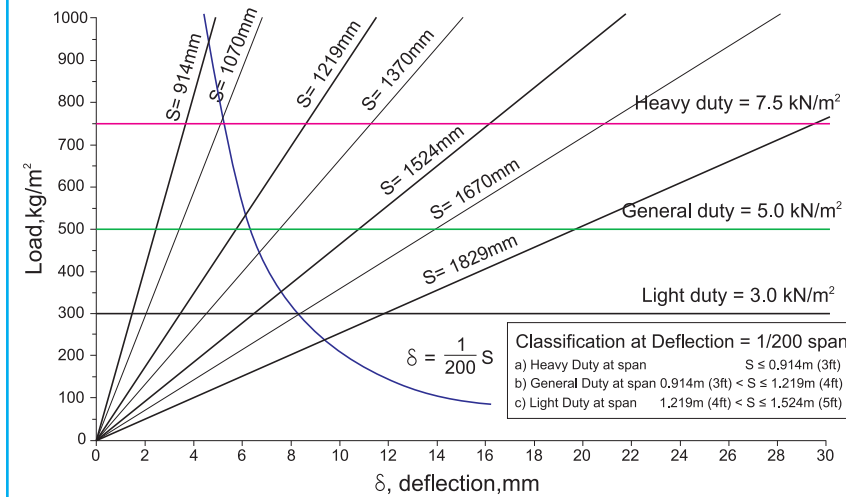
### 25mm (H) GRATING

CODE ITG2515		H = 25mm	D = 38mm	CP = 152mm
CODE ITG2530		H = 25mm	D = 38mm	CP = 304mm

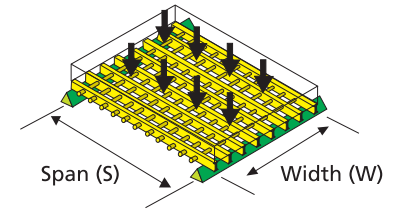
No. of Bars/m of width	Height (H) (mm)	Open Area	Load Bar Centers (D) (mm)	Approximate Weight (kg/m <sup>2</sup> )
27	25	60%	38	12.4

## Profile and Technical Data - 38mm (H) Grating

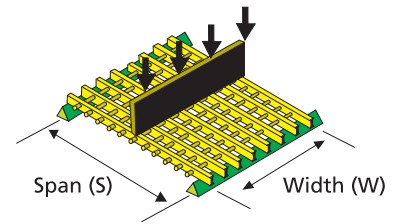
**Loading & Support Selection Chart  
for Uniform Load (38mm HT grating)**



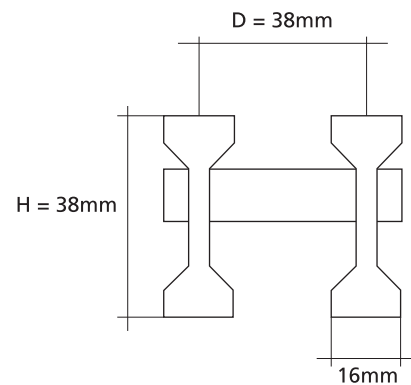
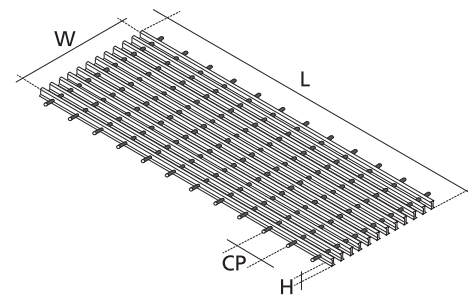
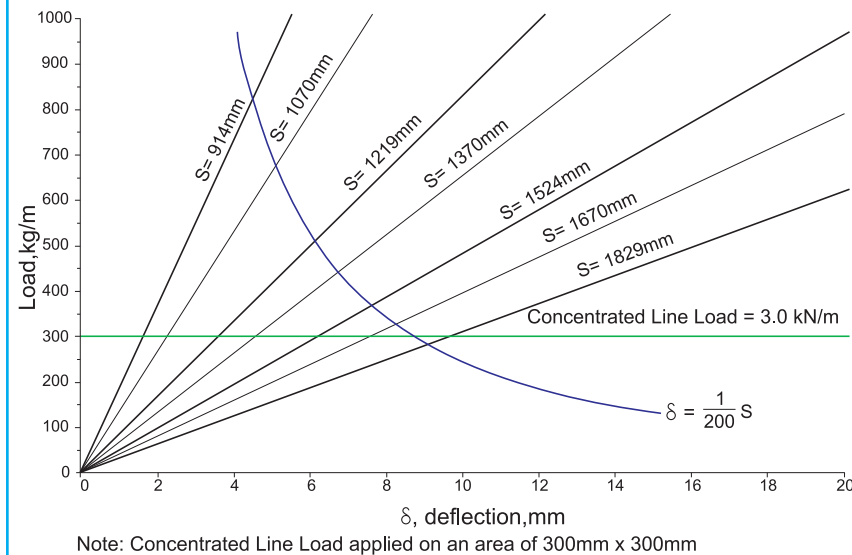
Uniform Load,  $\text{kg/m}^2$



Concentrated Line Load,  $\text{kg/m}$



**Loading & Support Selection Chart  
for Concentrated Line Load (38mm HT grating)**



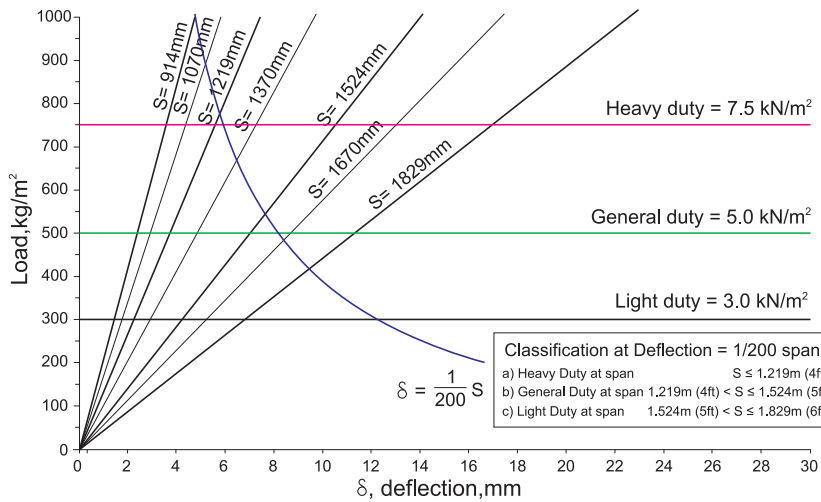
### 38mm (H) GRATING

CODE ITG3815	H = 38mm	D = 38mm	CP = 152mm
CODE ITG3830	H = 38mm	D = 38mm	CP = 304mm

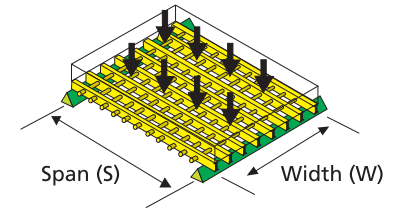
No. of Bars/m of width	Height (H) (mm)	Open Area	Load Bar Centers (D) (mm)	Approximate Weight (kg/m <sup>2</sup> )
27	38	60%	38	15.6

## Profile and Technical Data - 50mm (H) Grating

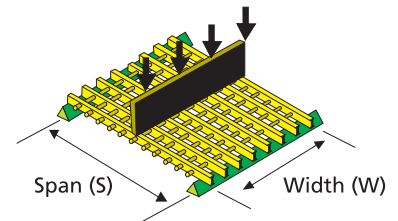
**Loading & Support Selection Chart  
for Uniform Load (50mm HT grating)**



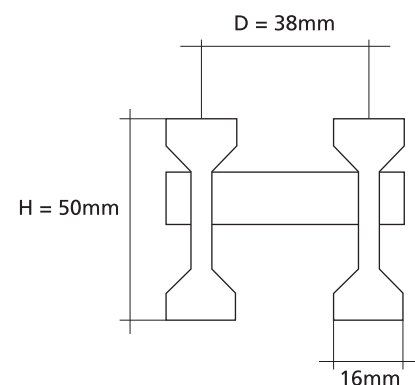
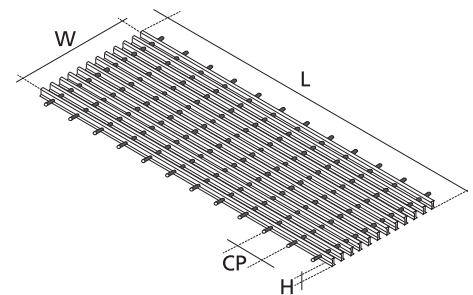
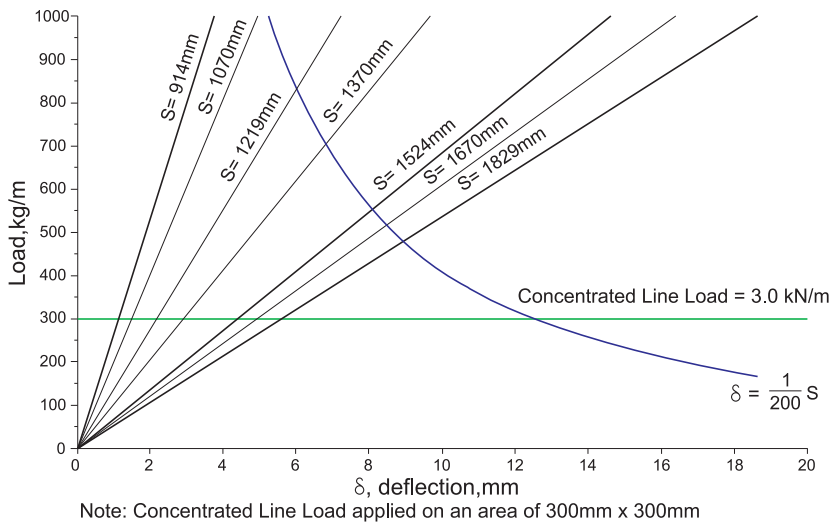
Uniform Load, kg/m²



Concentrated Line Load, kg/m



**Loading & Support Selection Chart  
for Concentrated Line Load (50mm HT grating)**



### 50mm (H) GRATING

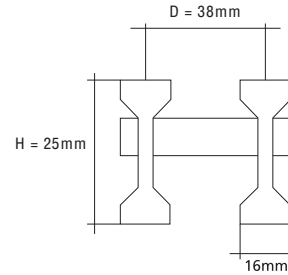
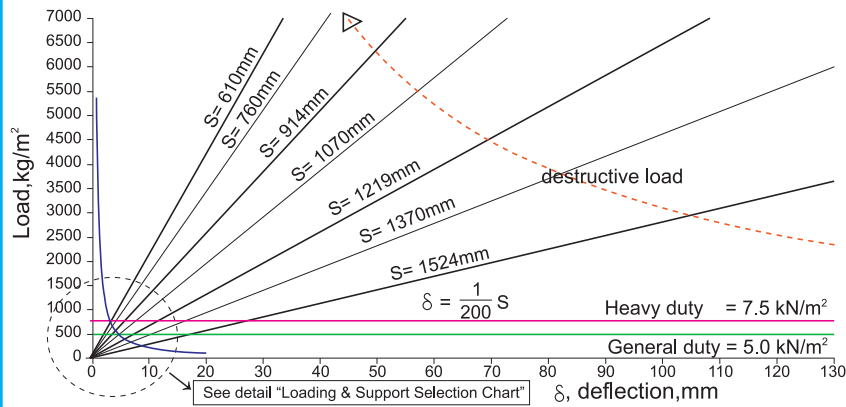
CODE ITG5015		H = 50mm	D = 38mm	CP = 152mm
CODE ITG5030		H = 50mm	D = 38mm	CP = 304mm

No. of Bars/m of width	Height (H) (mm)	Open Area	Load Bar Centers (D) (mm)	Approximate Weight (kg/m <sup>2</sup> )
27	50	60%	38	21.0



## Profile and Technical Data

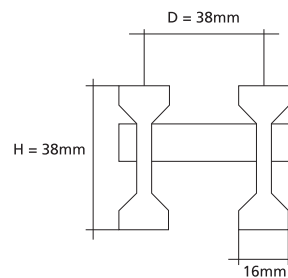
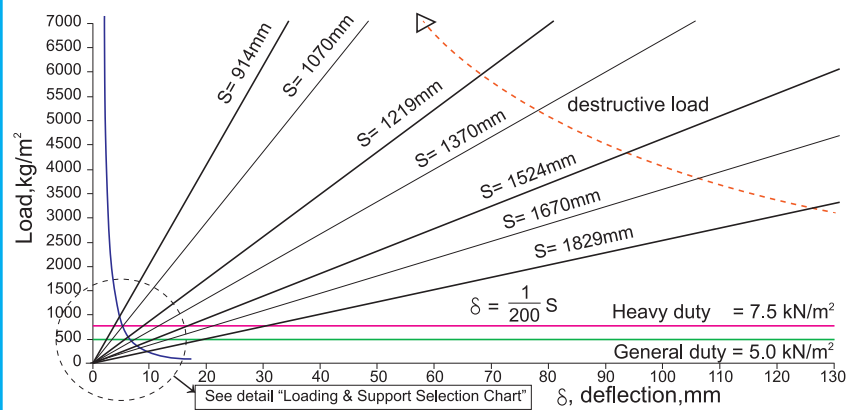
Load Vs Deflection Chart  
for Uniform Load (25mm HT grating)



### 25mm (H) GRATING

CODE	H	D	CP
ITG2515	25	38	152
ITG2530	25	38	304

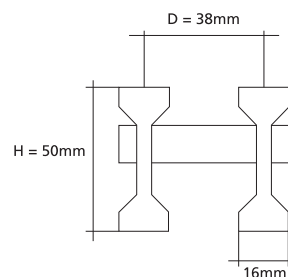
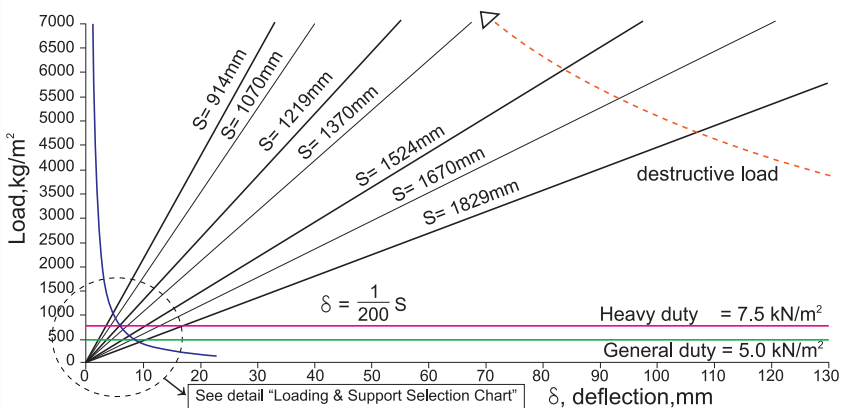
Load Vs Deflection Chart  
for Uniform Load (38mm HT grating)



### 38mm (H) GRATING

CODE	H	D	CP
ITG3815	38	38	152
ITG3830	38	38	304

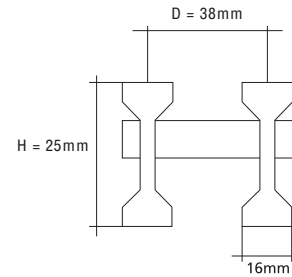
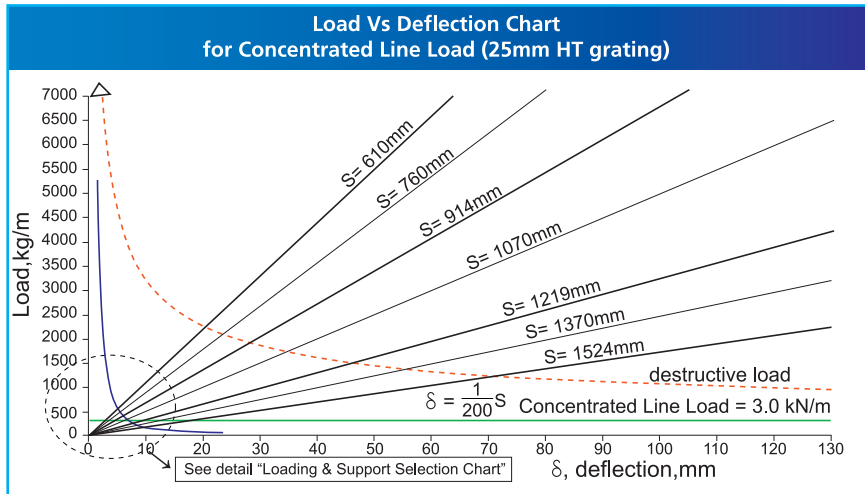
Load Vs Deflection Chart  
for Uniform Load (50mm HT grating)



### 50mm (H) GRATING

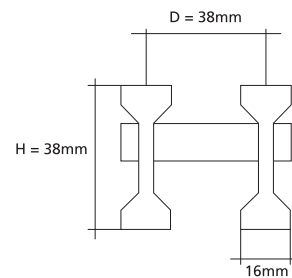
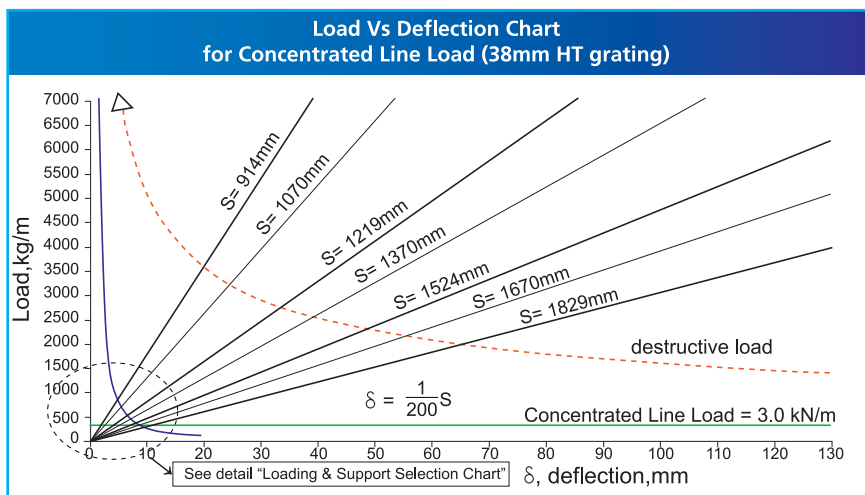
CODE	H	D	CP
ITG5015	50	38	152
ITG5030	50	38	304

## Profile and Technical Data



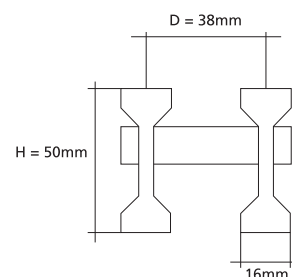
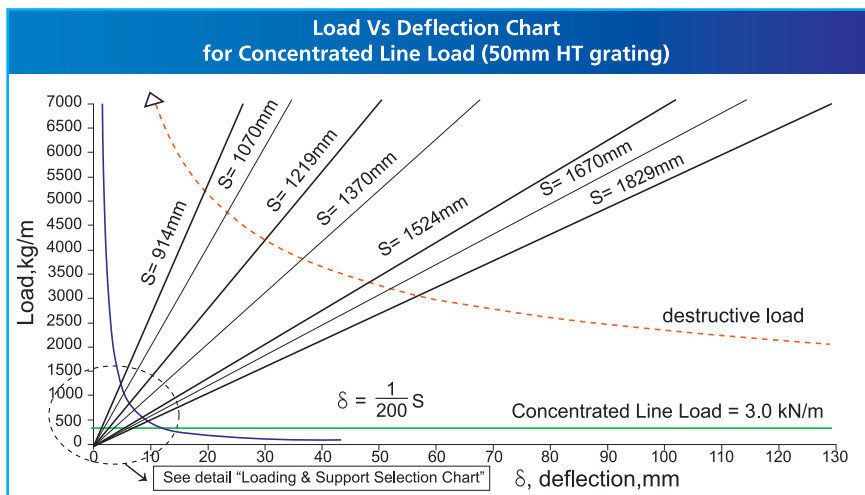
### 25mm (H) GRATING

CODE	H	D	CP
ITG2515	25	38	152
ITG2530	25	38	304



### 38mm (H) GRATING

CODE	H	D	CP
ITG3815	38	38	152
ITG3830	38	38	304

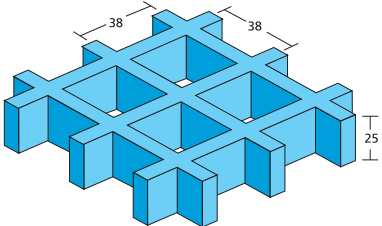
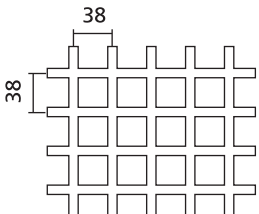
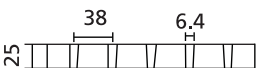


### 50mm (H) GRATING

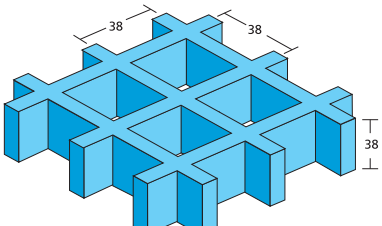
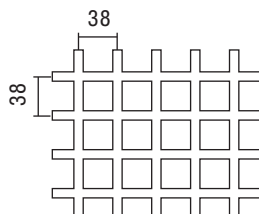

CODE	H	D	CP
ITG5015	50	38	152
ITG5030	50	38	304

## Detailed Specifications

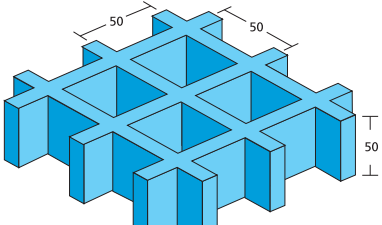
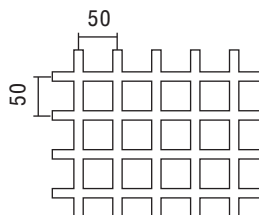
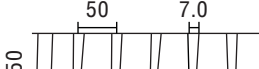
### Thickness: 25mm

	<b>Plan View</b>		25mm thick, 38x38mm square mesh, bearing bars run both direction
			Bearing bar thickness (Top/Bottom) : 6.4/5.0
	<b>Elevation View</b>		Bearing bar center : 38
			Open Area : 68%
			Approx. Weight : 12.30 kgs/m <sup>2</sup>
			Panel size available : 1524 x 4000, 1220 x 4000, 1220 x 3660, 1220 x 2440, 915 x 3050

### Thickness: 38mm

	<b>Plan View</b>		38mm thick, 38x38mm square mesh, bearing bars run both direction
			Bearing bar thickness (Top/Bottom) : 7.0/5.0
	<b>Elevation View</b>		Bearing bar center : 38
			Open Area : 68%
			Approx. Weight : 19.50 kgs/m <sup>2</sup>
			Panel size available : 1524 x 4000, 1524 x 3050, 1220 x 4000, 1220 x 3660, 1220 x 2440, 915 x 3050

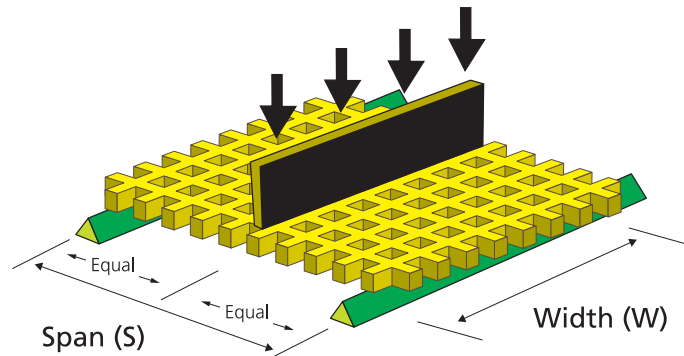
### Thickness: 50mm

	<b>Plan View</b>		50mm thick, 50x50mm square mesh, bearing bars run both direction
			Bearing bar thickness (Top/Bottom) : 7.0/5.0
	<b>Elevation View</b>		Bearing bar center : 50
			Open Area : 78%
			Approx. Weight : 20.80 kgs/m <sup>2</sup>
			Panel size available : 1524 x 4000, 1220 x 3660, 1800 x 4000, 1220 x 2440, 915 x 3050

Note:

All the above types could be customised to have different top & bottom solid panels, the Approx. Weight kgs/sq.m would change accordingly. For example, 3mm solid top FRP sheet with gritted top would weigh Approx 5.0 kg/sq.m. therefore 38mm thick, 38x38mm square mesh, with a 3mm gritted solid top would weigh Approx: 19.5 kgs/sq.m. (from the table above) + 5.0 kg/sq.m. = 24.5 kgs/sq.m. Various top & bottom panels could be added top the mesh to provide different finish & weigh requirements, please talk to us about your requirements for customised solutions.

## Moulded Grating Load Tables



### CONCENTRATED LINE LOAD TABLES - DEFLECTION IN MILLIMETERS

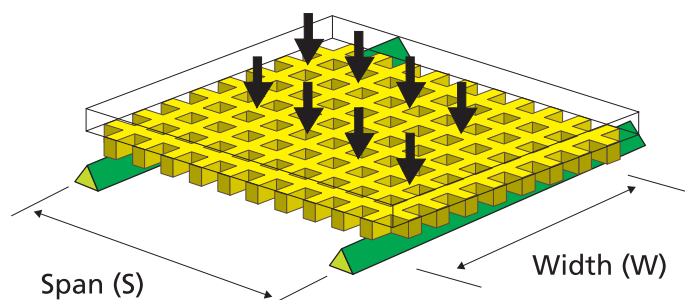
SPAN IN mm	THK	MESH	LOAD IN KN/M OF WIDTH (CONCENTRATED)												MAXIMUM RECOMMENDED	APPARENT EI x 10 <sup>6</sup> N-mm <sup>2</sup> /m
			3	5	10	15	20	25	40	50	60	70	80			
400	25	38x38	1.6	2.6	5.3	7.9	10.5	13.1						9	2.54	
	38	38x38	0.6	0.9	1.9	2.8	3.7	4.7	7.3	9.3	11.2	13.1	14.9	19	7.14	
	50	50x50	0.3	0.6	1.1	1.7	2.3	2.8	4.4	5.7	6.8	7.9	9.1	30	11.75	
600	25	38x38	4.8	8.0	16.0									6	2.82	
	38	38x38	1.6	2.6	5.3	7.9	10.5	13.2						13	8.56	
	50	50x50	0.9	1.5	3.0	4.5	6.1	7.6	11.8	15.1				21	14.85	
800	25	38x38	11.3											3	2.82	
	38	38x38	3.5	5.9	11.8									10	9.03	
	50	50x50	1.9	3.2	6.4	9.7	12.9							12	16.55	
1000	38	38x38	6.9	11.4										7	9.12	
	50	50x50	3.7	6.1	12.2									10	17.02	
1200	38	38x38	11.8											5	9.12	
	50	50x50	6.2	10.4										8	17.30	
1400	50	50x50	9.8											5	17.60	

#### NOTES

1. Maximum Recommended load should not be exceeded at any time.
2. Maximum Load indicates a 5:1 factor of safety on Ultimate Capacity.
3. Ultimate Capacity represents a complete and total failure of the grating.
4. Pedestrian traffic walking loads recommended is 2.4KN/M<sup>2</sup>. Deflections for worker comfort are typically limited to 9mm or span divided by 120 under full live load.
5. The permissible loads are for STATIC LOAD CONDITIONS at ambient temperatures. Permissible loads for impact or dynamic loads should be a maximum to one-half from the value shown. Long duration loads will cause added deflection due to creep in material and will require higher safety factors to ensure acceptable performance.



## Moulded Grating Load Tables



### UNIFORMED LOAD TABLES - DEFLECTION IN MILLIMETERS

SPAN IN mm	THK	MESH	LOAD IN KN/SQM (UNIFORMED)												MAXIMUM RECOMMENDED	APPARENT EI x 10 <sup>6</sup> N-mm <sup>2</sup> /m
			3	5	10	15	20	25	39	50	60	70	80			
400	25	38x38	0.4	0.7	1.3	2.0	2.6	3.3	5.1	6.6	7.9	9.2	10.5	48	2.54	
	38	38x38	0.1	0.2	0.5	0.7	0.9	1.2	1.8	2.3	2.8	3.3	3.7	100	7.14	
	50	50x50	0.1	0.1	0.3	0.4	0.6	0.7	1.1	1.4	1.7	2.0	2.3	154	11.75	
600	25	38x38	1.8	3.0	6.0	9.0	12.0	15.0						20	2.82	
	38	38x38	0.6	1.0	2.0	3.0	3.9	4.9	7.7	9.9	11.8	13.8	15.8	45	8.56	
	50	50x50	0.3	0.6	1.1	1.7	2.3	2.8	4.4	5.7	6.8	8.0	9.1	73	14.85	
800	25	38x38	5.7	9.5										9	2.82	
	38	38x38	1.8	3.0	5.9	8.9	11.8	14.8						26	9.03	
	50	50x50	0.1	0.2	0.3	0.5	0.7	0.8	1.3	1.6	2.0	2.3	2.6	35	16.54	
1000	25	38x38	13.9											5	2.82	
	38	38x38	4.3	7.1	14.3									14	9.12	
	50	50x50	2.3	3.8	7.7	11.5	15.3							21	17.01	
1200	38	38x38	8.9	14.8										9	9.12	
	50	50x50	4.7	7.8	15.6									14	17.30	
1400	50	50x50	8.5	14.2										8	17.60	

### NOTES

1. Maximum Recommended load should not be exceeded at any time.
2. Maximum Load indicates a 5:1 factor of safety on Ultimate Capacity.
3. Ultimate Capacity represents a complete and total failure of the grating.
4. Pedestrian traffic walking loads recommended is 2.4KN/M<sup>2</sup>. Deflections for worker comfort are typically limited to 9mm or span divided by 120 under full live load.
5. The permissible loads are for STATIC LOAD CONDITIONS at ambient temperatures. Permissible loads for impact or dynamic loads should be a maximum to one-half from the value shown. Long duration loads will cause added deflection due to creep in material and will require higher safety factors to ensure acceptable performance.

# Chemical Resistance Data

	Vinylester		Isophthalic Polyester	
	49"	99"	49"	99"
Up to temperature °C				
Acetaldehyde	R	N	N	N
Acetaldehyde, aq. 40%	N	N	N	N
Acetic Acid, glacial	L	N	N	N
Acetic Acid, 20% (25)	R	R	R	N
Acetic Acid, 80%	R	R	N	N
Acetic Anhydride	L	N	N	N
Acetone, 10%	R	N	N	N
Adipic Acid	R	N		
Alcohol, allyl	N	N	N	N
Alcohol, benzyl	L	N	N	N
Alcohol, butyl (n-butanol)	R	N	N	N
Alcohol, butyl (2-butanol)	R	N	N	N
Alcohol, ethyl	L	N	R	N
Alcohol, hexyl	R	L	N	N
Alcohol, isopropyl (2-propanol)	R	N	N	N
Alcohol, methyl	L	N	L	N
Alcohol, propyl (1-propanol)	R	N	N	N
Allyl chloride	N	N	N	N
Alum	R	R	R	R
Ammonia, gas	L	N	R	N
Ammonia, liquid	N	N	N	N
Ammonia, aq. 20%	R	N	N	N
Ammonia salts, except fluoride	R	R	R	R
Ammonium fluoride, 25%	R	N	N	N
Amlyl acetate	R	N	N	N
Amlyl chloride	R	N	N	N
Aniline	N	N	N	N
Aniline hydrochloride	R	N	N	N
Antimony trichloride			R	N
Aqua regia			N	N
Arsenic Acid, 80%	L	N		N
Aryl-sulfonic acid	R	R	N	N
Barium salts	R	R	R	N
Beef sugar liquor	R	N		
Benzaldehyde, 10%			N	N
Benzaldehyde, 10 - 100%	N	N	N	N
Benzene (Benzoil)	L	N	N	N
Benzene sulfonic acid, 10%	R	R	R	N
Benzene sulfonic acid, 50%	R	N	N	N
Benzonic acid	R	R	R	N
Black liquor - paper	R	R	N	N
Bleach, 12.5% active chlorine	R	N	N	N
Bleach, 5.5% active chlorine	R	N	R	N
Borax	R	R	R	N
Boric Acid	R	N	R	N
Brine	R	N	R	R
Bromic acid, < 50%	R	N		N
Bromine, liquid	N	N	N	N
Bromine, gas 25%	N	N	N	N
Bromine, aq.	R	N		
Butane	R	R	R	R
Butanediol (eythriol)	R	R	R	R
Butanediol	R	R	N	N
Butyl Acetate	N	N		
Butyl phenol	N	N	N	N
Butyric acid, < 50%	R	R	N	N
Calcium hypochlorite	R	N	R	N
Calcium hypochlorite	R	N	R	N
Calcium hydroxide, 100%	R	R	R	N
Cane sugar liquors	R	L		
Carbon disulfide	N	N	N	N
Carbon dioxide	R	R	R	N
Carbon dioxide, aq.	R	R	R	R
Carbon monoxide	R	R	R	R
Carbon tetrachloride	R	N	N	N
Casein	R	R	R	R
Castor oil	R	N		
Caustic potash (KOH)	R	N	N	N
Caustic soda (NaOH)	R	N	N	N
Chlorine, gas, dry	R	R	R	N
Chlorine, gas, wet	R	R	N	N
Chlorine, liquid	N	N	N	N
Chlorine, water	R	R	N	N
Chloroacetic acid	R	N	N	N
Chlorobenzene	L	N	N	N
Chloroform	N	N	N	N
Chlorosulfonic acid, 10%	N	N	N	N
Chromic acid, 10%	R	N		
Chromic acid, 30%	N	N	N	N
Chromic acid, 40%	N	N	N	N
Chromic acid, 50%	N	N	N	N
Citric acid	R	R	R	N
Coconut oil	R	R	R	N
Copper salts, aq.	R	R	R	R
Cottonseed oil	R	R	R	R
Cresylic acid, 50%	N	N	N	N

	Vinylester		Isophthalic Polyester	
	49"	99"	49"	99"
Up to temperature °C				
Cyclohexane	R	N	R	R
Cyclohexanol	R	N	R	N
Cyclohexanone			N	N
Diesel fuels	R	R	R	N
Diethyl amine	N	N	N	N
Diethyl phthalate	R	R	N	N
Dioxane - 1, 4			N	N
Dimethylamine	N	N	N	N
Dimethyl formamide	N	N	N	N
Detergents, aq.	R	R	R	R
Didutylphthalate	R	R	N	N
Didutylsebacate	R	N	R	R
Dichlorobenzene	R	N	N	N
Dichloroethylene	N	N	N	N
Ether (diethyl)	N	N	N	N
Ethyl halides	N	N	N	N
Ethylene halides	N	N	N	N
Ethylene glycol	R	R	R	R
Ethylene oxide	N	N	N	N
Fatty acids	R	R	R	R
Ferric salts	R	R	R	R
Fluorine, gas, dry	N	N	N	N
Fluorine, gas, wet	N	N	N	N
Fluoroboric acid, 25%	R	R	N	N
Fluorosilicic acid, 10%	R	N	N	N
Formaldehyde	R	N	R	N
Formic acid	L	N	N	N
Freon, F11, F12, 113, 114	N	N	N	N
Freon, F21, F22	N	N	N	N
Fruit Juices and pulps	N	N	R	N
Fuel oil	R	R	R	N
Furfural	N	N	N	N
Gas, natural, methane	R	N	R	N
Gasoline	R	L	R	N
Gelatin	R	L	R	N
Glycerine (glycerol)	R	R	R	N
Glycols	R	R	R	R
Glycolic acid	L	N	R	N
Green Liquor - paper	R	N	N	N
Heptane	R	R	R	N
Hexane	R	N	R	N
Hydrobromic acid, 25%	R	N	R	N
Hydrochloric acid	R	R	R	N
Hydrofluoric acid, 10%	R	N	L	N
Hydrofluoric acid, 60%	N	N	N	N
Hydrofluoric acid, 100%	N	N	N	N
Hydrocyanic acid	R	R	N	N
Hydrogen peroxide, 50%			N	N
Hydrogen peroxide, 90%			N	N
Hydrogen sulfide, dry	R	R	R	N
Hydrazine	N	N	N	N
Hypochlorous acid, 10%	R	L	N	N
Jet fuels, JP 4 and JP 5	R	N	N	N
Kerosene	R	N	R	N
Lactic acid, 25%	R	R	R	N
Lauric acid	R	R	R	N
Lauryl chloride	R	R	R	N
Lauryl sulfate	R	R	R	N
Lead salts	R	R	R	R
Linoleic acid	R	R	R	N
Linseed oil	R	R	R	N
Lithium salts	R	R	R	N
Lubricating oils	R	N	R	N
Machine oil	R	N	R	N
Magnesium salts	R	R	R	R
Maleic acid	R	R	N	N
Manganese sulfate	R	R	R	N
Mercuric salts	R	R	R	N
Mercury	R	R	R	R
Methane	R	R	R	R
Methyl acetate	N	N	N	N
Methyl bromide (gas)	N	N	N	N
Methyl cellosolve			R	N
Methyl chloride	N	N	N	N
Methyl chloroform	N	N	N	N
Methyl cyclohexanone	N	N	N	N
Methyl methacrylate	N	N	N	N
Methylene bromide	N	N	N	N
Methylene chloride	N	N	N	N
Methylene iodide	N	N	N	N
Mineral oil	R	R	R	N
Molasses	R	N	R	N
Monochlorobenzene	L	N	N	N
Monothanolamine	N	N	N	N
Motor oil	R	R	R	R
Naphtha	R	R	R	N
Napthalene	R	R	R	N
Nickel salts	R	R	R	R
Nitric acid, 0 to 20%	R	N	N	N

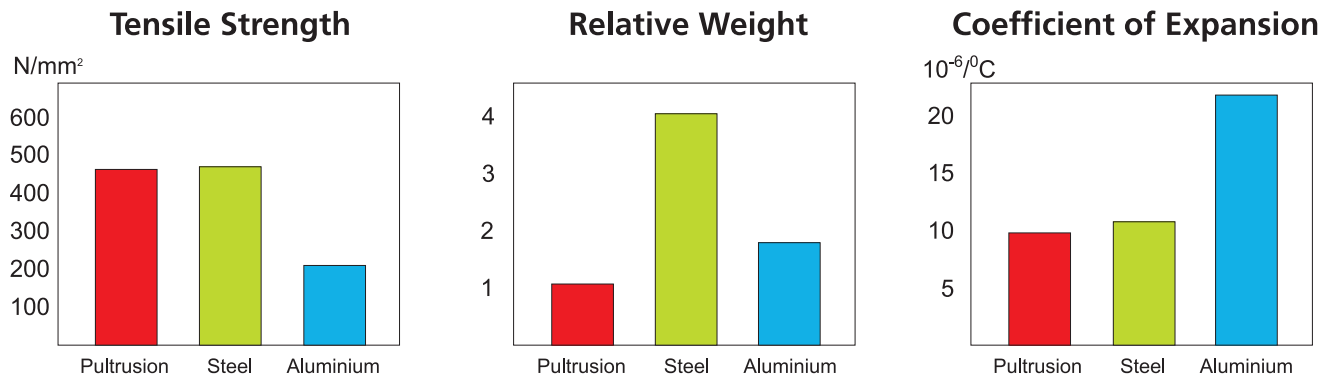
	Vinylester		Isophthalic Polyester	
	49"	99"	49"	99"
Up to temperature °C				
Nitric acid 21 to 100%	N	N	N	N
Nitric acid, fuming	N	N	N	N
Nitrobenzene	L	N	N	N
Nitrous acid	R	N	R	N
Oleic acid	R	R	R	R
Oleum	N	N	N	N
Olive oil	R	R	R	R
Oxalic acid		R	R	R
Ozone, gas, 5%	R	N	N	N
Palmitic acid, 10%	R	R	R	R
Palmitic acid, 70%	R	R	R	R
Paraffin	R	R	R	R
Pentane	R	N	R	N
Perchloric acid, 10%	R	N	N	N
Perchloric acid, 70%	R	N	N	N
Perchloroethylene	R	N	N	N
Petroleum, sour	R	R	R	N
Petroleum, refined	R	R	R	N
Phenol, 88%	N	N	N	N
Phenylcarbinol	N	N	N	N
Phenylhydrazine	N	N	N	N
Phosphoric acid	R	R	R	L
Phosphorous, yellow	N	N	N	N
Phosphorous, red	N	N	N	N
Phosphorous, trichloride	N	N	N	N
Phthalic acid	R	R		
Potassium salts, aq.	R	R	R	R
Potassium permanganate 25%	R	R	R	N
Propane	R	R	R	R
Propylene dichloride	N	N	N	N
Propylene glycol	R	R	R	N
Propylene oxide	N	N		
Pyridine	N	N	N	N
Rayon coagulating bath	R	N	N	N
Sea water	R	R	R	R
Salicylic acid	R	N	R	N
Sewage, residential	R	L	R	N
Silicic acid	R	R	R	N
Silicone oil	R	R	R	R
Silver salts	R	R	R	R
Soaps	R	R	R	R
Sodium hydroxide			N	N
Sodium salts, aq. except	R	R	R	R
Sodium chlorite 10%	R	N		
Sodium chlorate	R	R		
Sodium dichromate, acid	R	R		
Stannic chloride	R	R	R	N
Stannous chloride	R	R	R	R
Stearic acid	R	R	R	R
Sulfite liquor	R	R	R	N
Sulfur	R	R	R	N
Sugars, aq.			R	R
Sulfur dioxide, dry	R	R	R	R
Sulfur dioxide, wet	R	R	R	R
Sulfur trioxide, gas, dry	R	R	N	N
Sulfur trioxide, wet	N	N	N	N
Sulfuric acid, < 26%	R	R	R	N
Sulfuric acid, 26% to 80%	R	N	N	N
Sulfuric acid, 81% to 100%	N	N	N	N
Sulfurous acid, 10%	R	N	N	N
Tall oil	R	R	R	N
Tannic acid	R	R	R	R
Tartaric acid	R	R	R	R
Tetrachloroethane	R	N	N	N
Tetrahydrofuran	N	N	N	N
Thionyl chloride	N	N	N	N
Thread cutting oil	R	N	R	N
Terpineol	R	R	R	R
Toluene	R	N	N	N
Tributyl phosphate	R	N	N	N
Tricresyl phosphate	R	N	N	N
Trichloroacetic acid	R	R	N	N
Trichloroethylene	N	N	N	N
Triethanolamine	R	N	N	N
Triethylamine	R	N	N	N
Turpentine	R	R	N	N
Urea, 50%	R	N	R	N
Vaseline	R	R	R	R
Vegetable oils	R	R	R	R
Vinagar	R	R	R	N
Vinyl acetate	N	N	N	N
Water, distilled	R	R	R	N
Water, fresh	R	R	R	R
Water, mine	R	R	R	N
Water, salt	R	N	R	R
Water, tap	R	R	R	R
Whiskey	R	N	R	N
Wines	R	N	R	N
Xylene	R	N	N	N
Zinc salts	R	R	R	R

R=Resistant, N=Not resistant, L=Less resistant than R, but still suitable for some conditions

## Typical Properties of Pultrusion FRP Products

The information given below is a guide to the typical properties of Pultruded Fiberglass Reinforced plastic. The pultruded profiles are made from a combination of continuous Longitudinal Rovings, Continuous Filament Mats and Resin, thus properties will vary depending on reinforcement and resin choice.

### COMPARISONS



### PROPERTIES

#### Mechanical:

Tensile Strength, Longitudinal:	400 – 450	N/mm <sup>2</sup>
Flexural Stress, Longitudinal:	200 – 450	N/mm <sup>2</sup>
Elastic Modulus, Flexural, Longitudinal:	15,000 – 30,000	N/mm <sup>2</sup>
Compressive Strength:	150 – 300	N/mm <sup>2</sup>
Impact Strength:	1 – 2	kJ/M
Elongation at Rupture:	2	%
Hardness (Barcol 934-1):	50 – 60	
Specific Gravity:	1.7 – 1.9	

#### Electrical:

Dielectric Strength:	12	kV/mm
Volume Resistivity:	10 <sup>10</sup> – 10 <sup>12</sup>	Ω/cm <sup>2</sup>

#### Thermal:

Coefficient of Thermal Expansion:	8 – 10	10 <sup>-6</sup> /°K
Thermal Conductivity:	0.2 – 0.3	W/°K.M
Operating Temperature Range (resin dependent):	-70 to +120	°C

#### Fire:

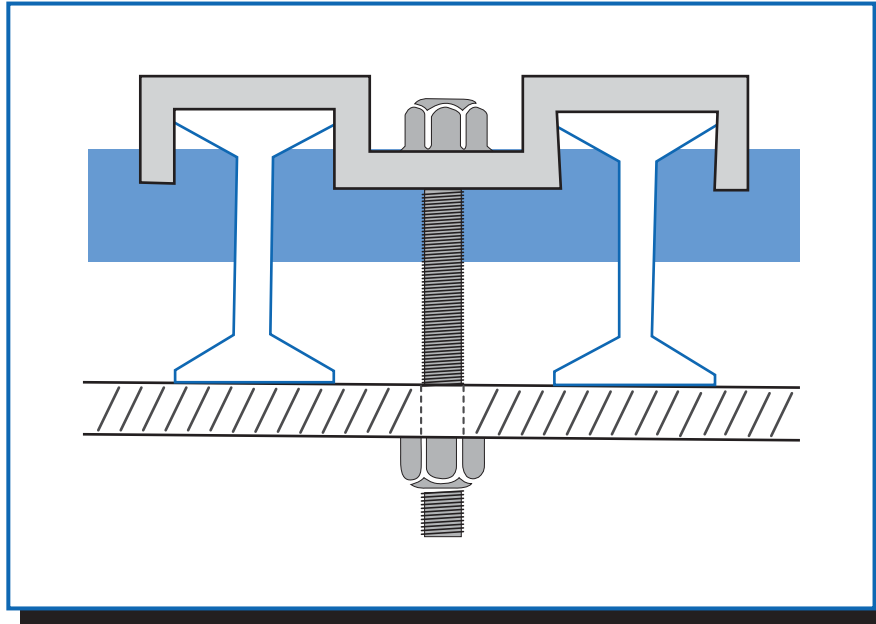
B.S. 476	- Class 1
ASTM E84	- Class A
IEC 60695	- 960 °C Max.

#### Smoke:

ASTM E662	- Ds at 1.5 min = 0.68
ASTM E84	- Class A

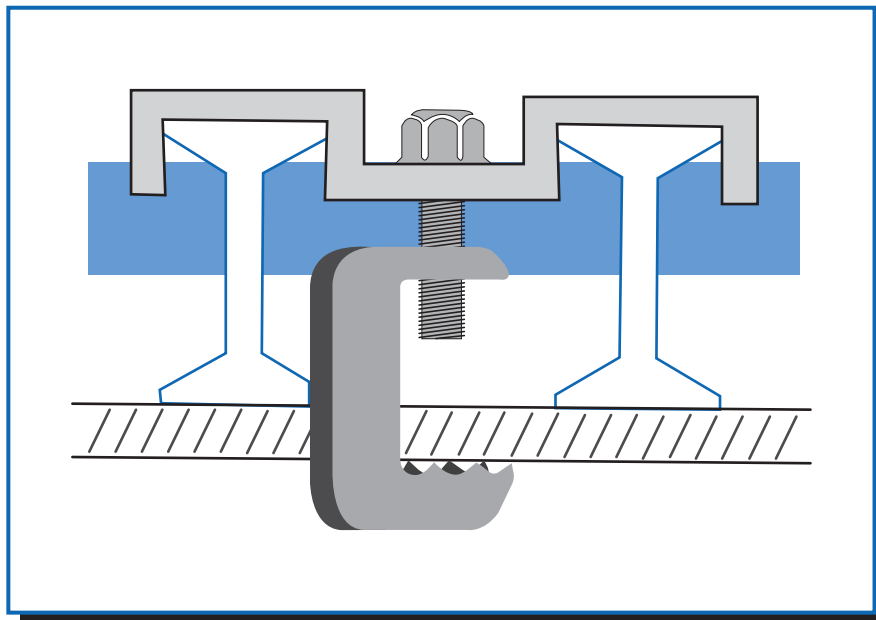


## Installation System



### M-CLIP

M-Clip is used to secure panels by drilling through the support structures. It is designed to use two adjacent grating bars for a more secure fit.



### G-CLIP

G-Clip is designed to attach grating to any structural support, with no drilling required. Recommended for offshore projects.



## Application

ARGOS FRP products can be used in either new application or for replacing existing application which is exposed to corrosive environment. The application can be found in all type of industrial such as :-

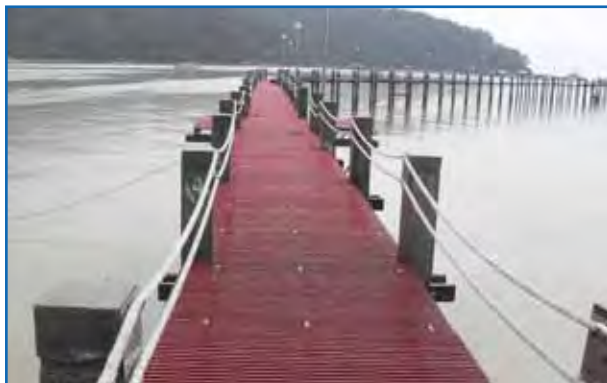
- Offshore, Onshore, and Oil & Gas
- Power Plants
- Pollution Control
- Recreation
- Government Properties
- Food Industry
- District Cooling System
- Petrochemical
- Chemical
- Water / Waste Treatment
- Public Facilities
- Fertilizer Plant
- Pharmaceutical



*Cooling Tower*



*FPSO*



*Jetty*



*Recreational Park Drainage Cover*



*Ship Building*

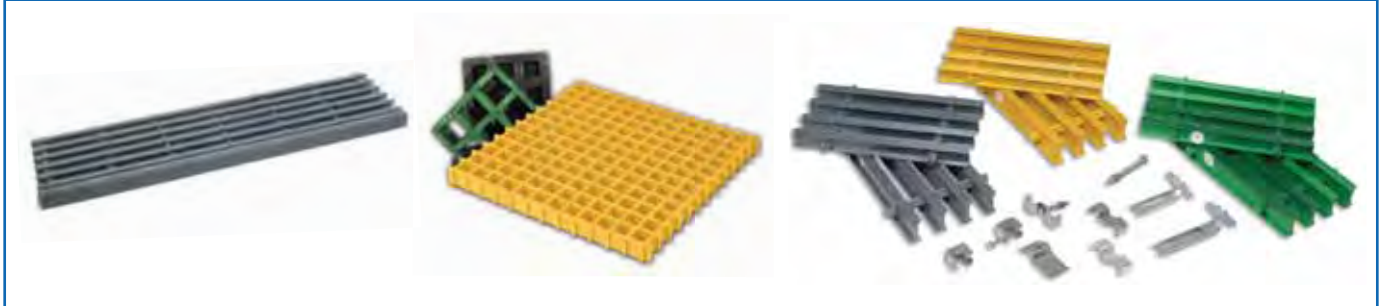


*Drain Cover*

## Full Range of ARGOS FRP Products

Assisting you to make a better choice from the best for your successful project with ARGOS FRP composite industrial products.

### Grating & Stair Tread



### Cable Ladder & Cable Tray



### Handrail & Caged Ladder System



### Structural Support System



FRP Anti-Slip Floor Decking

**Other Architectural Hand-Lay Up Products, Pipe spools, vessels, tanks, solar structures, scrubbers, rail related products etc. are available on request.**  
**Contact us for your requirements [info@argosfrp.com.au](mailto:info@argosfrp.com.au)**



## Application of All Range of ARGOS FRP Products

### COOLING TOWER



### POWER PLANT



### OFFSHORE PLATFORM



### FPSO



### REFINERY



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