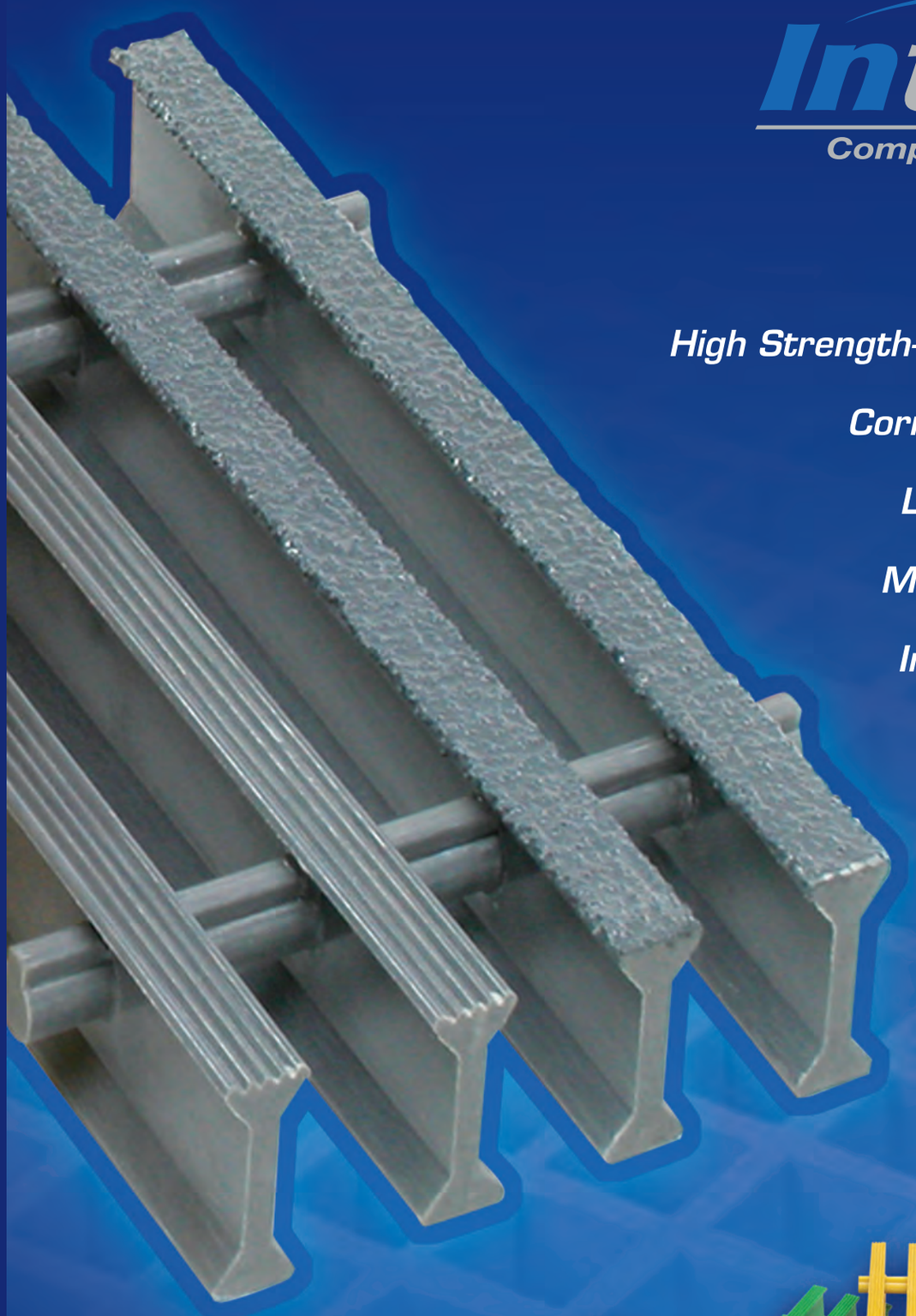
Intech
Composite solutions



High Strength-To-Weight Ratio

Corrosion Resistant

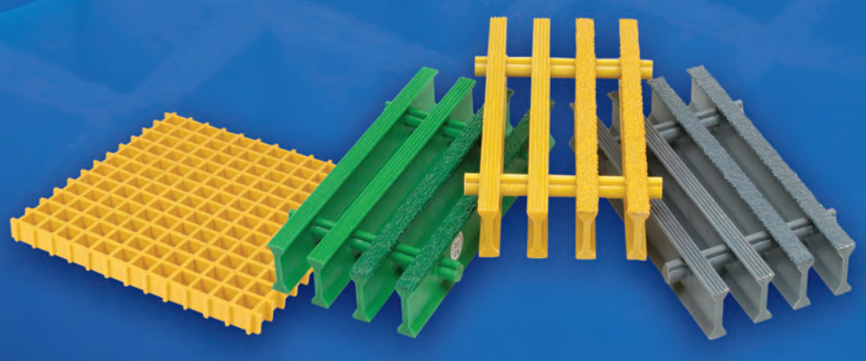
Long Service Life

Maintenance Free

Impact Resistant

Non-Conductive

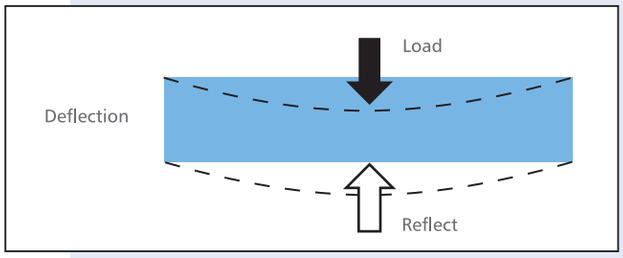
Anti Slip



FRP PULTRUDED & MOLDED GRATING

Materials and Manufacturing Process

FRP *(Fiber-glass Reinforced Plastic)* is a combination of fiberglass 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 shapping 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 fiberglass grating provides superior resistance to the effects of corrosion and ultraviolet exposure. **INTECH**'s uniquely formulated resin is responsible for the grating's fire retardant characteristics. **INTECH**'s 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 fiberglass 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 INTECH FRP Pultruded and Molded Grating

- **Corrosion Resistance**
  No rusting, peeling or flaking, even under the most aggressive conditions in any part of the world.

- **Lightweight and Durable**
  Lightweight 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.

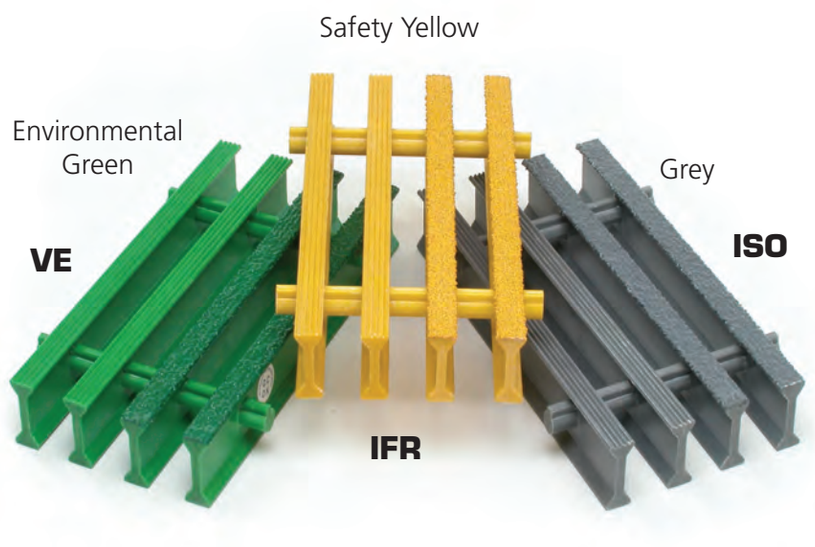
- **Superior Weatherability**
  INTECH's integral UV protection system gives long term protection against UV attack.

- **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.

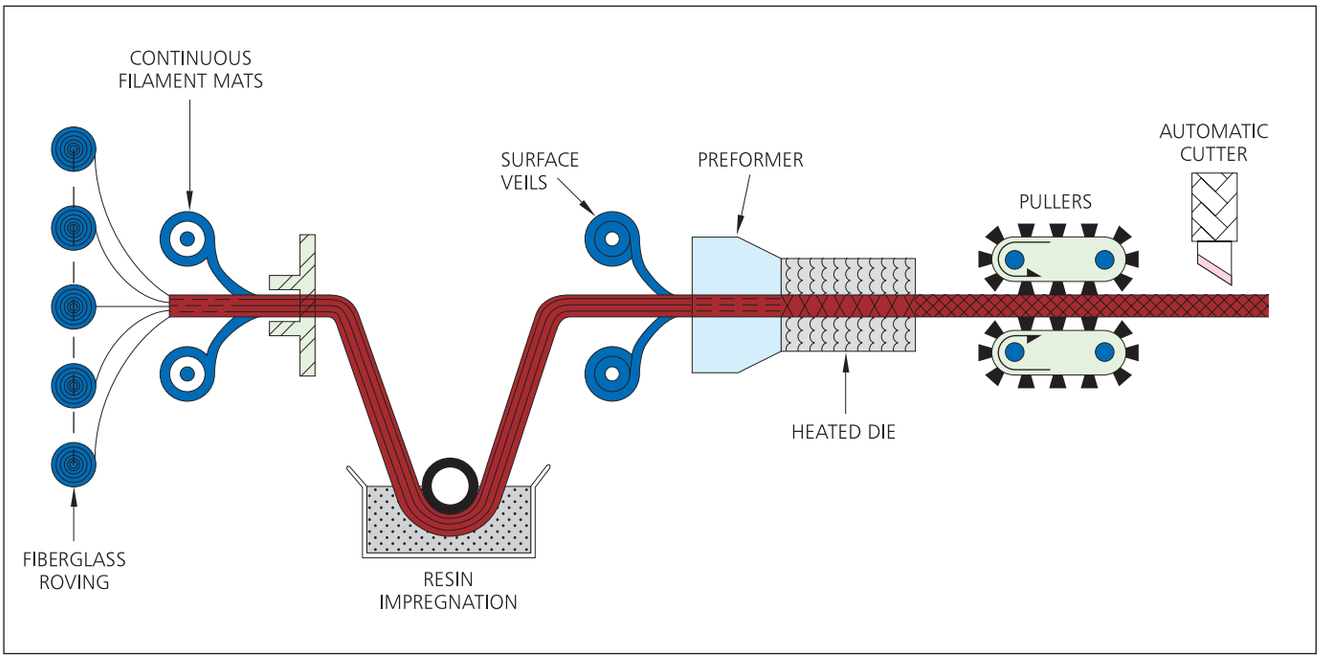
- **Fire Retardant**
  Fire retardant quality is available with compliance to ASTM-E84 and BS 476 standards.

Standard Colour Code :



FRP Pultrusion Process

CONTINUOUS PULTRUSION



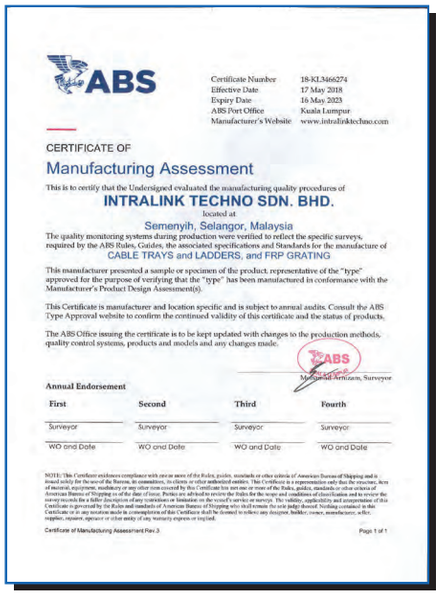
PULTRUSION PROCESS

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

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:



ABS

Certificate Number 18-KL3466274
Effective Date 17 May 2018
Expiry Date 16 May 2023
ABS Port Office Kuala Lumpur
Manufacturer's Website www.intralinktechno.com

CERTIFICATE OF

Manufacturing Assessment

This is to certify that the Undersigned evaluated the manufacturing quality procedures of

INTRALINK TECHNO SDN. BHD.

located at

Semenyih, Selangor, Malaysia

The quality monitoring systems during production were verified to reflect the specific surveys, required by the ABS Rules, Guides, the associated specifications and Standards for the manufacture of

CABLE TRAYS and LADDERS, and FRP GRATING

This manufacturer presented a sample or specimen of the product, representative of the "type" approved for the purpose of verifying that the "type" has been manufactured in conformance with the Manufacturer's Product Design Assessment(s).

This Certificate is manufacturer and location specific and is subject to annual audits. Consult the ABS Type Approval website to confirm the continued validity of this certificate and the status of products.

The ABS Office issuing the certificate is to be kept updated with changes to the production methods, quality control systems, products and models and any changes made.

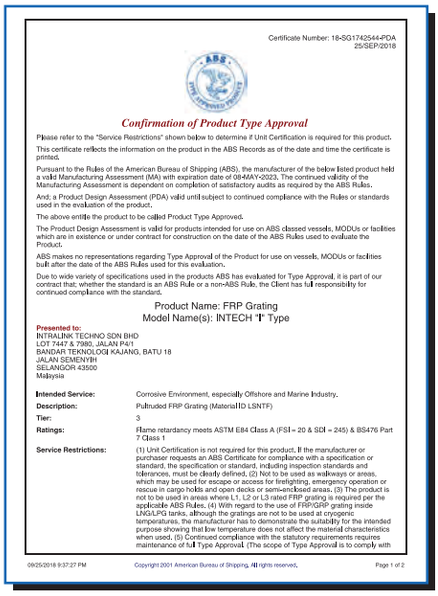
Mohamad Arrizam, Surveyor

Annual Endorsement

First	Second	Third	Fourth
Surveyor	Surveyor	Surveyor	Surveyor
WO and Date	WO and Date	WO and Date	WO and Date

NOTE: This Certificate evidences compliance with one or more of the Rules, guides, standards or other criteria of American Bureau of Shipping and is issued solely for the use of the Bureau, its committees, its clients or other authorized entities. This Certificate is a representation only that the structure, item or service described herein complies with the applicable Rules, Guides, standards or other criteria of the American Bureau of Shipping as of the date of issue. Parties are advised to review the Rules for the scope and conditions of classification and to review the survey records for a fuller description of any restrictions or limitations on the vessel's service or surveys. The validity, applicability and interpretation of this Certificate is governed by the Rules and standards of American Bureau of Shipping who shall remain the sole judge thereof. Nothing contained in this Certificate or in any notation made in consumption of this Certificate shall be deemed to relieve any designer, builder, owner, manufacturer, seller, supplier, repairer, operator or other entity of any warranty express or implied.

Certificate of Manufacturing Assessment Rev.3 Page 1 of 1



Certificate Number: 18-SG1742544-PDA
25/SEP/2018

Confirmation of Product Type Approval

Please refer to the "Service Restrictions" shown below to determine if Unit Certification is required for this product.

This certificate reflects the information on the product in the ABS Records as of the date and time the certificate is printed.

Pursuant to the Rules of the American Bureau of Shipping (ABS), the manufacturer of the below listed product held a valid Manufacturing Assessment (MA) with expiration date of 08-MAY-2023. The continued validity of the Manufacturing Assessment is dependent on completion of satisfactory audits as required by the ABS Rules.

And; a Product Design Assessment (PDA) valid until subject to continued compliance with the Rules or standards used in the evaluation of the product.

The above entitle the product to be called Product Type Approved.

The Product Design Assessment is valid for products intended for use on ABS classed vessels, MODUs or facilities which are in existence or under contract for construction on the date of the ABS Rules used to evaluate the Product.

ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

Product Name: FRP Grating
Model Name(s): INTECH "I" Type

Presented to:
INTRALINK TECHNO SDN BHD
LOT 7447 & 7980, JALAN P4/1
BANDAR TEKNOLOGI KAJANG, BATU 18
JALAN SEMENYIH
SELANGOR 43500
Malaysia

Intended Service:	Corrosive Environment, especially Offshore and Marine Industry.
Description:	Pultruded FRP Grating (MaterialID LSNTF)
Tier:	3
Ratings:	Flame retardancy meets ASTM E84 Class A (FSI = 20 & SDI = 245) & BS476 Part 7 Class 1
Service Restrictions:	(1) Unit Certification is not required for this product, If the manufacturer or purchaser requests an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined, (2) Not to be used as walkways or areas, which may be used for escape or access for firefighting, emergency operation or rescue in cargo holds and open decks or semi-enclosed areas, (3) The product is not to be used in areas where L1, L2 or L3 rated FRP grating is required per the applicable ABS Rules, (4) With regard to the use of FRP/GRP grating inside LNG/LPG tanks, although the gratings are not to be used at cryogenic temperatures, the manufacturer has to demonstrate the suitability for the intended purpose showing that low temperature does not affect the material characteristics when used, (5) Continued compliance with the statutory requirements requires maintenance of full Type Approval. (The scope of Type Approval is to comply with

09/25/2018 9:37:27 PM Copyright 2001 American Bureau of Shipping. All rights reserved. Page 1 of 2

ABS

CERTIFICATE NUMBER 18-SG1742544-PDA
EFFECTIVE DATE 09-May-2018
EXPIRATION DATE 08-May-2023
ABS TECHNICAL OFFICE Singapore Ship Engineering

CERTIFICATE OF

Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

INTRALINK TECHNO SDN BHD

located at

Lot 7447 & 7980, Jln. P4/1, Bandar Teknologi Kajang, Batu 18,
Jln. Semenyih, 43500 Semenyih, Selangor, Malaysia

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product FRP Grating

Model INTECH "I" Type

This Product Design Assessment ('PDA') Certificate remains valid until 08-May-2023 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification outstanding design reassessment (whichever occurs first).

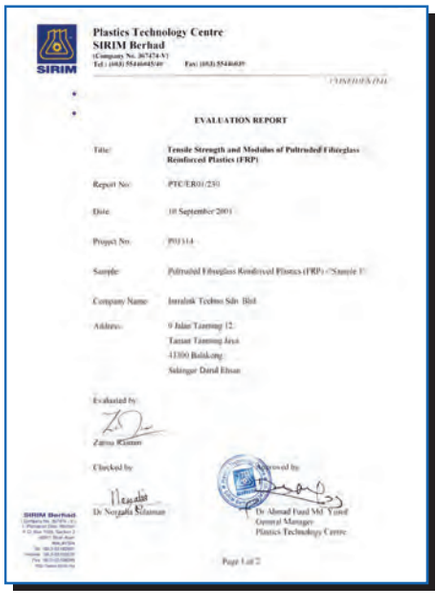
Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of POA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau of Shipping

Ramendra Kumar Pandey
Senior Engineering Specialist

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the characteristics of product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2018)



SIRIM

Plastics Technology Centre
SIRIM Berhad
(Company No. 367474-V)
Tel : (603) 55446455/49 Fax: (603) 55446829

EVALUATION REPORT

Title:	Tensile Strength and Modulus of Pultruded Fiberglass Reinforced Plastics (FRP)
Report No:	PTC/ER01/230
Date:	10 September 2001
Project No:	P01114
Sample:	Pultruded Fiberglass Reinforced Plastics (FRP) ("Sample I")
Company Name:	Intralink Techno Sdn. Bhd.
Address:	9 Jalan Tanming 12, Taman Tanming Jaya 43300 Balakong Selangor Darul Ehsan

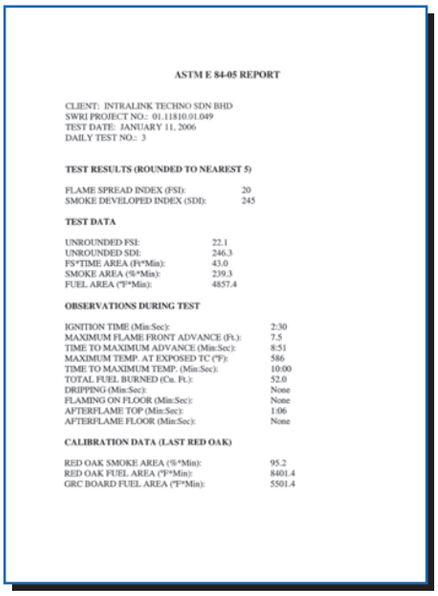
Evaluated by:
Zarina Kassim

Checked by:
Dr Norgaida Sulaiman

Approved by:
Dr Ahmad Fuad Md Yusof
General Manager
Plastics Technology Centre

SIRIM Berhad

Page 1 of 2



ASTM E 84-05 REPORT

CLIENT: INTRALINK TECHNO SDN BHD
SWRI PROJECT NO.: 01.11810.01.049
TEST DATE: JANUARY 11, 2006
DAILY TEST NO.: 3

TEST RESULTS (ROUNDED TO NEAREST 5)

FLAME SPREAD INDEX (FSI):	20
SMOKE DEVELOPED INDEX (SDI):	245

TEST DATA

UNROUNDED FSI:	22.1
UNROUNDED SDI:	246.3
FS*TIME AREA (Ft*Min):	43.0
SMOKE AREA (%*Min):	239.3
FUEL AREA (°F*Min):	4857.4

OBSERVATIONS DURING TEST

IGNITION TIME (Min:Sec):	2:30
MAXIMUM FLAME FRONT ADVANCE (Ft.):	7.5
TIME TO MAXIMUM ADVANCE (Min:Sec):	8:51
MAXIMUM TEMP. AT EXPOSED TC (°F):	586
TIME TO MAXIMUM TEMP. (Min:Sec):	10:00
TOTAL FUEL BURNED (Cu. Ft.):	52.0
DRIPPING (Min:Sec):	None
FLAMING ON FLOOR (Min:Sec):	None
AFTERFLAME TOP (Min:Sec):	1:06
AFTERFLAME FLOOR (Min:Sec):	None

CALIBRATION DATA (LAST RED OAK)

RED OAK SMOKE AREA (%*Min):	95.2
RED OAK FUEL AREA (°F*Min):	8401.4
GRC BOARD FUEL AREA (°F*Min):	5501.4

Lloyd's Register
LRQA

CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

Intralink Techno Sdn. Bhd. (495364-M)
Lot 7447 & 7980, Jalan P4/1
Bandar Teknologi Kajang
Batu 18, Off Jalan Semenyih
43500 Semenyih, Selangor
Malaysia

has been approved by Lloyd's Register Quality Assurance to the following Quality Management System Standards:

ISO 9001:2015
EN ISO 9001:2015
BS EN ISO 9001:2015
MS ISO 9001:2015

The Quality Management System is applicable to:

Design and manufacture of advanced composite materials such as fiberglass reinforced composite products.

Approval Certificate No: KLR 0403767

Original Approval: 11 March 2002
Current Certificate: 03 October 2017
Certificate Expiry: 10 March 2020

Issued by: Lloyd's Register of Shipping (M) Bhd
for and on behalf of Lloyd's Register Quality Assurance Ltd.

UKAS QUALITY MANAGEMENT 001

Lloyd's Register of Shipping (M) Bhd (111008-K), Level 20, Tower A, Naza Tower Platinum Park, No. 10, 50088 Persiaran KLCC, Kuala Lumpur, Malaysia
for and on behalf of Lloyd's Register Quality Assurance Ltd., 1 Trinity Park, Bickenhill Lane, Birmingham, B37 7ES, United Kingdom

Awards And Recognition

Cert. No: KLR 0403767

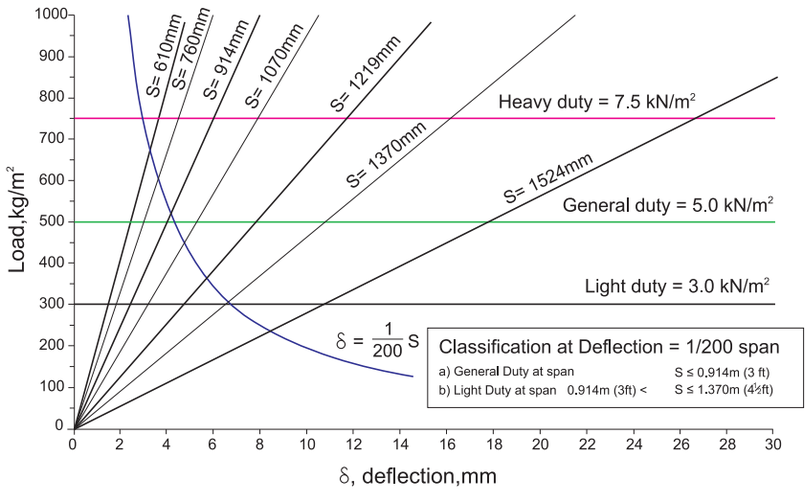
MITI INDUSTRIAL EXCELLENCE AWARD 2012

E50 2011

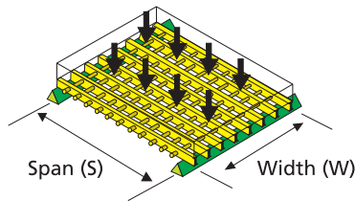
THE SMEs BEST BRAND 2011

Profile and Technical Data - 25mm (H) Grating

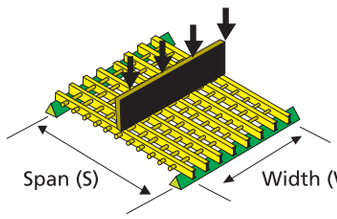
Loading & Support Selection Chart for Uniform Load (25mm HT grating)



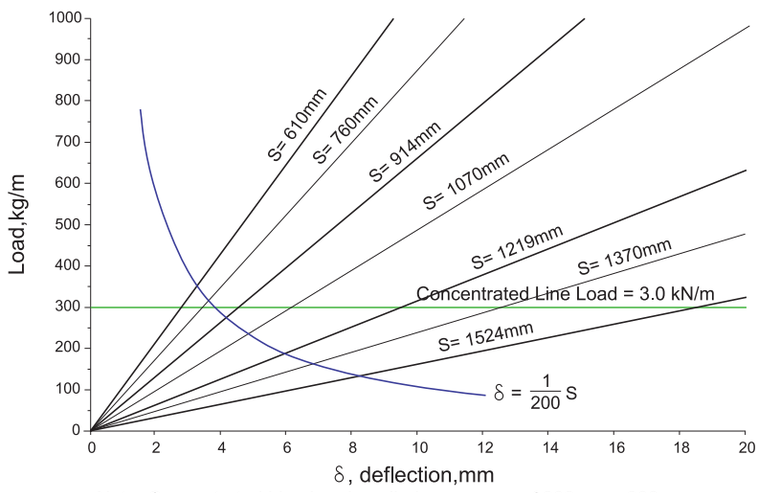
Uniform Load, kg/m²



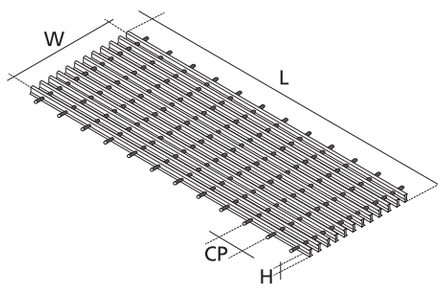
Concentrated Line Load, kg/m

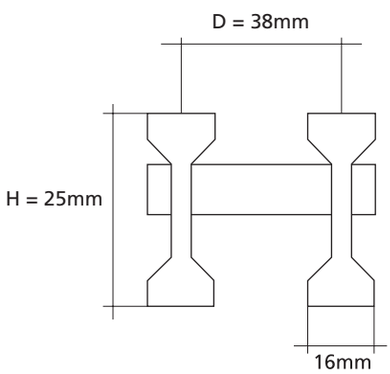


Loading & Support Selection Chart for Concentrated Line Load (25mm HT grating)



Note: Concentrated Line Load applied on an area of 300mm x 300mm





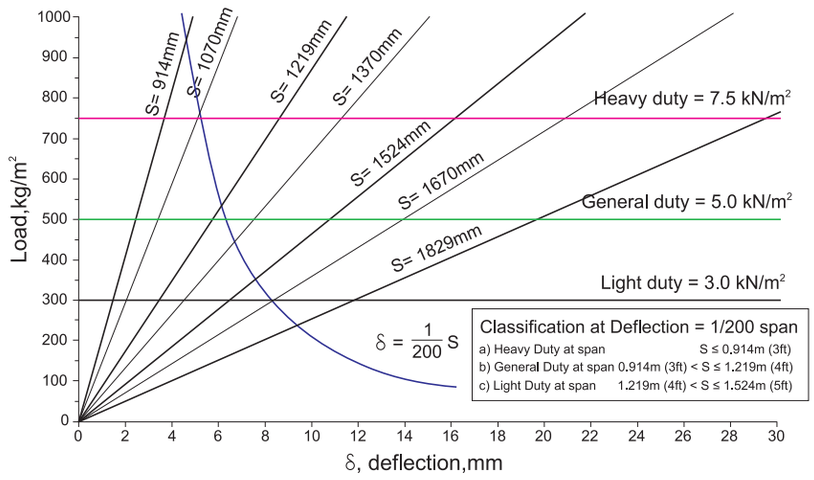
25mm (H) GRATING

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

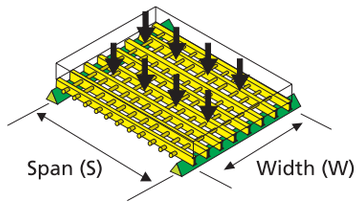
No. of Bars/m of width	Height (H) (mm)	Open Area	Load Bar Centers (D) (mm)	Approximate Weight (kg/m²)
27	25	60%	38	12.4

Profile and Technical Data - 38mm (H) Grating

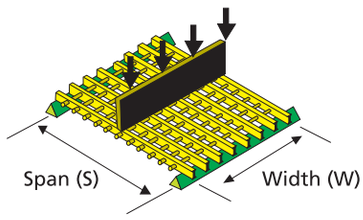
Loading & Support Selection Chart for Uniform Load (38mm HT grating)



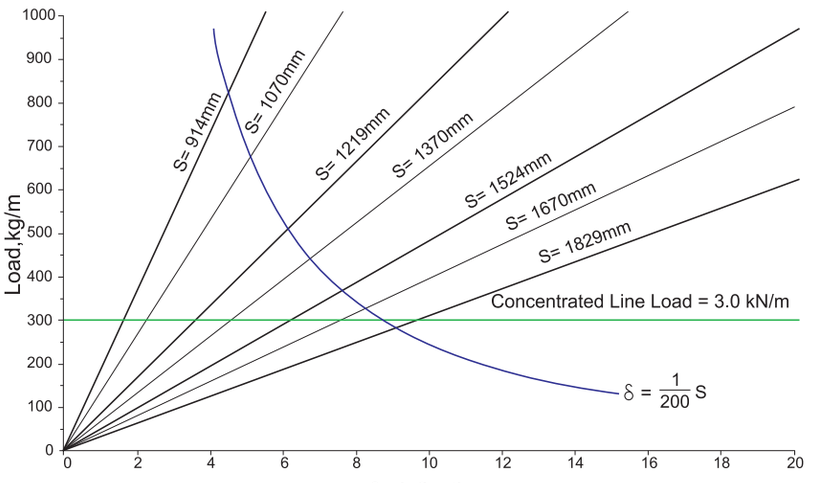
Uniform Load, kg/m²



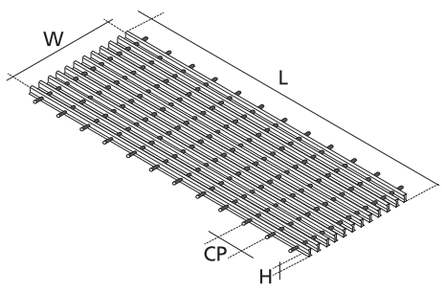
Concentrated Line Load, kg/m

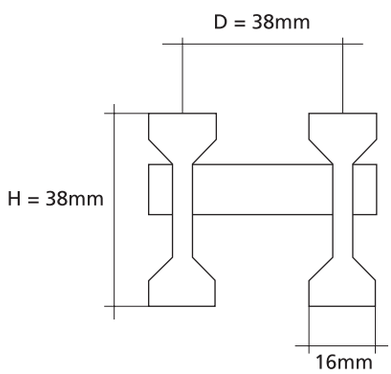


Loading & Support Selection Chart for Concentrated Line Load (38mm HT grating)



Note: Concentrated Line Load applied on an area of 300mm x 300mm





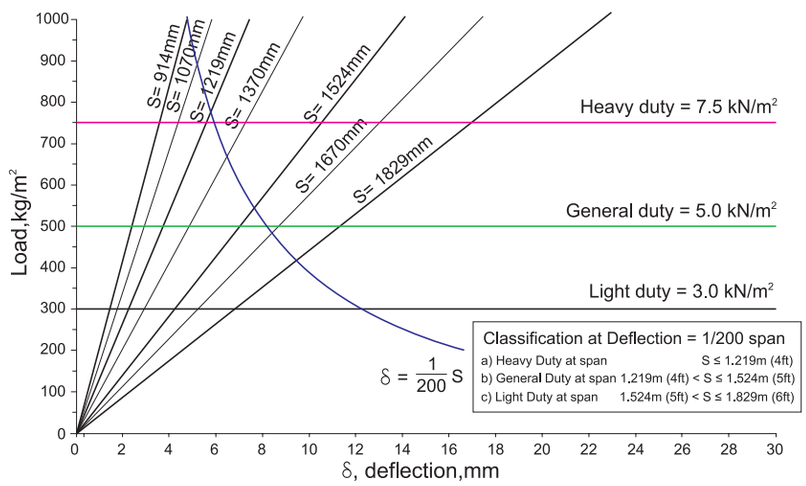
38mm (H) GRATING

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

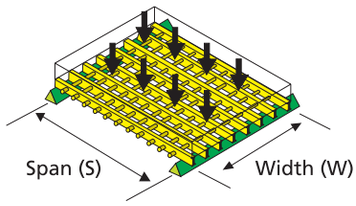
No. of Bars/m of width	Height (H) (mm)	Open Area	Load Bar Centers (D) (mm)	Approximate Weight (kg/m²)
27	38	60%	38	15.6

Profile and Technical Data - 50mm (H) Grating

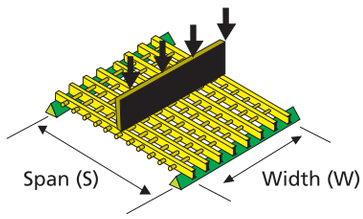
Loading & Support Selection Chart for Uniform Load (50mm HT grating)



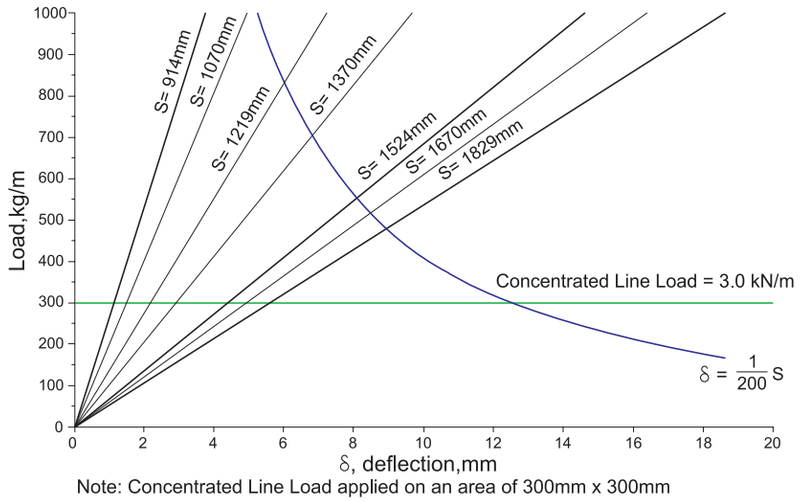
Uniform Load, kg/m²



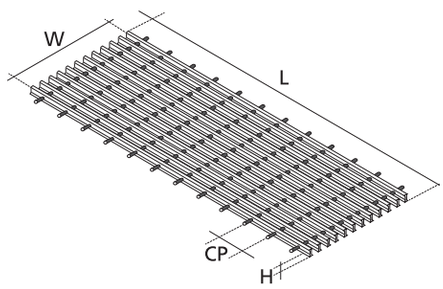
Concentrated Line Load, kg/m

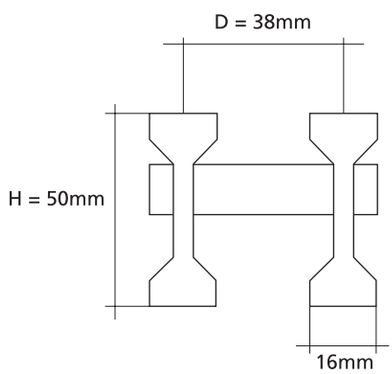


Loading & Support Selection Chart for Concentrated Line Load (50mm HT grating)



Note: Concentrated Line Load applied on an area of 300mm x 300mm





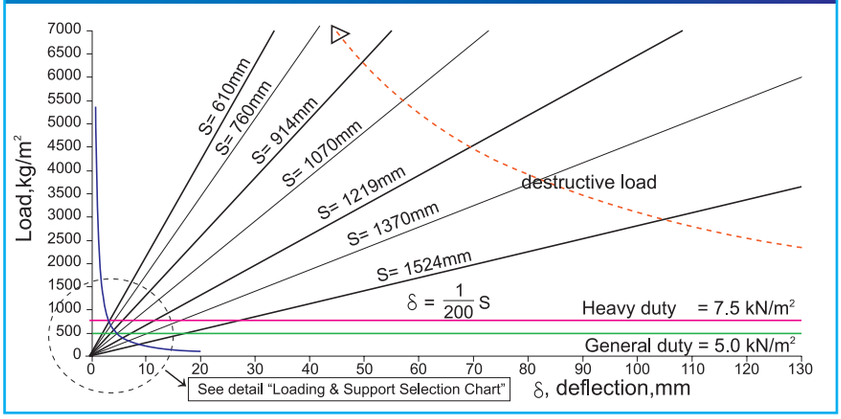
50mm (H) GRATING

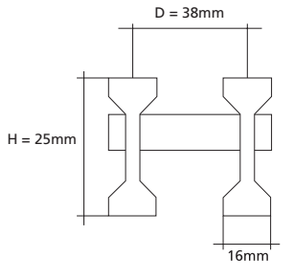
CODE ITG5015	H = 50mm	D = 38mm	CP = 152mm
CODE ITG5030	H = 50mm	D = 38mm	CP = 304mm

No. of Bars/m of width	Height (H) (mm)	Open Area	Load Bar Centers (D) (mm)	Approximate Weight (kg/m²)
27	50	60%	38	21.0

Profile and Technical Data

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

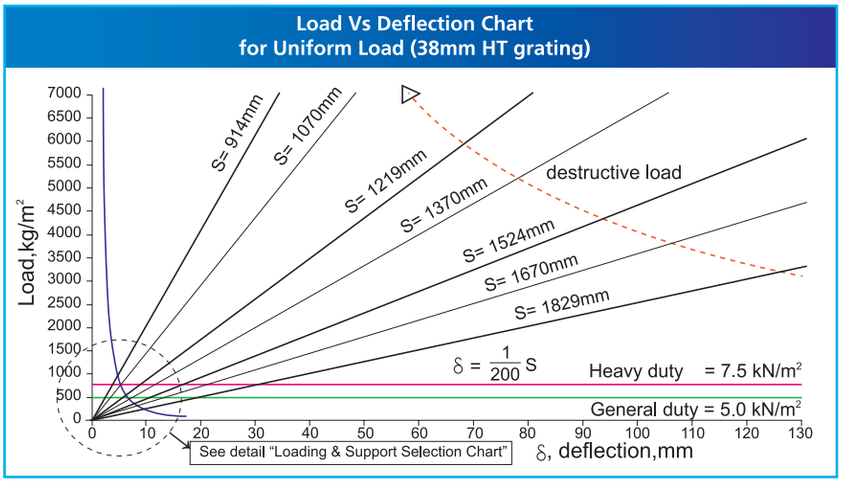


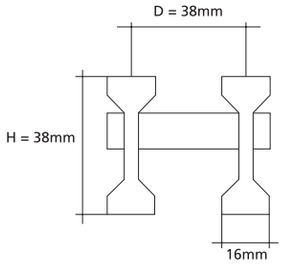


25mm (H) GRATING

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

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

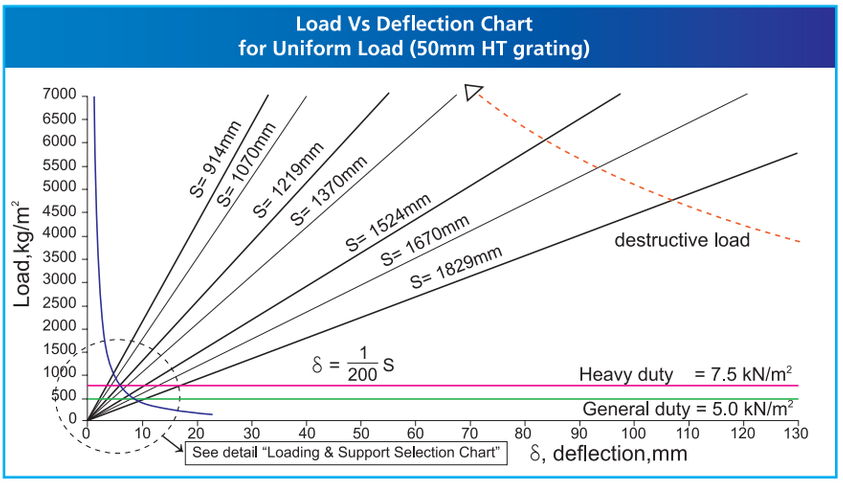


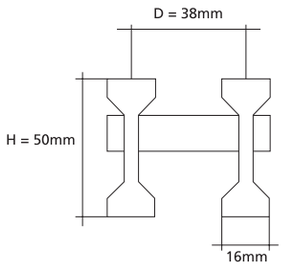


38mm (H) GRATING

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

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



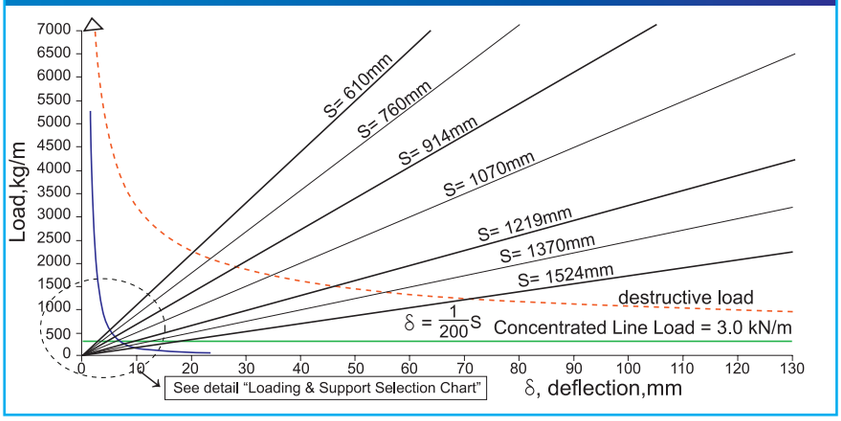


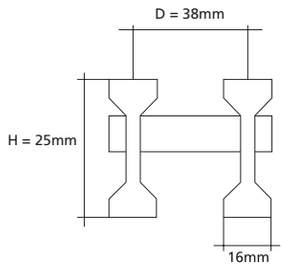
50mm (H) GRATING

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

Profile and Technical Data

Load Vs Deflection Chart for Concentrated Line Load (25mm HT grating)

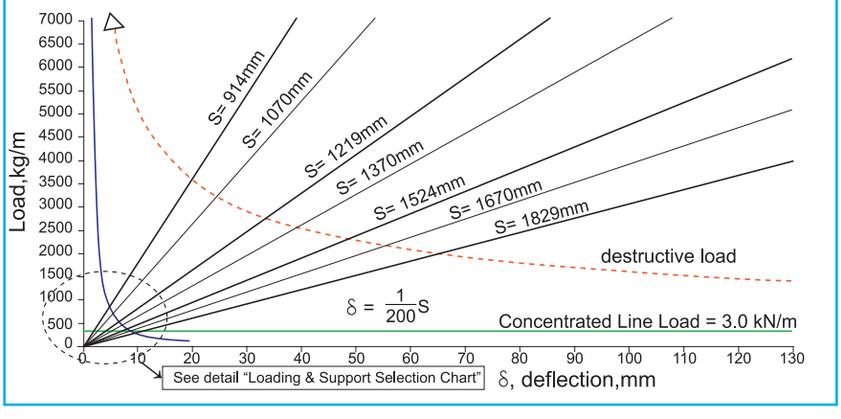


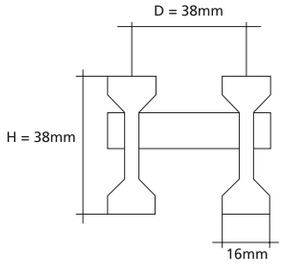


25mm (H) GRATING

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

Load Vs Deflection Chart for Concentrated Line Load (38mm HT grating)

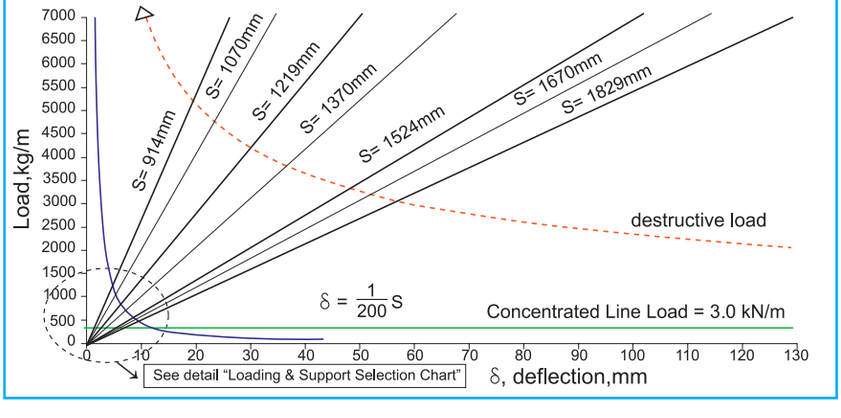


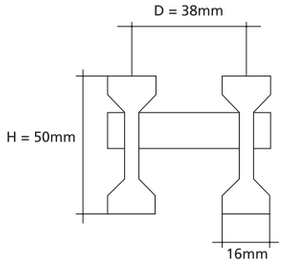


38mm (H) GRATING

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

Load Vs Deflection Chart for Concentrated Line Load (50mm HT grating)



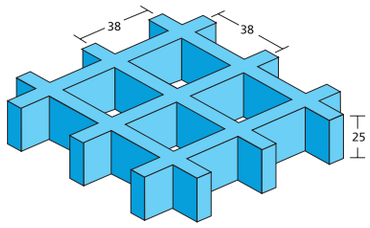


50mm (H) GRATING

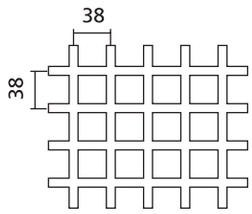
CODE	H	D	CP
ITG5015	50	38	152
ITG5030	50	38	304

Detailed Specifications

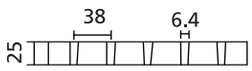
Thickness: 25mm



Plan View



Elevation View



25mm thick, 38x38mm square mesh, bearing bars run both direction

Bearing bar thickness (Top/Bottom) : 6.4/5.0

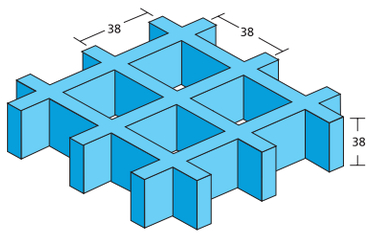
Bearing bar center : 38

Open Area : 68%

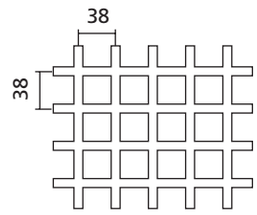
Approx. Weight : 12.30 kgs/m^2

Panel size available :
1524 x 4000, 1220 x 4000, 1220 x 3660, 1220 x 2440, 915 x 3050

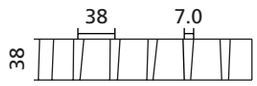
Thickness: 38mm



Plan View



Elevation View



38mm thick, 38x38mm square mesh, bearing bars run both direction

Bearing bar thickness (Top/Bottom) : 7.0/5.0

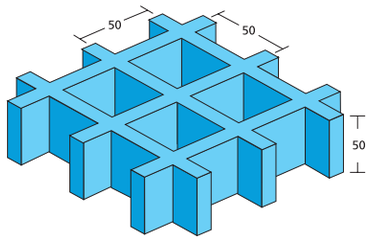
Bearing bar center : 38

Open Area : 68%

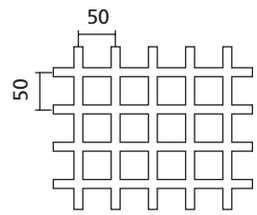
Approx. Weight : 19.50 kgs/m^2

Panel size available :
1524 x 4000, 1524 x 3050, 1220 x 4000, 1220 x 3660, 1220 x 2440, 915 x 3050

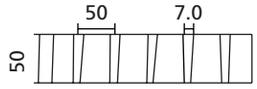
Thickness: 50mm



Plan View



Elevation View



50mm thick, 50x50mm square mesh, bearing bars run both direction

Bearing bar thickness (Top/Bottom) : 7.0/5.0

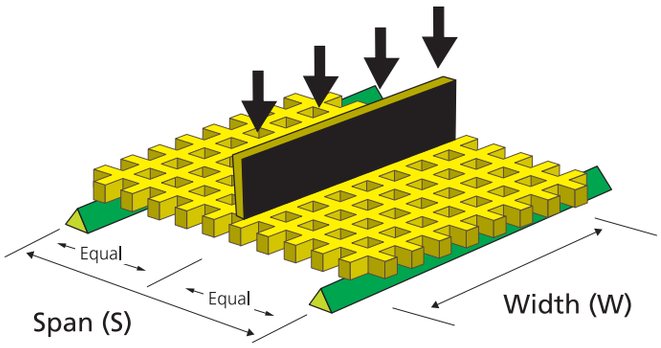
Bearing bar center : 50

Open Area : 78%

Approx. Weight : 20.80 kgs/m^2

Panel size available :
1524 x 4000, 1220 x 3660, 1800 x 4000, 1220 x 2440, 915 x 3050

INTECH Molded Grating Load Tables



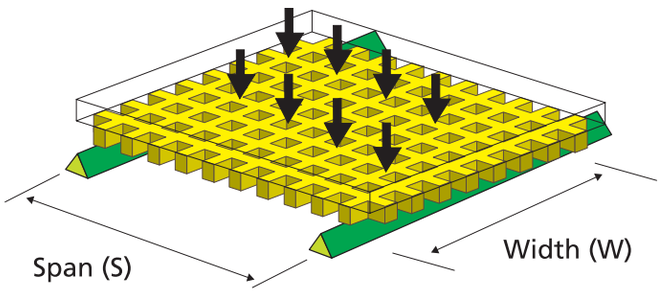
CONCENTRATED LINE LOAD TABLES - DEFLECTION IN MILLIMETERS

SPAN IN mm	THK	MESH	LOAD IN KN/M OF WIDTH (CONCENTRATED) 3	5	10	15	20	25	40	50	60	70	80	MAXIMUM RECOMMENDED	APPARENT EI x 10^6 N-mm^2/m
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^2. 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.

INTECH Molded Grating Load Tables



UNIFORMED LOAD TABLES - DEFLECTION IN MILLIMETERS

SPAN IN mm	THK	MESH	LOAD IN KN/SQM (UNIFORMED) 3	5	10	15	20	25	39	50	60	70	80	MAXIMUM RECOMMENDED	APPARENT EI x 10^6 N-mm^2/m
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^2. 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

Up to temperature °C	Vinylester 49°	Vinylester 99°	Isophathalic Polyester 49°	Isophathalic Polyester 99°
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-propanal)	R	N	N	N
Alcohol, methyl	L	N	L	N
Alcohol, propyl (1-propanaol)	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
Amyl 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
Beet 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
Calsium 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
Chlorocetic 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
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
Dioctyl 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
Dichlorethylene	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
Kerosense	R	N	R	N
Lactic acid, 25%	R	R	R	N
Lauric acid	R	R	R	N
Lauryl chloride	R	R	R	N
Laurlyl sulfate	R	R	R	N
Lead salth	R	R	R	R
Linoleic acid	R	R	R	N
Linseed oil	R	R	R	N
Lithium salth	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
Monoethanolamine	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
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, < 25%	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
Trichloracetic 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
Vinegar	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

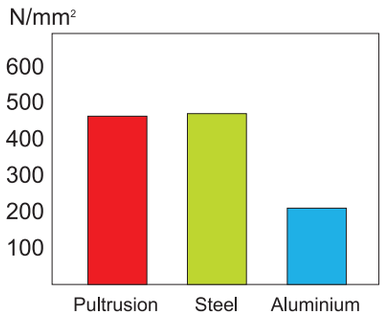
R=Resistant, N=Not resistant, L=Less resistant than R, but still suitable for some conditions

Typical Properties of Pultrusion FRP Products

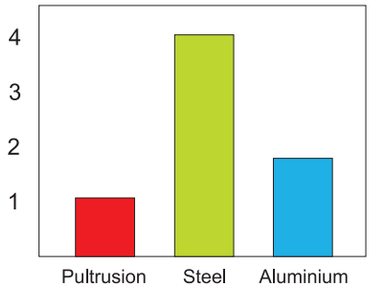
The information given below is a guide to the typical properties of Pultruded Fiberglass Reinforced plastic. The pultruded profiles are made from a combination of continuous Longitudinal Rovings, Continuous Filament Mats and Resin, thus properties will vary depending on reinforcement and resin choice.

COMPARISONS

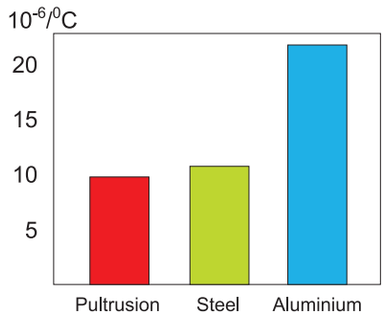
Tensile Strength



Relative Weight



Coefficient of Expansion



PROPERTIES

Mechanical:

Tensile Strength, Longitudinal:	400 – 450	N/mm^2
Flexural Stress, Longitudinal:	200 – 450	N/mm^2
Elastic Modulus, Flexural, Longitudinal:	15,000 – 30,000	N/mm^2
Compressive Strength:	150 – 300	N/mm^2
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:	$10^{10} – 10^{12}$	Ω/cm^2

Thermal:

Coefficient of Thermal Expansion:	8 - 10	$10^{-6}/^0K$
Thermal Conductivity:	0.2 – 0.3	$W/^0K.M$
Operating Temperature Range (resin dependent):	-70 to +120	^0C

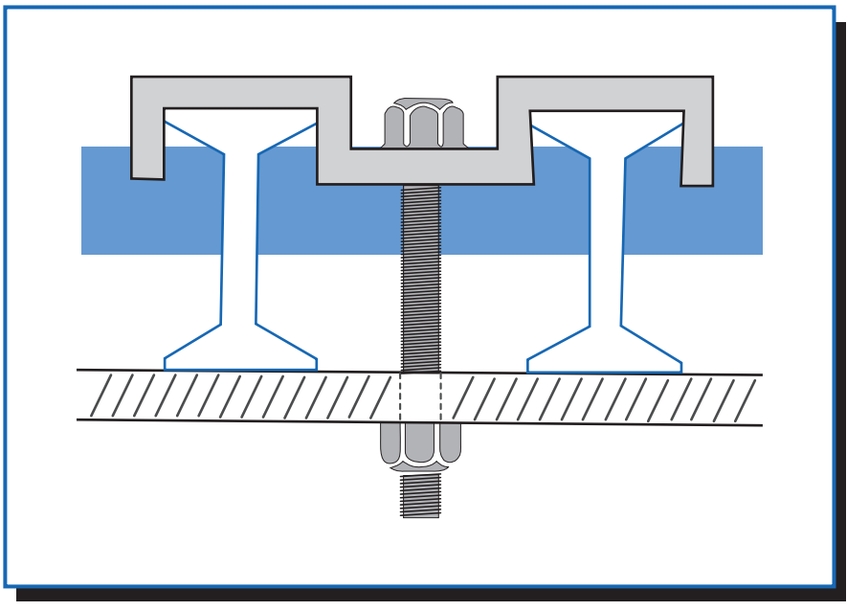
Fire:

B.S. 476 - Class 1
ASTM E84 - Class 1
IEC 60695 - 960 ^{0}C Max.

Smoke:

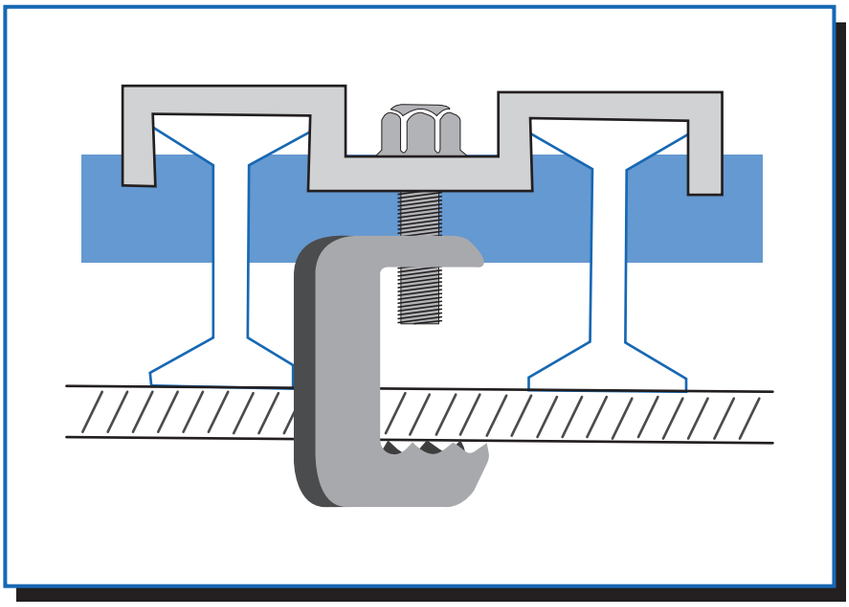
ASTM E662 - Ds at 1.5 min = 0.68
ASTM E84 - Class A

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

INTECH 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

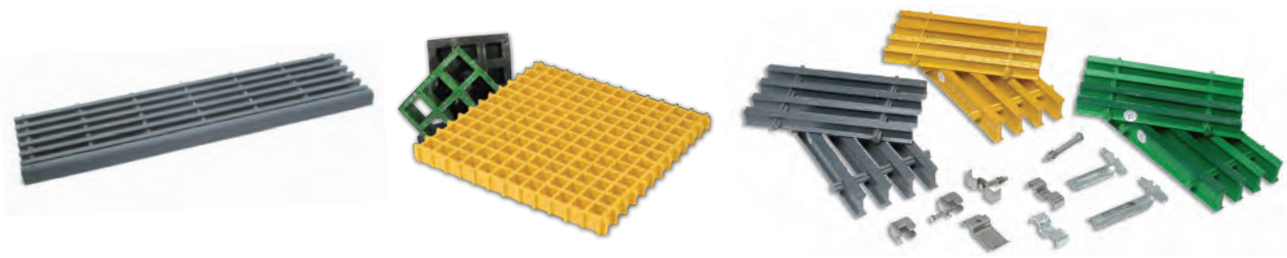
Ship Building

Drain Cover

Full Range of INTECH FRP Products

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

INTECH Grating & Stair Tread



INTECH Cable Ladder & Cable Tray

INTECH Handrail & Caged Ladder System

INTECH Structural Support System

FRP Anti-Slip Floor Decking

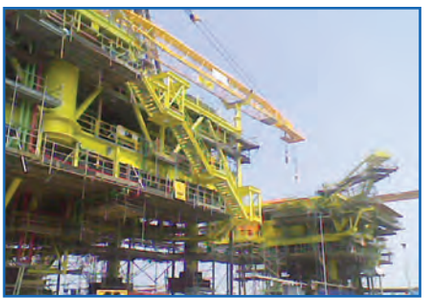
Other Architectural Hand-Lay Up Products

Application of All Range of INTECH FRP Products

COOLING TOWER

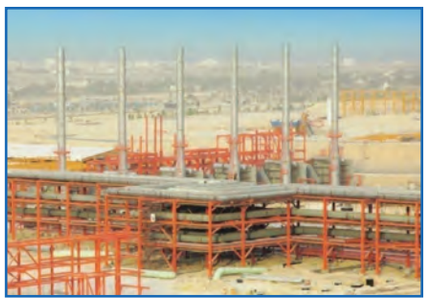
POWER PLANT

OFFSHORE PLATFORM



FPSO

REFINERY



Intech
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