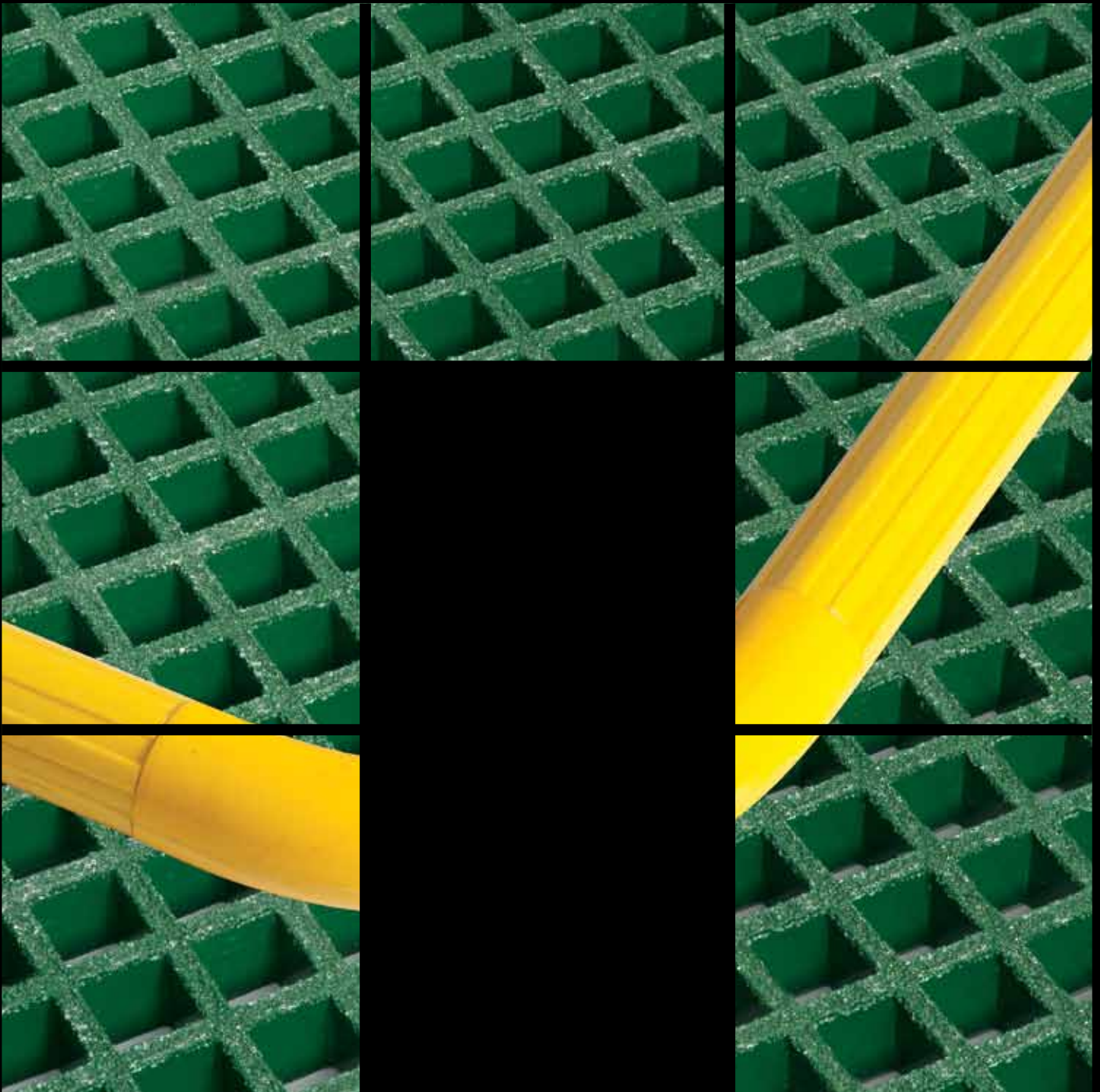


NEPEAN
Building &
Infrastructure

TM

Weldlok® Fibreglass Grating & Handrail



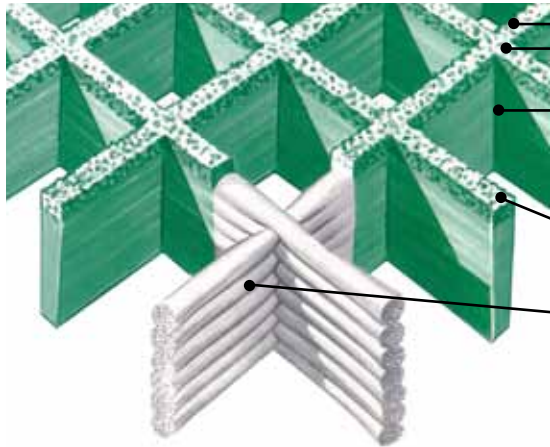
NEPEAN Building & Infrastructure is a division of NEPEAN, Australia's largest privately owned engineering, mining services and industrial manufacturing organisation.

Through our renowned Weldlok® brand, we manufacture and supply grating, handrails and drainage products, as well as perforated and expanded metals in a variety of materials, including galvanised mild steel, stainless steel and aluminium.

This brochure introduces the Weldlok® range of fibreglass grating and handrail manufactured from fibre-reinforced plastic (FRP).

Ask our sales team for a copy of these and other Weldlok® product brochures.

Special features of Weldlok® FRP grating



- One piece construction distributes load to bearing bars in both directions.
- The physical properties rely on the tensile strength of the glass fibres and the depth of the load bars.
- Coarse quartz grit built into the top surface provides a long lasting anti-slip finish.
- Continuous E-glass fibres laid in alternating layers in both horizontal directions is thoroughly wetted with thermosetting resin to provide excellent chemical resistance.

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FRP Properties, Ordering Information	3
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FRP Grating Applications

- > Maintenance walkways
- > Industrial access platforms
- > Disabled access ramps
- > Marinas, jetties, pontoons
- > Oil and gas platforms
- > Pedestrian bridges
- > Transmission tower platforms
- > Tourist site walkways
- > Petroleum refining access platforms
- > Water and sewage treatment plants
- > Food processing plants

Weldok grating is available in the following resin types

RESIN TYPE	AVAILABILITY	PROPERTIES see table of chemical resistance on page 11	Flame spread rating ASTM E84	APPLICATIONS Refer page 11
Isophthalic polyester	Standard in all grating patterns	Very good chemical resistance, good flame resistance, best general purpose resin	Class 1, 25 or less	Most applications including food and beverage processing, salt environments, waste water, certain chemical industries
Vinyl ester	Box pattern, standard Minimesh, Solid cover and Rectangular patterns, on request	Improved chemical resistance, good flame resistance	Class 1, 25 or less	Especially suitable for highly aggressive environments and high temperatures
Phenolic	All grating patterns, on request	Specially formulated for very high flame resistance and low smoke development	Class 1, 5 or less	Wherever a high flame resistance is required, e.g. offshore oil rigs

WELDLOK® FIBREGLASS WALKWAY GRATING

Properties of fibre reinforced plastic (FRP) grating

CHEMICAL RESISTANCE

High resin content provides resistance to a wide range of chemicals. See table on page 7.

ANTI-SLIP SURFACE

The coarse quartz grit finish where applied to the walking surface, provides excellent anti-slip performance.

FIRE RESISTANCE

Flame retardants are added to the resins to improve the fire resistance.

RESISTANT TO ULTRA VIOLET RADIATION

UV inhibitors are incorporated into the resin to reduce the effects of ultraviolet radiation. However, some loss of colour will occur on long exposure.

HIGH IMPACT RESISTANCE

FRP grating resists the effects of high impact loading which may superficially damage the surface but does not allow penetration.

HIGH STIFFNESS TO WEIGHT RATIO

High strength, with E-glass rovings moulded into a square grid grating pattern, provides a stiff and light flooring panel suitable for foot traffic

over a wide range of spans. See span/load/deflection tables for each grating pattern.

STIFFNESS IN BOTH DIRECTIONS

Due to the box pattern arrangement, FRP grating has load bar strength in both directions.

LIGHTWEIGHT PANELS

The lightweight nature of FRP grating allows for ease of handling compared with other materials.

NON ELECTRICALLY CONDUCTIVE

The non-metallic properties of FRP grating makes it ideal for electrically hazardous locations.

TRANSPARENT TO RADIO FREQUENCY

FRP grating does not cause any interference and is transparent to radio frequency transmissions.

NON SPARKING

FRP grating with plain and concave upper surfaces will not cause sparking when impacted by metallic objects.

COST PERFORMANCE

Compared to other materials, the use of FRP grating results in a long life product with low installation costs.

Ordering Information

1. Find the grating pattern and colour which suits your application, pages 4 & 5
2. Find the depth of load bars to suit the clear span and load of your application, pages 4 & 5
3. Decide which type of surface your application requires; plain, concave or anti-slip grit
4. Decide which type of resin is suitable for your application from table of properties on page 2 and the table of chemical resistance on page 11
5. Calculate the panel sizes required from the data for each pattern on pages 4 & 5, bearing in mind the installation tolerances diagrams on page 6. It is advisable to allow for a cut next to a load bar if open ends are to be avoided. (refer to cutting FRP on page 6).

Product Codes

1st character	grate material	F=Fibreglass
2nd & 3rd characters	depth in mm	14, 22, 25, 30, 38, 41, 50, 55 and 60
4th character	physical form	S=square mesh, R=rectangular mesh, M=minimesh, P=solid top plate, T=stair tread
5th character	surface type	C=concave, P=plain, A=antislip grit
6th character	resin type	I=Isophthalic, V=vinyl ester, P=phenolic

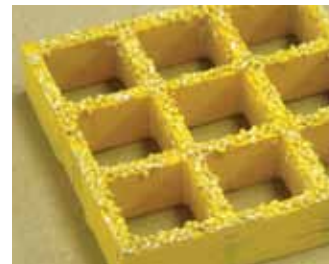
EXAMPLE: F30MAI = Fibreglass grating, 30mm depth, Minimesh profile, Antislip grit surface, Isophthalic resin

WELDLOK® FIBREGLASS WALKWAY GRATING

FRP Square Grating

LOAD DEFLECTION DATA								
LOADS GIVING DEFLECTIONS OF 5mm (recommended maximum deflection for pedestrian comfort)								
Product	Span (mm)	450	600	750	900	1050	1200	1500
F25S	Uniformly Distributed Load (kPa)	20.0	8.1	3.5	1.1			
	Line Load (kg/m)	483	203	109	63			
F38S	Uniformly Distributed Load (kPa)		19.0	8.0	4.4	3.0	1.6	
	Line Load (kg/m)		710	356	230	150	106	
F50S	Uniformly Distributed Load (kPa)			15.3	7.9	4.5	2.5	
	Line Load (kg/m)			742	456	306	210	
F60S	Uniformly Distributed Load (kPa)				23.6	13.9	7.8	3.5
	Line Load (kg/m)				1349	949	636	330

Availability:	Patterns marked thus * generally available ex stock				
Product code:	F25S *	F38S *	F50S	F60S	
Load bar depth:	25mm	38mm	50mm	60mm	
Area weight:	14.4 kg/m ²	21 kg/m ²	33.3 kg/m ²	48 kg/m ²	
Web spacing centres:	38 x 38mm	38 x 38mm	50 x 50mm	38 x 38mm	



Applications:
Maintenance platforms and general purpose industrial walkways (complies with AS1657-1992)

Resin types:
Isophthalic and vinyl ester standard, phenolic on request

Colours:
Green, yellow standard; other colours on request

Panel Sizes:
915 x 3050mm,
1220 x 3660mm

Openings:
32 x 32mm

Open area:
68% approximately

FRP Solid Top Cover Grating

LOAD DEFLECTION DATA						
LOADS GIVING DEFLECTIONS OF 5mm (recommended maximum deflection for pedestrian comfort)						
Product	Span (mm)	600	750	900	1050	1200
F41P	Uniformly Distributed Load (kPa)	33.8	20.0	6.8	4.0	2.4
	Line Load (kg/m)	1095	750	399	290	190
F55P	Uniformly Distributed Load (kPa)	57.7	33.0	13.3	8.5	4.6
	Line Load (kg/m)	2351	1460	856	575	380

Availability:	On request	
Product code:	F41P	F55P
Load bar depth :	41mm	55mm
Area weight:	28 kg/m ²	33 kg/m ²
Web spacing centres:	38mm x 38mm	50 x 50mm centres



Applications:
Maintenance platforms, industrial walkways and food processing plants where covered grating is required to prevent contamination of work surfaces below, for example, walkways over tanks and vats. Covered grating offers a strong, level surface for foot or wheeled traffic. Complies with AS1428-2001 and AS3996-2006.

Resin types:
Isophthalic standard, vinyl ester and phenolic on request

Colours:
Light grey standard; other colours on request

Panel Sizes:
Made to order to nearest web dimensions



Sydney Harbour Bridge rail walkway



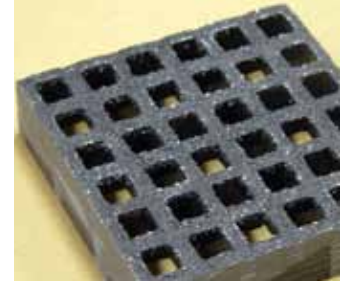
Concrete batching plant, Busselton, WA

WELDLOK® FIBREGLASS WALKWAY GRATING

FRP Minimesh Grating

LOAD DEFLECTION DATA							
LOADS GIVING DEFLECTIONS OF 5mm (recommended maximum deflection for pedestrian comfort)							
Product	Span (mm)	300	450	600	750	900	1050
F14M	Uniformly Distributed Load (kPa)	22.5	4.1	1.3			
	Line Load (kg/m)	233	72	33			
F22M	Uniformly Distributed Load (kPa)	118	23	7.4	3.1		
	Line Load (kg/m)	1442	435	187	95		
F30M	Uniformly Distributed Load (kPa)			15.3	5.7	2.6	
	Line Load (kg/m)			423	233	133	
F38M	Uniformly Distributed Load (kPa)			31.6	12.9	5.7	3.6
	Line Load (kg/m)			891	427	268	165

Availability:	Patterns marked thus * generally available ex stock			
Product code:	F14M	F22M	F30M *	F38M
Load bar depth:	14mm	22mm	30mm	38mm
Area weight:	9 kg/m ²	15kg/m ²	19 kg/m ²	23 kg/m ²
Web spacing:	20 x 20mm centres on top, 40 x 40mm centres load bars underneath			



Applications:
Pedestrian walkways/boardwalks, safe access for disabled (complies with AS1428-2001), sufficient light penetration for vegetation growth underneath.

Resin types:
Isophthalic standard, vinyl ester and phenolic on request

Colours:
Dark grey standard; other colours on request

Panel Sizes:
1247 x 1527, 1807, 2407, 3007mm

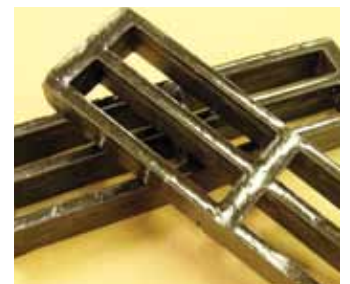
Openings:
13 x 13mm

Open area:
42% approximately

FRP Rectangular Grating

LOAD DEFLECTION DATA						
LOADS GIVING DEFLECTIONS OF 5mm (recommended maximum deflection for pedestrian comfort)						
Product	Span (mm)	450	600	750	900	1000
F25R	Uniformly Distributed Load (kPa)	27	8.5	3.5	1.7	1.1
	Line Load (kg/m)	460	205	105	40	29

Availability:	On request
Openings:	88 x 19mm
Web spacing:	100 x 25mm
Open area:	85%
Load bar depth:	25mm



Application:
Walkways & boardwalks. The rectangular pattern has a higher open area than Minimesh to allow more light penetration for vegetation growth underneath

Resin types:
Isophthalic standard, vinyl ester and phenolic on request

Colours:
Dark grey standard; other colours on request

Panel Sizes:
1000 x 2000mm
1000 x 3000mm



Coogee Beach Jetty, WA



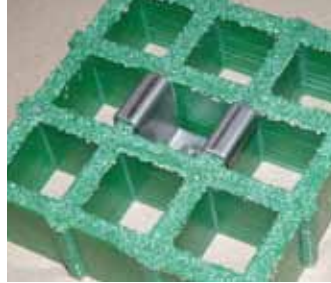
De Bortoli Wines, NSW

WELDLOK® FIBREGLASS WALKWAY GRATING

Fastening Methods

FRP moulded grating should be securely fastened using one of the clip types shown. A minimum of 4 clips per panel is recommended, with extra clips at mid-span on larger panels.

A fixing clip consists of cliptop, bolt, washer and nut; all in 316 stainless steel. Tek screws are also available on request.



M clip
Restrains movement in all directions

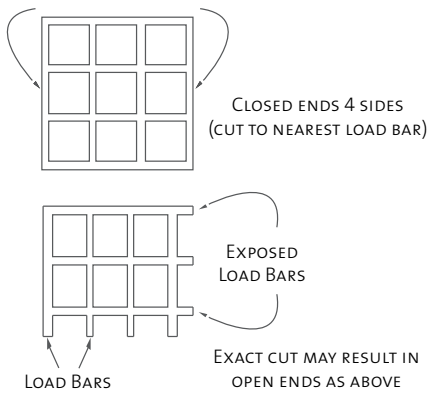


L clip
For moderate loads



C clip
Joining of two unsupported ends of adjacent panels

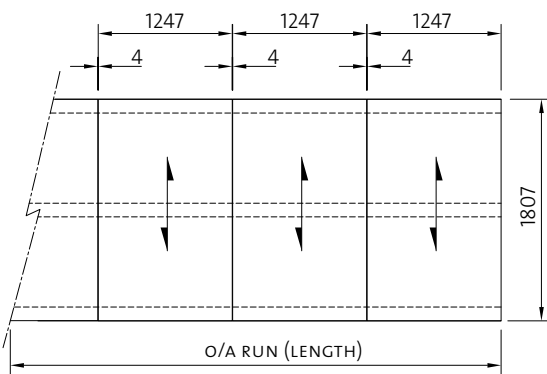
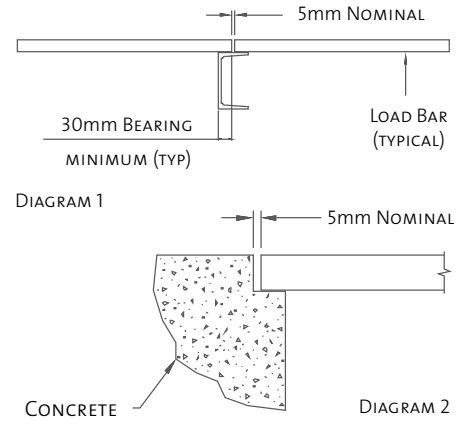
Cutting FRP Grating Panels to Size



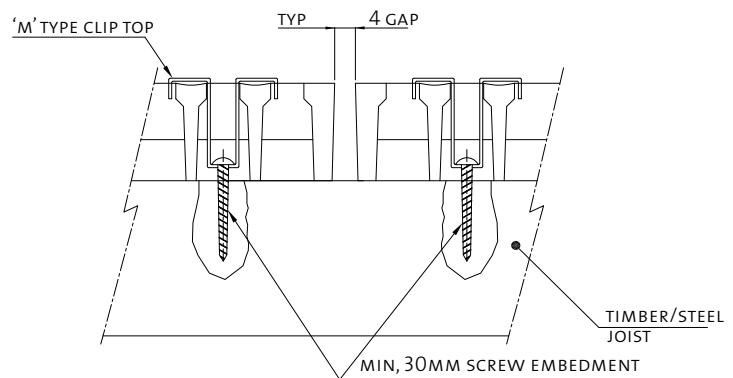
Use a power saw with a masonry carbide or diamond coated blade with the panel upside-down. All cut edges should be ground smooth and should be given a light coating of UV stable, 2 part resin or a UV stable urethane spray coating.

When cutting FRP grating, always wear personal protective equipment such as eye protection, dust protection mask and gloves, as required by State OH&S legislation.

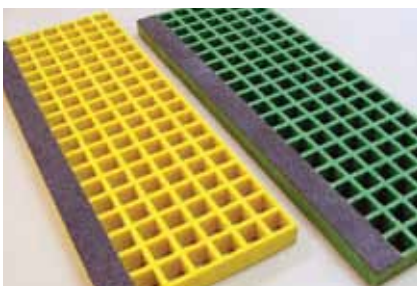
Installation Tolerances



Setout of FRP grating panels and joists

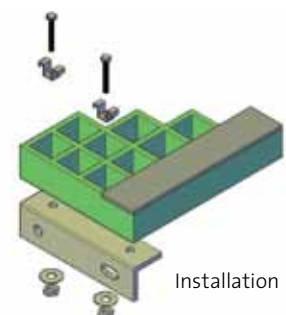


Fixing grating with M clips



Weldlok® Fibreglass Grating Stair Treads

- Pattern:** 38 x 38mm mesh pattern x 38mm deep
- Resin type:** Isophthalic or vinyl ester resins
- Top surface:** Anti-slip quartz grit
- Colours:** Yellow or green with black nosing
- Lengths:** 880mm, 768mm, 730mm
- Widths:** 235mm, 273mm, 311mm



Installation

FIBRELOK™ RIBBED FIBREGLASS HANDRAIL

FRP handrails, in combination with FRP walkway grating and stair treads, provide the ultimate in corrosion resistance for aggressive environments such as offshore oil platforms, food processing plants, etc.

Fibrelok™ Ribbed FRP Handrail offers a superior solution compared with conventional FRP handrail systems.

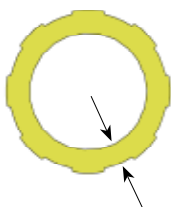
Our unique ribbed easy-to-grip tube combined with our no-slag fittings provides a more comfortable handrail.

Strong yet lightweight, made from pultruded fibreglass and isophthalic polyester resin, this system can be used in the harshest of environments.

Connectors are steel core encapsulated for ultimate strength.

Product Details

- > Ribbed Tube – 7.2mm wall thickness pultruded isophthalic polyester
- > All connectors have a steel core for greater strength and durability
- > Resistant in most acidic and caustic environments
- > Ideal for food, beverage or salt process applications
- > Stanchion centres at 1500mm maximum
- > Tested to comply with Australian Standard AS1657:1992.



Ribbed Tube (7.2mm wall)



Ribbed Tube



Features

- > Lightweight and easy to install
- > Strong and durable
- > Components supplied pre-drilled
- > Can be supplied prefabricated or in kit form
- > Chemical and corrosion resistant (refer table on page 11)
- > UV resistant
- > Fire retardant
- > Low conductivity

FRP Handrail Applications

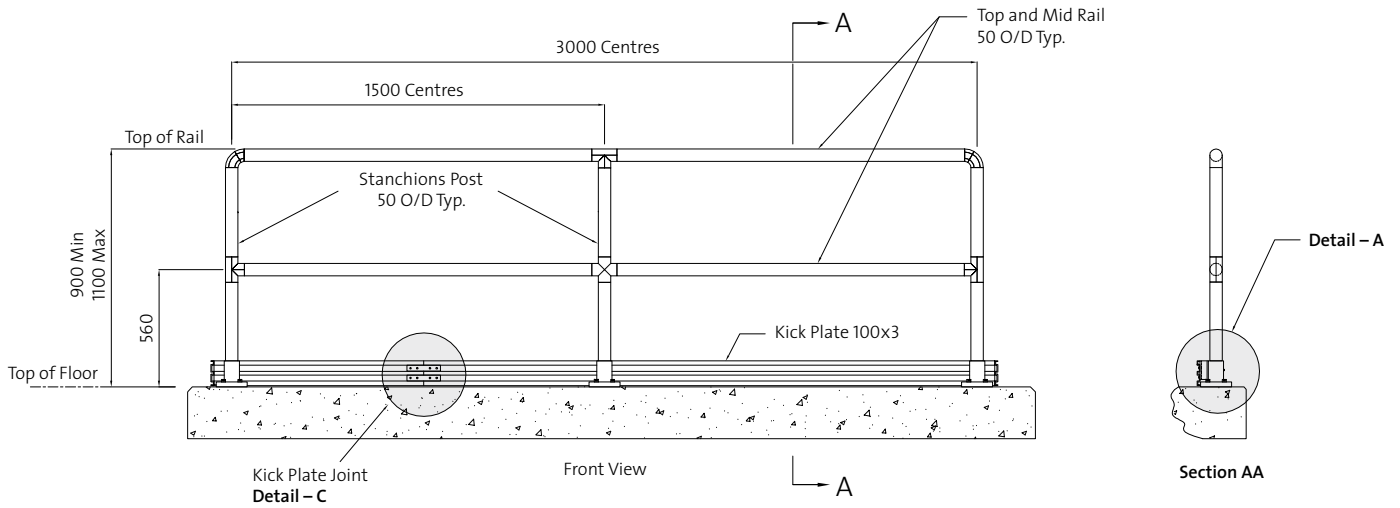
- > Maintenance walkways
- > Industrial access platforms
- > Transmission tower platforms
- > Marinas, jetties, pontoons
- > Oil and gas platforms
- > Petroleum refining access platforms
- > Water and sewage treatment plants
- > Food processing plants



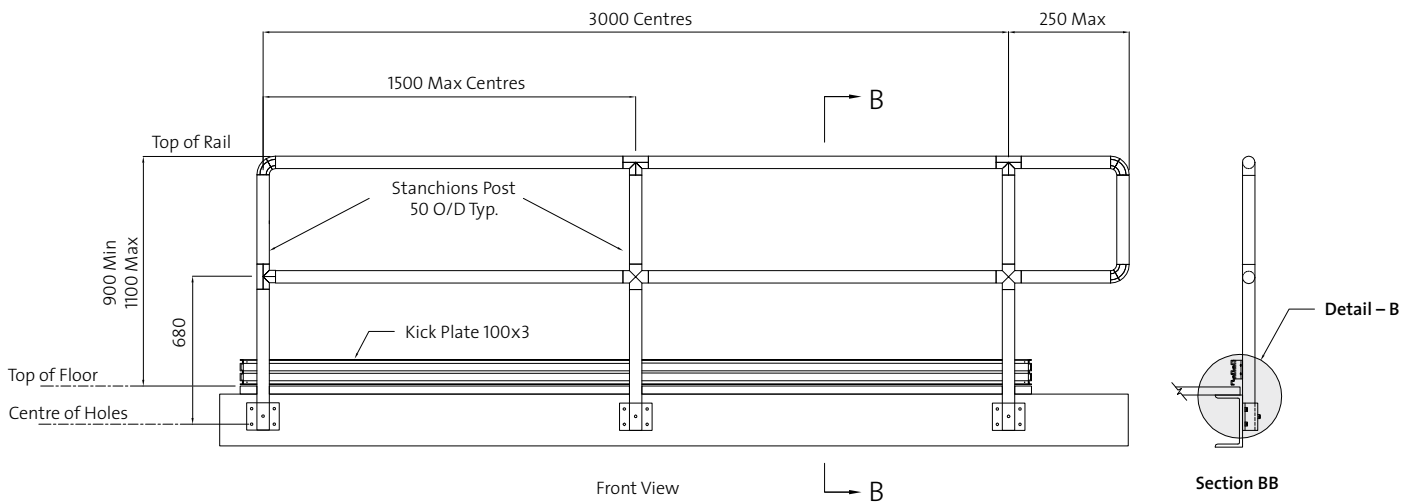
Easy fit components
Refer page 10 for details

FIBRELOK™ RIBBED FIBREGLASS HANDRAIL

Top-mounted FRP handrail



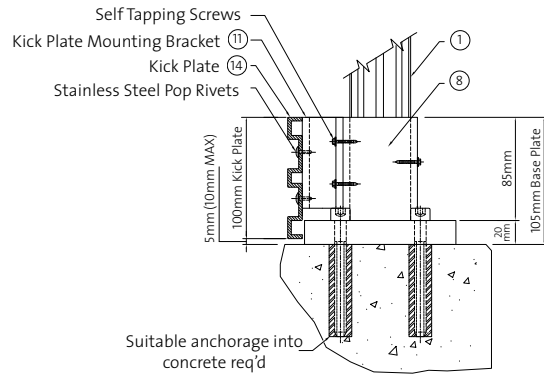
Side-mounted FRP handrail



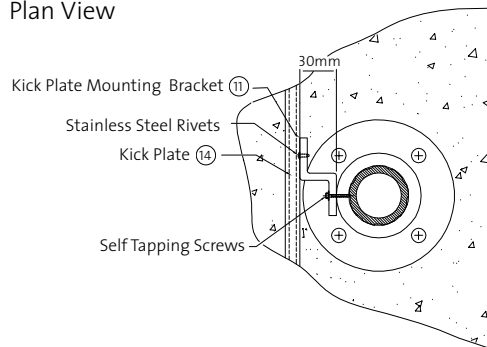
FIBRELOK™ RIBBED FIBREGLASS HANDRAIL

Detail A

Elevation View

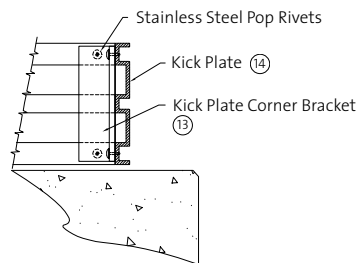


Plan View

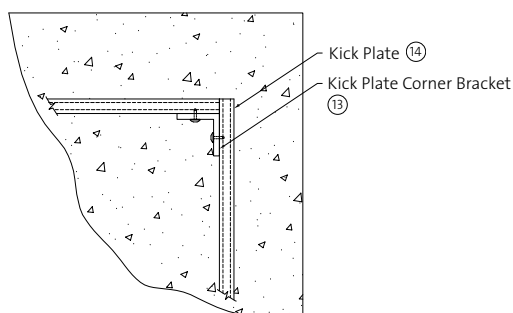


Kick Plate Corner Bracket

Elevation View

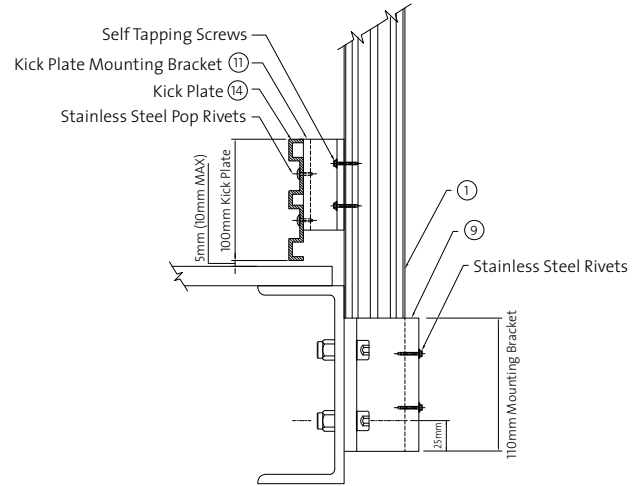


Plan View

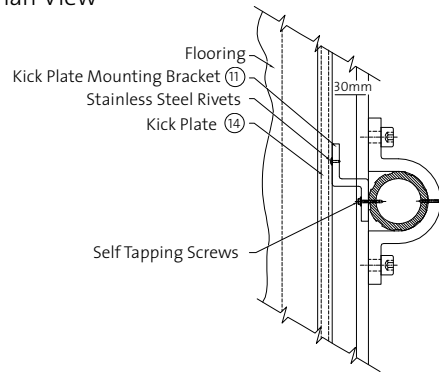


Detail B

Elevation View

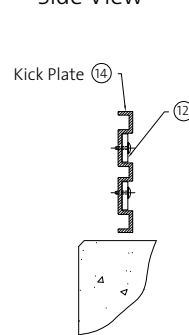


Plan View

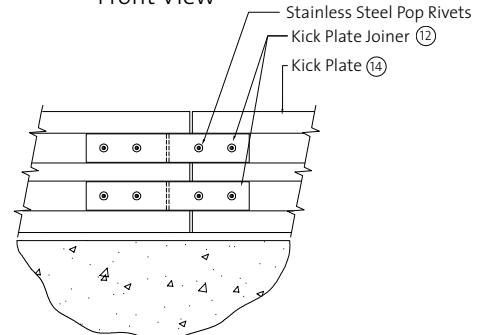


Detail C

Side View



Front View



Numbered components illustrated on page 10.

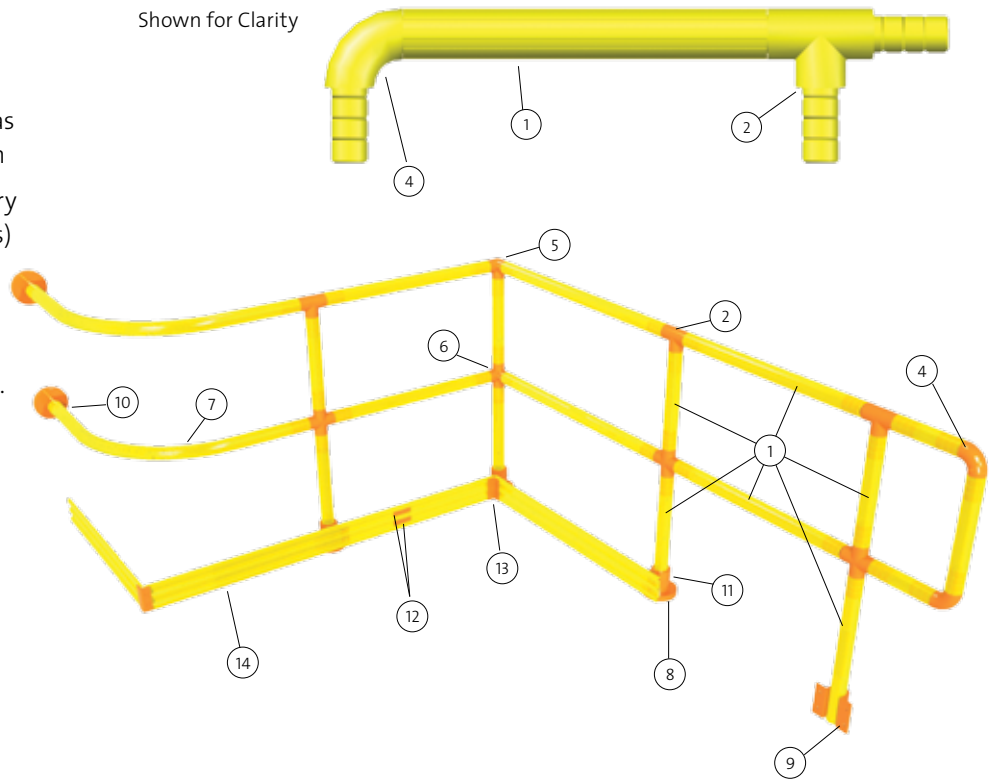
FIBRELOK™

RIBBED FIBREGLASS HANDRAIL

Cutting & Assembling FRP Handrail

When cutting FRP handrail, always wear personal protective equipment such as eye protection, dust protection mask and gloves, as required by State OH&S legislation

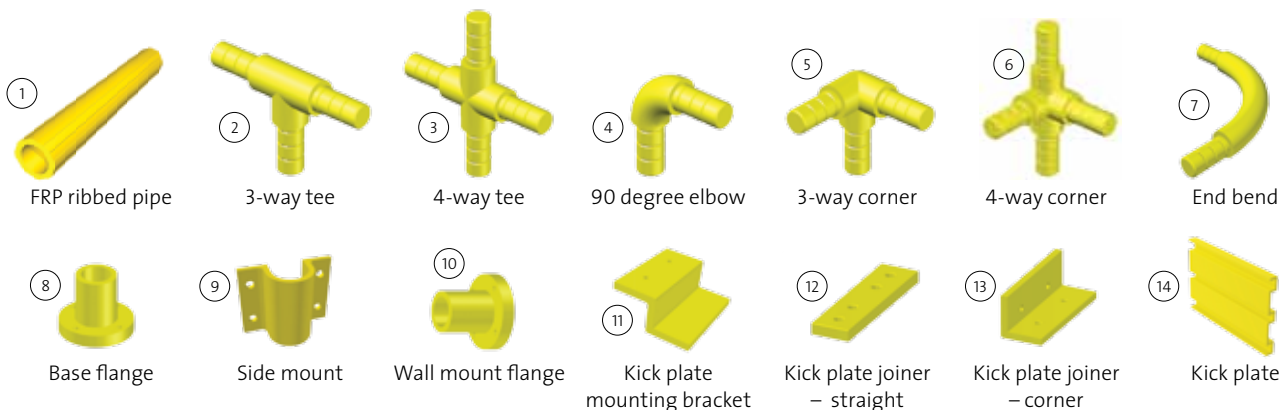
- > Use a power saw with a masonry carbide or diamond (continuous) coated blade.
- > Ribbed pipe and components should be glued together with suitable high strength adhesive.
- > Ribbed tube to be riveted to components using supplied stainless steel rivets.
- > When fixing base plates ensure surface is completely flat.



Fibrelok™ Components

Item No.	Product Code	Description
1	F50P	FRP ribbed pipe (50mm OD x 35mm ID)
2	F3T	3-way tee connector
3	F4T	4-way tee connector
4	F90E	90 degree elbow
5	F3C	3-way corner connector
6	F4C	4-way corner connector
7	F90B	90 degree bend

Item No.	Product Code	Description
8	FBF	Surface mount base flange
9	FSMB	Side mount bracket
10	FWF	Wall mount flange
11	FKPMB	Kick plate mounting bracket
12	FKPJS	Kick plate joiner – straight
13	FKPJC	Kick plate joiner – corner
14	F100KP	Ribbed kick plate (100 x 12 x 3mm thick)



CHEMICAL RESISTANCE TABLE

CHEMICAL ENVIRONMENT	Concentration	Isophthalic Resin			Vinylester Resin		
		25°C	52°C	53°C – 93°C	25°C	52°C	53°C – 93°C
MINERAL ACID & ORGANIC ACID							
Sulphuric Acid	10%	R	R	R	R	R	R
	25%	R	R	R	R	R	R
	50%	R	R	R	R	R	R
Hydrochloric Acid	10%	R	RSD	N	R	R	R
Nitric Acid	5%	R	R	N	R	R	R
	50%	R	N	N	R	RSD	N
	HIGH	N	N	N	N	N	N
Chromic Acid	30%	N	N	N	R	R	RSD
Phosphoric Acid	25%	R	R	R	R	R	R
	50%	R	R	R	R	R	R
Acetic Acid	50%	R	R	N	R	R	N
Oxalic Acid	15%	R	/	/	R	R	R
Lactic Acid		R	R	R	R	R	R
Tartaric Acid		R	R	R	R	R	R
ALKALI							
Sodium Hydroxide	5%	R	N	N	R	R	R
Barium Hydroxide	10%	RSD	RSD	N	R	R	R
Ammonia	28%	N	N	N	—	—	—
Calcium Hydroxide		R	R	N	R	R	R
Sodium Carbonate	10%	N	N	N	R	R	R
ACID SALT							
Ammonium Chloride		R	R	R	R	R	R
Ammonium Nitrate		R	R	R	R	R	R
Ammonium Sulphate		R	R	R	R	R	R
Ferric Chloride		R	R	R	R	R	R
Nickel Nitrate		R	R	R	R	R	R
Zinc Sulphate	10%	R	R	R	R	R	R
Sodium Sulphite		R	R	R	R	R	R
ALKALI SALT							
Sodium Hypochlorite	10%	R	R	R	R	R	R
Calcium Hypochlorite		R	R	N	R	R	R
NEUTRAL SALT							
Magnesium Chloride		R	R	R	R	R	R
Mercury Chloride		R	R	R	R	R	R
Potassium Dichromate		—	—	—	R	R	R
Potassium Permanganate		R	R	R	R	R	R
Sodium Nitrate		R	R	R	R	R	R
ORGANIC COMPOUND							
Petroleum		R	N	N	R	N	N
Kerosene		R	R	R	R	R	R
Methanol		RSD	N	N	R	R	N
Ethanol		R	/	/	R	R	/
Ethylene Glycol	25 – 75%	R	R	RSD	R	R	RSD
Toluene		RSD	N	N	RSD	N	N
Acetone	25%	N	N	N	RSD	N	N
OTHER							
Water		R	R	R	R	R	R
Hydrogen Peroxide	5 – 10%	R	R	R	R	/	/
Chlorine Dioxide Bleach		R	R	R	R	R	R

Key to Table: R = good resistance, N = non-resistant, RSD = intermediate resistance, / = use with care, depends on conditions, - = not tested

This table is for general guidance only. Users must determine the suitability of resins for particular applications. No guarantee of specific performance is given or implied..

NEPEAN
Building & Infrastructure

HEAD OFFICE

NSW

117-153 Rookwood Road
(PO Box 57)
Yagoona NSW 2199
Australia

P: + 61 2 9707 5000
F: + 61 2 9790 1013
E: bi@nepean.com

BRANCHES

NSW (COFFS HARBOUR)

47 Wingara Drive
(PO Box 396)
Coffs Harbour, NSW 2450
Australia

P: + 61 2 6652 4100
F: + 61 2 6652 2285
E: coffs.bi@nepean.com

QLD

967 Nudgee Road
(PO Box 283)
Banyo QLD 4014

P: + 61 7 3633 1333
F: + 61 7 3633 1313
E: qld.bi@nepean.com

VIC

171 Derrimut Drive
Derrimut VIC 3030
Australia

P: + 61 3 9394 1001
F: + 61 3 9394 1441
E: vic.bi@nepean.com

WA

98 Campbell Street
Belmont WA 6104
(PO Box 267
Cloverdale, WA 6985)

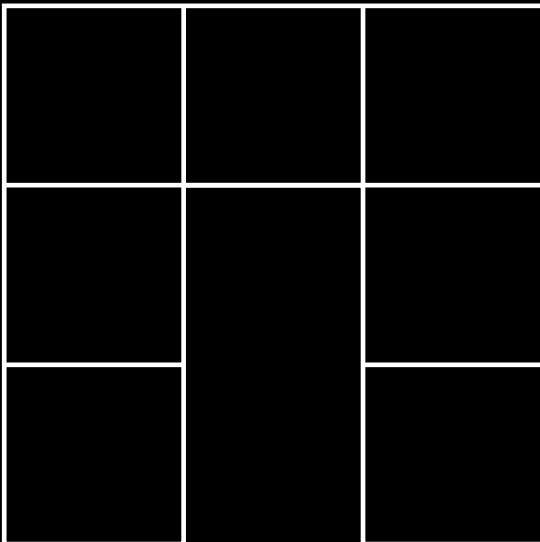
P: + 61 8 9478 1034
F: + 61 8 9277 7742
E: wa.bi@nepean.com

CHINA

12F Digital Mansion
16 Huizhandonglu Road
Torch Zone, Zhongshan City
Guangdong Province
P.R. China 528437

P: + 86 760 8992 3558
F: + 86 760 8992 3559
M: + 86 159 1334 3700 (China)
M: + 61 419 782 122 (Australia)
E: nepean.asia@nepean.com

www.nepean.com



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