

NEPEAN
Building &
Infrastructure

TM

Weldlok® Steel Grating



NEPEAN™ Building & Infrastructure



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 is designed to assist the draftsman, engineer, fabricator and specifier in the correct selection of our forgedwelded mild steel grating.

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Weldlok® Steel Grating

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



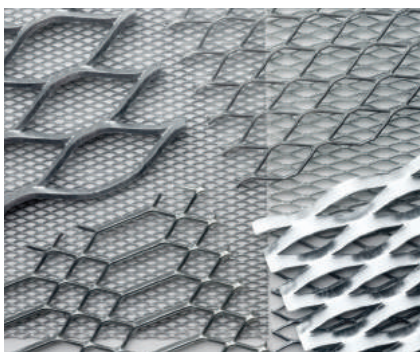
Balltube & Fabricated Handrailing



Drainage Products



Fibreglass Platforms, Walkways & Treads



Expanded Metal



Perforated Metal



Aluminium Grating, Treads & Handrail

WELDLOK® STEEL GRATING INFORMATION

Construction

Weldok® forgebar mild steel grating is constructed using an electro-forgewelding process that applies pressure and heat to fuse square, twisted cross bars into load-bearing bars of various thicknesses and depths. The result is a product with a one-piece construction that complies with the requirements of AS1657.

Load Bar Top Surface

Load bars can be supplied with the top surface either plain or serrated. Careful consideration should be given to the type of surface profile required for each application. Standard grating has square-edge load bars, but where a higher slip resistance may be required, serrated load bars should be considered. Note that serrated surfaces are not recommended on 20mm-deep load bars.

For sloping walkways, the designer should consult the requirements of AS1657. Depending on the slope, 10mm x 10mm square bar cleats or yellow abrasive strips may be required.

Surface Treatment

Three surface treatments are available:

Untreated (black) raw mild steel

Hot-dip galvanised to AS/NZS4680

Black bitumen coated

Note that bitumen coating is not recommended for corrosive environments, as there is no pre-treatment of steel prior to bitumen coating.

Availability

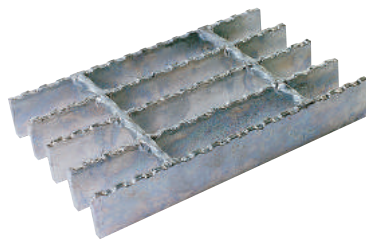
Many common size gratings are carried in stock in standard mat sizes. Common material types, which are likely to be held in stock, are highlighted in bold type in the following charts. Non-standard products can also be made to order. For assistance contact our sales department.

Product Applications

Forgebar grating is extensively used in a variety of pedestrian and screening applications. Forgebar grating allows the passage of light, air and water. The manufacturing process makes it one of the most economical steel grating products.



Plain – Standard top surface profile



Serrated – Optional top surface Profile

Design Criteria

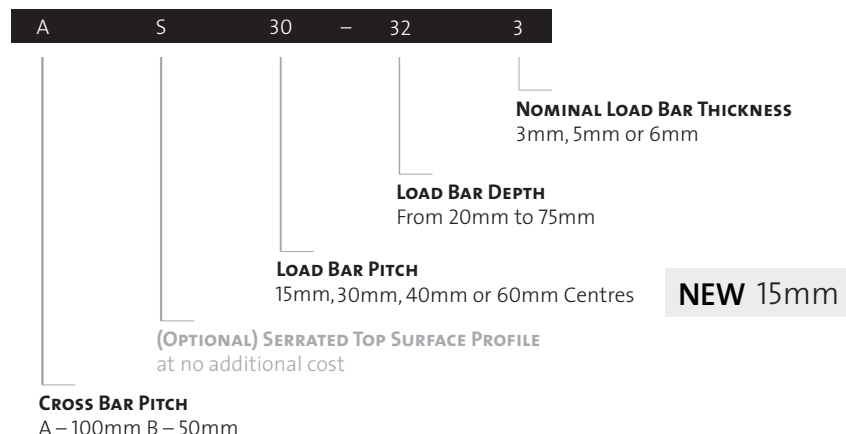
All safe load tables were calculated in accordance with the following criteria:

1. Loading Code AS1170-1 (load combination 1.25 x dead load and 1.5 x live load).
2. Steel Structures Code AS4100.
3. Mass calculated on untreated and un-edged grating.
4. Australian Made grating has a 250MPa minimum yield strength of steel or 235MPa for imported grating.
5. Load calculated with allowable bending stress of 171.6 MPa (0.66 Fy)
6. Load bars assumed to be simply supported and unserrated.
7. Spans based on maximum 5mm deflection, which is a limiting deflection for pedestrian comfort.

See load tables on Pages 5, 6, 7 and 8



Product Code Examples: Plain A30-323 or Serrated AS30-323



WELDLOK® STEEL GRATING ORDERING

Ordering Floor Grating

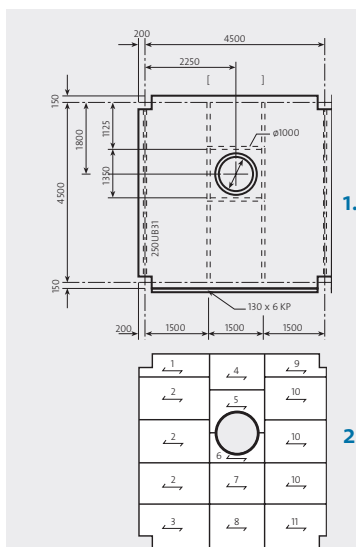
The following procedure is recommended when ordering Weldlok® floor grating. For terminology, see page 11.

- Establish:
The largest floor grating support centres (SPAN in mm) in the direction the load-bearing bars will run.
 - > From the Quick Selection Charts on Pages 5, 6, 7 or 8, select Grating Type Example: Design load required is 4 kPa with a span of 2000mm
 - > Series 15 grating - A15-325
 - > Series 30 grating – A30-405 or B30-405
 - > Series 40 grating – A40-455 or B40-455
 - > Series 60 grating – B60-505
- Choose from a Plain or Serrated surface profile.
- If stock mats are required, refer to Standard Mat Sizes table, on the same pages, for each Grating Series.
- For fabricated grating, specify if grating is to be edge-banded using edge bars or un-edged (no edge bars). Unless specified otherwise, standard fabrication welding of edge banding (edge bars) will be provided (see page 14).
- Specify the number of panels required and provide each overall panel Span (mm) x Width (mm). The SPAN should always be the first dimension stated, and should also be clearly defined as SPAN.

Alternatively, or for large floor, areas provide drawings of grating outline details and structural support steel details.

Supplied drawings should indicate:

- Grating product type and surface treatment
 - Span (load bar direction).
 - Dimensioned location and sections size of support steel.
 - Location and size of all cut-outs and removable areas.
 - Location of nosing, kick plates and penetrations (indicate if penetrations are required to be split).
- Indicate surface treatment required: Untreated, Galvanised or Black Bitumen.
 - Specify the type of fasteners, if required. Refer to page 12 & 13.

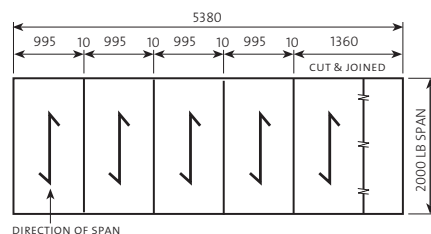


Order Example

One platform – 2000mm Load Bar Span x 5380mm Wide

The illustration shows a typical layout. The platform is split up into standard stock panel widths of 995mm, plus a cut and joined end panel with the width taken to the nearest load bar to match the required dimension.

Note: Depending on location, make-up panels will be welded to the adjacent panel if less than the 300mm width (WA) or 500mm width (all other locations).



Drafting

There is no need to submit fully detailed panel drawings. We will design the most economical combination of panels to suit the floor layout. Save time and cost and allow us to do it for you.

1. What we require from you

- > Dimensioned outline grating details.
- > Dimensioned structural steel support details.

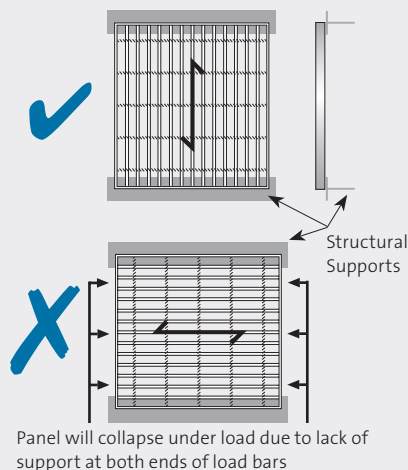
2. What you receive from us

Marking plan with each panel tagged to suit

IMPORTANT:

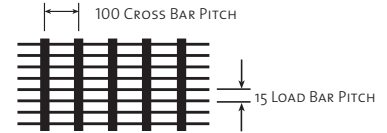
Always check the Load Bar Span Direction before requesting a quotation or placing an order. A mistake could mean the difference between winning or losing a tender. It could also save a lot of unnecessary cost on rework.

Compare load bar direction to support location



WELDLOK® FORGE BAR SERIES 15 GRATING (15mm Centres)

Weldok® Series 15 is the next generation in grating profiles. Fully compliant with AS1657:2019, specifically clause 4.5 pertaining to safety below the platform or landing. Designed to prevent objects falling through the floor.



Standard Mat Sizes

	SPAN X WIDTH (mm)	LOAD BAR THICK. (mm)	LOAD BAR No.
All States	5800 x 993	3	67
	5800 x 995	5	67

Quick Selection Chart

GRATING TYPE	MAXIMUM SPAN (mm) FOR VARIOUS LOADS WITH 5.00mm DEFLECTION			
	2.5 kPa	4.0 kPa	5.0 kPa	kg/m ²
A15-203	1422	1264	1196	34.3
A15-205	1616	1437	1359	55.2
A15-253	1681	1495	1414	42.1
A15-255	1910	1700	1606	68.3
A15-323	2023	1800	1701	53.1
A15-325	2300	2044	1933	86.7

Bold type indicates preferred product (more likely to be in stock)

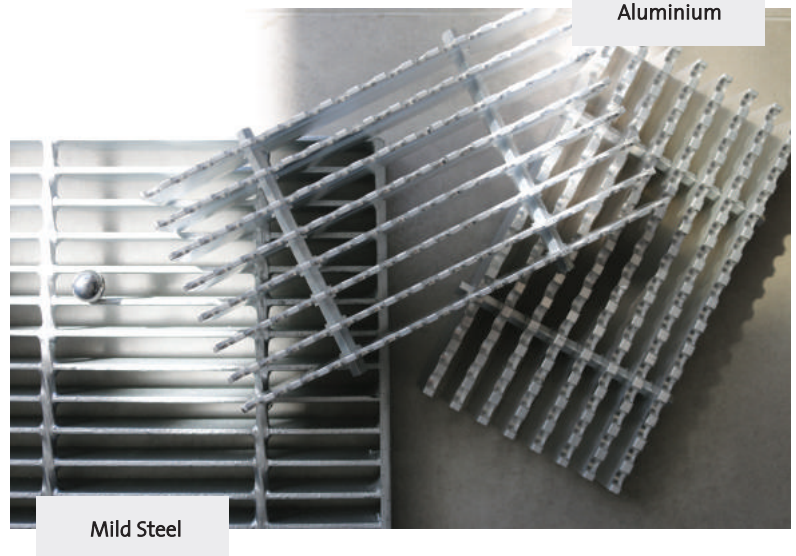
Typical Application Loadings

AS1657 (4.2)	Fixed Platforms, Walkways and Stairways	2.5 kPa
AS1170.1 (Table 3.1E)	Warehousing and Storage Areas	4 kPa
AS1170.1 (Table 3.1E)	Plant Rooms, Fan Rooms incl weight of machinery	5 kPa
AS1170.1 (Table 3.1 C5)	Public Assembly Areas susceptible to overcrowding	7.5 kPa

Series 15 grating provides a clean aesthetic look. The single-piece design prevents debris build up between the mesh and grate allowing for easy maintenance. Additionally, the A15 profile is less labour intensive to fabricate reducing production lead times.

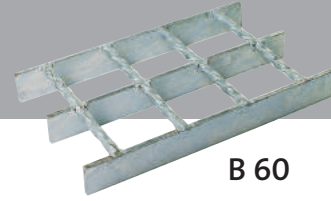
Series 15 Features:

- 15mm load bar centres
- Cross rods at 100mm for reliable stability
- 3mm or 5mm thick load bars
- Standard or serrated finish available in mild steel or aluminum



Series 15 is fully compliant with AS1657:2019 including clause 4.5 pertaining to safety below the platform or landing.

WELDLOK® FORGEBAR SERIES 60 GRATING (60mm Centres)

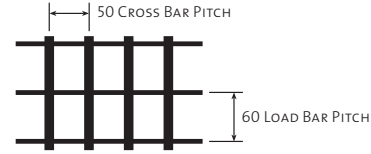


B 60

Weldlok® Series 60 grating was developed initially for the mining industry to minimise build-up of spillage materials on platform floors. The larger openings allow most materials to fall through, providing a safer walking surface.

Weldlok® Series 60 grating is not suitable for floors subject to high impact loads.

Note: Weldlok® Series 60 is very light and has only 50% of the load carrying capacity of Series 30 grating.



Standard Mat Sizes

	SPAN X WIDTH (mm)	LOAD BAR THICK. (mm)	LOAD BAR No.
All States	5800 x 1023	3	18
	5800 x 1025	5	18

Quick Selection Chart

GRATING TYPE	MAXIMUM SPAN (mm) FOR VARIOUS LOADS WITH 5.00mm DEFLECTION			
	2.5 kPa	4.0 kPa	5.0 kPa	7.5 kPa
B60-205	1140	1020	965	875
B60-253	1185	1050	1005	895
B60-255	1375	1195	1140	1030
B60-323	1420	1275	1195	1085
B60-325	1640	1445	1355	1230
B60-403	1700	1495	1420	1285
B60-405	1925	1700	1615	1460
B60-455	2070	1860	1760	1590
B60-505	2220	2010	1900	1720
B60-555	2420	2130	2040	1845
B60-655	2745	2445	2330	2090

Typical Application Loadings

Fixed Platforms, Walkways and Stairways	2.5 kPa
Warehousing and Storage Areas	4 kPa
Plant Rooms, Fan Rooms incl weight of machinery	5 kPa
Public Assembly Areas susceptible to overcrowding	7.5 kPa

Bold type indicates preferred product (more likely to be in stock)

Safe Load & Deflection Table

GRATING TYPE	CROSSBAR PITCH mm	Mass kg/m ²	NOM. LOAD BAR SIZE mm		SPANS (mm)													SERRATED EDGE CONVERSION FACTOR				
					300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100		2400	2700		
B60-205	50	19.0	20x5	U	81.98	36.45	20.50	13.04	6.29													NOT REC
				D	0.80	1.81	3.22	5.00	5.00													
B60-253	50	15.7	25x3	U	76.90	34.18	19.22	12.30	7.37	3.97												0.876
				D	0.64	1.45	2.57	4.02	5.00	5.00												
B60-255	50	22.3	25x5	U	128.1	56.96	32.04	20.50	12.29	6.63												0.876
				D	0.64	1.45	2.57	4.02	5.00	5.00												
B60-323	50	18.5	32x3	U	125.9	55.99	31.49	20.15	13.99	8.34	4.89											0.902
				D	0.50	1.13	2.01	3.14	4.52	5.00	5.00											
B60-325	50	27.0	32x5	U	209.9	93.31	52.46	33.59	23.33	13.91	8.16	5.09										0.902
				D	0.50	1.13	2.01	3.14	4.52	5.00	5.00	5.00										
B60-403	50	21.7	40x3	U	196.8	87.45	49.22	31.49	21.87	16.06	9.54	5.97										0.922
				D	0.40	0.90	1.61	2.51	3.62	4.93	5.00	5.00										
B60-405	50	32.3	40x5	U	328.1	145.8	81.98	52.46	36.45	26.78	15.91	9.95	6.52	4.45								0.922
				D	0.40	0.90	1.61	2.51	3.62	4.93	5.00	5.00	5.00	5.00								
B60-455	50	35.7	45x5	U	415.2	184.5	103.8	66.40	46.12	33.89	22.68	14.16	9.28	6.34	4.47							0.930
				D	0.36	0.80	1.43	2.23	3.22	4.38	5.00	5.00	5.00	5.00	5.00							
B60-505	50	39.0	50x5	U	512.5	227.8	128.1	81.98	56.96	41.85	31.10	19.41	12.75	8.70	6.14	4.46						0.937
				D	0.32	0.72	1.29	2.01	2.90	3.94	5.00	5.00	5.00	5.00	5.00	5.00						
B60-555	50	42.4	55x5	U	620.0	275.6	155.0	99.22	68.92	50.62	38.77	25.86	16.96	11.58	8.17	5.93	4.41					0.943
				D	0.29	0.66	1.17	1.83	2.63	3.58	4.68	5.00	5.00	5.00	5.00	5.00	5.00					
B60-655	50	49.0	65x5	U	866.3	385.0	216.5	138.6	96.26	70.71	54.11	42.69	27.99	19.72	13.50	9.80	7.28	4.26				0.951
				D	0.25	0.56	0.99	1.55	2.23	3.03	3.96	5.00	5.00	5.00	5.00	5.00	5.00	5.00				

U = Safe uniformly distributed load in kPa (or kN/m²)
D = Deflection (mm) at mid-span caused by U
For Design Criteria ref. page 4
• Spans shown have maximum 5mm deflection, which is the limiting deflection for pedestrian comfort

For galvanised fabricated panels, add 7.5% to mass

WELDLOK® STEEL GRATING STAIR TREADS

Stair Treads

Weldlok® stair treads can be supplied in Series 30, 40 & 60 forgebar grating. Treads may be selected using the Recommended Width and Recommended Max Length tables. Non-standard treads can also be supplied on request, please consult our sales department.

Ordering Stair Treads

1. Select from the tread types shown (T1 to T6).
2. Refer to Recommended Max. Lengths table. Select a Load Bar Size and Series with a maximum length equal to or greater than the required tread length. For example, if the required tread length is 1100mm, the Series 40 grating with 32 x 5 load bars (A40-325) would be appropriate.
3. From the Recommended Widths table, choose a width that corresponds to the tread type and Series selected. For example, based on the Series 40 grating and a T1 tread, the tread width would be either 125, 165, 205, 245, 285 or 325mm.

Example would be:

TREAD TYPE T1 ~ 1100 x 285 FROM A40 – 325

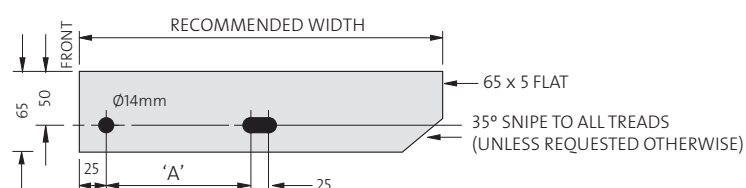
RECOMMENDED MAXIMUM LENGTHS (mm)			
LOAD BAR SIZE	25 x 5	32 x 5	40 x 5
SERIES 30	900	1300	1600
SERIES 40	750	1200	1500
SERIES 60	500	800	1300

RECOMMENDED WIDTHS (mm) *							
TREAD TYPES T1 TO T6							
SERIES 30	125	155	185	215	245	275	305
SERIES 40	125	165		205	245	285	325
SERIES 60	125		185		245		305

*Note: In order to comply with AS1657 a minimum tread width of 225mm is required.

BOLTED CONNECTIONS							
END PLATE HOLE CENTRES (mm)							
'A'	45	75	75	100	100	100	100

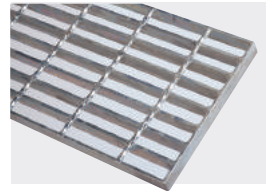
Standard End Plates for Bolted Threads



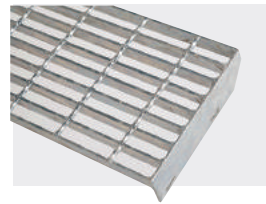
Note: Special End Plate Hole Centres available on request.

Tread Types

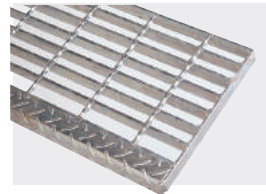
T1 Welded fixing –
No nosing



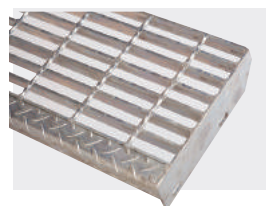
T2 Bolted fixing –
No nosing



T3 Welded fixing –
Floor plate nosing



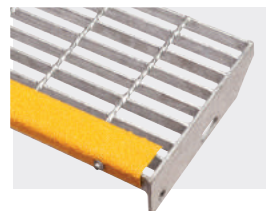
T4 Bolted fixing –
Floor plate nosing



T5 Welded fixing –
Abrasive nosing



T6 Bolted fixing –
Abrasive nosing



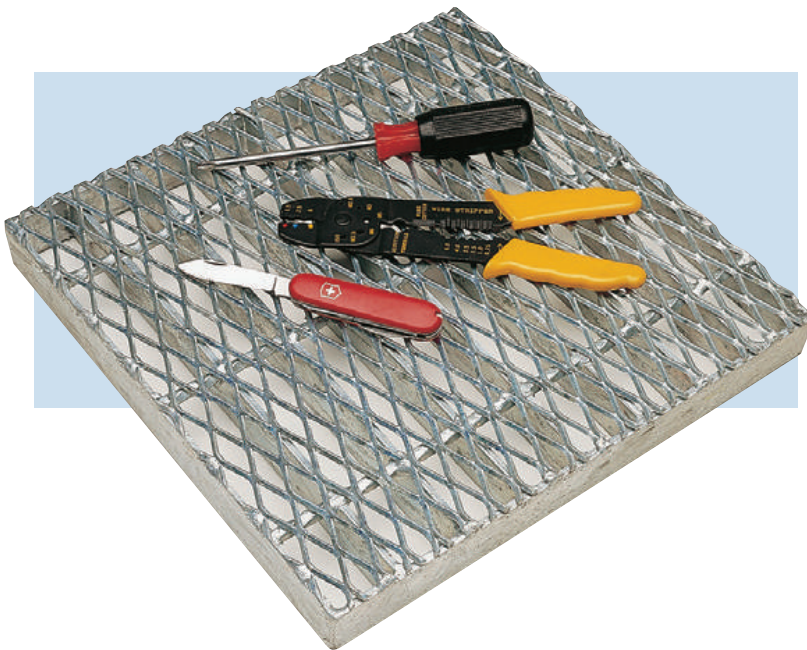
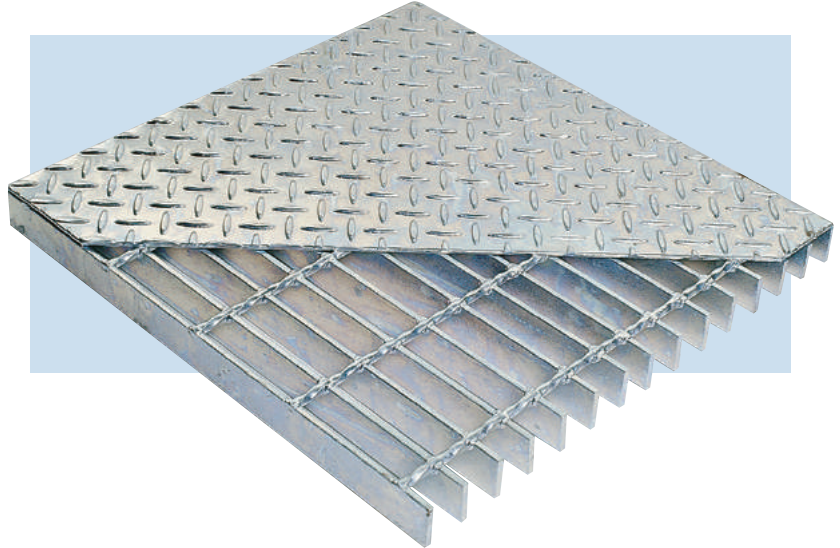
WELDLOK® FORGEBAR GRATING COMPOSITE FLOORING

Weldlok® Gridplate

Gridplate is a composite flooring arrangement comprising steel floorplate welded to the top of any of the grating types listed in this brochure.

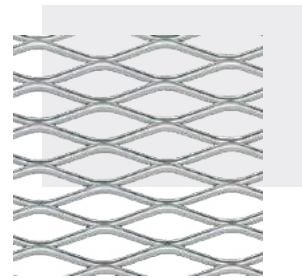
Gridplate is available as:

- 3mm or 5mm thicknesses
- Maximum panels are 2000mm length in load bar direction on standard panel widths
- Nominated holes as required for fixing



Weldlok® Safe-T-Grating

Safe-T-Grating is a composite flooring comprising light gauge mesh typically welded to the underside of grating to prevent small objects falling through, as required by AS1657, or to the top for trolleys or pedestrian traffic.



LD1616 Expanded Metal

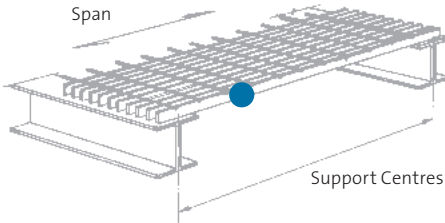
LD1616 EXPANDED METAL SPECIFICATIONS							
MATERIAL	LVM	SWM	THICKNESS	STRAND WIDTH	SHEET SIZE	APPROX WT kg/m ²	APPROX % OPEN
STEEL	28.00	9.00	1.60mm	1.60mm	1200 x 2400	4.4kg/m ²	65%

Safe-T-Grating is manufactured using LD1616 expanded mesh. Refer to the Weldlok Expanded Mesh brochure for more information on our mesh offering.

WELDLOK® FORGEBAR GRATING TERMINOLOGY

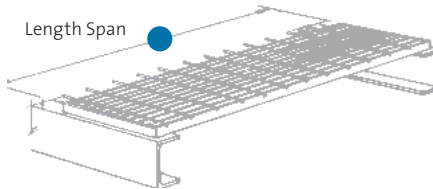
Load Bearing Bar

A load-carrying member spanning between supports.



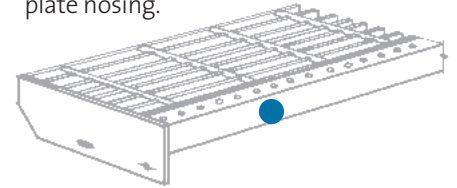
Length (Direction of Span)

The overall dimension of a panel parallel to the load-bearing bars.



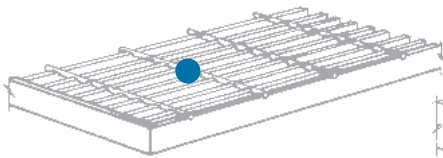
Nosing Bar

An attachment to the front edge of a stair tread or top stair landing panel such as yellow replaceable nosing or plate nosing.



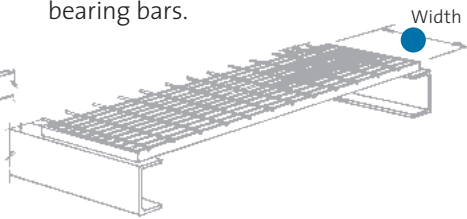
Cross Bar

A member fixed at right angles to the load bearing bars to provide lateral restraint.



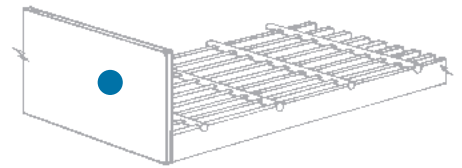
Width

The overall dimension of a panel at right angles to the load-bearing bars.



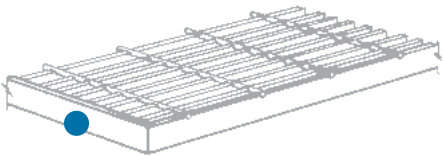
Kick Plate

A large, flat bar welded to the side of a panel or ends and around cut-outs, where specified. Nominally 100mm above walking surface.



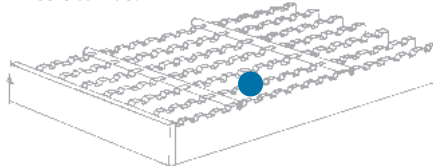
Edge Bar

Non-load-bearing bars, running at right angles to the load-bearing members.



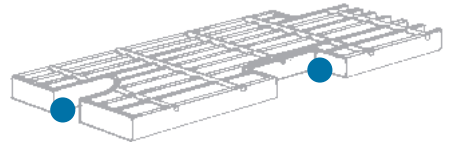
Serrations

Notches formed in the top of load-bearing bars to improve skid resistance.



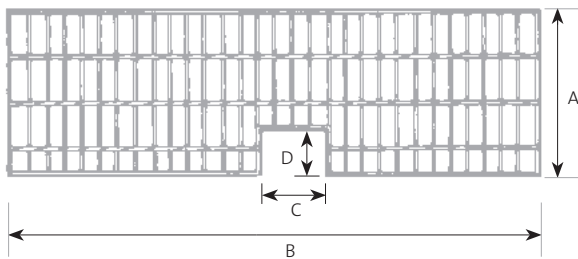
Cut-Outs

Area of flooring removed to clear around columns, pipes, machinery, etc.



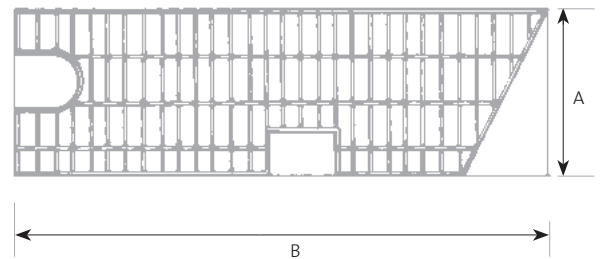
Nett Area

The area of flooring remaining after deducting cut-outs $([A \times B] - [C \times D])$.



Gross Area

Total area of flooring, including cut-outs $(A \times B)$.



WELDLOK® FORGE BAR GRATING FASTENING METHODS

Weldlok® Clipsets

A range of fastening solutions are available for steel grating, specially designed to suit a variety of applications.

Weldlok recommends grating panels are fixed at a frequency of 4 clipsets per sqm, or 4 clipsets per panel when a panel is under 1 sqm. Larger panels may reduce to 3 per sqm pending steel support locations, consult with your engineer.

Diagrams detail individual item codes in blue.

Additional options are available for stainless steel or aluminum, contact your Weldlok representative for more information or to obtain a full parts list.



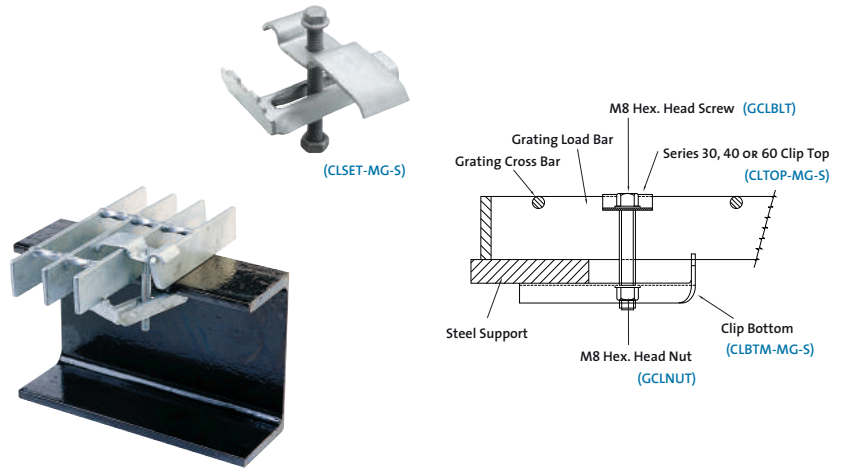
Clip Down

Code: CLSET-MG-S
Finishes: Galvanised

Weldlok® clamp style fixing clipset has been designed to connect the grating to steel support structures.

Easily installed on site from the top of grating, this style is suited to grating up to 50mm where a flange is present. (5-16mm flange thickness).

Note: Deeper grating can be accommodated by using 100mm long bolt.

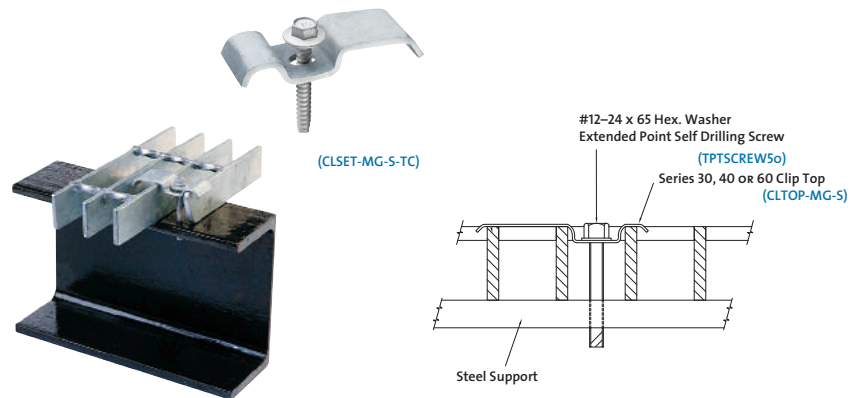


Screw Down

Code: CLSET-MG-S-TC
Finishes: Galvanised

Screw down fixing designed to connect grating panels to steel support using a M8x50mm trilobular self tapping screw. A pre-drilled pilot hole in the steel support is required.

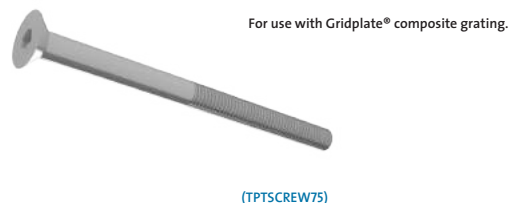
Ideal where no flange is present or areas where vibration is a concern. Suited to grating up to 50mm.



Screw Down Gridplate

Code: TPTSCREW75
Finishes: Galvanised

Designed to screw down Gridplate® grating with into steel supports with pre-drilled holes. Utilising a countersunk-head M8x75mm trilobular self tapping screw, this style is suitable in areas where vibration is a concern. Suited grating less than 50mm including Gridplate top.



WELDLOK® FORGEBAR GRATING FASTENING METHODS

Rivet Down

Code: CLSET-MG-M60X32-RV
Finishes: Galvanised Clip Top
 Zinc Plated Rivet or Galvanised Screw

Designed for use on Series 60 grating only, this style of fixing is ideal for areas of high vibration. Utilising a high strength dome headed 1/4" structural rivet to attach the top clip and fix the grating to steel supports. Suitable for grating depths of 20mm, 25mm, 32mm and 40mm only, with an 8-20mm rivet range.

Note: Where required, the rivet can be replaced with the M8x50mm trilobular, self tapping screw.



(CLSET-MG-M60X32-RV)

Grate-Fast® Anti-Vibration Clip Set

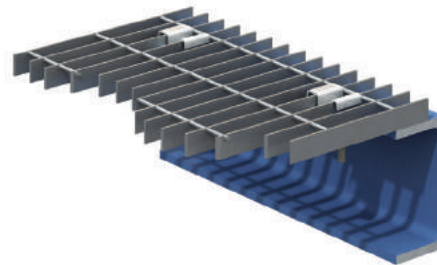
Code: CLSET-MG-LIND
Finishes: Galvanised

Lindapter® clamp style clipset has been designed to clip the grating to steel support.

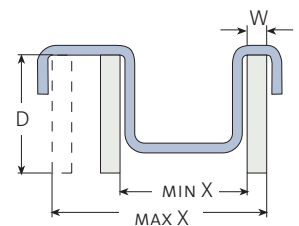
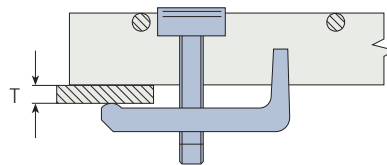
The Lloyds approved clip set is designed for areas of high vibration.

Clipsets comprise of :

- a top-hat bracket
- cast clip bottom
- and M10 socket head cap screw.



(CLSET-MG-LIND)



Grate-Fast® Clip Dimensions

FLANGE	LOAD BAR	LOAD BAR	LOAD BAR
T (mm)	D (mm)	W (mm)	X (mm)
3 – 19	20 – 30	3 – 7	25 – 45



Weld Down

Where there is no requirement to remove grating at a some later date, on-site welding of grating panels to the structural steel is considered an acceptable method of fixing.

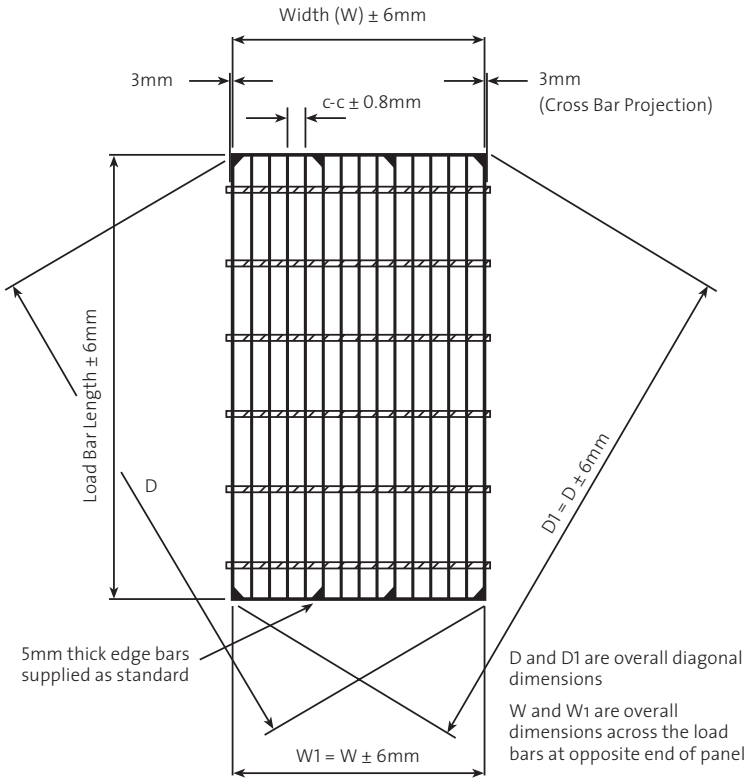
Minimum Requirements for Weld Down Fixing:

- 4 welds per panel
- Each weld consisting of a 6mm fillet
- Weld lengths of 25mm spaced at 1000mm centres

WELDLOK® FORGE BAR GRATING MANUFACTURING TOLERANCES

Overall Dimensions and Squareness

All dimensions are maximum permissible tolerances



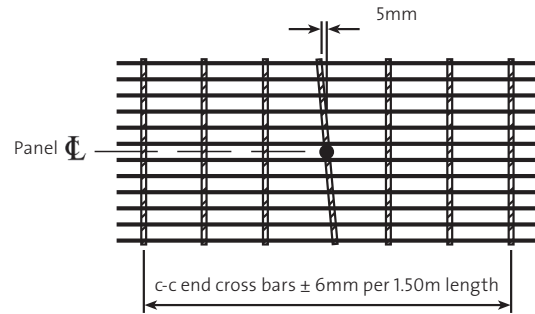
Standard Fabrication Welding

Edge bars and attachments are welded with a minimum 3mm fillet weld to one side of:
 Every 5th load bar on Series 30 Grating
 Every 4th load bar on Series 40 Grating
 Every 3rd load bar on Series 60 Grating

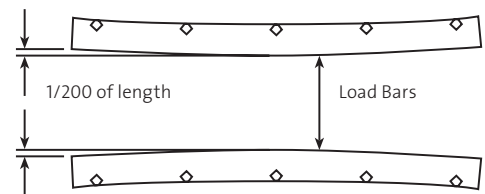
Optional Welding

Full Weld:
 Weld one side of every load bar.
Seal Weld:
 Weld both sides top and bottom.

Cross Bar Alignment Spacing

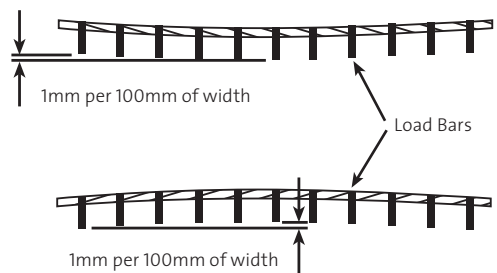


Longitudinal Bow

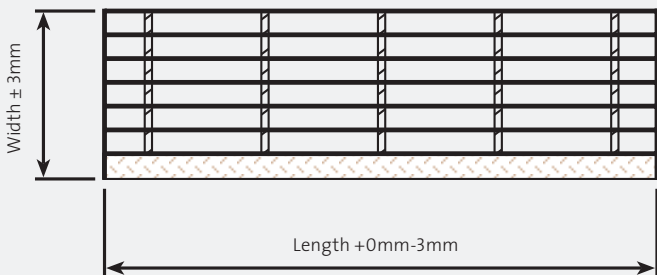


Transverse Bow

(Before fastening to supports)



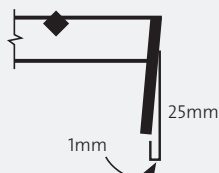
Stair Tread Tolerances



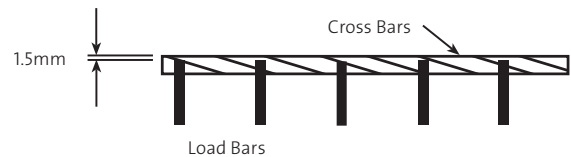
Note: Length of tread is distance between outer faces of end flats

Stair Tread End Flat Lean

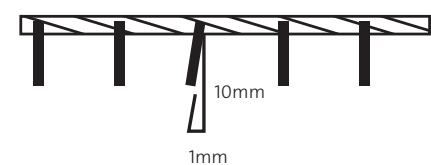
Fabrication: Edge bars and end plates welded on side of every load bar with minimum 3mm fillet weld



Cross Bar Location



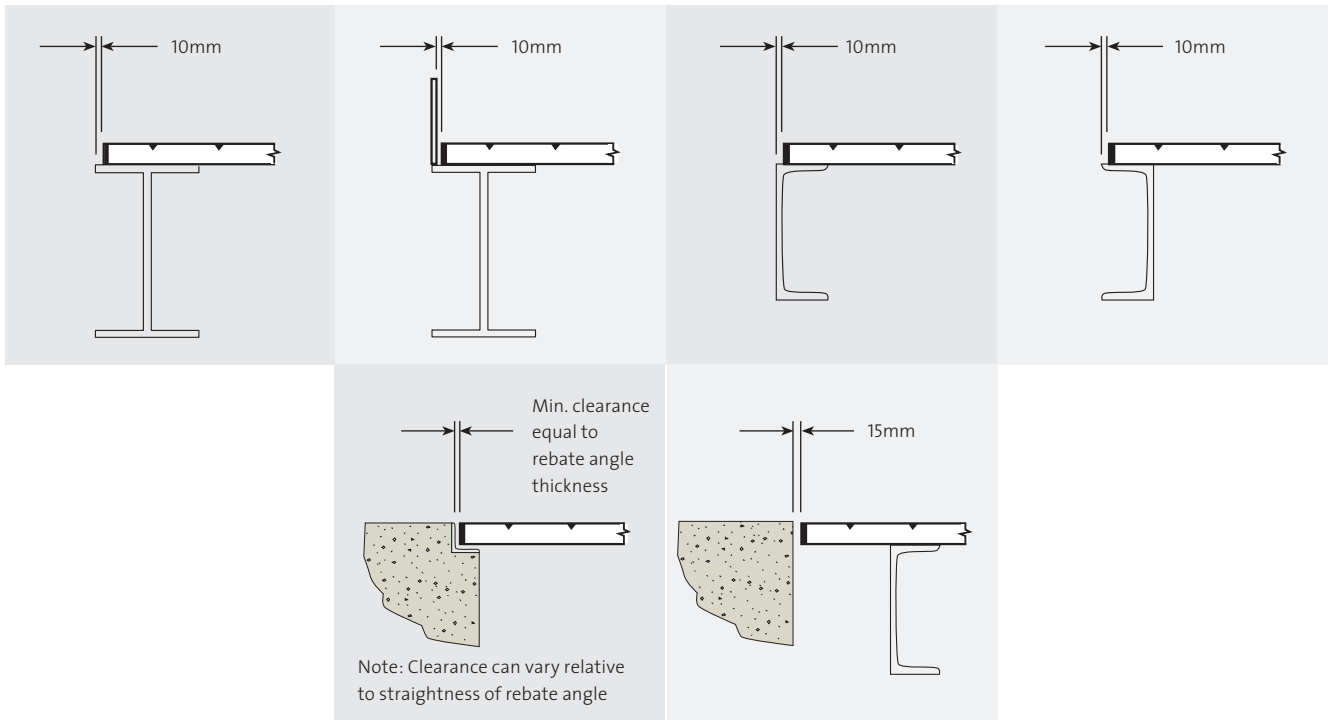
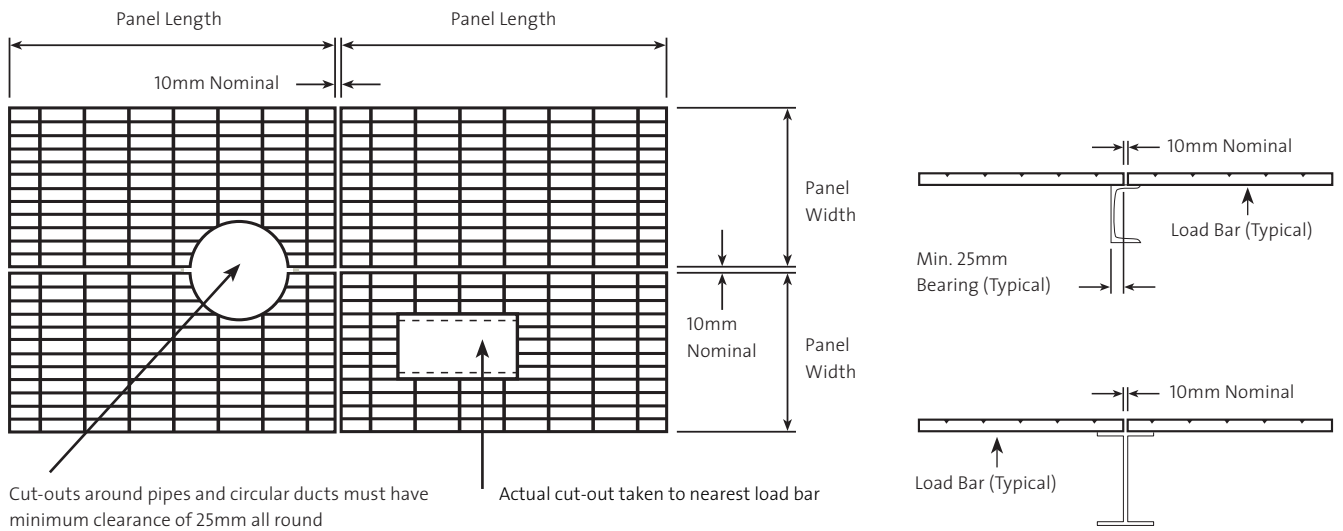
Load Bar Lean



WELDLOK® FORGEBAR GRATING INSTALLATION TOLERANCES

Installation Tolerances

All dimensions are maximum permissible tolerances



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BRANCHES

NEW SOUTH WALES

117-153 Rookwood Road
Yagoona NSW 2199

P: + 61 2 9707 5000
E: info@weldlok.com.au

VICTORIA

171 Derrimut Drive
Derrimut VIC 3026

P: + 61 3 8353 3701
E: vic.bi@nepean.com

QUEENSLAND

967 Nudgee Road
Banyo QLD 4014

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

WESTERN AUSTRALIA & NORTHERN TERRITORY

98 Campbell Street
Belmont WA 6104

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

Visit us Online

weldlok.com.au

Freecall

1800 WELDLOK



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