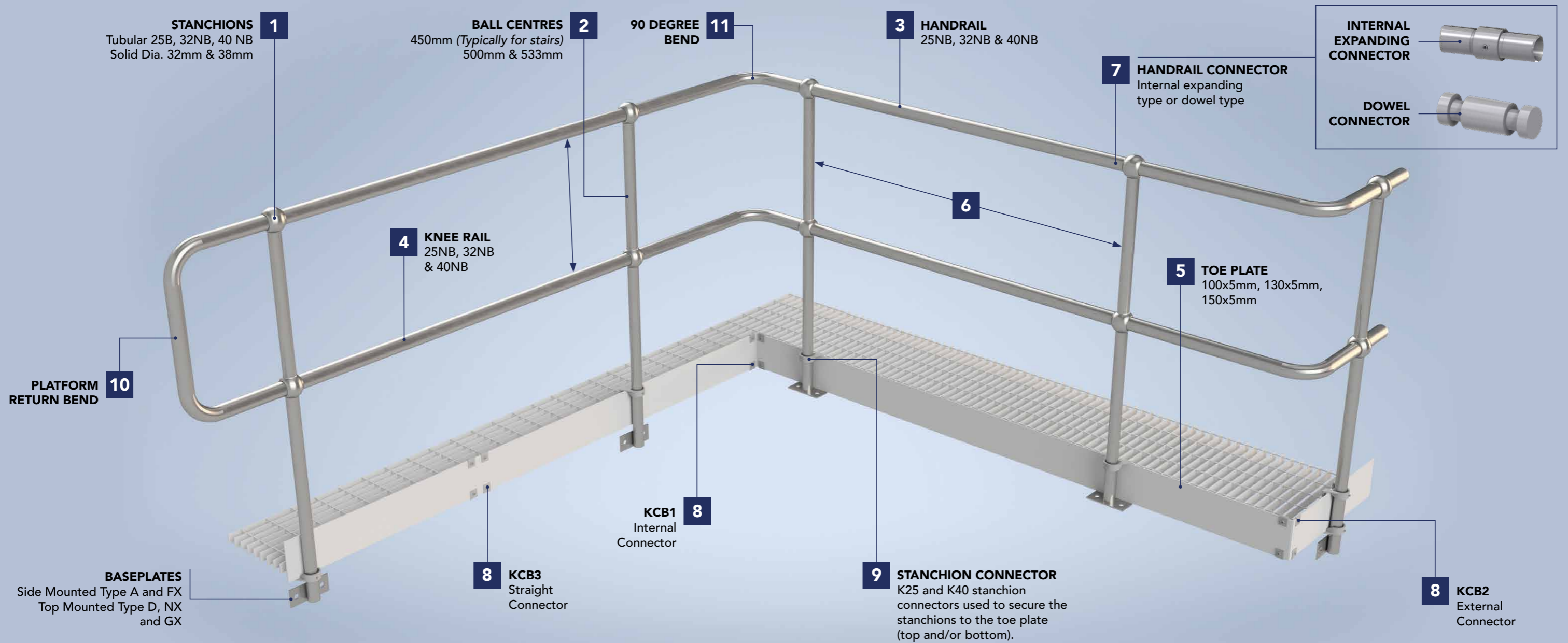




**LIONWELD
KENNEDY[®]
GROUP**

SAFERAIL



INTRODUCTION

Lionweld Kennedy, part of Hill & Smith PLC, are a market-leading supplier of safe, compliant and sustainable steel and GRP access products. We have been proudly manufacturing steel access products in the UK for over 100 years and are experts in our industry.

Steel Handrail System

Saferail is a steel industrial handrailing system used extensively throughout the UK in a wide variety of industries and applications.

Saferail can be provided as a fully fabricated system or in standard modular

shapes to allow simple handrail systems to be pieced together with the support of tubular or solid handrail stanchions.

The range consists of stanchions, handrail, gates, kick flat/toe plate and a range of fixings and connectors, all designed in

accordance with British and European standards (BS4592-0:2006+A1:2012 and BS EN ISO 14122-3: 2016).

TERMINOLOGY

1. Stanchion – Upright post comprising of a shank (tube) and balls - to accept handrail - and a baseplate to facilitate fixing to supporting structure. Tube sizes vary and ball spacing is set to meet required industry standards.

2. Ball Centres – The vertical distance between the centre line of the handrail and knee rail.

3. Handrail – The uppermost tube; for personnel to hold onto and for support.

4. Knee Rail – The lower tube; to prevent personnel falling from the walkway and to achieve the requirement of a maximum 500mm gap in any part of the system.

5. Toe Plate – A 5mm thick flat bar at the base of the handrail system to form a barrier to prevent objects falling off the walkway and to achieve the requirement of a maximum 500mm gap in any part of the system.

6. Stanchion Pitch – The distance between stanchions determined by load requirements and stanchion section size.

7. Handrail Connector – Method of fixing two tubes together to form a continuous handrail / knee rail. Located a maximum of 150mm from the centre line of adjacent stanchion.

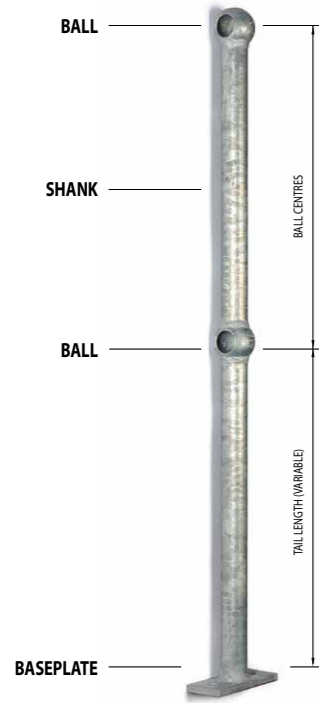
8. Toe Plate Connectors – Method of fixing two lengths of toe plate together.

9. Stanchion Connector – K25 and K40 stanchion connectors, used to secure the stanchions to the toe plate (top and/or bottom).

10. Platform Return Bend

11. 90 Degree Bend

DESIGN CONSIDERATIONS

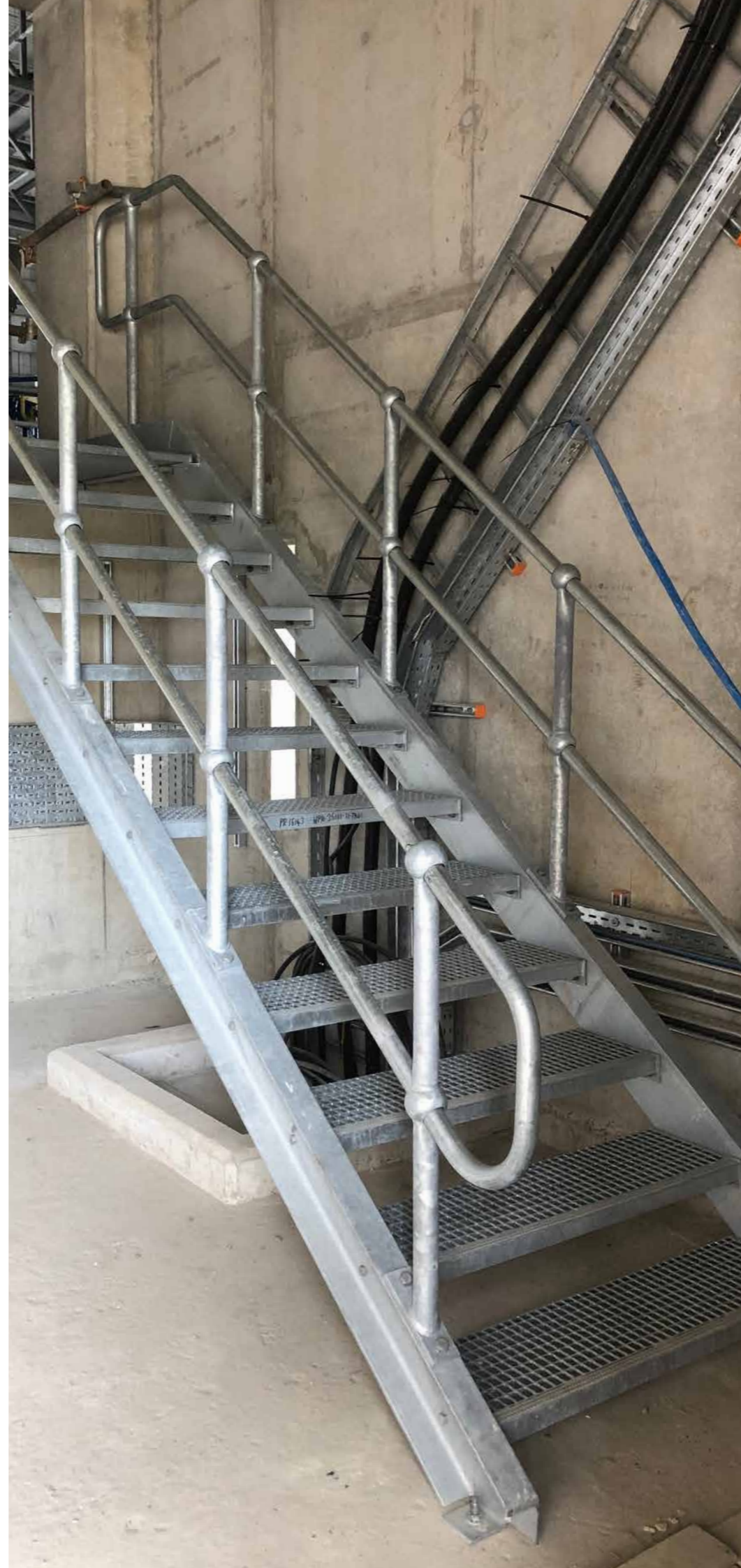


PLATFORM RAIL

- Design height should be 1100mm from top of the floor.
- Distance between rails to create an opening no greater than 500mm.

STAIR RAIL

- Distance from the pitch line to the centreline of the stair handrail should be between 900mm – 1000mm.



AVAILABLE BALL CENTRES

533mm (standard offering)
500mm (standard offering)
450mm (typical for Stair Rail)

LOADING REQUIREMENTS

There are 2 main loading categories recommended by BS4592-0:2006+A1:2012.

1. General duty of 0.36kN/m
2. Heavy duty of 0.74kN/m

AVAILABLE TAIL LENGTH DIMENSIONS

Variable to suit application.

For quick delivery it may be possible to utilise our stock range of stanchions.

The stanchion section size and the loading requirement will determine the distance between stanchions - see load tables for further information.

Note: The maximum opening within any part of the handrail system must be no more than 500mm. Toe plate of varying heights can be fixed to the stanchion to ensure this is adhered to.

Key Design Criteria

This information is designed to help you select a stanchion / handrail system that is compliant with the British Standard – BS4592-0:2006 + A1:2012.

Lionweld Kennedy Standard Sizes

To ensure your handrail meets the key design criteria, Lionweld Kennedy offer a standard design to compliment our steel grating products up to 50mm deep.

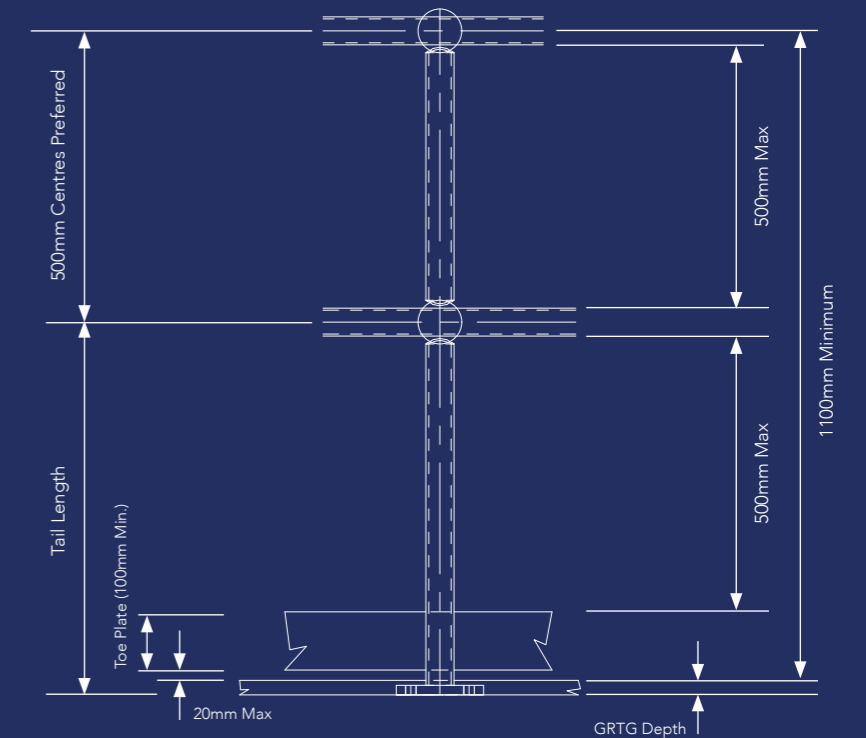
The table below shows the tail length and the toe plate size required to ensure the lower opening remains within the 500mm limit and the handrail provides the minimum 1100mm overall height from the walking surface.

FLAT BASE STANDARD SIZES

Grating Depth	Ball Centres	Tail Length	Toe Plate required (if welded to flooring)	Uprand Provided	Toe Plate required (if fixed to handrail)
25mm	500mm	650mm	150mm	125mm	100mm
30mm	500mm	650mm	150mm	120mm	100mm
40mm	500mm	650mm	150mm	110mm	100mm
50mm	500mm	650mm	150mm	100mm	100mm

SIDE PALM STANDARD SIZES

Grating Depth	Ball Centres	Tail Length	Toe Plate required (if welded to flooring)	Uprand Provided	Toe Plate required (if fixed to handrail)
25mm	500mm	725mm	150mm	125mm	100mm
30mm	500mm	725mm	150mm	120mm	100mm
40mm	500mm	725mm	150mm	110mm	100mm
50mm	500mm	725mm	150mm	100mm	100mm



STANCHIONS

Tubular Stanchion Sizes

All stanchions are manufactured using S235JR grade material with a 3.0mm wall thickness.

Other sizes are available upon request.

STANCHION SIZE	BALL SIZE (NOMINAL DIAMETER)	RAIL SIZE
25nb (33.7mm o/d)	60mm	25nb (33.7mm o/d)
32nb (42.4mm o/d)	60mm	25nb (33.7mm o/d)
32nb (42.4mm o/d)	75mm	32nb (42.4mm o/d)
40nb (48.3mm o/d)	75mm	32nb (42.4mm o/d)
40nb (48.3mm o/d)	75mm	40nb (48.3mm o/d)

Solid Stanchion Sizes

Solid stanchions are manufactured using S275JR grade material as standard.

STANCHION SIZE	BALL SIZE (NOMINAL DIAMETER)	RAIL SIZE
32mm	63mm	25nb (33.7mm o/d)
38mm	70mm	25nb (33.7mm o/d)
38mm	70mm	32nb (42.4mm o/d)
45mm	80mm	32nb (42.4mm o/d)
45mm	80mm	40nb (48.3mm o/d)

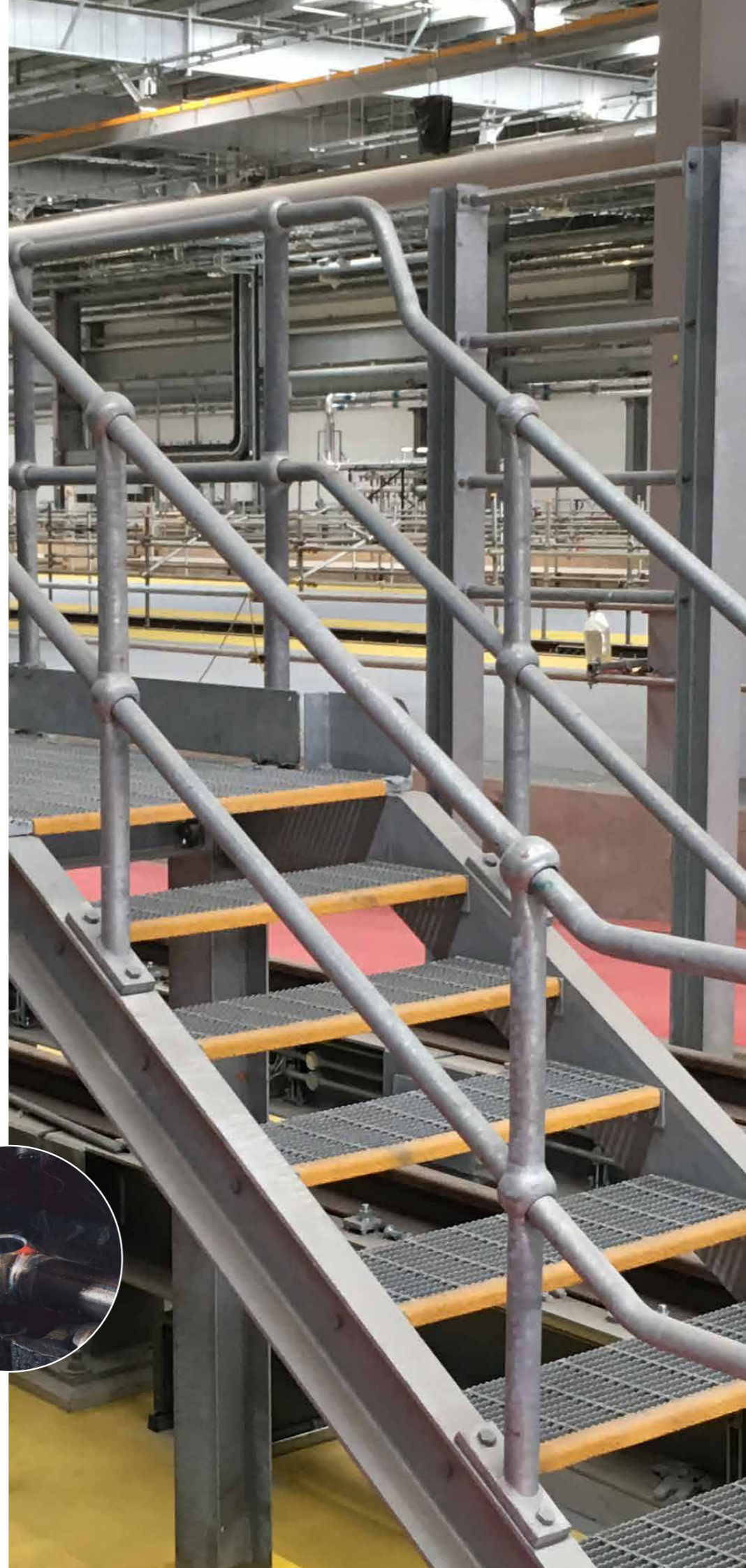
Bespoke Stanchions

Handrail stanchions can be manufactured with many variations including single ball stanchions or three-ball stanchions and can be manufactured with special base plates. Where necessary, gate hinges and toe plate brackets can be welded to the stanchions.

Lionweld Kennedy offer a fully bespoke fabrication service for industrial handrailing to suit simple or high complexity designs.

We are able to manufacture handrailing for walkways, staircases and storage tanks whilst also allowing for non-standard connections such as welded joints. All fabricated handrail is drawn using our CAD or Tekla software then fabricated and piece marked for easy on site erection.

Saferail is supplied as pre-galvanised tube as standard but is also available with a hot dipped galvanized or self colour finish.



BASE PLATES

Standard Base Plates

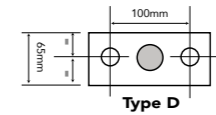
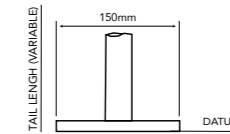


Type D Flat Base

Type A Side Palm

Type NX Raked Flat Base

Type D Top Mounted

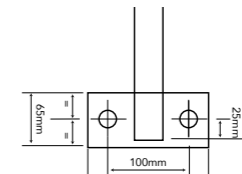


Type D

Available Ball Centres	Available Toe Plate
450mm (Typically for stairs)	100x5
500mm	130x5
533mm	150x5
	180x5

Fabricated from 6m lengths

Type A Side Palm

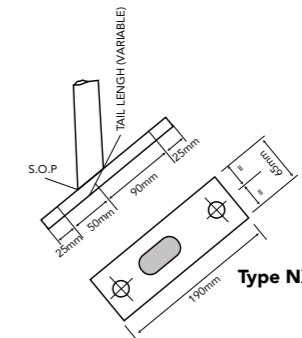


Type A

Available Ball Centres	Available Toe Plate
450mm (Typically for stairs)	100x5
500mm	130x5
533mm	150x5
	180x5

Fabricated from 6m lengths

Type NX Top Mounted



Type NX

Available Ball Centres	Available Toe Plate
450mm (Typically for stairs)	100x5
500mm	130x5
533mm	150x5
	180x5

Fabricated from 6m lengths

Heavy Duty Base Plates



GX Base Plate

Type FX Base Plate

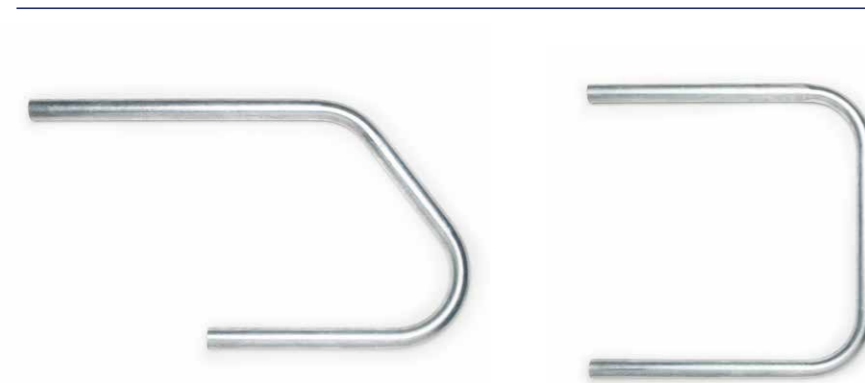
MODULAR HANDRAIL BENDS

Pre-fabricated handrail sections are held in stock to facilitate speedy deliveries, allowing simple handrail systems to be formed without the need for bending on site.



Ramp Bend

90 Degree Bend



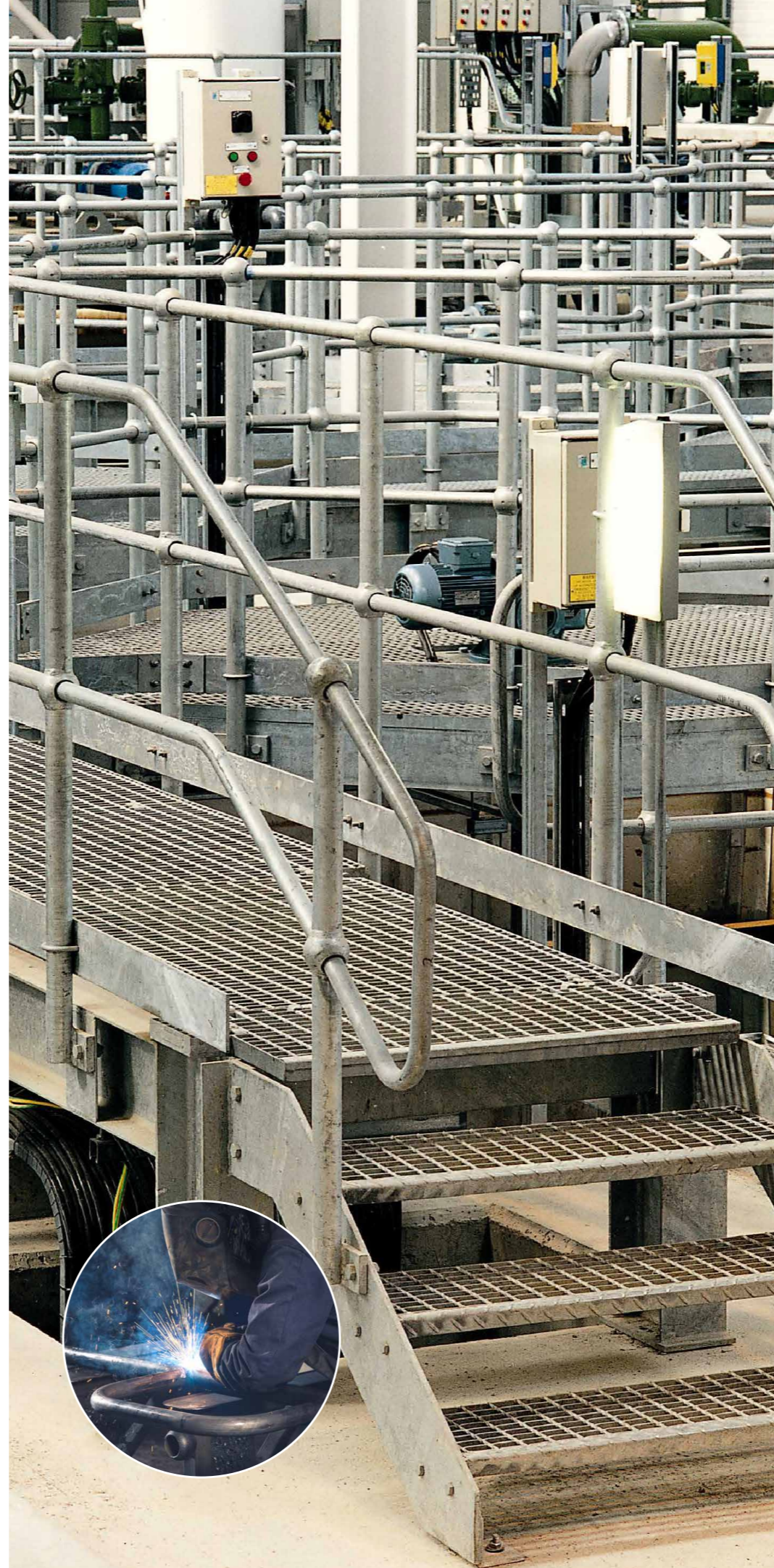
Stair Return

Platform Return



Wreath Bend

6.4m Straight Length



CONNECTORS & FIXINGS

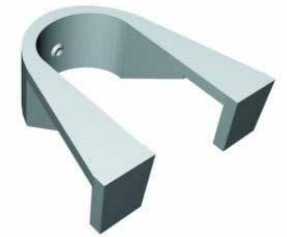
K25 / K40 CONNECTOR

K25 Used with:

- 25nb Tubular Stanchions
- 32mm dia. Solid Stanchion

K40 Used with:

- 32nb Tubular Stanchions
- 40nb Tubular Stanchions
- 38mm dia. Solid Stanchion



TOE PLATE CONNECTORS

To accompany the KickKlamps, corner brackets (KCB1 / KCB2) and straight connectors (KCB3) can be used to join the lengths of toe plate as required.



KCB1
Internal Connector



KCB2
External Connector



KCB3
Straight Connector

HANDRAIL CONNECTORS

EXPANDING CONNECTORS

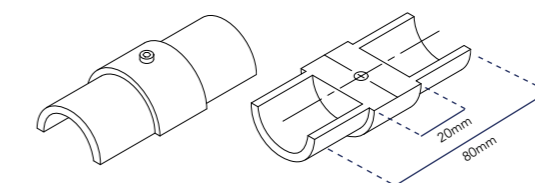
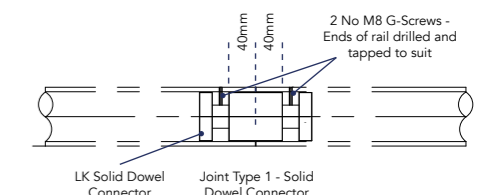
Expanding handrail connectors are used for joining tubular handrailing:

- 25mm nominal bore (33.7mm o/d),
- 32mm nominal bore (42.4mm o/d),
- 40mm nominal bore (48.4mm o/d)

The handrail connectors are simply pushed into the tube and secured by tightening the grub screw with an Allen key. This type of connection is generally used for handrail with a 3.2mm wall thickness.

DOWEL CONNECTORS

Each section of handrail tube is drilled and tapped to enable an M8 grub screw to be located between the groove of the connector and be secured into position. This type of connection is generally used for 3.2mm thick handrail.



TOE PLATE / KICKKLAMP

Toe plate is used to form a barrier to prevent objects falling off the edge of the walkway. 5mm flat bar is supplied in various heights (depending on the depth of flooring) to provide a 100mm high edge protection around the open grid flooring.

Toe plate can be either welded to the flooring or attached to the handrail stanchions using a U bolt or our innovative KickKlamp system.

KICKKLAMP SYSTEM

KickKlamp brackets (K25/K40) are a revolutionary system for fixing kick flat / toe plate to handrail standards.

The basic principle involves gripping the toe plate with steel 'forked fingers' and fixing to the stanchion with a single grub screw.

GATES

Self closing gates are designed to compliment our handrail system and are usually provided with an enclosed spring assembly, hinged to an adjoining handrail stanchion or bolted to a flat member, such as an angle, using a 65mm x 850mm x 12mm thick fixing plate.

BS4592-0:2006+A1:2012 requires gates to provide equal protection to that required for the surrounding guarding.

It should consist of a handrail, at least one intermediate or knee rail and a toe plate.

This design criteria makes the traditional half height gate non-compliant unless it is being used at ground level where toe plate is not required.



HANDRAIL LOAD TABLES

TOP MOUNTED - 1150mm HIGH STANCHIONS (TWO HOLE FLAT BASE)

Tubular Stanchion Shank Size	Shank Material Grade	Loading Category	Max Centres of 1150mm High Stanchions	Ball Diameter	Baseplates Thickness	Handrail Section Size
33.7mm o/d x 3.0mm Wall Thickness (25nb)	S235	0.36kN/m	750mm	64mm	12mm	33.7mm o/d x 3.2mm Wall Thickness (25nb)
42.4mm o/d x 3.0mm Wall Thickness (32nb)	S235	0.36kN/m	1250mm	64mm	12mm	33.7mm o/d x 3.2mm Wall Thickness (25nb)
				64mm	12mm	42.4mm o/d x 3.2mm Wall Thickness (32nb)
48.3mm o/d x 3.0mm Wall Thickness (40nb)	S235	0.36kN/m	1660mm	75mm	15mm	33.7mm o/d x 3.2mm Wall Thickness (25nb) 42.4mm o/d x 3.2mm Wall Thickness (32nb)
48.3mm o/d x 5.0mm Wall Thickness (40nb)	S355	0.74kN/m	1050mm	75mm	15mm	42.4mm o/d x 3.2mm Wall Thickness (32nb) 48.3mm o/d x 3.2mm Wall Thickness (40nb)
32mm Diameter Solid	S275	0.36kN/m	1380mm	60mm	12mm	33.7mm o/d x 3.2mm Wall Thickness (25nb)
		0.36kN/m	1720mm	70mm	15mm	33.7mm o/d x 3.2mm Wall Thickness (25nb)
38mm Diameter Solid	S275	0.36kN/m	1720mm	70mm	15mm	33.7mm o/d x 3.2mm Wall Thickness (25nb)
		0.74kN/m	1120mm	70mm	15mm	42.4mm o/d x 3.2mm Wall Thickness (32nb)

SIDE MOUNTED - 1225mm HIGH STANCHIONS (TWO HOLE HORIZONTAL SIDE PALM)

Tubular Stanchion Shank Size	Shank Material Grade	Loading Category	Max Centres of 1225mm High Stanchions	Ball Diameter	Baseplates Thickness	Handrail Section Size
33.7mm o/d x 3.0mm Wall Thickness (25nb)	S235	0.36kN/m	700mm	64mm	12mm	33.7mm o/d x 3.2mm Wall Thickness (25nb)
42.4mm o/d x 3.0mm Wall Thickness (32nb)	S235	0.36kN/m	1170mm	64mm	12mm	33.7mm o/d x 3.2mm Wall Thickness (25nb)
				75mm	12mm	42.4mm o/d x 3.2mm Wall Thickness (32nb)
48.3mm o/d x 3.0mm Wall Thickness (40nb)	S235	0.36kN/m	1570mm	75mm	15mm	33.7mm o/d x 3.2mm Wall Thickness (25nb) 42.4mm o/d x 3.2mm Wall Thickness (32nb)
48.3mm o/d x 5.0mm Wall Thickness (40nb)	S355	0.74kN/m	1010mm	75mm	15mm	42.4mm o/d x 3.2mm Wall Thickness (32nb) 48.3mm o/d x 3.2mm Wall Thickness (40nb)
32mm Diameter Solid	S275	0.36kN/m	1200mm	60mm	12mm	33.7mm o/d x 3.2mm Wall Thickness (25nb)
		0.36kN/m	1720mm	70mm	15mm	33.7mm o/d x 3.2mm Wall Thickness (25nb)
38mm Diameter Solid	S275	0.36kN/m	1720mm	70mm	15mm	33.7mm o/d x 3.2mm Wall Thickness (25nb)
		0.74kN/m	1010mm	70mm	15mm	42.4mm o/d x 3.2mm Wall Thickness (32nb)



Due to our policy of continual improvement we reserve the right to change specifications at all times without prior notice.

November 2023

Lionweld Kennedy Flooring Ltd
Marsh Road
Middlesbrough
TS1 5JS

Reception: **+44 (0) 1642 245151**
Sales: **+44 (0) 1642 233299**
Technical: **+44 (0) 1642 233297**
Email: **sales@lk-uk.com**

LK-UK.COM