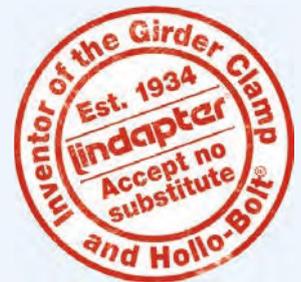
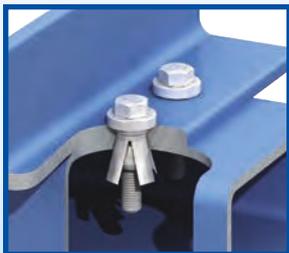


**2019**  
Edition



**lindapter**<sup>®</sup>  
Established 1934

**Celebrating 85 years of innovation**



**Technical Innovation in Steelwork Connections**

## Welcome

For over 85 years Lindapter® has earned a respected reputation as the pioneer in the design and manufacture of steelwork clamping systems, growing from a modest family business into a reputable global brand by providing a faster, cost-effective alternative to drilling or welding.

### History

Original 1930s logo



Lindapter's proud heritage began in 1934 when Engineer Henry Lindsay invented an entirely new concept of connecting steelwork with the Lindsay Bolt Adapter, a solution that allowed steel beams to be quickly clamped together, instead of time-consuming drilling or welding.

Henry combined the words 'Lindsay' and 'Adapter' to create the now-famous brand name. Today Lindapter remains true to its roots, by continuing to invent and manufacture high quality products that save steel contractors time and money.

Lindapter's unique connections can be installed with standard hand tools and allow faster construction, reduced labour costs, on-site adjustability and no damage to steel sections.

### Girder Clamps

PAGES  
4 - 29

Steel sections are clamped together using high strength connections configured to suit specific requirements without damaging the steelwork, for example, to resist 250kN tensile loading / 70kN slip.



### Rail Fixings

PAGES  
30 - 33

Low speed rail is safely secured with easy-to-install products such as the **Type HD** that offers convenient lateral adjustability during installation.



### Lifting Points

PAGES  
34 - 37

These assemblies support the lifting or rigging of general equipment. Can be used for single lift situations or permanent applications such as theatre, lighting and rigging units.



- Factors of safety (FOS) shown in this catalogue are typical values and vary with different products from 2:1 to 5:1.
- The tightening torques stated must not be exceeded. If in doubt, contact Lindapter's Technical Support team.

## Connections for a range of industries...



Construction



Energy



Bridges



Rail



Telecoms

### **Hollo-Bolt®**

PAGES  
38 - 47

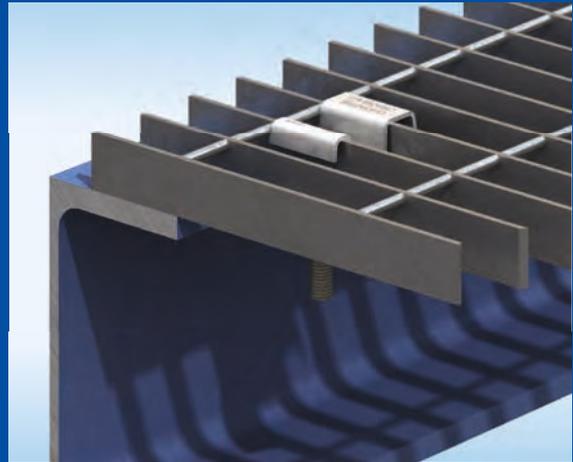
A family of expansion bolts for quickly connecting steel sections to pre-drilled Structural Hollow Section (SHS) that require access to one side only. Products include the **Hollo-Bolt®** and the **Lindibolt®**.



### **Floor Fixings**

PAGES  
48 - 51

A range of innovative fixings for connecting steel flooring to the supporting steelwork without the need for on-site drilling or welding. Installation can be carried out quickly and safely from above.



### **Support Fixings**

PAGES  
52 - 59

Easy-to-install solutions for suspending building services from structural or secondary beams. The adjustability of these products allows pipework and other equipment to be quickly positioned.



### **Decking Fixings**

PAGES  
60 - 69

High quality, cost effective connections for building services, designed to fit inside the dovetail re-entrant channel of major decking profiles, this zero-impact method avoids damaging the decking.



PAGES  
71 - 77

**FAQs & Section Details**

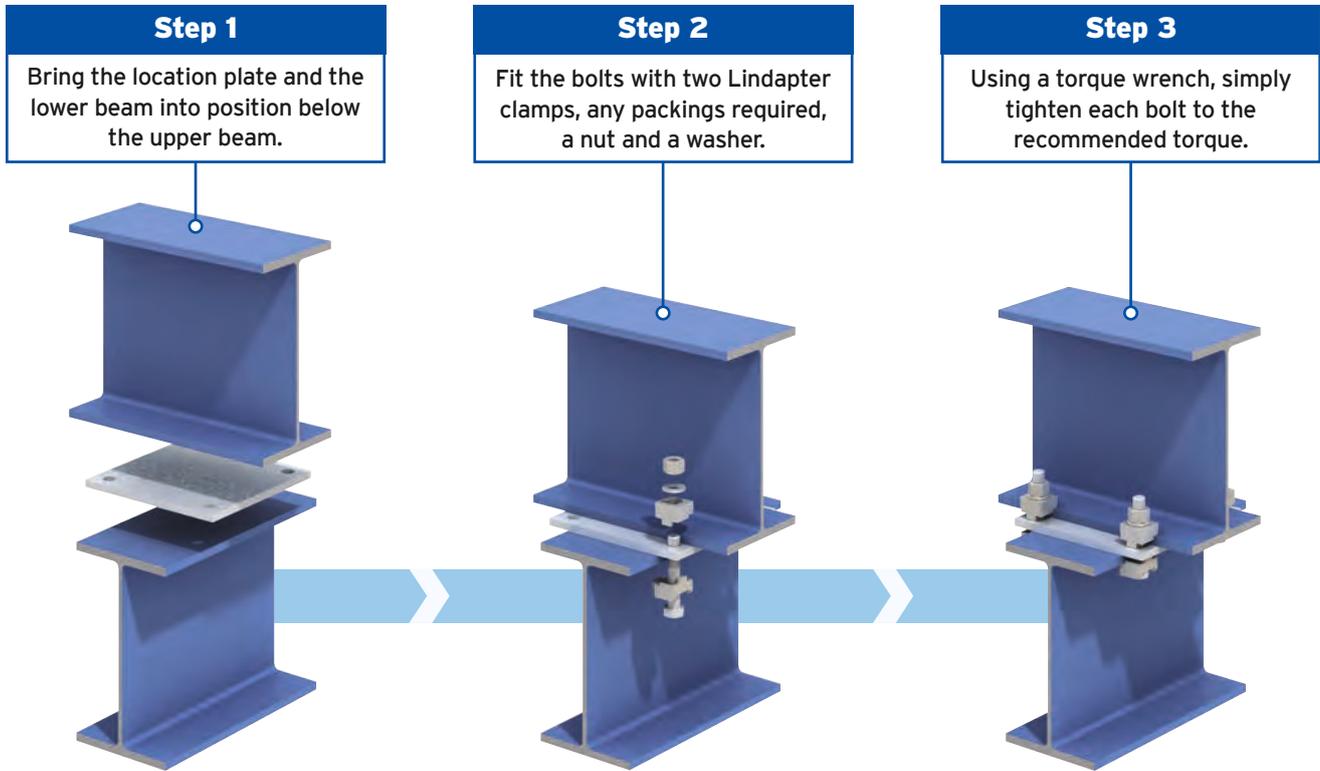
PAGES  
78 - 83

**Case Studies, Approvals & Technical Support**

# Girder Clamp - The Connection Concept

Lindapter products provide a faster, cost-effective alternative to on-site drilling or welding and are designed to reduce installation time and labour costs. A high strength, permanent (or temporary) connection is quickly achieved by clamping two steel sections together.

## Quick and easy to install



REASONS TO USE...

**Save time and money**  
Clamping two steel sections together avoids time-consuming welding or conventional drilling and bolting.

**High strength**  
Lindapter clamps are manufactured from high strength materials to resist high load requirements and harsh environments.

**Adjustable**  
Quickly align steel sections by sliding the section into the correct position before tightening the Girder Clamp to complete the installation.

**Safer connections**  
On-site drilling and welding is avoided, removing the need for hot work permits and encouraging safer site conditions.

**Industry leading approvals**  
Lindapter has earned a reputation synonymous with safety and reliability, gaining multiple independent approvals. Further details can be found on **page 82**.

**Free connection design**  
Lindapter's experienced Engineers can design a bespoke connection based on your specific requirements free of charge. See **page 83** for more details.

Turn to **page 6** to see the components of a Girder Clamp in more detail.

Watch installation videos of Girder Clamps and many more products at [www.Lindapter.com](http://www.Lindapter.com)

+44 (0) 1274 521444

[www.Lindapter.com](http://www.Lindapter.com)

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HOLLO-BOLT  
FLOOR FIXINGS  
SUPPORT FIXINGS  
DECKING FIXINGS

## Typical Configurations

The Girder Clamp represents a range of Lindapter products that are compatible with virtually any shape or size of steel section and can withstand loading conditions in a wide variety of applications, for example:

### STANDARD

#### Beam-to-beam (tensile loading) .....

The original configuration is designed to secure steel sections and resist tensile loading. It features a pre-drilled location plate that is placed between the beams to locate the four bolts. Each bolt has two Lindapter components to clamp the flange immediately above and below the plate.

For thicker beams, packing pieces are required to raise the height of the clamps to enable the product to sit correctly on the beam.

See the components of a Girder Clamp in more detail on [page 6](#).



### HIGH SLIP RESISTANCE

#### Beam-to-column (slip resistance) .....

This configuration utilises a High Slip Resistance (HSR) clamp per bolt to achieve a secure connection to vertical columns.

An end plate is pre-fabricated to the section that will be joined to the column. The purpose of this plate is to locate the bolts and provide a fastening position for the Lindapter clamps.

Lindapter's range of HSR clamps can be found on [pages 12 - 17](#).



### ADJUSTABLE

#### Inclined beam-to-beam (combined loading) .....

A fabricated assembly, optimised with Lindapter's adjustable HSR clamps to resist both tensile loading and slip.

This solution adjusts to fit a wide range of flange thicknesses for added convenience. Lindapter can design and supply the entire assembly to suit individual applications.

Read more about the free connection design service on [page 83](#).



More examples of typical Lindapter configurations can be found on [pages 26 - 29](#). Alternatively, visit the [website](#).

# Girder Clamp Configuration

A Girder Clamp is a connection system configured with components to suit specific application requirements, for example high tensile loading or high corrosion resistance. Take advantage of the free connection design service to find the best solution for your connection requirement.

## Standard Lindapter Girder Clamp components

The standard configuration consists of Type A and Type B clamps. See pages 26 - 29 for more examples.

**Standard Hardened Washer (200 Hv).**

**Lindapter Clamps**  
Dependent on the application, different clamps can be used (See page 7).

**Standard Hex Nut (Property Class 8 or 10).**

**Location Plate (can be supplied)**  
An essential part of the assembly that enables all the components to be located in the correct position.

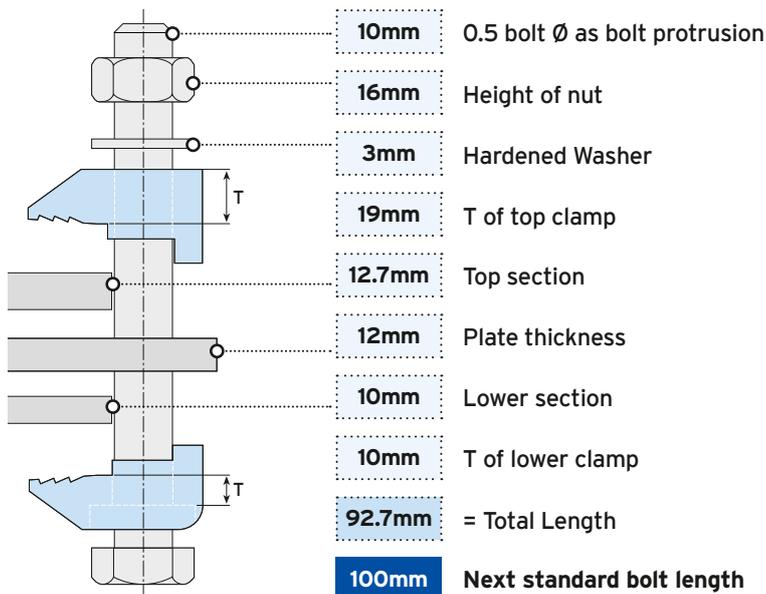
**Packings (if required)**  
Increase the clamping range to suit thick beams.

**Standard Hexagon Bolt / Setscrew**  
Property Class 8.8 or 10.9, dependent on the clamp type.

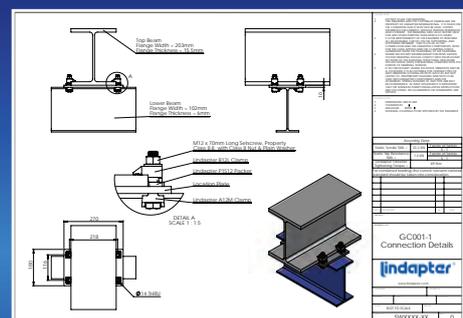
➤ **Safe working load up to 78.8kN tensile or 9kN slip resistance (size M24 Type A/B clamps). For higher loads up to 250kN tensile or 70kN slip resistance, see Type AF on page 14.**

## Bolt Length Calculator

To calculate bolt length, simply add up all parts the bolt will go through. The next standard bolt length should be used. The example below is based on a Type A and B size M20 with sections (Top: 254mm x 146mm x 43mm U.B. Bottom: 254mm x 102mm x 28mm U.B.).



## Can we help? Try Lindapter's free connection design



For your next project, Lindapter's team of experienced Engineers can advise the correct product and detail the connection for you free of charge, providing CAD drawings in 2D or 3D BIM compatible files that can be imported into all major software. Turn to page 83 for more information.

## Product Comparison

The table below shows the various components that can be assembled in a Girder Clamp arrangement. Each product has specific properties, for example the Type AF heavy duty clamp can resist tensile loads up to 250kN when used with four bolts (property class 10.9) in a Girder Clamp assembly.

### Single Components

Product	Parallel Flanges	Tapered Flanges	Tensile	High Slip Resistance	Low Temp. Down to -60°C	Slotted Clearance Holes	Adjustable	Stainless Steel
<b>Type A</b> page 8	 ✓	-	✓	-	-	-	-	-
<b>Type B</b> page 9	 ✓	-	✓	-	-	-	-	-
<b>Type AAF</b> page 12	 ✓	✓	✓	✓	✓	✓	✓	-
<b>Type AF</b> page 14	 ✓	✓	✓	✓	-	✓	-	-
<b>Type CF</b> page 15	 ✓	✓	✓	✓	-	-	✓	-
<b>Type LR</b> page 18	 ✓	✓	✓	-	-	✓	✓	-
<b>Type D2</b> page 19	 ✓	-	✓	-	-	-	✓	-
<b>Type LS</b> page 22	 ✓	✓	✓	-	-	✓	✓	✓
<b>Type RC</b> page 24	 ✓	-	✓	-	-	✓	-	-

### Other Clamp Systems (these products do not require a location plate)

Product	Parallel Flanges	Tapered Flanges	Tensile	High Slip Resistance	Low Temp. Down to -60°C	Slotted Clearance Holes	Adjustable	Stainless Steel
<b>Type F9</b> page 24	 ✓	-	✓	-	-	-	✓	-
<b>Type FC</b> page 25	 ✓	✓	✓	-	-	-	✓	-

### Also available

#### Lindapter Rail Fixings

See pages 30 - 33 for more information



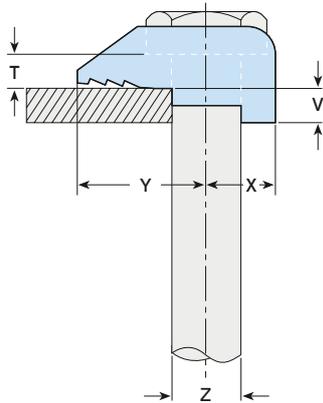
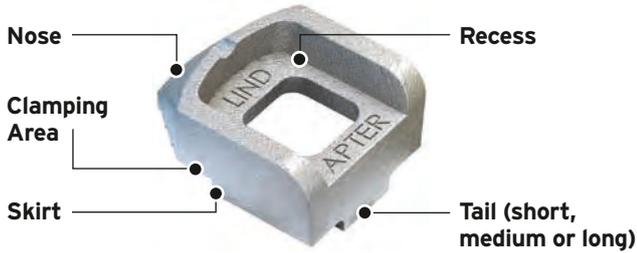
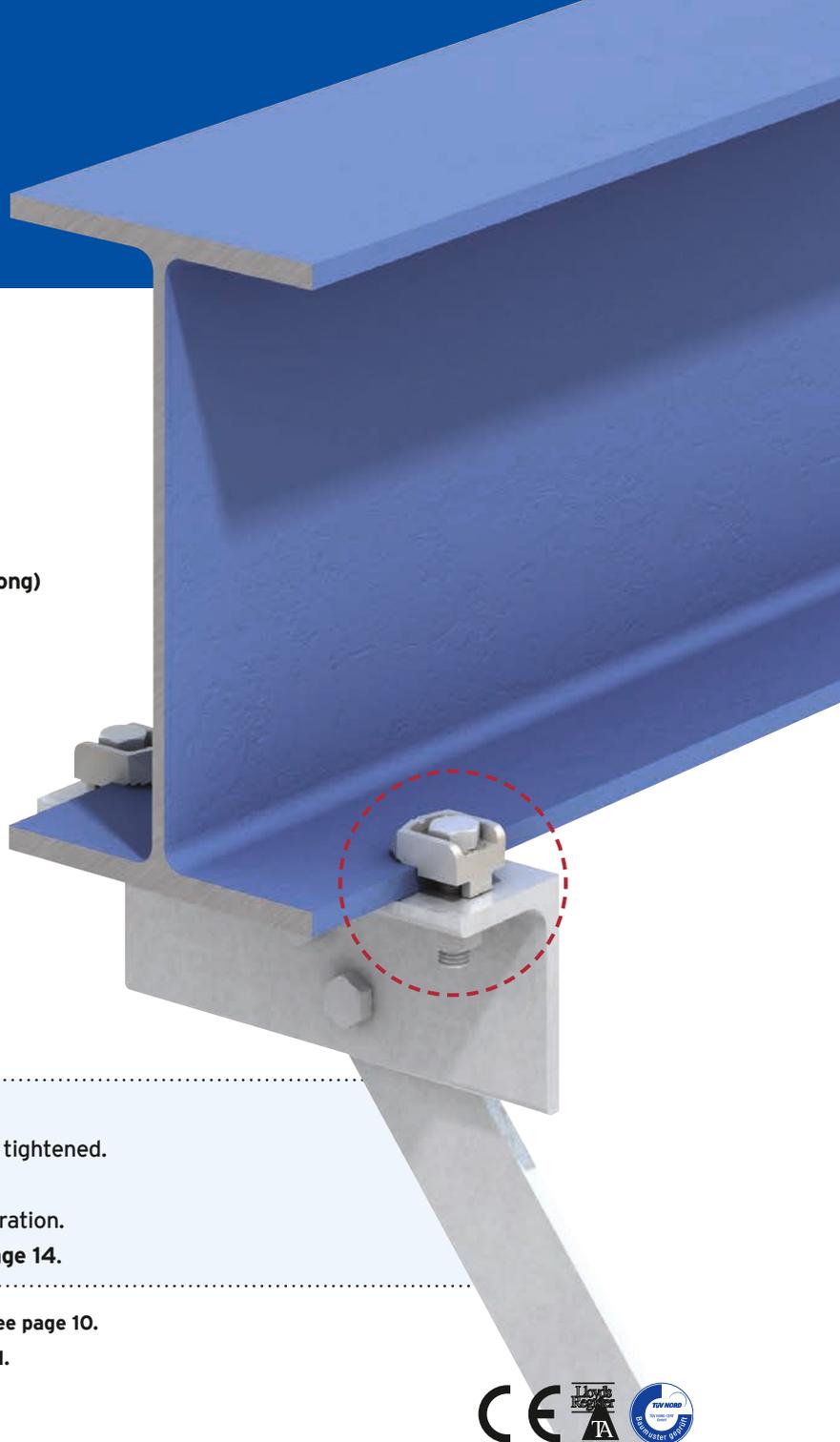
#### Lindapter Lifting Points

See pages 34 - 37 for more information



# Type A

Lindapter's standard clamp is used to resist moderate tensile loading. Can also be used with Type B in a Girder Clamp configuration.



- CE Mark, Lloyd's Register and TÜV approved.
- Recessed top holds the bolt captive while the nut is tightened.
- Ideal for parallel flanges.
- Supports up to 78.8kN tensile in a four-bolt configuration.
- For higher loads the Type AF should be used, see [page 14](#).

- Packings are available to increase the clamping range, see [page 10](#).
- Location plate / end plate details can be found on [page 11](#).

Material: Malleable iron, zinc plated or hot dip galvanised.



Product Code	Bolt 8.8 Z	Safe Working Loads (FOS 5:1)			Tightening Torque*	Dimensions		Tail Length V			T	Width
		Tensile / 1 Bolt	Slip / 2 Bolts	Y		X	Tail Length V					
							mm	mm	short mm	medium mm		
A08	M8	1.0	-	6	16	8	-	4	-	4	20	
A10	M10	1.5	-	20	20	11	4	5	7	5	26	
A12	M12	5.8	0.7	69	26	13	4.5	6	9.5	6	29	
A16	M16	7.3	1.5	147	30	16	5.5	8	11	8	36	
A20	M20	14.7	3.0	285	36	19	7	10	12.5	10	46	
A24	M24	19.7	4.5	491	48	25	9	12	16	13	55	

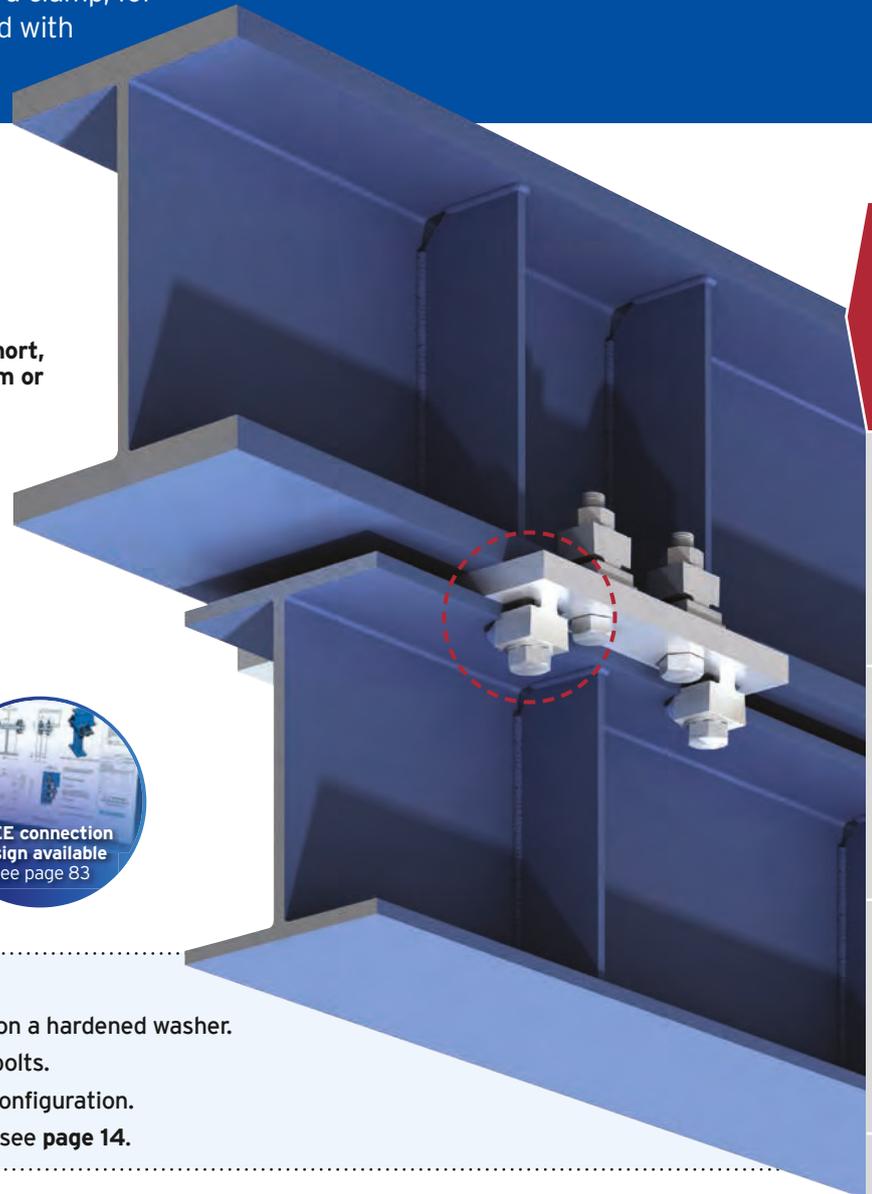
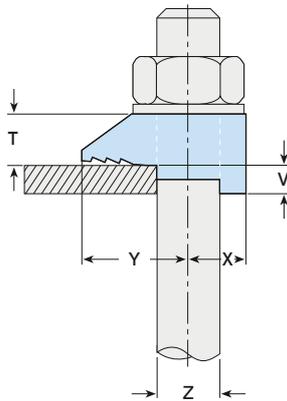
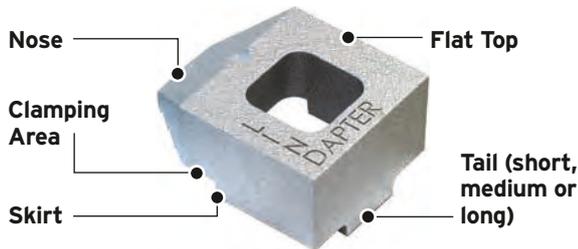
\* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see [page 70](#).

CE For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.003 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

GIRDER CLAMPS  
RAIL FIXINGS  
LIFTING POINTS  
HOLLO-BOLT  
FLOOR FIXINGS  
SUPPORT FIXINGS  
DECKING FIXINGS

## Type B

The flat-top version of Lindapter's standard clamp, for moderate tensile loading. Can also be used with Type A in a Girder Clamp configuration.



- CE Mark, Lloyd's Register and TÜV approved.
- Flat top allows the bolt head or nut to rotate on a hardened washer.
- Suitable for use with bolts, studs, tie rods, J-bolts.
- Supports up to 78.8kN in a tensile four-bolt configuration.
- For higher loads the Type AF should be used, see [page 14](#).

- Packings are available to increase the clamping range, see [page 10](#).
- Location plate / end plate details can be found on [page 11](#).

Material: Malleable iron, zinc plated or hot dip galvanised.



Product Code	Bolt 8.8 Z	Safe Working Loads (FOS 5:1)			Tightening Torque*	Y mm	X mm	Dimensions			T mm	Width mm
		Tensile / 1 Bolt kN	Slip / 2 Bolts kN					Tail Length V				
							short mm	medium mm	long mm			
B08	M8	1.0	-	6	16	8	-	4	-	8	20	
B10	M10	1.5	-	20	20	11	4	5	7	10	26	
B12	M12	5.8	0.7	69	26	13	4.5	6	9.5	12	29	
B16	M16	7.3	1.5	147	30	16	5.5	8	11	16	36	
B20	M20	14.7	3.0	285	36	19	7	10	12.5	19	46	
B24	M24	19.7	4.5	491	48	25	9	12	16	25	55	

\* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see [page 70](#).

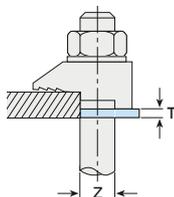
CE For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.003 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

# Packing Pieces for Types A and B

These packing pieces are compatible with the Type A and Type B clamps and are used to increase the clamping range to suit flange thicknesses. Types A and B are available with three different tail lengths (short, medium or long) and the correct combination of packing pieces should be used.

## Packing Pieces

### Type CW

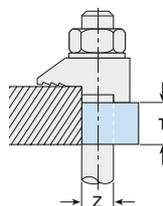


Mild steel, zinc plated or hot dip galvanised.

Product Code	Bolt Size Z	Dimension T (mm)
CW08*	M8	2
CW10	M10	2
CW12	M12	2.5
CW16	M16	3
CW20	M20	4
CW24	M24	4

\* CW08 is only available zinc plated.

### Type P1/ P2 short



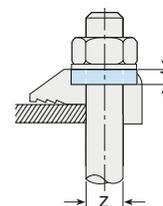
Mild steel, malleable iron, zinc plated or hot dip galv.

Product Code	Bolt Size Z	Dimension T (mm)
P1S08	M8	4
P1S10	M10	5
P1S12	M12	6
P1S16	M16	8
P1S20	M20	10
P1S24	M24	12

P2S10	M10	10
P2S12	M12	12
P2S16	M16	16
P2S20	M20	20
P2S24	M24	25

## Also Available

### Type W



Mild steel, malleable iron, zinc plated or hot dip galv.

Product Code	Bolt Size Z	Dimension T (mm)
W08	M8	4
W10	M10	5.5
W12	M12	6
W16	M16	8
W20	M20	10

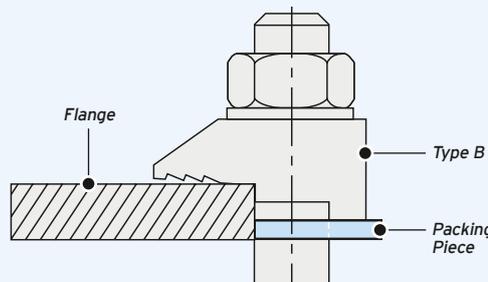
Note: The Type W is used to fill the recess in the Type A to convert it into a flat top clamp to enable the bolt head or nut to be rotated on a hardened washer.

## Tail Length / Packing Piece Combinations for Types A and B

Choose the correct Type A/B configuration for your application using the table below.

For example, a M24 Type A/B on a 26mm flange requires 1 x Type A/B short tail (S), 1 x Type CW (CW) and 1 x Type P1 short (P1S).

➔ For thicker flanges contact Lindapter.



Flange Thickness mm	M12				M16				M20				M24			
	A/B	CW	P1S	P2S												
5	S	-	-	-	S	-	-	-	-	-	-	-	-	-	-	-
6	M	-	-	-	S	-	-	-	-	-	-	-	-	-	-	-
7	S	1	-	-	M	-	-	-	S	-	-	-	-	-	-	-
8	S	1	-	-	M	-	-	-	S	-	-	-	-	-	-	-
9	M	1	-	-	S	1	-	-	M	-	-	-	S	-	-	-
10	L	-	-	-	L	-	-	-	M	-	-	-	S	-	-	-
11	M	2	-	-	L	-	-	-	S	1	-	-	M	-	-	-
12	L	1	-	-	S	2	-	-	S	1	-	-	M	-	-	-
13	S	1	1	-	L	S	1	-	L	-	-	-	S	1	-	-
14	S	1	1	-	L	1	-	-	M	1	-	-	S	1	-	-
15	L	2	-	-	S	3	-	-	S	2	-	-	L	-	-	-
16	L	-	1	-	M	-	1	-	S	2	-	-	L	-	-	-
17	M	2	1	-	L	2	-	-	S	-	1	-	S	2	-	-
18	M	-	-	1	L	2	-	-	M	2	-	-	S	2	-	-
19	S	1	-	1	L	-	1	-	S	3	-	-	L	1	-	-
20	S	1	-	1	L	3	-	-	M	-	1	-	L	1	-	-
21	M	1	-	1	L	3	-	-	S	1	1	-	S	-	1	-
22	L	-	-	1	L	1	1	-	M	3	-	-	S	-	1	-
23	S	-	1	1	L	1	1	-	L	-	1	-	M	-	1	-
24	M	-	1	1	M	-	-	1	M	1	1	-	M	-	1	-
25	S	1	1	1	L	2	1	-	S	2	1	-	S	1	1	-
26	S	1	1	1	L	2	1	-	S	2	1	-	S	1	1	-
28	L	-	1	1	S	2	-	1	M	2	1	-	L	-	1	-
30	M	-	-	2	L	1	-	1	M	-	-	1	S	2	1	-

A/B = Type A/B S = A/B short M = A/B medium L = A/B long CW = Type CW P1S = Type P1 short P2S = Type P2 short

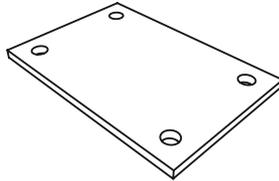
## Location and End Plates for Types A and B

These plates ensure the clamps and bolts are located in the correct position relative to the supporting steelwork. If you would like help choosing a suitable plate, please contact Lindapter.

### Location Plate

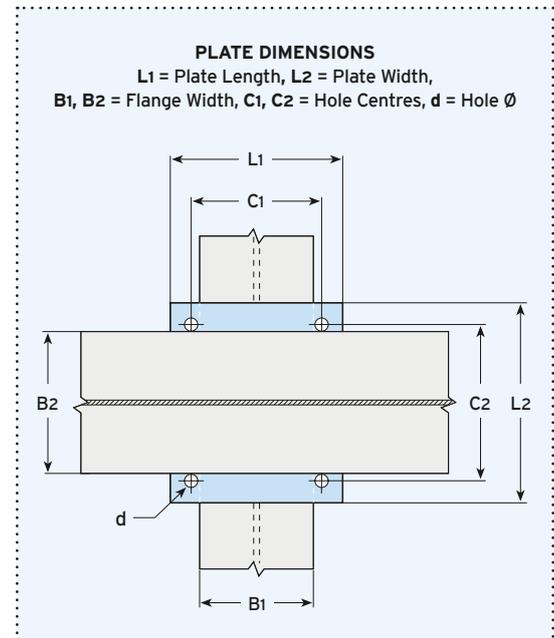
#### What is it?

Location plates are simple fabricated items designed to sit between the two sections to be clamped together to ensure the bolts are fixed at the correct centres.



Material: Structural steel grade S275 JR or JO.  
For other grades contact Lindapter.

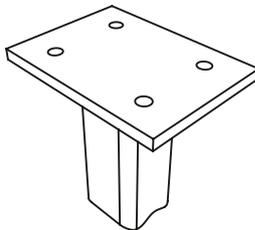
Bolt Size	Hole Ø d mm	Plate Thick. mm	Hole Centres C1 mm	Length min L1 mm	Hole Centres C2 mm	Width min L2 mm
M8	9	6	B1 + 9	B1 + 36	B2 + 9	B2 + 36
M10	11	8	B1 + 11	B1 + 44	B2 + 11	B2 + 44
M12	14	8	B1 + 14	B1 + 54	B2 + 14	B2 + 54
M16	18	10	B1 + 18	B1 + 70	B2 + 18	B2 + 70
M20	22	12	B1 + 22	B1 + 88	B2 + 22	B2 + 88
M24	26	15	B1 + 26	B1 + 104	B2 + 26	B2 + 104



### End Plate

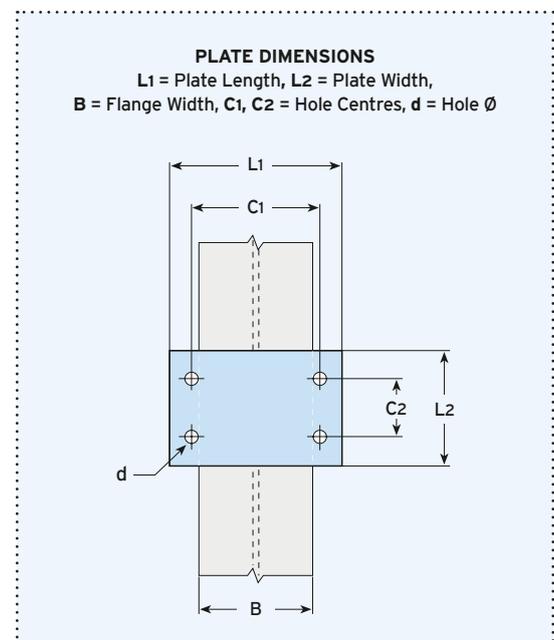
#### What is it?

End plates are simple fabricated items that are pre-welded to support frames, bracket or sections, allowing connection to the supporting structure with standard Lindapter clamps.



Material: Structural steel grade S275 JR or JO.  
For other grades contact Lindapter.

Bolt Size	Hole Ø d mm	Plate Thick. <sup>1)</sup> mm	Hole Centre C1 mm	Length min L1 mm	Hole Centre min C2 mm	Width min L2 mm
M8	9	10	B + 9	B + 36	40	C2 + 40
M10	11	12	B + 11	B + 44	50	C2 + 40
M12	14	12	B + 14	B + 54	60	C2 + 50
M16	18	15	B + 18	B + 70	70	C2 + 60
M20	22	20	B + 22	B + 88	90	C2 + 70
M24	26	25	B + 26	B + 104	110	C2 + 90

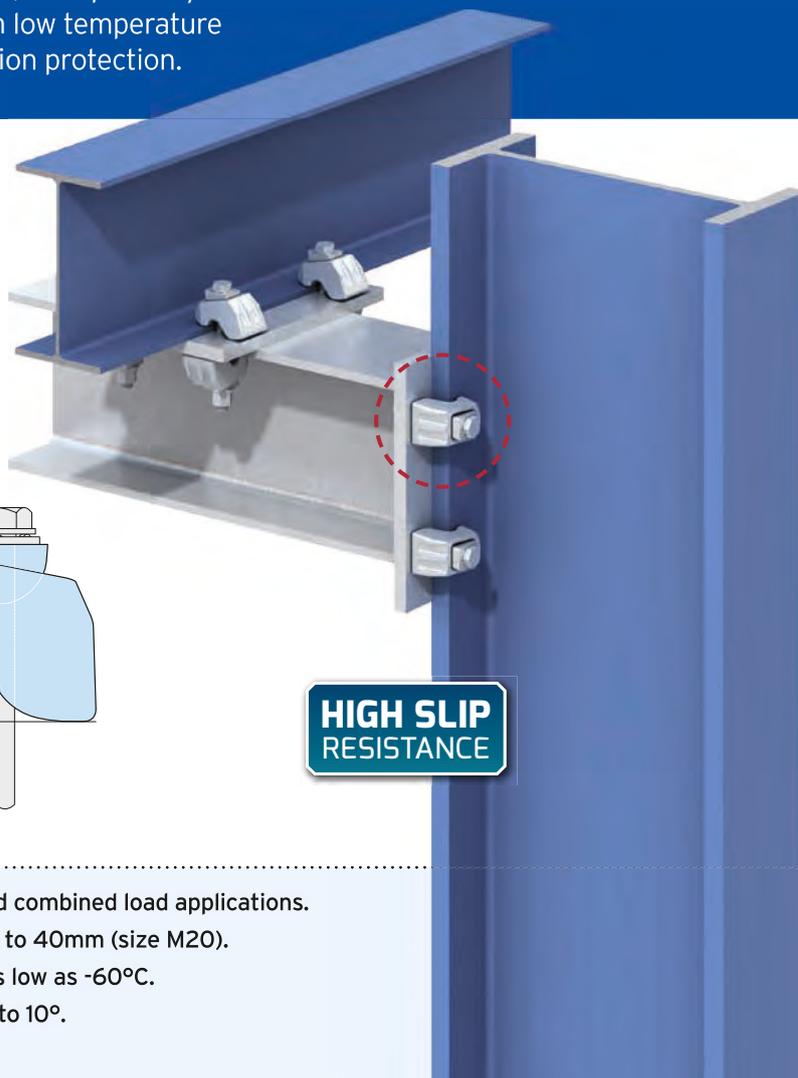


1) Depending on the type of connection and associated end plate use, the thickness may need to be modified to comply with accepted local design codes.

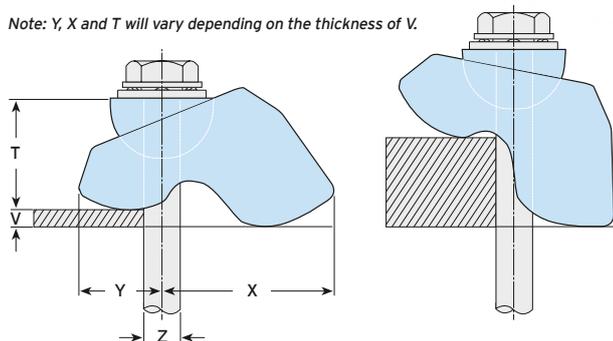
- To calculate the bolt length, add up the total distance that the bolt will pass through, plus half of the bolt diameter. Then round up the total to the nearest available bolt length. An example can be found on page 6.

# Type AAF

This adjustable High Slip Resistance (HSR) clamp is easy to install and provides high load capacities even in low temperature environments. Hot dip galvanised corrosion protection.



Note: Y, X and T will vary depending on the thickness of V.



- High slip resistance for tensile, frictional and combined load applications.
- Self-adjusts to suit flange thicknesses 6mm to 40mm (size M20).
- Safe working loads apply in temperatures as low as -60°C.
- Suitable for parallel and tapered flanges up to 10°.
- The tail spans slotted clearance holes.

- Packings are available to increase the clamping range, see page 16. Location plate / end plate details can be found on page 17.
- Lindapter recommends the use of DTI Washers conforming to EN14399-9 with the Type AAF. For further information please refer to page 70.

Material: Low temperature SG iron, hot dip galvanised.



Product Code	Bolt		Safe Working Loads			Tightening Torque*	Clamping Range <sup>3)</sup> V	Dimensions			
	Size Z	Property Class <sup>4)</sup>	Tensile / 1 Bolt (FOS 4.5:1)	Slip <sup>1)</sup> / 2 Bolts (FOS 2:1)				Y	X	T	Width
				Painted Steelwork <sup>2)</sup>	Galvanised Steelwork						
			kN	kN	kN	Nm	mm	mm	mm	mm	mm
AAF12	M12	8.8	8.5	3.4	3.9	90	5 - 26	25 - 34	27 - 49	26 - 35	41
AAF16	M16	8.8	16.0	8.0	10.0	240	6 - 30	34 - 50	31 - 58	35 - 46	56
AAF20	M20	8.8	26.3	13.0	16.0	470	6 - 40	48 - 78	49 - 64	52 - 64	77
AAF12	M12	10.9	10.0	4.0	5.2	130	5 - 26	25 - 34	27 - 49	26 - 35	41
AAF16	M16	10.9	19.5	11.0	12.0	300	6 - 30	34 - 50	31 - 58	35 - 46	56
AAF20	M20	10.9	30.0	20.0	25.0	647	6 - 40	48 - 78	49 - 64	52 - 64	77

1) Slip resistant values calculated against movement exceeding 0.1mm.

2) Shot blast and painted steelwork.

3) For thicker flanges, packing pieces AFP1 and AFP2 are available (for AAF12 and AAF16 only) or packing piece AAFP3 (for AAF20 only). See page 16.

4) For ease of installation when using 10.9 bolts Lindapter recommends using fastener assemblies to EN 14399-1.

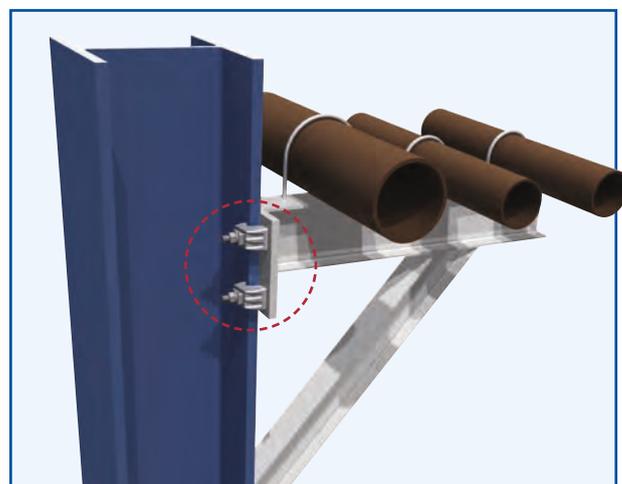
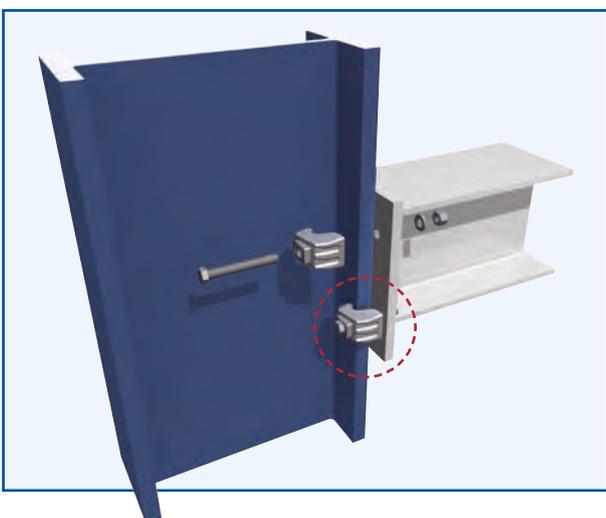
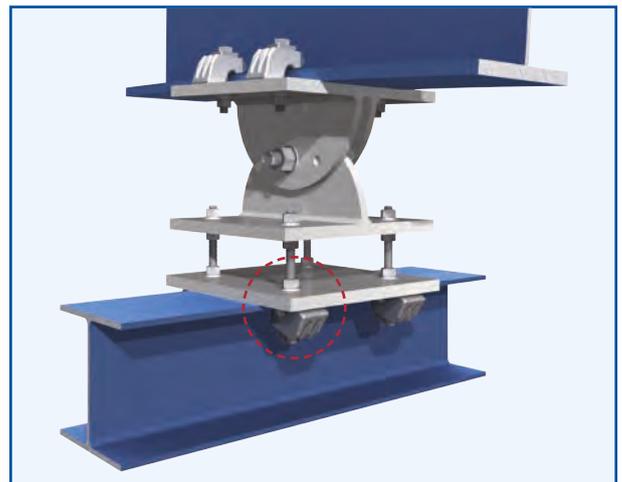
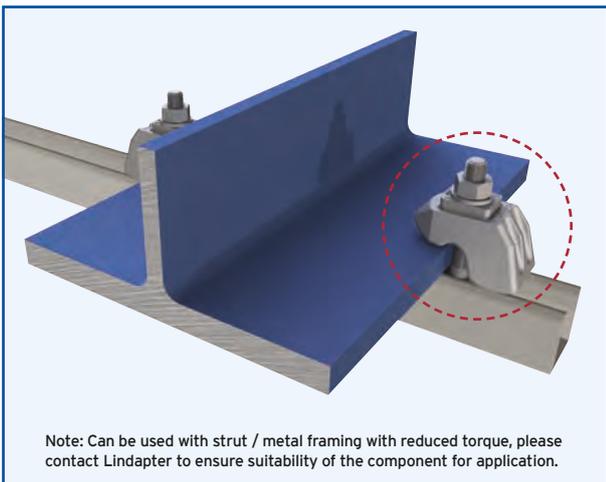
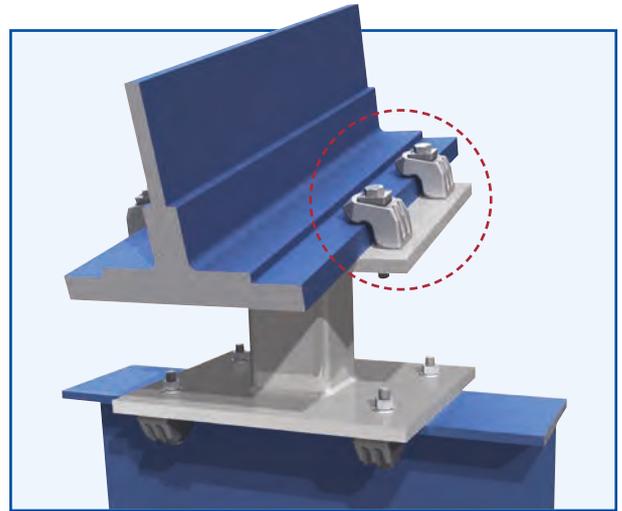
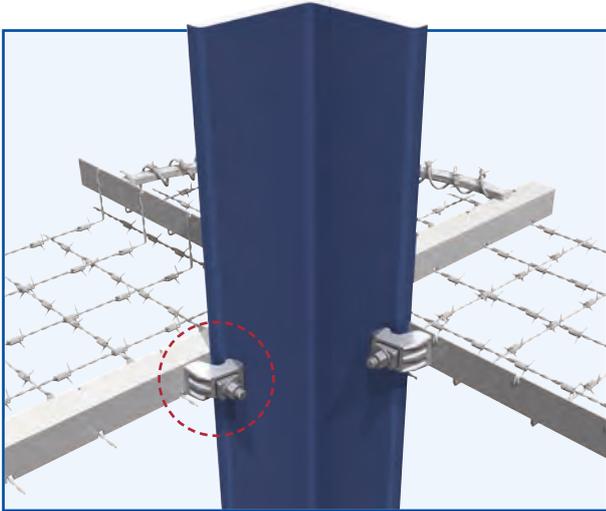
\* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 70.

CE For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.005 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

GIRDER CLAMPS  
RAIL FIXINGS  
LIFTING POINTS  
HOLLO-BOLT  
FLOOR FIXINGS  
SUPPORT FIXINGS  
DECKING FIXINGS

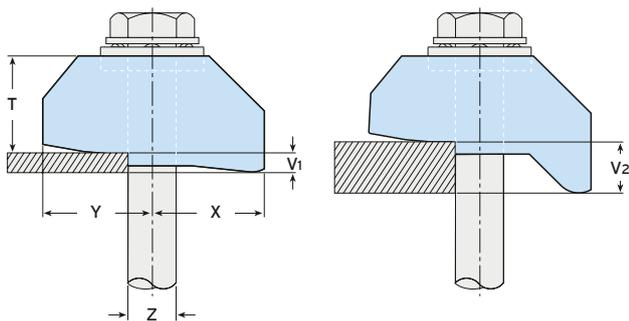
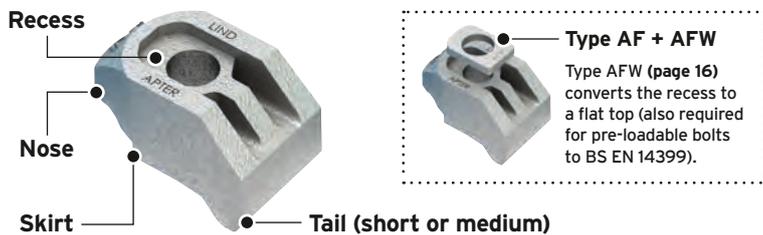
## Typical Applications for the Type AAF

The Type AAF is one of three products in Lindapter's range of High Slip Resistance (HSR) clamps, designed specifically for frictional applications and high tensile loading. This heavy duty clamp is used in many diverse industries and situations, here are some application examples:

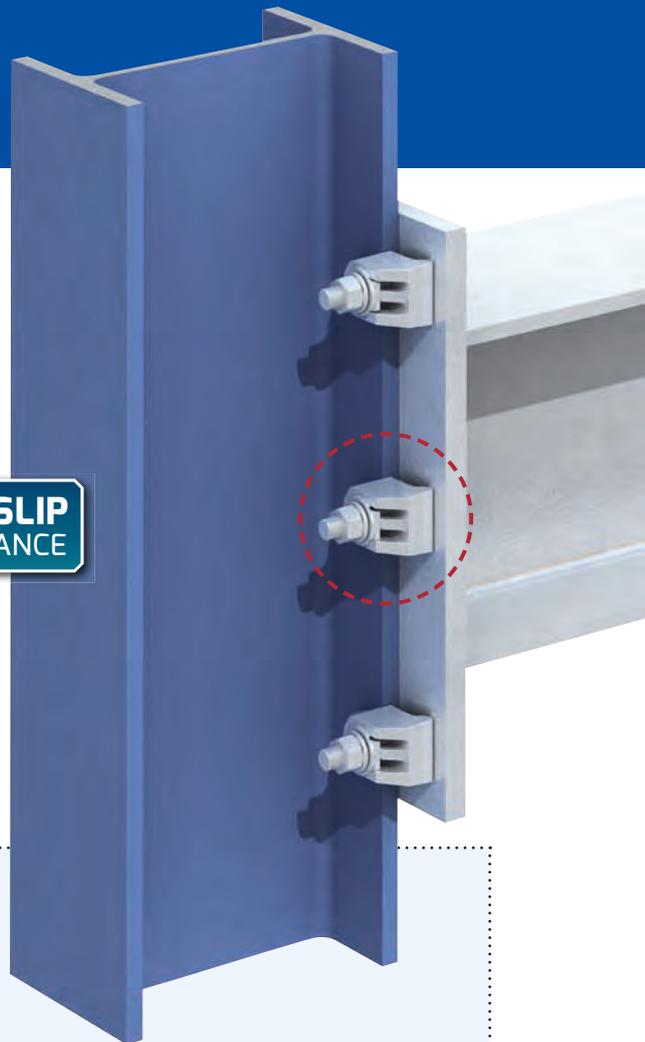


# Type AF

A heavy duty clamp offering the highest load capacities of all Lindapter's High Slip Resistance clamps. Hot dip galvanised corrosion protection.



**HIGH SLIP RESISTANCE**



- High slip resistance for tensile, frictional and combined load applications.
- 70kN static slip resistance or 250kN tensile (AF24 with 4 x property class 10.9 fasteners).
- Recess holds the bolt head captive (property class 8.8).
- Suitable for parallel and tapered flanges up to 10°.
- The tail spans slotted clearance holes.

- Packings are available to increase the clamping range, see page 16. Location plate / end plate details can be found on page 17.
- Lindapter recommends the use of DTI Washers conforming to EN14399-9 with the Type AF. For further information please refer to page 70.

Material: SG iron, hot dip galvanised.



Product Code	Bolt		Safe Working Loads			Tightening Torque* Nm	Tail Length		Dimensions				Width mm
	Size Z	Property Class <sup>4)</sup>	Tensile / 1 Bolt (FOS 5:1) kN	Slip <sup>1)</sup> / 2 Bolts (FOS 2:1)			short V1 mm	medium V2 mm	Y mm	X mm	T mm	T mm	
				Painted Steelwork <sup>2)</sup> kN	Galvanised Steelwork kN								
AF12	M12	8.8	8.5	3.4	3.9	90	5	12.5	27	27	17	22	39
AF16	M16	8.8	16.0	8.0	10.0	240	8	15	35	37	22	27	49
AF20	M20	8.8	26.3	13.0	16.0	470	10	18	40	39	25	31	56
AF24	M24	8.8	40.0	24.0	30.0	800	15	30	48	60	32	42	82
AF12	M12	10.9	10.0	4.0	5.2	130	5	12.5	27	27	17	22	39
AF16	M16	10.9	19.5	11.0	12.0	300	8	15	35	37	22	27	49
AF20	M20	10.9	30.0	20.0	25.0	647	10	18	40	39	25	31	56
AF24	M24	10.9	62.5 <sup>3)</sup>	28.0	35.0	1000	15	30	48	60	32	42	82

1) Slip resistant values calculated against movement exceeding 0.1mm.  
 2) Shot blast and painted steelwork.  
 3) 3.2:1 Factor of Safety.  
 4) For ease of installation when using 10.9 bolts Lindapter recommends using fastener assemblies to EN 14399-1.

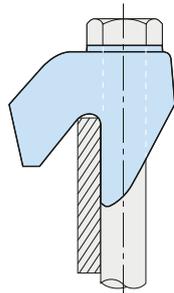
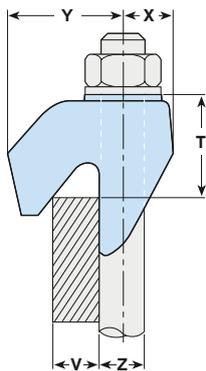
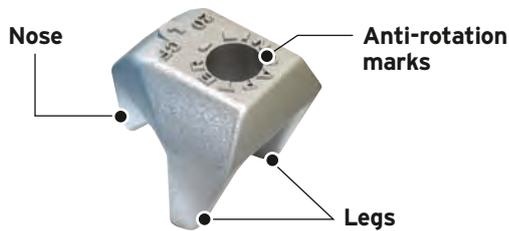
\* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 70.

CE For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.004 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

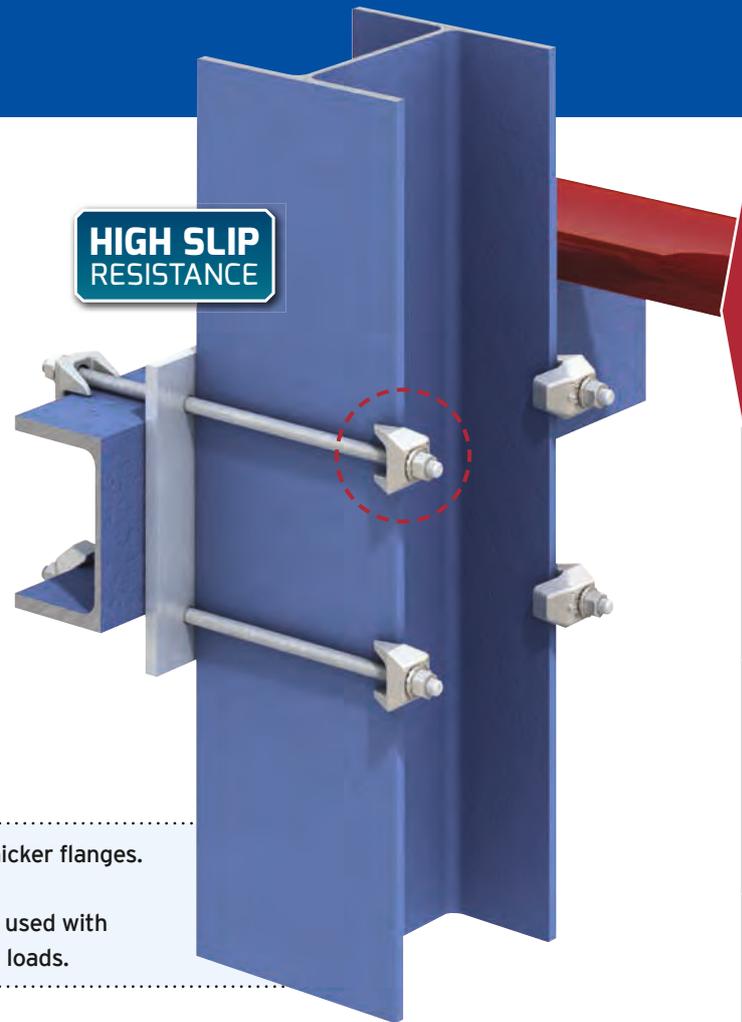
GIRDER CLAMPS  
RAIL FIXINGS  
LIFTING POINTS  
HOLLO-BOLT  
FLOOR FIXINGS  
SUPPORT FIXINGS  
DECKING FIXINGS

## Type CF

Hooks over the flanges of beams, angles and channels to connect steel sections that do not face, such as connecting horizontal beams with vertical columns.



Note: T will vary depending on the thickness of V.



- New options available to suit larger steel sections with thicker flanges.
- Suitable for parallel and tapered flanges up to 8°.
- Can be combined with other Lindapter HSR clamps when used with property class 8.8 bolts; see table below for safe working loads.

- Location plate / end plate details can be found on page 17.
- Lindapter recommends the use of DTI Washers conforming to EN14399-9 with the Type CF. For further information please refer to page 70.

Material: SG iron, hot dip galvanised.



	Product Code	Bolt 8.8 Z	Safe Working Loads			Tightening Torque*	Clamping Range V	Dimensions			
			Tensile / 1 Bolt (FOS 5:1)	Slip <sup>1)</sup> / 2 Bolts (FOS 2:1)				Y	X	T	Width
				kN	Painted Steelwork <sup>2)</sup> kN						
	CF12	M12	8.5	3.4	3.9	90	6 - 13	32	14	21 - 29	46
NEW	CF212	M12	8.5	3.4	3.9	90	12 - 20	39	16	28 - 37	48
	CF16	M16	16	8	10	240	8 - 16	44	18	25 - 33	56
NEW	CF216	M16	16	8	10	240	15 - 25	50	21	35 - 47	62
	CF20	M20	26.3	13	16	470	10 - 19	53	22	30 - 41	65
NEW	CF220	M20	26.3	13	16	470	18 - 30	64	27	41 - 55	70
CF combinations with other Lindapter clamps	CF + A <sup>3)</sup>	M12	5.8	0.7	0.7	69					
	CF + A <sup>3)</sup>	M16	7.3	1.5	1.5	147					
	CF + A <sup>3)</sup>	M20	14.7	3.0	3.0	285					
	CF + AF / AAF	M12	8.5	3.4	3.9	90					
	CF + AF / AAF	M16	16.0	8.0	10.0	240					
	CF + AF / AAF	M20	26.3	13.0	16.0	470					

1) Slip resistant values calculated against movement exceeding 0.1mm.

2) Shot blast and painted steelwork.

3) Also applies to Type B (page 9), Type LR (page 18), Type D2 (page 19) and Type BR (page 31).

\* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 70.



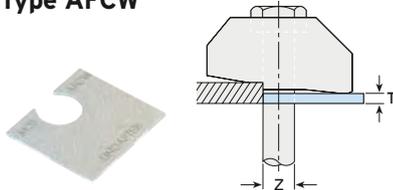
For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.011 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

# Packing Pieces for Types AF and AAF

Packing pieces are used to increase the clamping range to suit a range of flange thicknesses. The Type AF is available with two different tail lengths (short and medium) and the correct combination of packing pieces should be used, see the table at the bottom of the page.

## Packing Pieces

### Type AFCW



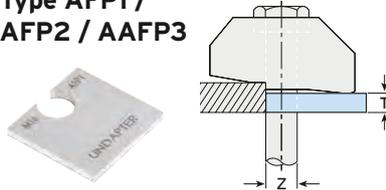
Mild steel, hot dip galvanised.

Product Code	Bolt Size Z	Dimension T (mm)
AF12CW*	M12	2
AF16CW*	M16	2
AF20CW	M20	2

\* Also compatible with Type AAF clamp.

Note: The AFCW has a slight bend along its centre line which flattens out during installation.

### Type AFP1 / AFP2 / AAFP3



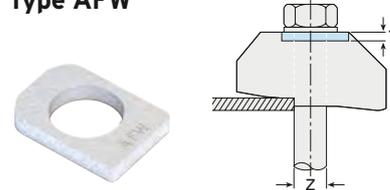
Mild steel, hot dip galvanised.

Product Code	Bolt Size Z	Dimension T (mm)
AF12P1*	M12	5
AF16P1*	M16	5
AF20P1	M20	5
AF24P1	M24	5
AF12P2*	M12	10
AF16P2*	M16	10
AF20P2	M20	10
AF24P2	M24	10
AAFP20P3*	M20	20

\* Also compatible with Type AAF clamp.

## Also Available

### Type AFW



SG iron, mild steel, hot dip galvanised.

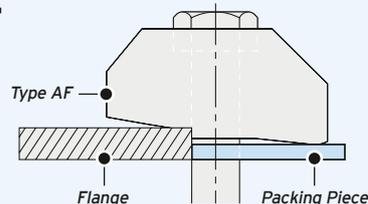
Product Code	Bolt Size Z	Dimension T (mm)
AFW12	M12	5
AFW16	M16	5
AFW20	M20	6
AFW24	M24	10

Note: The Type AFW is used to fill the recess in the Type AF to convert it into a flat top clamp to enable the bolt head or nut to be rotated on a hardened washer. The Type AFW is also required when using pre-loadable bolts to BS EN 14399 due to their larger hexagon heads.

## Tail Length / Packing Piece Combinations for Type AF

Choose the correct combination for your configuration using the table below. Please note these calculations are for **parallel flanges and beams up to 10° slopes only**. For example, a M20 Type AF on a 40mm flange requires 1 x Type AF medium tail (M), 1 x Type AFCW and 2 x Type AFP2.

➤ For thicker flanges contact Lindapter.



Flange Thickness mm	M12				M16				M20				M24				Flange Thickness mm	M12				M16				M20				M24			
	AF	AFCW	AFP1	AFP2	AF	AFCW	AFP1	AFP2	AF	AFCW	AFP1	AFP2	AF	AFP1	AFP2	AF		AFCW	AFP1	AFP2	AF	AFCW	AFP1	AFP2	AF	AFCW	AFP1	AFP2	AF	AFCW	AFP1	AFP2	
5	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	M	-	1	1	S	-	-	2	M	-	-	1	M	-	-		
6	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	M	1	1	1	M	-	1	1	M	-	-	1	M	-	-		
7	S	1	-	-	S	-	-	-	-	-	-	-	-	-	30	S	-	1	2	M	-	1	1	M	1	-	1	M	-	-			
8	S	1	-	-	S	-	-	-	-	-	-	-	-	-	31	S	-	1	2	M	-	1	1	M	1	-	1	M	-	-			
9	S	2	-	-	S	-	-	-	S	-	-	-	-	-	32	M	-	-	2	M	1	1	1	M	-	1	1	M	1	-			
10	S	-	1	-	S	1	-	-	S	-	-	-	-	-	33	M	-	-	2	M	1	1	1	M	-	1	1	M	1	-			
11	S	3	-	-	S	1	-	-	S	-	-	-	-	-	34	M	1	-	2	M	-	-	2	M	-	1	1	M	1	-			
12	S	1	1	-	S	2	-	-	S	1	-	-	S	-	35	S	-	-	3	M	-	-	2	S	-	1	2	M	1	-			
13	M	-	-	-	S	1	-	-	S	1	-	-	S	-	36	S	-	-	3	M	-	-	2	M	1	1	1	M	1	-			
14	M	1	-	-	S	3	-	-	S	2	-	-	S	-	37	M	-	1	2	M	1	-	2	M	-	-	2	M	1	-			
15	S	-	-	1	M	-	-	-	S	-	1	-	S	-	38	M	-	1	2	S	-	-	3	M	-	-	2	M	-	1			
16	M	2	-	-	M	-	-	-	S	3	-	-	S	-	39	M	1	1	2	M	-	1	2	M	-	-	2	M	-	1			
17	M	-	1	-	M	1	-	-	M	-	-	-	S	-	40	S	-	1	3	M	-	1	2	M	1	-	2	M	-	1			
18	M	-	1	-	S	-	-	1	M	-	-	-	S	1	41	S	-	1	3	M	-	1	2	M	1	-	2	M	-	1			
19	M	1	1	-	M	-	1	-	M	-	-	-	S	1	42	M	-	-	3	M	1	1	2	M	-	1	2	M	-	1			
20	S	-	1	1	M	-	1	-	M	1	-	-	S	1	43	M	-	-	3	S	-	1	3	M	-	1	2	M	1	1			
21	M	2	1	-	M	-	1	-	M	1	-	-	S	1	44	M	1	-	3	M	-	-	3	M	-	1	2	M	1	1			
22	M	2	1	-	M	1	1	-	M	2	-	-	S	1	45	S	-	-	4	M	-	-	3	M	1	1	2	M	1	1			
23	M	-	-	1	M	1	1	-	M	-	1	-	S	-	46	S	-	-	4	M	-	-	4	M	-	1	2	M	1	1			
24	M	1	-	1	M	-	-	1	M	1	1	-	S	-	47	M	-	1	3	M	1	-	3	M	-	-	3	M	1	1			
25	S	-	-	2	M	-	-	1	M	1	1	-	S	-	48	M	-	1	3	S	-	-	4	M	-	-	3	M	-	2			
26	M	2	-	1	M	-	-	1	S	1	1	1	S	-	49	S	-	1	4	M	-	1	3	M	-	-	3	M	-	2			
27	M	2	-	1	M	1	-	1	S	1	1	1	M	-	50	S	-	1	4	M	-	1	3	M	1	-	3	M	-	2			

AF = Type AF | AFCW = Type AFCW | AFP1 = Type AFP1 | AFP2 = Type AFP2 | S = AF short | M = AF medium

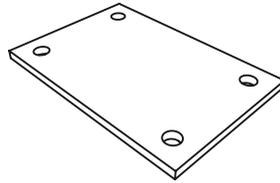
## Location and End Plates for Types AF, AAF and CF

These plates ensure the clamps and bolts are located in the correct position relative to the supporting steelwork. If you would like help choosing a suitable plate, please contact Lindapter.

### Location Plate

#### What is it?

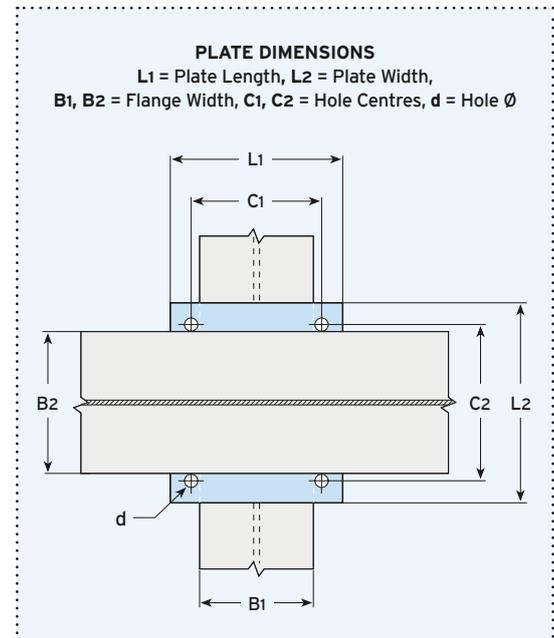
Location plates are simple fabricated items designed to sit between the two sections to be clamped together to ensure the bolts are fixed at the correct centres.



Material: Structural steel grade S355 JR, JO or J2.  
For other grades contact Lindapter.

Bolt Size	Hole Ø d mm	Plate Thickness		Hole Centres C1 mm	Length min L1 mm	Hole Centres C2 mm	Width min L2 mm
		8.8 mm	10.9 mm				
M12	14	10	12	B <sub>1</sub> + 14	B <sub>1</sub> + 90	B <sub>2</sub> + 14	B <sub>2</sub> + 90
M16	18	15	15	B <sub>1</sub> + 18	B <sub>1</sub> + 110	B <sub>2</sub> + 18	B <sub>2</sub> + 110
M20	22	20	20	B <sub>1</sub> + 22	B <sub>1</sub> + 150*	B <sub>2</sub> + 22	B <sub>2</sub> + 150*
M24	26	25	25	B <sub>1</sub> + 26	B <sub>1</sub> + 180	B <sub>2</sub> + 26	B <sub>2</sub> + 180

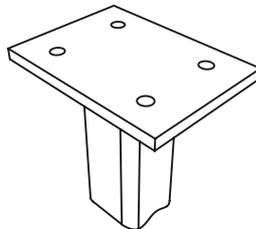
\* Plate length / width for Type AF size M20 can be reduced to 130mm if required.



### End Plate

#### What is it?

End plates are simple fabricated items that are pre-welded to support frames, bracket or sections, allowing connection to the supporting structure with standard Lindapter clamps.

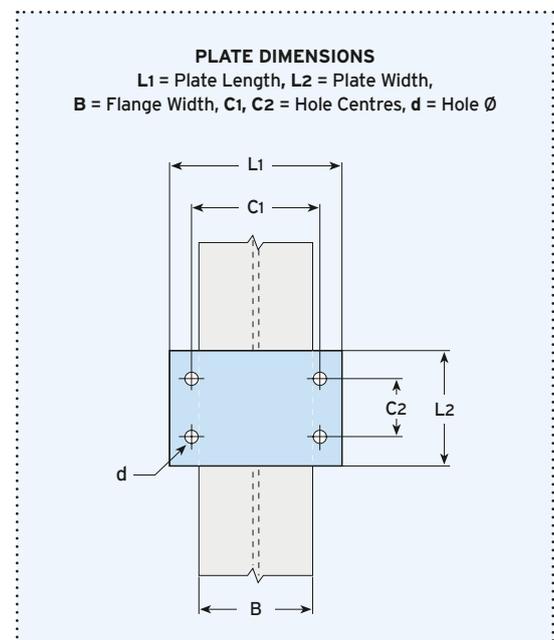


Material: Structural steel grade S355 JR, JO or J2.  
For other grades contact Lindapter.

Bolt Size	Hole Ø d mm	Plate Thickness <sup>1)</sup>		Hole Centres C1 mm	Length min L1 mm	Hole Centres min C2 mm	Width min L2 mm
		8.8 mm	10.9 mm				
M12	14	15	20	B + 14	B + 90	80	C <sub>2</sub> + 80
M16	18	20	25	B + 18	B + 110	100	C <sub>2</sub> + 100
M20	22	25	25	B + 22	B + 150*	180	C <sub>2</sub> + 180
M24	26	30	30	B + 26	B + 180	200	C <sub>2</sub> + 200

\* Plate length for Type AF size M20 can be reduced to 130 if required.

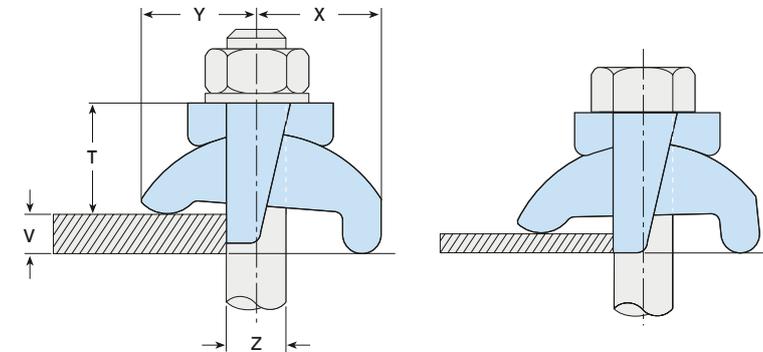
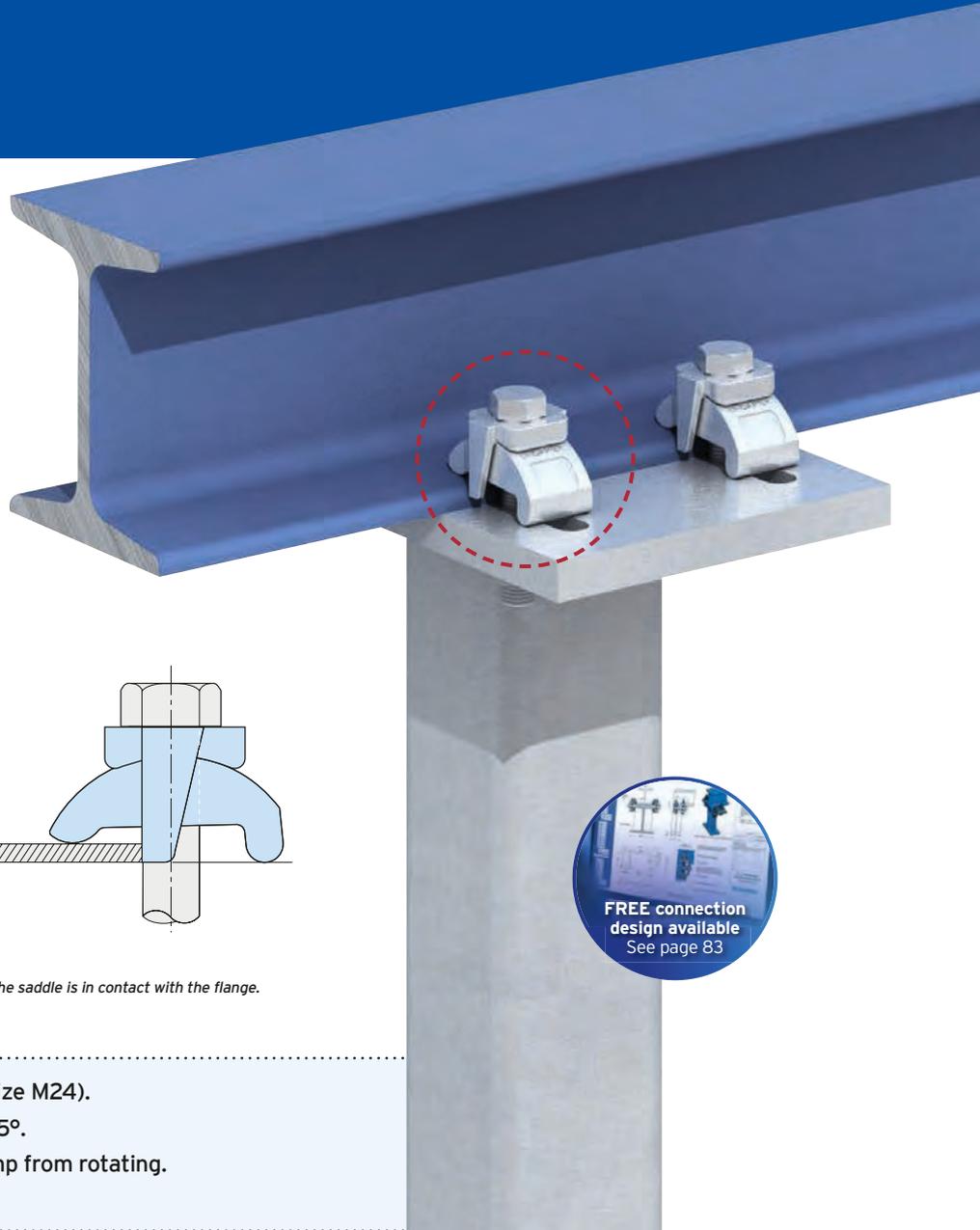
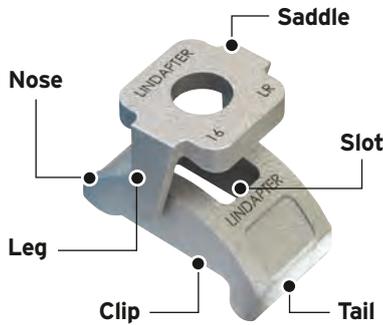
1) Depending on the type of connection and associated end plate use, the thickness may need to be modified to comply with accepted local design codes.



- To calculate the bolt length, add up the total distance that the bolt will pass through, plus half of the bolt diameter. Then round up the total to the nearest available bolt length. An example can be found on page 6.

# Type LR

A versatile, self-adjusting clamp designed to suit a range of flange thicknesses.



Note 1: When installing, ensure the straight (not tapered) leg of the saddle is in contact with the flange.  
 Note 2: Y, X and T will vary depending on the thickness of V.

- Clamping ranges from 3mm - 24mm (size M24).
- For parallel and tapered flanges up to 15°.
- The leg of the saddle prevents the clamp from rotating.
- The tail spans slotted clearance holes.

- Packings are available to increase the clamping range, see page 20.
- Location plate / end plate details can be found on page 21.

Material: Malleable iron, zinc plated or hot dip galvanised.

Product Code	Bolt 8.8 Z	Safe Working Loads (FOS 5:1)			Clamping Range V	Dimensions			Width with Saddle
		Tensile / 1 Bolt	Slip / 2 Bolts	Tightening Torque*		Y	X	T	
		kN	kN	Nm	mm	mm	mm	mm	mm
LR10	M10	1.5	-	20	3 - 10	21 - 24	24 - 26	21 - 24	33
LR12	M12	5.8	0.7	69	3 - 12	26 - 29	25 - 31	25 - 29	39
LR16	M16	7.3	1.5	147	3 - 16	30 - 35	34 - 37	30 - 36	46
LR20	M20	14.7	3.0	285	3 - 20	42 - 49	46 - 51	41 - 48	57
LR24	M24	19.7	4.5	491	3 - 24	47 - 57	52 - 58	44 - 54	76

\* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 70.

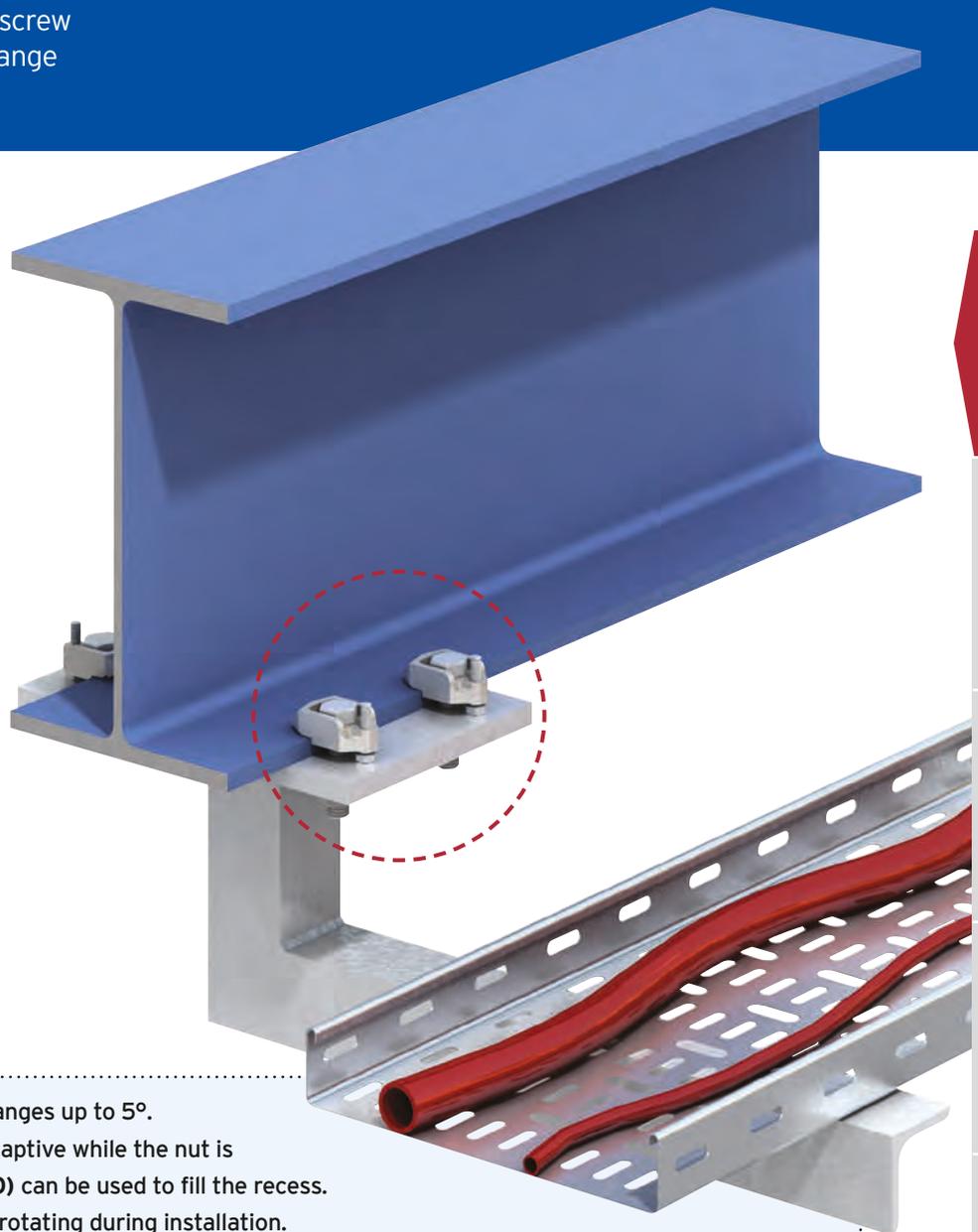
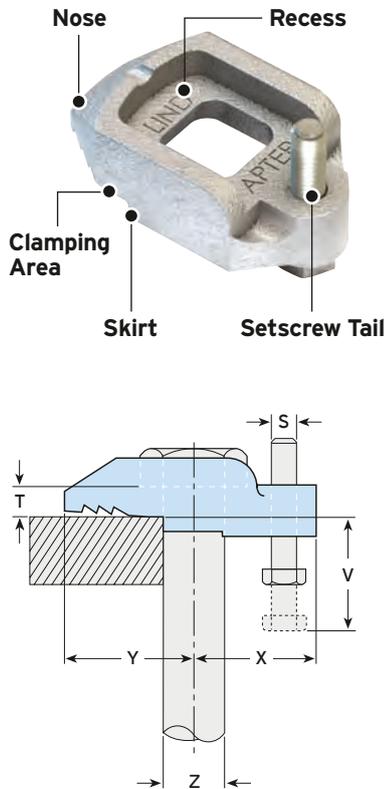
CE For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.006 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)



GIRDER CLAMPS  
RAIL FIXINGS  
LIFTING POINTS  
HOLLO-BOLT  
FLOOR FIXINGS  
SUPPORT FIXINGS  
DECKING FIXINGS

## Type D2

This clamp has an adjustable Setscrew Tail that can be adapted to fit a range of flange thicknesses.



- Suitable for parallel and tapered flanges up to 5°.
- Recessed top holds the bolt head captive while the nut is tightened. Type W washer (page 20) can be used to fill the recess.
- The skirt prevents the clamp from rotating during installation.

- Packings are available to increase the clamping range, see page 20.
- Location plate / end plate details can be found on page 21.

Material: Malleable iron, zinc plated or hot dip galvanised.



Product Code	Bolt 8.8 Z	Safe Working Loads (FOS 5:1)			Tightening Torque*		Dimensions				
		Tensile / 1 Bolt kN	Slip / 2 Bolts kN	Tightening Nm	Clamping Range		Y mm	X mm	S mm	T mm	Width mm
					V <sup>1)</sup> mm	V <sup>2)</sup> mm					
D210	M10	1.5	-	20	5 - 10	10 - 20	20	20	M6	5	26
D212	M12	5.8	0.7	69	5 - 10	10 - 22	26	25	M6	6	29
D216	M16	7.3	1.5	147	6.5 - 13	13 - 20	30	30	M8	8	35
D220	M20	14.7	3.0	285	8.5 - 17	17 - 24	36	35	M10	10	42

1) Setscrew (S) inserted from above.

2) Setscrew (S) inserted from below.

\* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 70.

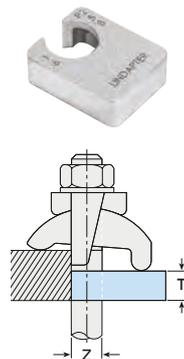
CE For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.007 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

# Packing Pieces for Types LR and D2

These packing pieces are compatible with the Types LR and D2 fixings and are used to increase the clamping range to suit a range of flange thicknesses. Please select the correct packing combination from the table below.

## Packing Pieces

### Type P1 long / Type P2 long

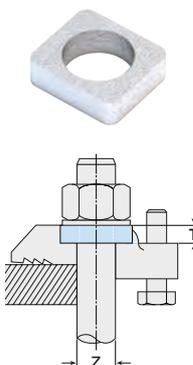


Mild steel, malleable iron, zinc plated or hot dip galv.

Product Code	Bolt Size Z	Dimension T (mm)
P1L10	M10	5
P1L12	M12	6
P1L16	M16	8
P1L20	M20	10
P1L24	M24	12
P2L10	M10	10
P2L12	M12	12
P2L16	M16	16
P2L20	M20	20
P2L24	M24	25

## Also Available

### Type W



Mild steel, zinc plated or hot dip galvanised.

Product Code	Bolt Size Z	Dimension T (mm)
W08	M8	4
W10	M10	5.5
W12	M12	6
W16	M16	8
W20	M20	10

Note: The Type W is used to fill the recess in the Type D2 to convert it into a flat top clamp to enable the bolt head or nut to be rotated on a hardened washer.

## Tail Length / Packing Combinations

### Packing Combinations for Type LR (Parallel flanges only)

Combinations			Clamping Range				
LR	P1L	P2L	M10 mm	M12 mm	M16 mm	M20 mm	M24 mm
1	-	-	3 - 10	3 - 12	3 - 16	3 - 20	3 - 24
1	1	-	8 - 15	9 - 18	11 - 24	13 - 30	15 - 36
1	-	1	13 - 20	15 - 24	19 - 32	23 - 40	27 - 48
1	1	1	18 - 25	21 - 30	27 - 40	33 - 50	39 - 60
1	-	2	23 - 30	27 - 36	35 - 48	43 - 60	51 - 72
1	1	2	28 - 35	33 - 42	43 - 56	53 - 70	63 - 84
1	-	3	33 - 40	39 - 48	51 - 64	63 - 80	75 - 96

### Packing Combinations for Type LR (For IPN-Beams of an 8° slope only)

IPN Profile mm	M10			M12			M16			M20			M24		
	LR	P1L	P2L												
80	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	1	-	-	1	-	-	-	-	-	-	-	-	-	-	-
120	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-
140	1	-	-	1	-	-	1	-	-	-	-	-	-	-	-
160	1	-	-	1	-	-	1	-	-	1	-	-	-	-	-
180	1	-	-	1	-	-	1	-	-	1	-	-	-	-	-
200	1	-	-	1	-	-	1	-	-	1	-	-	-	-	-
220	1	-	-	1	-	-	1	-	-	1	-	-	1	-	-
240	1	1	-	1	-	-	1	-	-	1	-	-	1	-	-
260	1	1	-	1	-	-	1	-	-	1	-	-	1	-	-
280	1	1	-	1	1	-	1	-	-	1	-	-	1	-	-
300	1	1	-	1	1	-	1	-	-	1	-	-	1	-	-
320	1	1	-	1	1	-	1	-	-	1	-	-	1	-	-
340	1	1	-	1	1	-	1	-	-	1	-	-	1	-	-
360	1	-	1	1	1	-	1	1	-	1	-	-	1	-	-
380	1	-	1	1	1	-	1	1	-	1	-	-	1	-	-
400	1	-	1	1	1	-	1	1	-	1	-	-	1	-	-
425	1	-	1	1	-	1	1	1	-	1	1	-	1	-	-
450	1	-	1	1	-	1	1	1	-	1	1	-	1	-	-
475	1	1	1	1	-	1	1	1	-	1	1	-	1	-	-
500	1	1	1	1	-	1	1	1	-	1	1	-	1	-	-
550	1	1	1	1	1	1	1	-	1	1	1	-	1	1	-
600	-	-	-	1	1	1	1	-	1	1	1	-	1	1	-

### Packing Combinations for Type D2 (Parallel flanges and beams of up to 5° slope)

Combinations			Clamping Range			
D2	P1L	P2L	M10 mm	M12 mm	M16 mm	M20 mm
1 <sup>1)</sup>	-	-	5 - 10	5 - 10	6.5 - 13	8.5 - 17
1	-	-	10 - 20	10 - 22	13 - 20	17 - 24
1	1	-	15 - 25	16 - 28	21 - 28	27 - 34
1	-	1	20 - 30	22 - 34	29 - 36	37 - 44
1	1	1	25 - 35	28 - 40	37 - 44	47 - 54
1	-	2	30 - 40	34 - 46	45 - 52	57 - 64
1	1	2	35 - 45	40 - 52	53 - 60	67 - 74
1	-	3	40 - 50	46 - 58	61 - 68	77 - 84

1) Setscrew inverted.

LR = Type LR P1L = Type P1 long P2L = Type P2 long

➔ For thicker flanges please contact Lindapter.

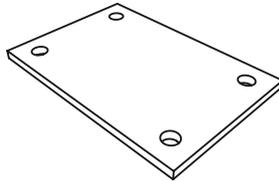
## Location and End Plates for Types LR and D2

These plates ensure the clamps and bolts are located in the correct position relative to the supporting steelwork. If you would like help with choosing a suitable plate, please contact Lindapter.

### Location Plate

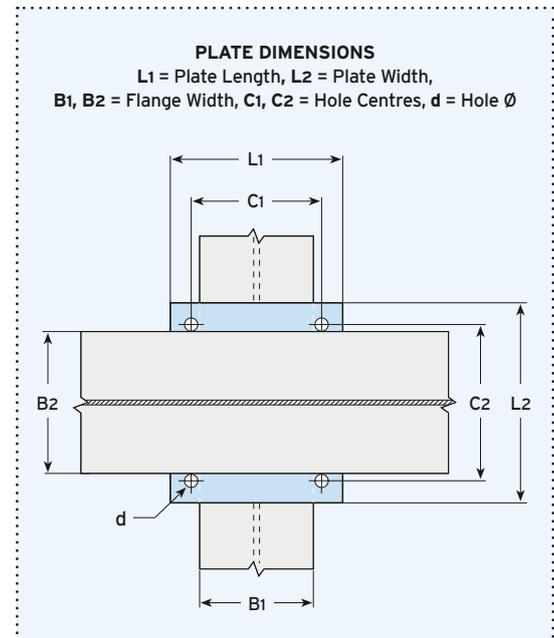
#### What is it?

Location plates are simple fabricated items designed to sit between the two sections to be clamped together to ensure the bolts are fixed at the correct centres.



Material: Structural steel grade S355 JR or JO.  
For other grades contact Lindapter.

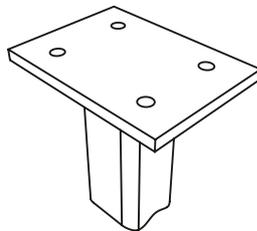
Bolt Size	Hole Ø d mm	Plate Thick. mm	Hole Centres C1 mm	Length min L1 mm	Hole Centres C2 mm	Width min L2 mm
M10	11	8	B1 + 11	B1 + 66	B2 + 11	B2 + 66
M12	14	10	B1 + 14	B1 + 81	B2 + 14	B2 + 81
M16	18	15	B1 + 18	B1 + 105	B2 + 18	B2 + 105
M20	22	20	B1 + 22	B1 + 132	B2 + 22	B2 + 132
M24	26	20	B1 + 26	B1 + 156	B2 + 26	B2 + 156



### End Plate

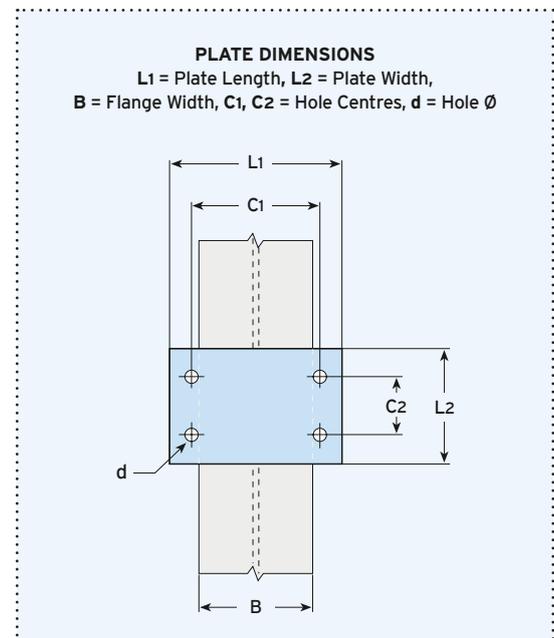
#### What is it?

End plates are simple fabricated items that are pre-welded to support frames, bracket or sections, allowing connection to the supporting structure with standard Lindapter clamps.



Material: Structural steel grade S355 JR or JO.  
For other grades contact Lindapter.

Bolt Size	Hole Ø d mm	Plate Thick. <sup>1)</sup> mm	Hole Centres C1 mm	Length min L1 mm	Hole Centres C2 mm	Width min L2 mm
M10	11	8	B + 11	B + 66	70	C2 + 50
M12	14	10	B + 14	B + 81	80	C2 + 60
M16	18	15	B + 18	B + 105	100	C2 + 70
M20	22	20	B + 22	B + 132	120	C2 + 90
M24	26	20	B + 26	B + 156	150	C2 + 110



1) Depending on the type of connection and associated end plate use, the thickness may need to be modified to comply with accepted local design codes.

- To calculate the bolt length, add up the total distance that the bolt will pass through, plus half of the bolt diameter. Then round up the total to the nearest available bolt length. An example can be found on page 6.

## Type LS

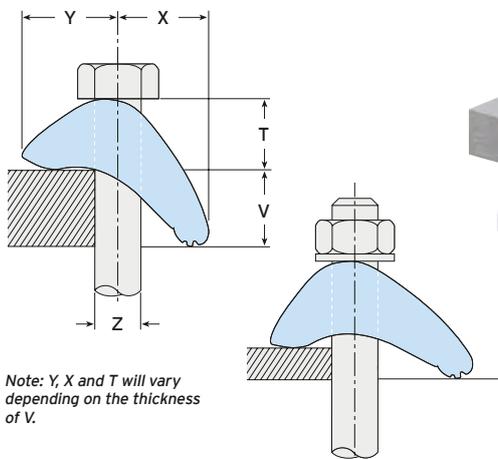
Providing excellent corrosion resistance, Lindapter's stainless steel clamp self-adjusts to suit a range of flange thicknesses.

Nose



STAINLESS  
STEEL  
Grade 316

Tail



Note: Y, X and T will vary depending on the thickness of V.



- Made from high strength stainless steel grade 316.
- Self-adjusts to suit 3mm - 30mm flange thicknesses (size M20).
- For parallel and tapered flanges up to 10°.
- The tail spans slotted clearance holes.

➤ Packings are available to increase the clamping range, see page 23.

➤ Location plate / end plate details can also be found on page 23.

Material: Cast stainless steel grade 316.



Product Code	Bolt A4-70 Z	Safe Working Loads			Tightening Torque*	Clamping Range V mm	Dimensions			Width mm
		Tensile / 1 Bolt (FOS 5:1) kN	Slip <sup>1)</sup> / 2 Bolts (FOS 2:1) kN	Y mm			X mm	T mm		
LS10	M10	3.0	1.5	40	3 - 15	17 - 19	18 - 24	16 - 21	38	
LS12	M12	7.0	2.0	80	3 - 20	16 - 22	18 - 29	17 - 23	40	
LS16	M16	10.0	3.0	200	3 - 25	22 - 25	27 - 37	20 - 28	55	
LS20	M20	18.0	5.0	400	3 - 30	24 - 31	25 - 42	23 - 32	60	

1) Slip resistant values calculated against movement exceeding 0.1mm.

\* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 70.



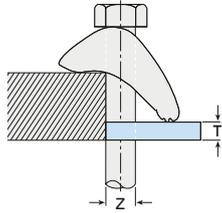
For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.008 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

## Packing Pieces and Plate Details for Type LS

Stainless steel packing pieces are available to increase the clamping range of the Type LS, please select the correct packing combination from the table below. This page also contains information for designing location / end plates.

### Packing Pieces

Type  
LSP2



Material: Stainless steel grade 316.

Product Code	Bolt Size Z	Dimension T (mm)
LS10P2	M10	10
LS12P2	M12	10
LS16P2	M16	10
LS20P2	M20	10

### Packing Combinations for Type LS

Choose the correct combination for your configuration using the table below. Please note these calculations are for **parallel flanges and beams up to 10° slopes only**. For example, a size M20 Type LS on a 42mm flange requires 2 x Type LSP2.

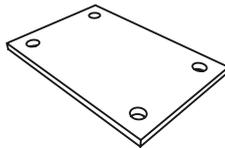
Combinations		Clamping Range			
LS	LSP2	M10 mm	M12 mm	M16 mm	M20 mm
1	-	3 - 15	3 - 20	3 - 25	3 - 30
1	1	13 - 25	13 - 30	13 - 35	13 - 40
1	2	23 - 35	23 - 40	23 - 45	23 - 50

➔ For thicker flanges please contact Lindapter.

### Location Plate

What is it?

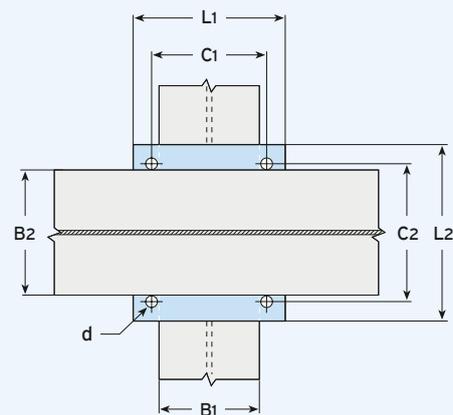
Location plates are simple fabricated items designed to sit between the two sections to be clamped together to ensure the bolts are fixed at the correct centres.



Material: Stainless steel grade 304 / 316.

Bolt Size	Hole Ø	Plate Thick.	Hole Centres	Length		Width	
				min L1 mm	C2 mm	min L2 mm	B2 + 70
M10	11	10	B1 + 11	B1 + 70	B2 + 11	B2 + 70	
M12	14	12	B1 + 14	B1 + 80	B2 + 14	B2 + 80	
M16	18	15	B1 + 18	B1 + 100	B2 + 18	B2 + 100	
M20	22	20	B1 + 22	B1 + 130	B2 + 22	B2 + 130	

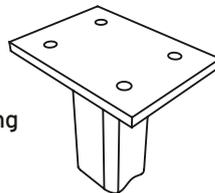
PLATE DIMENSIONS: L1 = Plate Length, L2 = Plate Width, B1, B2 = Flange Width, C1, C2 = Hole Centres, d = Hole Ø



### End Plate

What is it?

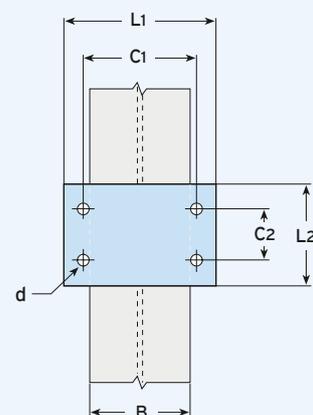
End plates are simple fabricated items that are pre-welded to support frames, bracket or sections, allowing connection to the supporting structure with standard Lindapter clamps.



Material: Stainless steel grade 304 / 316.

Bolt Size	Hole Ø	Plate Thick. <sup>1)</sup>	Hole Centres	Length		Width	
				min L1 mm	min C2 mm	min L2 mm	C2 + 90
M10	11	10	B + 11	B + 70	80	C2 + 60	
M12	14	15	B + 14	B + 80	80	C2 + 60	
M16	18	20	B + 18	B + 100	110	C2 + 80	
M20	22	25	B + 22	B + 130	120	C2 + 90	

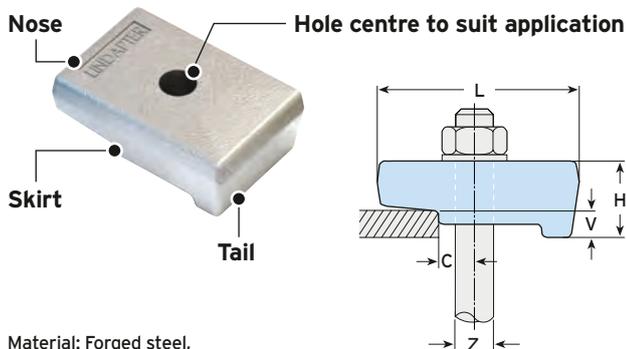
PLATE DIMENSIONS: L1 = Plate Length, L2 = Plate Width, B = Flange Width, C1, C2 = Hole Centres, d = Hole Ø



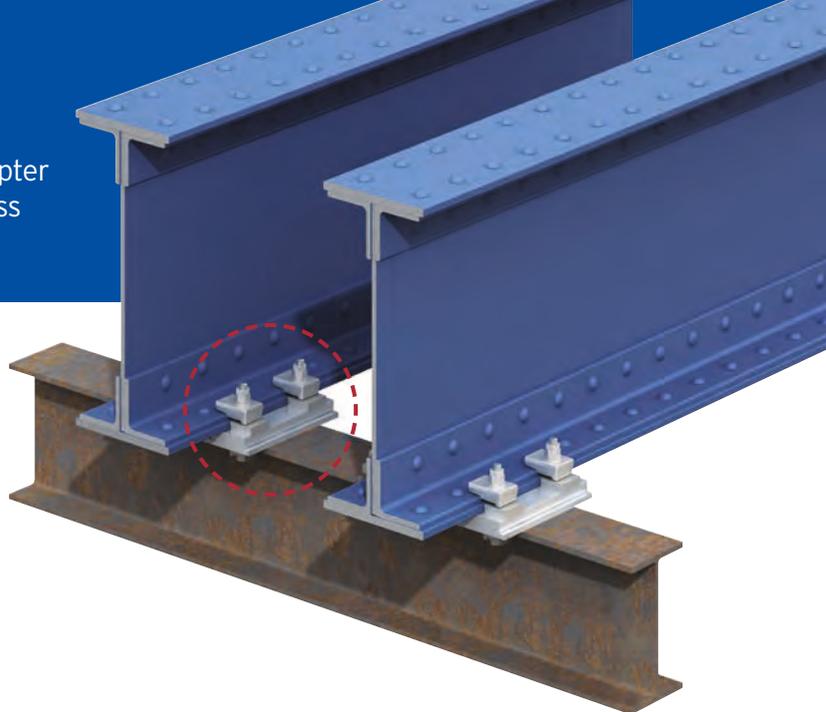
1) Depending on the type of connection and associated end plate use, the thickness may need to be modified to comply with accepted local design codes.

## Type RC

Customised position of hole centre, drilled by Lindapter to suit the application. For flanges of 10mm thickness or greater, either parallel or tapered up to 5°.



Material: Forged steel, corrosion protection as required.



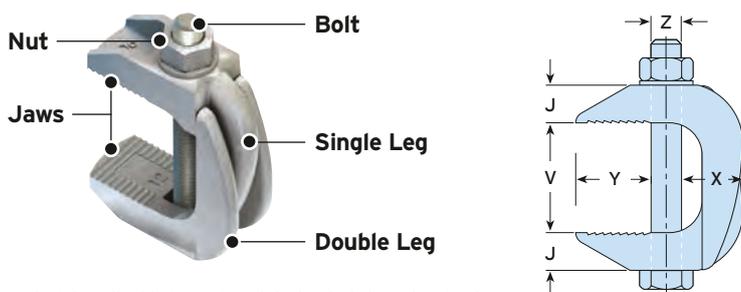
Product Code	Bolt 8.8 Z	Safe Working Loads		Tightening Torque*	Tail Length V	Dimensions			
		Tensile / 1 Bolt (FOS 5:1)	kN			Nm	mm	C	L
RCS12	M12	2.6	69	10	6.5 - 26.5	76	29	50	
RCS16	M16	4.0	147	10	9 - 24	76	29	50	
RCS20	M20	9.6	285	10	11 - 22	76	29	50	
RCS24	M24	12.3	491	10	13 - 20	76	29	50	

\* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 70.

➔ Contact Lindapter to ensure suitability of the component for application.

## Type F9

A flange clamp for connecting parallel running steel sections with flanges of the same width. Can be used with bolts or threaded rod.



Material: Malleable iron, zinc plated or hot dip galvanised.



Product Code		Bolt 8.8 Z	Safe Working Loads		Tightening Torque*	Clamping Range V	Dimensions			
with Bolt	without Bolt		Tensile / 1 Bolt (FOS 5:1)	kN			Nm	mm	Y	J
F910NC	F910NB	M10	2.0	20	19 - 42	25	13	19	24	
F912NC	F912NB	M12	2.8	39	26 - 60	35	17	24	30	
F916NC	F916NB	M16	5.6	93	29 - 69	43	21	28	35	
F920NC	F920NB	M20	8.4	177	32 - 82	51	25	35	44	
F924NCHDG <sup>1)</sup>	F924NBHDG <sup>1)</sup>	M24	14.0	235	45 - 95	76	38	55	63	

<sup>1)</sup> Available in hot dip galvanised only.

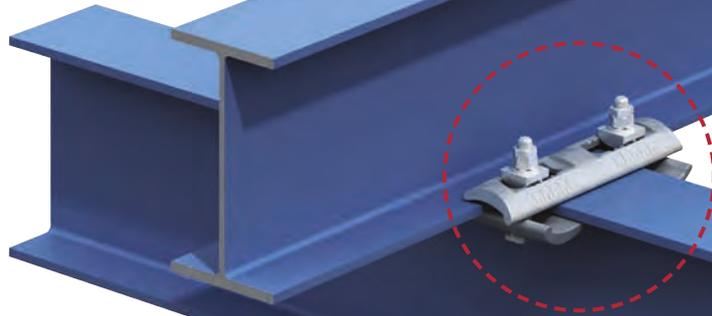
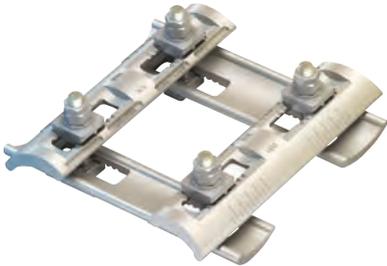
\* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 70.

➔ Not suitable for tapered flanges.

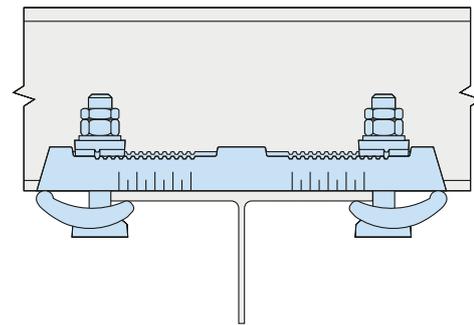
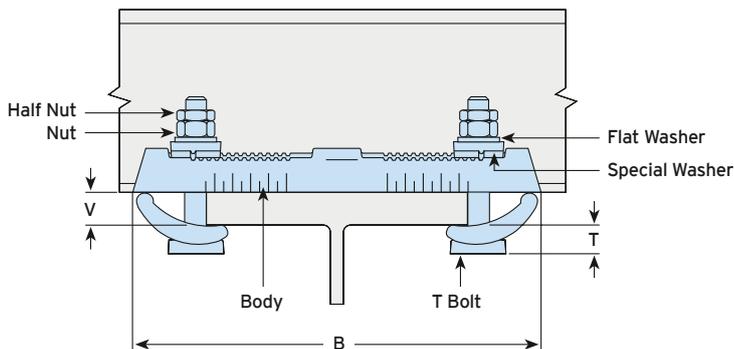
CE For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.010 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

## Type FC - Flush Clamp

A full connection system that adjusts to fit a variety of beam types. This pre-configured assembly does not require a location plate and is ready for assembly 'out of the box'.



- 'All-in-one' device for connecting steel sections.
- Adjustable to suit both beam width and flange thickness.
- Quick and easy to install.
- For parallel and tapered flanges up to 10°.



Material: Forged steel, zinc plated plus JS500.



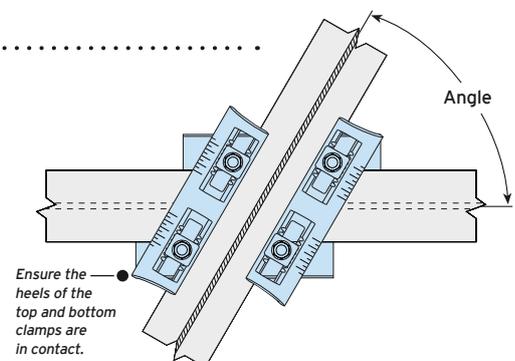
Product Code	T Bolt 8.8	Safe Working Loads (FOS 5:1)			Clamping Range		Dimensions	
		Tensile / 4 Bolts kN	Slip / 4 Bolts kN	Tightening Torque* Nm	Flange Thickness V mm	Flange Width <sup>1)</sup> mm	T mm	B mm
FC16	M16	30.0	7.5	147	5 - 19	75 - 180	22 - 27	304

<sup>1)</sup> Depending on beam connection angles (see table below).

\* Torque figures based on bolts / setscrews in an unlubricated condition (as supplied). For further information on lubricated fasteners see page 70.

### Minimum Possible Beam Connection Angles

		Top Beam				
Bottom Beam	Flange Width	76.2mm	101.6mm	127.0mm	152.4mm	177.8mm
		76.2mm	45°	50°	55°	65°
	101.6mm	50°	50°	55°	65°	75°
	127.0mm	55°	55°	55°	65°	75°
	152.4mm	65°	65°	65°	65°	75°
	177.8mm	75°	75°	75°	75°	80°

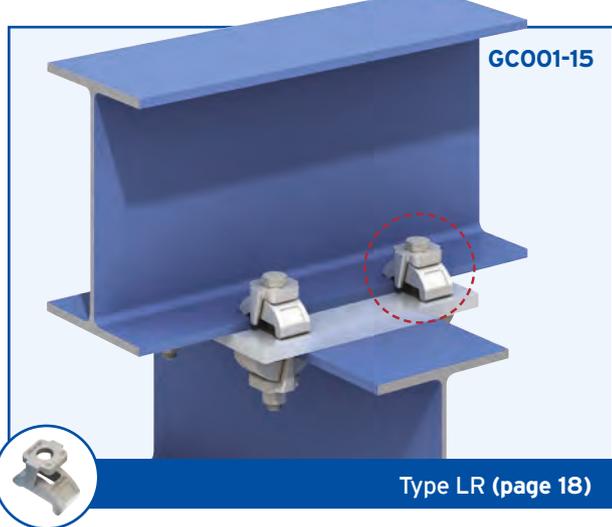
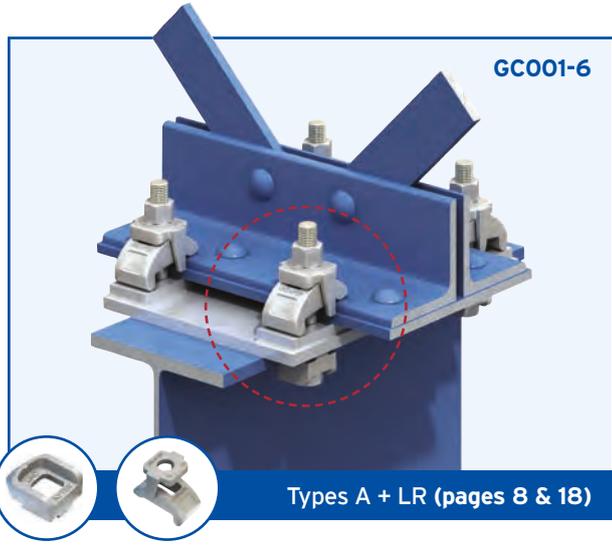
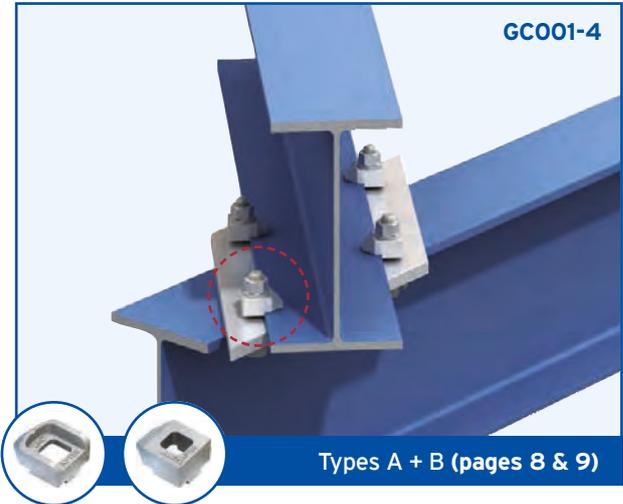
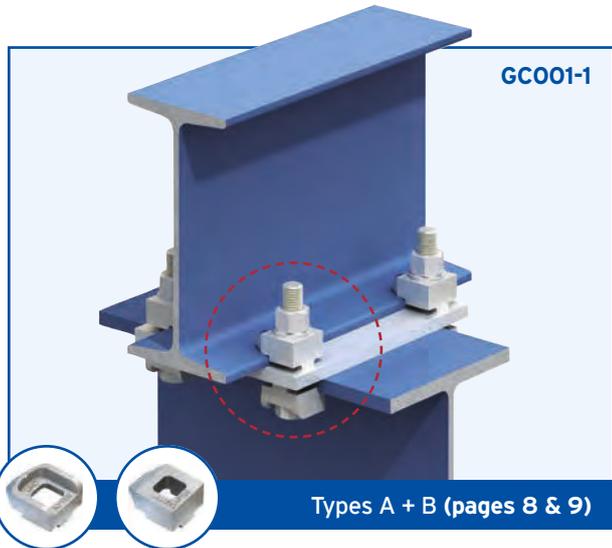


CE For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.012 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

## Typical Applications for Girder Clamps

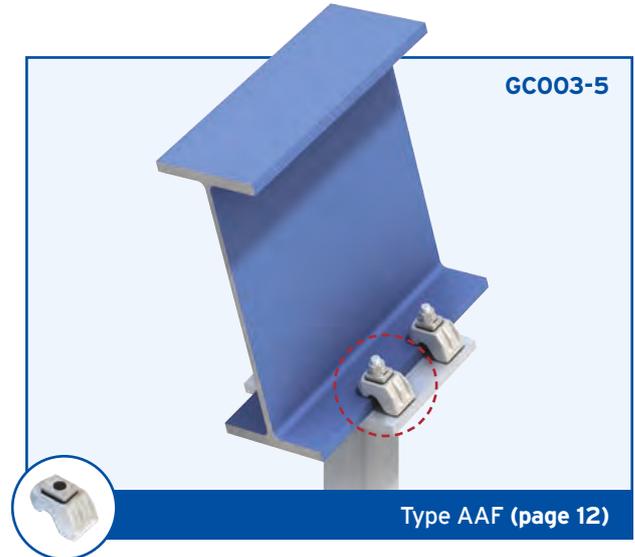
Popular connection assemblies are shown below. They represent a fraction of the possibilities as Lindapter's clamps are used all over the world to connect almost every type of steel section. Visit the website for more examples or contact Lindapter to discuss your connection requirement.

GIRDER CLAMPS  
 RAIL FIXINGS  
 LIFTING POINTS  
 HOLLO-BOLT  
 FLOOR FIXINGS  
 SUPPORT FIXINGS  
 DECKING FIXINGS



## Typical Applications for Girder Clamps

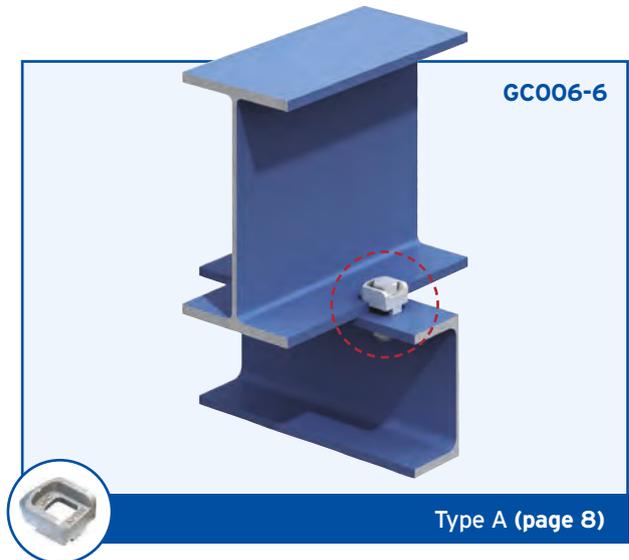
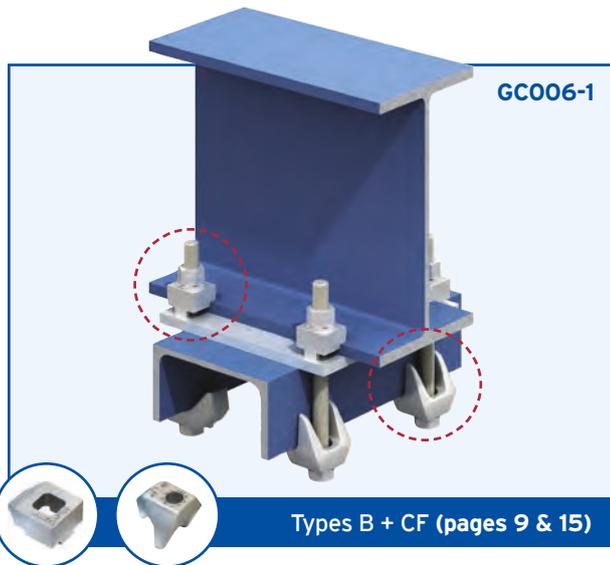
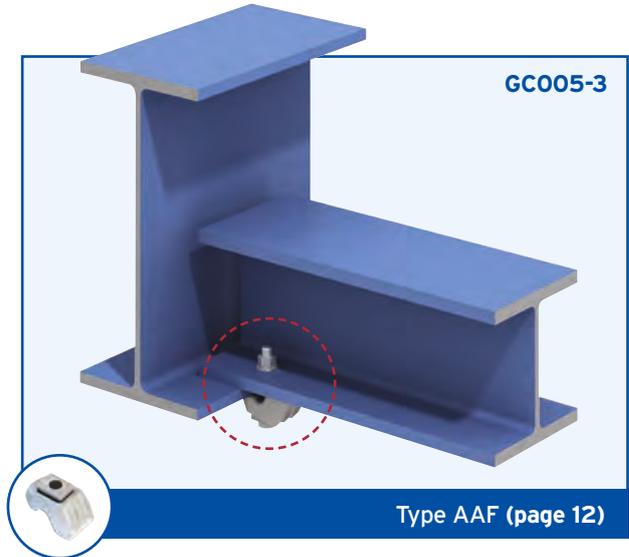
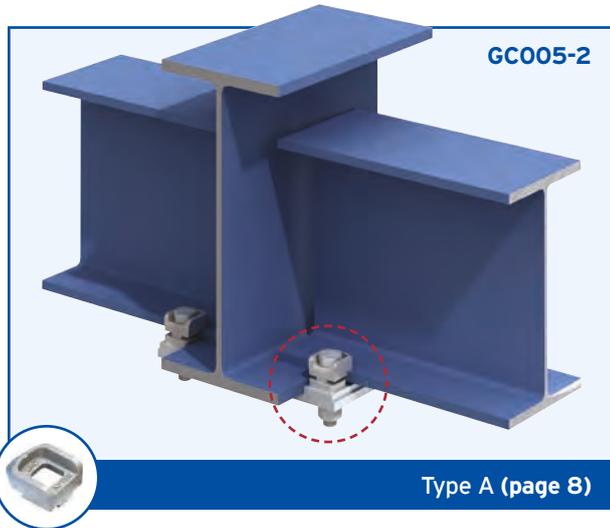
Examples of popular connection arrangements are continued below.



# Typical Applications for Girder Clamps

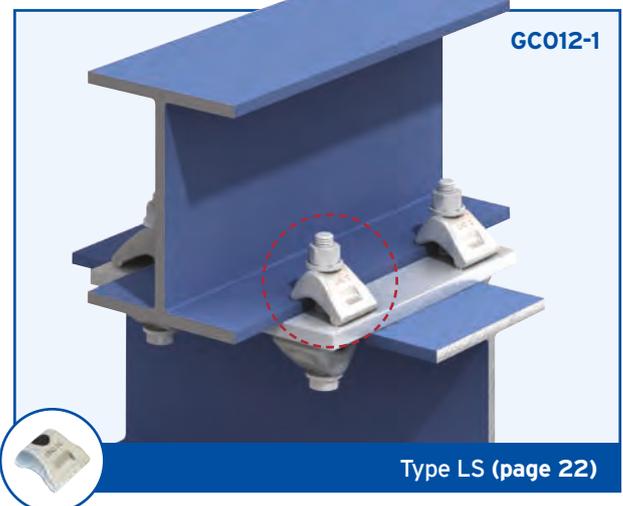
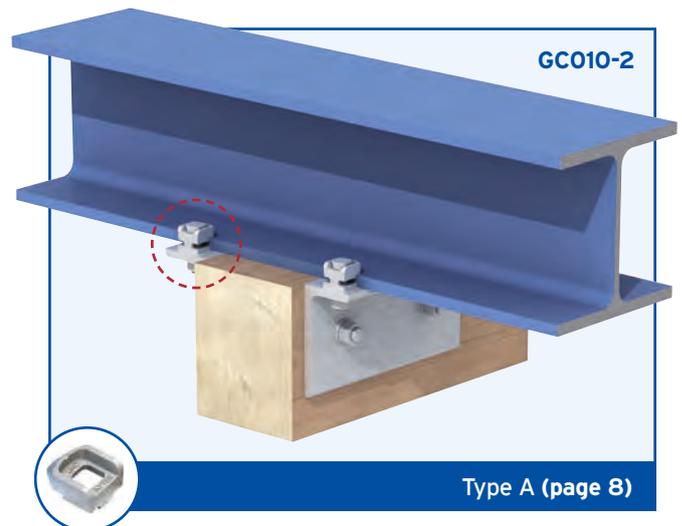
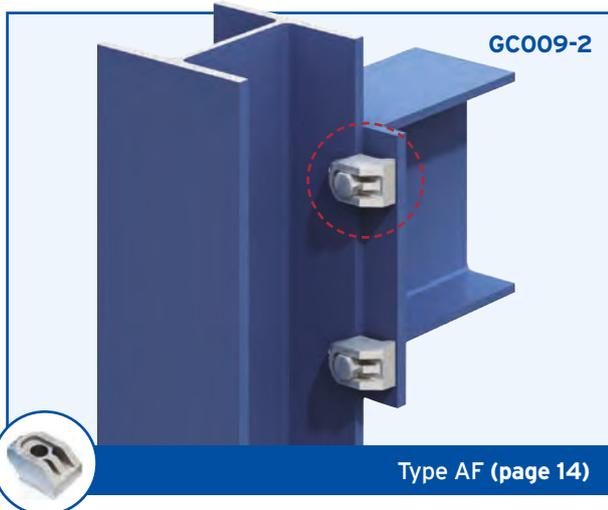
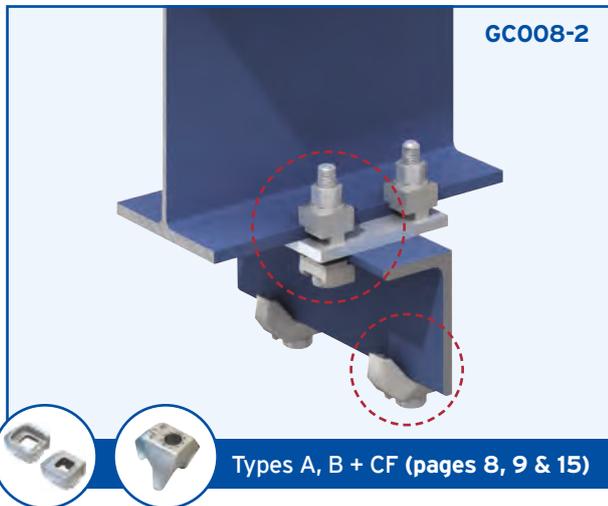
More examples of popular connection assemblies are shown below.

GIRDER CLAMPS  
RAIL FIXINGS  
LIFTING POINTS  
HOLLO-BOLT  
FLOOR FIXINGS  
SUPPORT FIXINGS  
DECKING FIXINGS



## Typical Applications for Girder Clamps

Examples of popular connection arrangements are continued below.  
Contact Lindapter to discuss your connection requirement.



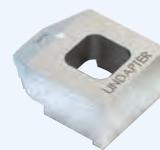


The popular Type HD provides lateral adjustability to allow the quick and precise alignment of rails (see page 32).

# Rail Fixings

For securing rails or crane lines in low speed applications such as ground track, elevated rail and overhead gantries. These fixings are used in a wide range of environments including, train maintenance depots, industrial facilities, water treatment plants, dam/dockside cranes, automated warehouses and power stations.

**Type BR**  
page 31

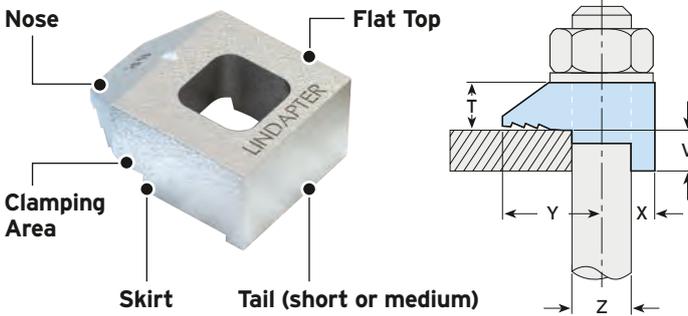


**Type HD**  
pages 32 - 33



# Type BR

A basic clamp for securing low speed rail or steel beams with either parallel or tapered flanges up to 8°. The tail is available in two lengths and spans slotted clearance holes.



Material: Malleable iron, zinc plated or hot dip galvanised.

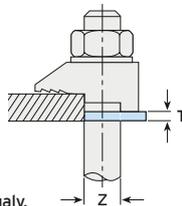
Product Code	Bolt 8.8 Z	Standard Loads (FOS 5:1)			Reduced Loads (FOS 5:1) (not suitable for slip conditions)		Dimensions					
		Tensile / 1 Bolt kN	Slip / 2 Bolts kN	Tightening Torque* Nm	Tensile / 1 Bolt kN	Tightening Torque* Nm	Y mm	X mm	Tail Length V		T mm	Width mm
									short mm	medium mm		
BR12	M12	5.8	0.7	69	3.7	39	26	13	4	6	13	29
BR16	M16	7.3	1.5	147	5.2	93	30	16	6	8	16	35
BR20	M20	14.7	3.0	285	8.6	177	36	19	7	10	19	42

\* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 70.

- Contact Lindapter to ensure suitability of the component for application.
- Please ensure the anchor device is suitable for the torque value shown above.

## Packing Pieces and Combinations for Type BR

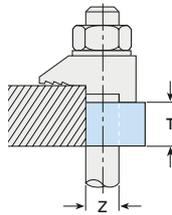
### Type CW



Mild steel, zinc plated or hot dip galv.

Product Code	Bolt Size Z	Dimension T (mm)
CW12	M12	2.5
CW16	M16	3
CW20	M20	4

### Type P1 short / Type P2 short



Mild steel, malleable iron, zinc plated or hot dip galv.

Product Code	Bolt Size Z	Dimension T (mm)
P1S12	M12	6
P1S16	M16	8
P1S20	M20	10
P2S12	M12	12
P2S16	M16	16
P2S20	M20	20

### Packing Combinations for Type BR (For rails up to and including 8° slope)

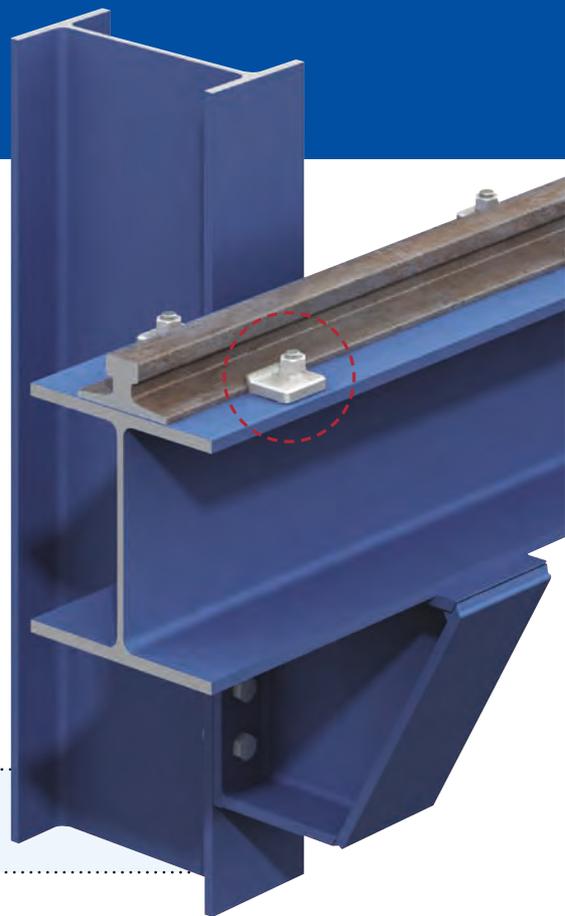
➤ For thicker flanges please contact Lindapter.

Flange Thickness mm	M12				M16				M20			
	BR	CW	P1S	P2S	BR	CW	P1S	P2S	BR	CW	P1S	P2S
5	S	-	-	-	-	-	-	-	-	-	-	-
6	M	-	-	-	S	-	-	-	-	-	-	-
7	S	1	-	-	S	-	-	-	S	-	-	-
8	M	1	-	-	M	-	-	-	S	-	-	-
9	S	2	-	-	S	1	-	-	S	-	-	-
10	S	2	-	-	S	1	-	-	M	-	-	-
11	M	2	-	-	M	1	-	-	S	1	-	-
12	M	-	1	-	S	2	-	-	S	1	-	-
13	S	1	1	-	S	2	-	-	S	1	-	-
14	M	1	1	-	S	-	1	-	M	1	-	-
15	S	2	1	-	S	-	1	-	S	2	-	-
16	S	2	1	-	M	-	1	-	S	2	-	-
17	M	2	1	-	S	1	1	-	S	-	1	-
18	M	2	1	-	S	1	1	-	M	2	-	-
19	S	1	-	1	M	1	1	-	S	3	-	-
20	M	1	-	1	S	2	1	-	M	-	1	-
21	M	1	-	1	S	2	1	-	M	-	1	-
22	S	-	1	1	S	-	-	1	M	3	-	-
23	M	2	-	1	M	-	-	1	M	3	-	-
24	M	-	1	1	M	-	-	1	M	1	1	-
25	S	1	1	1	S	1	-	1	S	2	1	-
26	M	1	1	1	S	1	-	1	S	2	1	-
27	S	2	1	1	M	1	-	1	S	-	-	1
28	S	-	-	2	S	2	-	1	M	2	1	-
29	S	-	-	2	S	2	-	1	M	2	1	-
30	M	-	-	2	M	2	-	1	M	-	-	1
31	S	1	-	2	M	2	-	1	S	1	-	1

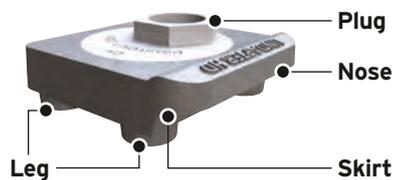
S = BR short M = BR medium CW = Type CW P1S = P1 short P2S = P2 short

# Type HD

This convenient fixing provides lateral adjustability for fast and precise rail alignment in low speed applications.



## Type HD Soft



## Type HD Spring



## Type HD Hard



## Type HD Isolated



- Suitable for all rails with tapered flanges and crane speeds up to 60m/min.
- Safely and easily secures rail using only hand tools.

- Contact Lindapter for wheel loads above 400kN or lateral loads higher than wheel loads.
- Please contact Lindapter to ensure suitability of component for application.

## Type HD Product Comparison

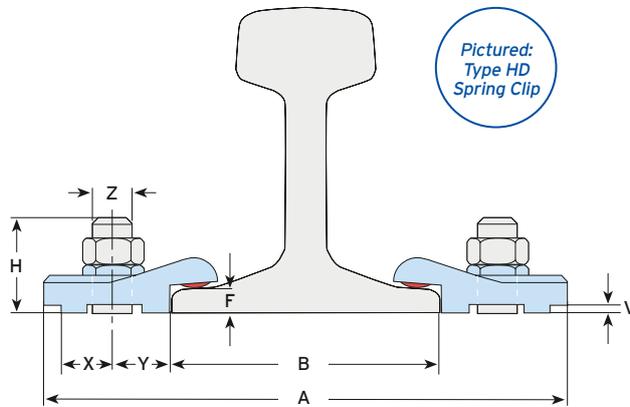
The table below shows the four options available. Each product has specific properties, e.g. a nylon insulator supplied with the Type HD Isolated will allow the product to be electrically isolated from the rails. Contact Lindapter for more information.

	<b>Type HD Soft</b> Allows rail wave Codes: HD20S / HD24S	<b>Type HD Hard</b> Clamps the rail down tightly Codes: HD20H / HD24H	<b>Type HD Spring</b> Includes an elastomer spring Codes: HD20SP / HD24SP	<b>Type HD Isolated</b> Supplied with nylon insulator Codes: HD20SPOR / HD24SPOR
Precise lateral adjustability	✓	✓	✓	✓
High strength SG Iron material	✓	✓	✓	✓
Various corrosion protection options	✓	✓	✓	✓
High resistance to lateral loads	✓	✓	✓	✓
Allows vertical rail / rail wave movement	✓	-	✓*	-
Electrically isolated from the rail	-	-	-	✓
Reduces track running noise	-	-	✓	-
Suitable for use with a resilient pad	✓	-	✓	✓

\* The elastomer spring with a Shore A hardness of 90-97 provides some vertical restraint to the rail while still allowing it to lift with rail wave.

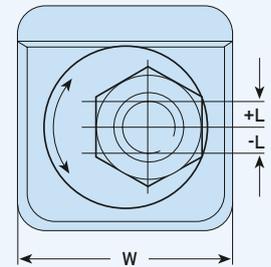
## Type HD Technical Data

Type HD is suitable for all rails with tapered flanges and crane speeds up to 60 metres per minute. Please contact Lindapter for wheel loads above 400kN or lateral loads higher than wheel loads.

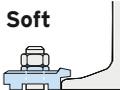
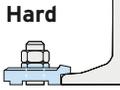


### Lateral Adjustability

The rotatable plug allows lateral adjustment (L) towards and away from the rail. Before installing, ensure the hexagon on the plug is at the 3 o'clock position (as shown).



Material: SG iron, corrosion protection as requested.

Clip Type	Product Code	Bolt 8.8 Z	Normal Lateral Conditions		High Lateral Conditions		Leg Length <sup>3)</sup>		Dimensions		Distances <sup>1)</sup>		Width
			SWL (FOS 4:1) kN	Tight. Torque* Nm	SWL (FOS 4:1) kN	Tight. Torque* Nm	V mm	H mm	Lateral Adjust. L mm	Plate Width min. A mm	Y mm	X mm	
 Soft	HD20S	M20	22.5	185	46.0	450	F - 4	F + 40	+/- 11.5	B + 137	30	27	74
	HD24S	M24	40.0	320	60.0	760	F - 4	F + 43	+/- 8	B + 130	30	27	74
 Hard	HD20H <sup>2)</sup>	M20	22.5	185	46.0	450	F - 8	F + 38	+/- 11.5	B + 137	30	27	74
	HD24H <sup>2)</sup>	M24	40.0	320	60.0	760	F - 8	F + 41	+/- 8	B + 130	30	27	74
 Spring	HD20SP	M20	22.5	185	46.0	450	F - 7	F + 40	+/- 11.5	B + 137	30	27	74
	HD24SP	M24	40.0	320	60.0	760	F - 7	F + 43	+/- 8	B + 130	30	27	74
 Isolated	HD20SPOR	M20	22.5	185	46.0	450	F - 6	F + 42	+/- 11.5	B + 147	35	27	74
	HD24SPOR	M24	40.0	320	60.0	760	F - 6	F + 45	+/- 8	B + 140	35	27	74

1) Based on plug set at 3 o'clock position.

2) Not suitable for use with a resilient pad.

3) Please specify the required leg length (V) when ordering. If you are using the resilient pad, increase the leg length and stud length (H) by the thickness of the pad.

\* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 70.



### How to install...

- 1) Position the HD clip on the bolt or stud, ensuring the plug is at the 3 o'clock position, place a hexagon nut and loosely tighten.
- 2) Rotate the plug in a clockwise direction to locate the clip against the rail. Laterally adjust the rail if required.
- 3) Tighten the hexagon nut to the recommended torque.

 Watch the installation video at [www.Lindapter.com](http://www.Lindapter.com)





The versatile Type ALP not only provides lateral adjustability, it also adjusts to suit different beam sizes and the orientation of the lift (see page 36).

# Lifting Points

Lindapter's lifting points are used in a variety of industries to support the lifting and rigging of heavy equipment. Applications vary from suspending overhead audio-visual kit in theatres to lifting drilling risers onto offshore oil platforms.

**Type ALP  
(Standard)**  
page 36



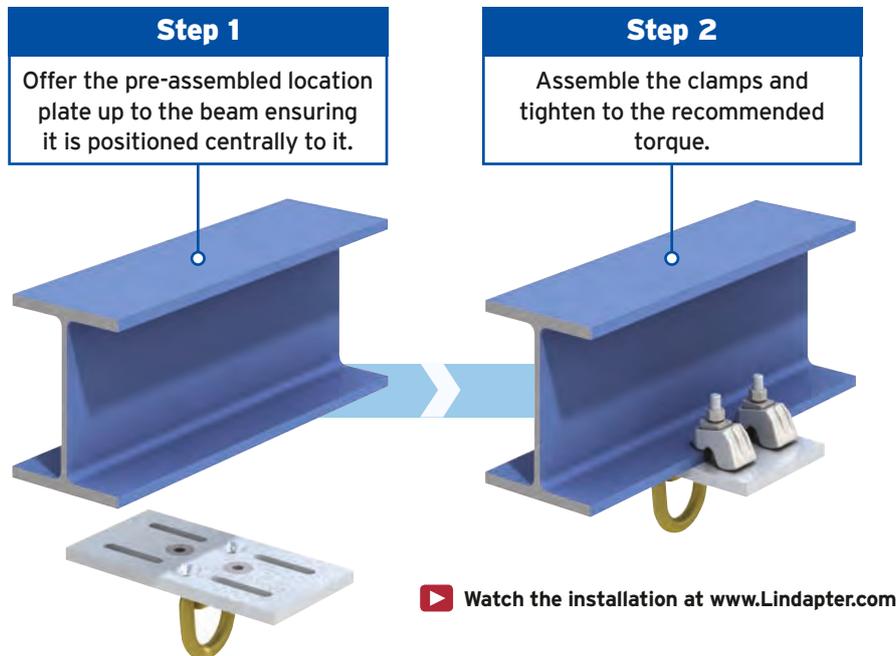
**Type LP  
(Bespoke)**  
page 37



## Lifting Point Configuration

Lindapter manufactures Lifting Points that are configured with adjustable, high strength components to suit heavy loads up to 200kN SWL. Take advantage of the Free Connection Design service for advice on the best solution for your connection.

### Quick and easy to install



### 6 REASONS TO USE

- 1) Quick and easy to install using standard hand tools.
- 2) Easy to align / reposition.
- 3) Maximum safe working load up to 200kN (Type LP).
- 4) For parallel and tapered flanges up to 10°.
- 5) Utilises Lindapter clamps approved by TÜV.
- 6) Free Connection Design service available.

Email [support@Lindapter.com](mailto:support@Lindapter.com) your connection details and Lindapter's experienced Engineers will do the rest!

### STANDARD

#### Type ALP

Ideal for most applications up to 3t (29.4kN), this assembly self-adjusts to suit a range of flange thicknesses. For further convenience, the slotted holes in the location plate allow the clamp to adapt to different beam widths, often allowing contractors to use just one type of lifting point throughout a project. Lindapter's standard lifting point is immediately available off-the-shelf.

See the Type ALP and its components in more detail on [page 36](#).



### BESPOKE

#### Type LP

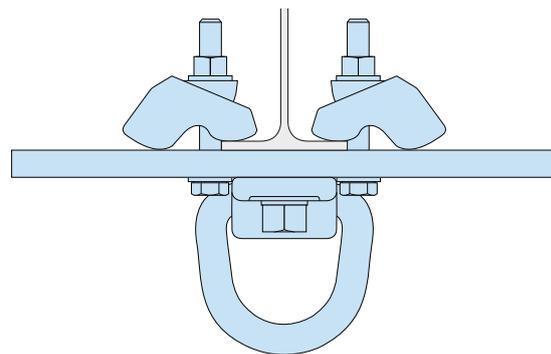
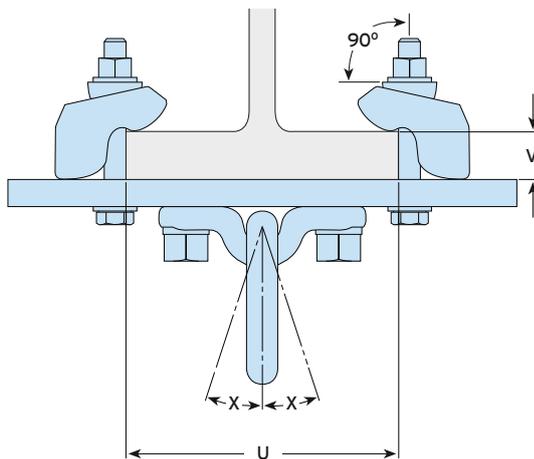
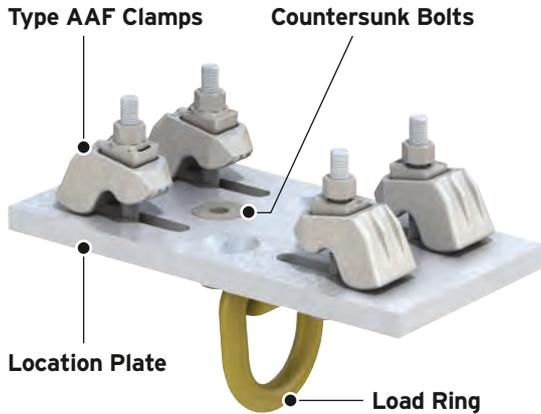
For large steel sections or loads up to 200kN, Lindapter manufactures custom-made solutions for specific application requirements. Whatever the application, Lindapter's durable products are valued for their quality and reliability, and provide contractors with a safe, quick and convenient lifting system.

See the Type LP and its components in more detail on [page 37](#).



# Type ALP

Lindapter's standard rigging and lifting solution adjusts to suit the beam width, flange thickness and orientation of the lift. Safely supports loads up to three metric tonnes.



- Available 'off-the-shelf' with a safe working load up to 3t (29.4kN).
- Large load ring can be set to suit the lift orientation.
- Adjusts to suit different sized beams and can be easily repositioned.
- Suitable for parallel and tapered beams up to 10°.

- Suitable for static loads only.
- Lifting Points must be regularly inspected to ensure safe operation.
- Safe Working Loads subject to the capacity of the supporting section.

Material: Type AAF clamps (low temperature SG iron, hot dip galvanised), Location Plate (mild steel, hot dip galvanised) and Load Ring (forged steel, painted).

Product Code	Torque Figures*				Clamping Range		Safe Working Loads (FOS 4:1)	Max Angle of Load X
	Load Ring Countersunk Bolts		Type AAF Set Screws		Flange Thickness V	Beam Width U		
	10.9 Bolt	Torque Nm	8.8 Bolt	Torque Nm				
ALP 3T-1	M16	100	M12	90	5 - 26	70 - 210	3t (29.4kN)	18°
ALP 3T-2	M16	100	M12	90	5 - 26	190 - 330	3t (29.4kN)	18°
ALP 3T-3	M16	100	M12	90	5 - 26	310 - 450	3t (29.4kN)	18°

\* Torque figures based on bolts / setscrews in an unlubricated condition as supplied. For further information on lubricated fasteners see page 70.

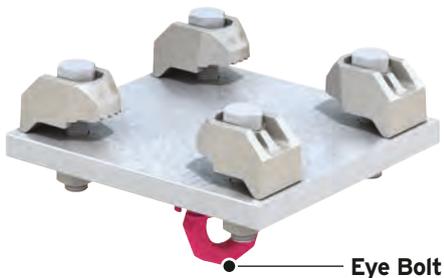
GIRDER CLAMPS  
 RAIL FIXINGS  
 LIFTING POINTS  
 HOLLO-BOLT  
 FLOOR FIXINGS  
 SUPPORT FIXINGS  
 DECKING FIXINGS

## Type LP

Utilising Lindapter's high strength Type AF clamps for heavy loads, the Type LP is available in bespoke configurations up to 200kN SWL.

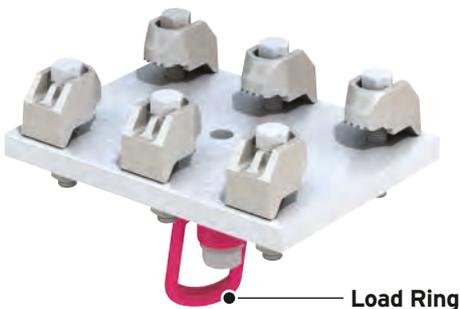
### LP4 (up to 45kN SWL)

Lifting Point with 4 Type AF clamps



### LP6 (up to 100kN SWL)

Lifting Point with 6 Type AF clamps



- Suitable for static loads only.
- Lifting Points must be regularly inspected to ensure safe operation.
- Safe Working Loads subject to the capacity of the supporting section.

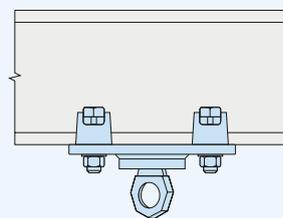


### Bespoke Configurations

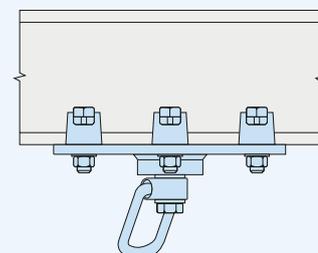
Lindapter manufactures customised Lifting Points to meet individual requirements, two examples are shown on the right. These bespoke connections are designed to specific application requirements, such as vertical loads, loads at an angle and rotation of up to 360°. The product designation, i.e. LP(#), determines the number of Type AF clamps.

For example, the LP6 has six M24 Type AF clamps to create a Safe Working Load of 100kN (4:1 Factor of Safety). Provide details of the loading, rotation, angle and beam dimensions and Lindapter's team of Engineers will design a connection solution to suit your needs.

Type LP4 (with Eye Bolt)



Type LP6 (with Load Ring)





The Hollo-Bolt HCF (High Clamping Force) is optimised for higher strength structural connections (see page 40).



# Hollo-Bolt®

Lindapter's expansion bolts require access to only one side of the Structural Hollow Section (SHS), and offer a faster alternative to welding or through-bolting, enabling contractors to reduce construction time and labour costs.

The Hollo-Bolt is independently approved for primary structural connections (see pages 39-45). The Lindibolt is ideal for applications in standard clearance holes (page 46).

**Hollo-Bolt®**  
pages 39 - 45



**Lindibolt®**  
page 46



# Hollo-Bolt® by Lindapter®

Installation is quickly carried out by inserting into pre-drilled steelwork and tightening with a torque wrench. Independent approvals include CE Mark, TÜV and ICC-ES seismic accreditation.



**Standard Hollo-Bolt**  
See page 40



**Hollo-Bolt HCF (High Clamping Force)**  
See pages 40 and 41



GIRDER CLAMPS

RAIL FIXINGS

LIFTING POINTS

HOLLO-BOLT

FLOOR FIXINGS

SUPPORT FIXINGS

DECKING FIXINGS

- Fast, cost saving installation from one side.
- For square, rectangular and circular hollow sections.
- High resistance to shear and tension.
- Unique High Clamping Force design.
- A range of head types for architectural finishes.
- CE Mark, TÜV and ICC-ES Seismic approvals.

## Hollo-Bolt Options

Hollo-Bolts are available in a range of head types for a variety of architectural finishes...

		Head Variants		
		HEXAGONAL Normal visible protrusion	COUNTERSUNK (HEAD) Minimal visible protrusion	FLUSH FIT Zero visible protrusion
Sizes Available	M8	✓	✓	✓
	M10	✓	✓	✓
	M12	✓	✓	✓
	M16 High Clamping Force	✓	✓	-
	M20 High Clamping Force	✓	-	-
Corrosion Protection	Zinc Plated plus JS500	✓	✓	✓
	Hot Dip Galvanised	✓	-	-
	Sheraplex	✓	✓	✓
	Stainless Steel	✓	✓	✓



\* Sizes M16 and M20, known as the Hollo-Bolt (HCF), feature a High Clamping Force mechanism to produce three times more clamping force than the same sized product without the mechanism. Turn to **pages 40 and 41** to see the significance of clamping force and the superior performance of this unique product.

# Hollo-Bolt High Clamping Force

Lindapter Hollo-Bolts are available in two versions; the original standard design for general hollow section connections and larger sized High Clamping Force (HCF) for higher strength structural connections.

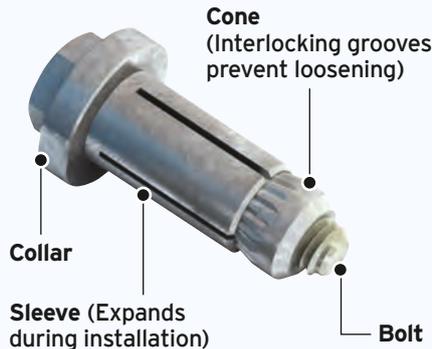
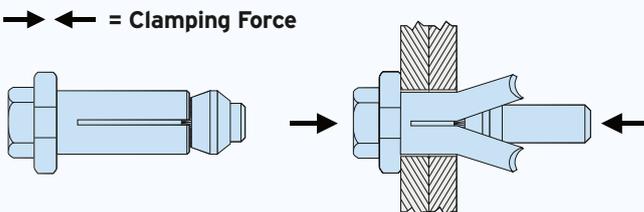
Sizes M8, M10 and M12

## Standard Hollo-Bolt

A typical connection is made by inserting the Hollo-Bolt into the pre-drilled holes of the fixture and hollow section. As the bolt head is tightened, the cone is pulled up the bolt thread, causing the sleeve to expand until the cone locks the sleeve against the hollow section's inner wall.

At full tightening torque, a clamping force is established between the fixture and the steel section to form a secure connection. Once installed, only the head and collar are visible.

→ ← = Clamping Force



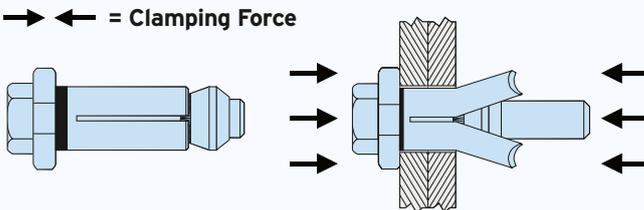
Sizes M16 and M20

## Hollo-Bolt HCF

By working closely with Structural Engineers and Steel Fabricators, Lindapter identified the need for the larger M16 and M20 Hollo-Bolts to have an increased clamping force suitable for higher strength structural connections. This led to Lindapter's invention of the High Clamping Force (HCF) design, optimised for superior performance.

The HCF mechanism consists of a special rubber washer that compresses during installation to significantly increase the clamping force between the connecting steelwork, when compared to a product of the same size without the mechanism, thereby reducing displacement.

→ ← = Clamping Force



Watch the Hollo-Bolt video at [www.Lindapter.com](http://www.Lindapter.com) to see how the HCF mechanism increases clamping force.

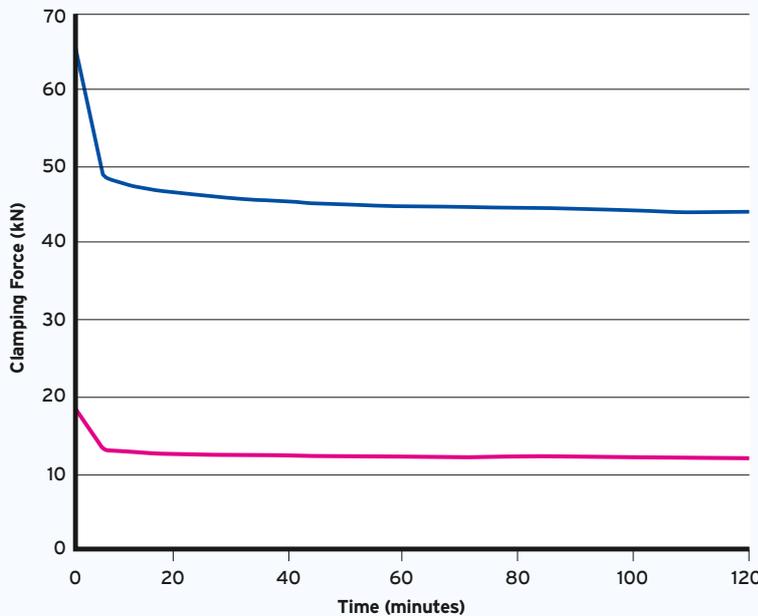


# Hollo-Bolt Clamping Force

Hollo-Bolts are optimised for structural connections and the larger M16 and M20 sizes feature a High Clamping Force (HCF) mechanism. The graphs below compare the performance of a size M20 Hollo-Bolt HCF and an expansion bolt of the same size without the mechanism.

## Clamping Force for Hollo-Bolt HCF (size M20)

Graph for illustration purposes only, see pages 42 and 43 for connection design.



**Hollo-Bolt HCF (With Mechanism)**  
Hot Dip Galvanised, Size 2

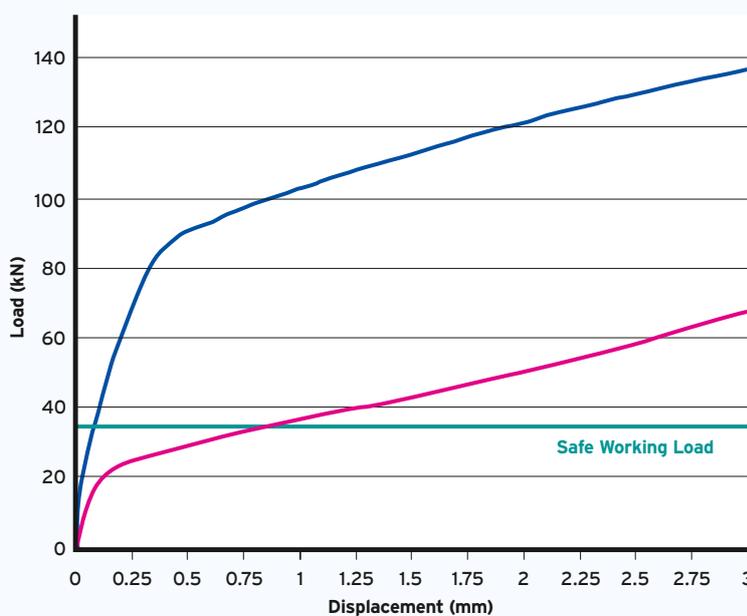
**(Without Mechanism)**  
Hot Dip Galvanised, Size 2

### Typical Performance Increase

As with any structural bolt, immediately after installation the bolt relaxes until a typical clamping force is reached. The typical clamping force of the Hollo-Bolt (HCF) is over **three times higher** than the same sized product without the HCF mechanism. This results in a more secure connection and a greater force that has to be overcome before displacement begins.

## Connection Load vs Ply Displacement for Hollo-Bolt HCF (size M20)

Graph for illustration purposes only, see pages 42 and 43 for connection design.



**Hollo-Bolt HCF (With Mechanism)**  
Hot Dip Galvanised, Size 2

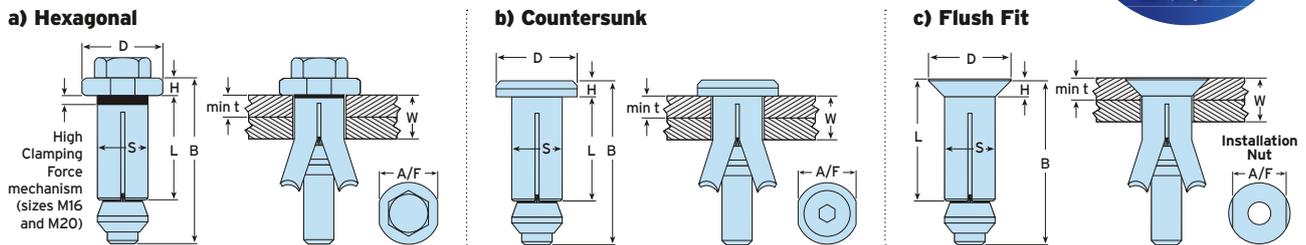
**(Without Mechanism)**  
Hot Dip Galvanised, Size 2

### Typical Performance Increase

This graph highlights the significance of increased clamping force. The blue curve demonstrates the superior performance of the Hollo-Bolt HCF in contrast to the same sized product without Lindapter's unique mechanism. At Safe Working Load, displacement (movement in the connection) is minimised when using the Hollo-Bolt HCF for a safer and more secure connection.

# Hollo-Bolt Safe Working Loads

The Hollo-Bolt is featured in the BCSA and SCI design guide 'Joints in Steel Construction - Simple Connections', refer to this guide for designing primary structural connections. For connections to secondary steelwork, please refer to the tables below.



a) Hexagonal		b) Countersunk		Sleeve			Collar			Safe Working Loads (5:1 Factor of Safety)			
Product Code	Bolt Length B mm	Product Code	Bolt Length B mm	Clamping Thickness W mm	Outer Ply min t mm	Length L mm	Outer Ø S mm	Height H mm	Ø D mm	A/F mm	Tightening Torque Nm	Tensile kN	Single Shear kN
HB08-1	M8 x 50	HBCSK08-1	M8 x 50	3 - 22	-	30	13.75	5	22	19	23	4.0	5.0
HB08-2	M8 x 70	HBCSK08-2	M8 x 70	22 - 41	-	49	13.75	5	22	19	23	4.0	5.0
HB08-3	M8 x 90	HBCSK08-3	M8 x 90	41 - 60	-	68	13.75	5	22	19	23	4.0	5.0
HB10-1	M10 x 55	HBCSK10-1	M10 x 50	3 - 22	-	30	17.75	6	29	24	45	8.5	10.0
HB10-2	M10 x 70	HBCSK10-2	M10 x 70	22 - 41	-	48	17.75	6	29	24	45	8.5	10.0
HB10-3	M10 x 90	HBCSK10-3	M10 x 90	41 - 60	-	67	17.75	6	29	24	45	8.5	10.0
HB12-1	M12 x 60	HBCSK12-1	M12 x 55	3 - 25	-	35	19.75	7	32	30	80	10.5	15.0
HB12-2	M12 x 80	HBCSK12-2	M12 x 80	25 - 47	-	57	19.75	7	32	30	80	10.5	15.0
HB12-3	M12 x 100	HBCSK12-3	M12 x 100	47 - 69	-	79	19.75	7	32	30	80	10.5	15.0
HB16-1	M16 x 75	HBCSK16-1	M16 x 70	12 - 29	8	41.5	25.75	8	38	36	190	21.0	30.0
HB16-2	M16 x 100	HBCSK16-2	M16 x 100	29 - 50	8	63	25.75	8	38	36	190	21.0	30.0
HB16-3	M16 x 120	HBCSK16-3	M16 x 120	50 - 71	8	84	25.75	8	38	36	190	21.0	30.0
HB20-1	M20 x 90	-	-	12 - 34	8	50	32.75	10	51	46	300	35.0	40.0
HB20-2	M20 x 120	-	-	34 - 60	8	76	32.75	10	51	46	300	35.0	40.0
HB20-3	M20 x 150	-	-	60 - 86	8	102	32.75	10	51	46	300	35.0	40.0



Sizes M16 and M20, known as the Hollo-Bolt (HCF), feature a High Clamping Force mechanism to produce three times more clamping force than the same sized product without the mechanism. Turn to pages 40 and 41 to see the significance of clamping force and the superior performance of this unique product.

c) Flush Fit		Sleeve			Collar			Safe Working Loads (5:1 Factor of Safety)			
Product Code	Countersunk Bolt B mm	Clamping Thickness W mm	Outer Ply min t mm	Length L mm	Outer Ø S mm	Height H mm	Ø D mm	Installation Nut A/F mm	Tightening Torque Nm	Tensile kN	Single Shear kN
HBFF08-1	M8 x 50	10 - 27	8	35	13.75	5	24	19	23	4.0	5.0
HBFF08-2	M8 x 70	27 - 45	8	54	13.75	5	24	19	23	4.0	5.0
HBFF08-3	M8 x 90	45 - 64	8	73	13.75	5	24	19	23	4.0	5.0
HBFF10-1	M10 x 50	12 - 27	10	36	17.75	6	30	24	45	8.5	10.0
HBFF10-2	M10 x 70	27 - 45	10	54	17.75	6	30	24	45	8.5	10.0
HBFF10-3	M10 x 90	45 - 64	10	73	17.75	6	30	24	45	8.5	10.0
HBFF12-1	M12 x 55	12 - 30	10	42	19.75	7	33	30	80	10.5	15.0
HBFF12-2	M12 x 80	30 - 52	10	64	19.75	7	33	30	80	10.5	15.0
HBFF12-3	M12 x 100	52 - 74	10	86	19.75	7	33	30	80	10.5	15.0

Hollo-Bolts can be used on a wide variety of steel hollow shape sections. Safe working loads shown are based on use in S275 structural hollow section and are applicable to the Hollo-Bolt only in both tension and shear. Failure of the section, particularly on those with thin walls and a wide chord face, could occur at a lower figure and its strength should be checked by a qualified Structural Engineer.

Published by the SCI/BCSA Connections Group, 'Joints in Steel Construction - Simple Connections' provides design guidance for using Hollo-Bolt and structural steelwork connections in buildings designed using the 'Simple Method' i.e. braced frames where connections carry mainly shear and axial loads only. For more information please contact The Steel Construction Institute on +44 (0) 1344 636525 or visit [www.steel-sci.com](http://www.steel-sci.com)



# Hollo-Bolt Characteristic Resistances

The values listed in the tables below are to be used when designing bolted connection to Eurocode 3 only, they are **not** standard safe working loads. The Declaration of Performance (No. DoP 001) can be viewed on the website: [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)



## Hollo-Bolt Hexagonal

Product Code	Nominal Size	Tensile	Shear	Sleeve
		F <sub>t,Rk</sub>	F <sub>v,Rk</sub>	Material Strength
		kN	kN	N/mm <sup>2</sup>
HB08	M8	23.1	32.9	430
HB10	M10	39.6	54.2	430
HB12	M12	45.8	71.0	430
HB16	M16	84.3	139.0	430
HB20	M20	124.0	211.0	390

HCF

## Hollo-Bolt Hexagonal Stainless Steel

Product Code	Nominal Size	Tensile	Shear	Sleeve
		F <sub>t,Rk</sub>	F <sub>v,Rk</sub>	Material Strength
		kN	kN	N/mm <sup>2</sup>
HBST08	M8	26.8	30.7	500
HBST10	M10	46.0	51.0	500
HBST12	M12	53.3	65.0	500
HBST16	M16	98.0	128.0	500
HBST20	M20	154.0	205.0	500

HCF

## Hollo-Bolt Countersunk

Product Code	Nominal Size	Tensile	Shear	Sleeve
		F <sub>t,Rk</sub>	F <sub>v,Rk</sub>	Material Strength
		kN	kN	N/mm <sup>2</sup>
HBCSK08	M8	23.1	32.9	430
HBCSK10	M10	39.6	54.2	430
HBCSK12	M12	45.8	71.0	430
HBCSK16	M16	84.3	139.0	430

HCF

## Hollo-Bolt Countersunk Stainless Steel

Product Code	Nominal Size	Tensile	Shear	Sleeve
		F <sub>t,Rk</sub>	F <sub>v,Rk</sub>	Material Strength
		kN	kN	N/mm <sup>2</sup>
HBSTCSK08	M8	26.8	30.7	500
HBSTCSK10	M10	46.0	51.0	500
HBSTCSK12	M12	53.3	65.0	500
HBSTCSK16	M16	98.0	128.0	500

HCF



Sizes M16 and M20, known as the Hollo-Bolt (HCF), feature a High Clamping Force mechanism to produce three times more clamping force than the same sized product without the mechanism. Turn to pages 40 and 41 to see the significance of clamping force and the superior performance of this unique product.

## Hollo-Bolt Flush Fit

Product Code	Nominal Size	Tensile	Shear	Sleeve
		F <sub>t,Rk</sub>	F <sub>v,Rk</sub>	Material Strength
		kN	kN	N/mm <sup>2</sup>
HBFF08	M8	23.1	32.9	430
HBFF10	M10	39.6	54.2	430
HBFF12	M12	45.8	71.0	430

## Hollo-Bolt Flush Fit Stainless Steel

Product Code	Nominal Size	Tensile	Shear	Sleeve
		F <sub>t,Rk</sub>	F <sub>v,Rk</sub>	Material Strength
		kN	kN	N/mm <sup>2</sup>
HBSTFF08	M8	26.8	30.7	500
HBSTFF10	M10	46.0	51.0	500
HBSTFF12	M12	53.3	65.0	500

- Hollo-Bolt lengths 1, 2 and 3 are covered by ETA 10/0416. The characteristic values are used to determine the design resistance of the Hollo-Bolt. The design resistance is calculated by dividing the characteristic value by a partial factor  $\gamma_{M2}$ . The partial factor is a nationally determined parameter (eg:  $\gamma_{M2} = 1.25$  in UK).
- For Hollo-Bolt safe working loads with a Factor of Safety of 5:1 please refer to the tables on page 42 of this catalogue. The characteristic values are valid for the assembly itself, in any connection detail the design resistance of the connection may be limited to a lesser value. For example, when the thickness of the connected component is small, pull out failure may occur before failure of the Hollo-Bolt. Design checks should be carried out to determine the static design resistance.

The SCI Greenbook publication 'Joints in Steel Construction: Simple Joints to Eurocode 3' contains a number of checks on the section. The characteristic values are only valid when the Hollo-Bolts are installed as per Lindapter's installation instructions. For more information please contact The Steel Construction Institute on +44 (0) 1344 636525 or visit [www.steel-sci.com](http://www.steel-sci.com)

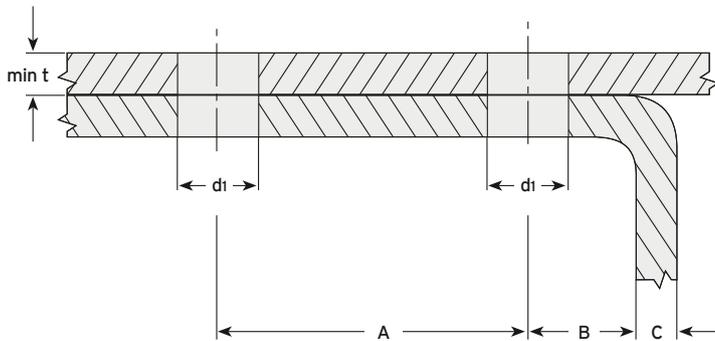


# Holo-Bolt Hexagonal and Countersunk - Drilling and Installation

Please ensure that the holes are drilled into both the fixture and the section according to the drilling guidance below. Please note that the holes are slightly larger than standard bolt clearance holes to accommodate the sleeve and cone.



## Preparation for installing Holo-Bolt Hexagonal and Countersunk



Type		Outer Ply min t mm	Clearance Hole $\varnothing^*$ d1 mm	Hole Distances		Edge Distances B + C mm
Hexagonal	Countersunk			min A mm	min B mm	
HB08	HBCSK08	-	14 (+1.0/-0.2)	35	13	> 17.5
HB10	HBCSK10	-	18 (+1.0/-0.2)	40	15	> 22.5
HB12	HBCSK12	-	20 (+1.0/-0.2)	50	18	> 25.0
HB16	HBCSK16	8	26 (+2.0/-0.2)	55	20	> 32.5
HB20	-	8	33 (+2.0/-0.2)	70	25	> 33.0

\* For Holo-Bolts with Hot Dip Galvanised Finish, drilling the clearance hole to the top tolerance is recommended.

➔ Sizes M16 and M20 require outer ply thickness (min t) to be at least 8mm.



## Tool sizes for installing Holo-Bolt Hexagonal

Holo-Bolt Hexagonal			
Product Code	Spanner	Socket	Tightening Torque Nm
	mm	mm	
HB08	19	13	23
HB10	24	17	45
HB12	30	19	80
HB16	36	24	190
HB20	46	30	300



## Tool sizes for installing Holo-Bolt Countersunk

Holo-Bolt Countersunk			
Product Code	Spanner	Hexagon Key	Tightening Torque Nm
	mm	mm	
HBCSK08	19	5	23
HBCSK10	24	6	45
HBCSK12	30	8	80
HBCSK16	36	10	190



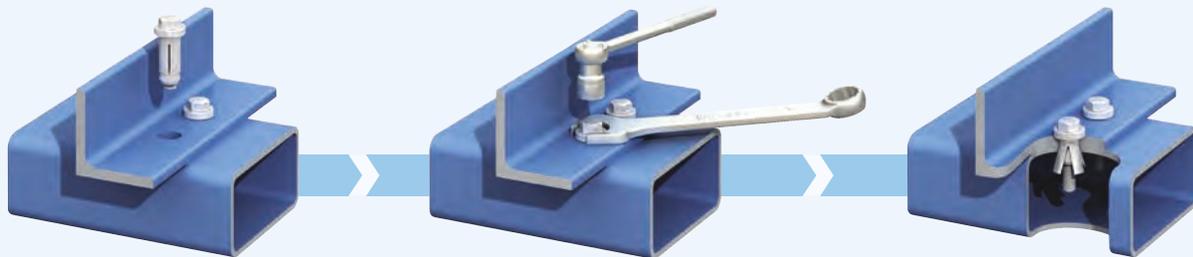
### How to install...

▶ Watch the Holo-Bolt installation video at [www.Lindapter.com](http://www.Lindapter.com)

1) Align pre-drilled fixture and section then insert the Holo-Bolt<sup>a)</sup>.

2) Grip Holo-Bolt collar with an open ended spanner.

3) Using a calibrated torque wrench, tighten the central bolt to the recommended torque<sup>b)</sup>.



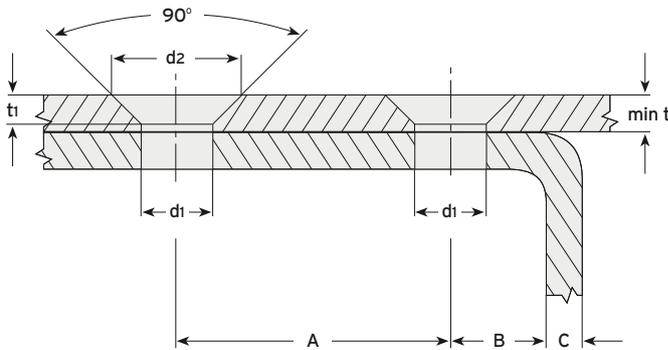
#### Notes:

- Before tightening, ensure that the materials that are to be connected together are touching. See page 42 for tightening torque.
- Power tools, such as an impact wrench, may be used to speed up the tightening of the Holo-Bolt. However, when using power tools, always complete the tightening process with a calibrated torque wrench to ensure the correct torque is applied to the Holo-Bolt.

# Hollo-Bolt Flush Fit - Drilling and Installation

Please ensure that the holes are drilled into both the fixture and the section according to the drilling guidance below. Please note that the holes are slightly larger than standard bolt clearance holes to accommodate the sleeve and cone.

## Preparation for installing Hollo-Bolt Flush Fit



Type	Outer Ply min t mm	Clearance Hole Ø d1 mm	Countersunk		Hole Distances		Edge Distances B + C mm
			d2 mm	t1 mm	min A mm	min B mm	
<b>HBFF08</b>	8	14 (+1.0/-0.2)	27	6.5	35	13	> 17.5
<b>HBFF10</b>	10	18 (+1.0/-0.2)	31	6.5	40	15	> 22.5
<b>HBFF12</b>	10	20 (+1.0/-0.2)	35	7.5	50	18	> 25.0

## Tool sizes for installing Hollo-Bolt Flush Fit

Hollo-Bolt Flush Fit			
Product Code	Spanner mm	Hexagon Key mm	Tightening Torque Nm
<b>HBFF08</b>	19	5	23
<b>HBFF10</b>	24	6	45
<b>HBFF12</b>	30	8	80



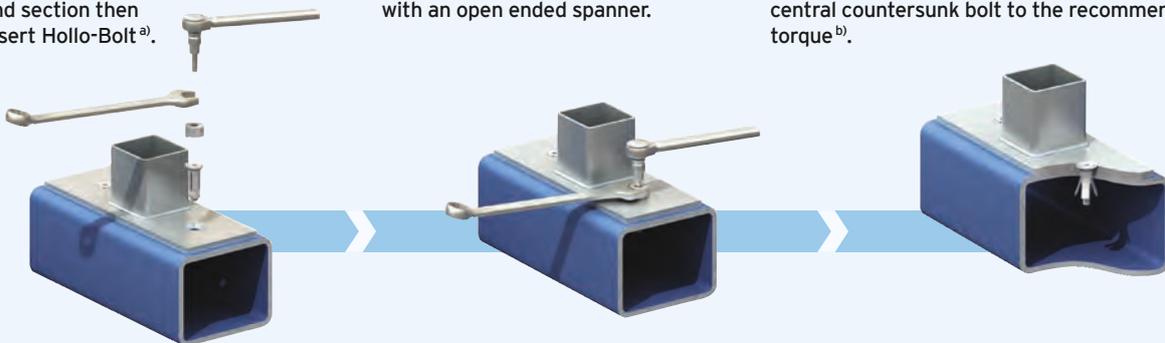
### How to install...

▶ Watch the Hollo-Bolt installation video at [www.Lindapter.com](http://www.Lindapter.com)

1) Align pre-drilled fixture and section then insert Hollo-Bolt<sup>a)</sup>.

2) Apply the installation nut and grip with an open ended spanner.

3) Using a calibrated torque wrench, tighten the central countersunk bolt to the recommended torque<sup>b)</sup>.

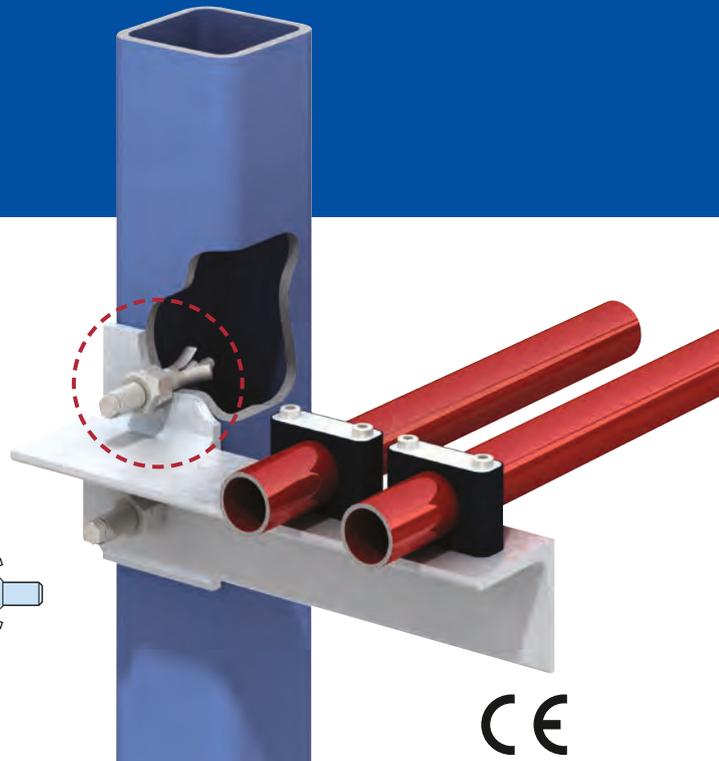
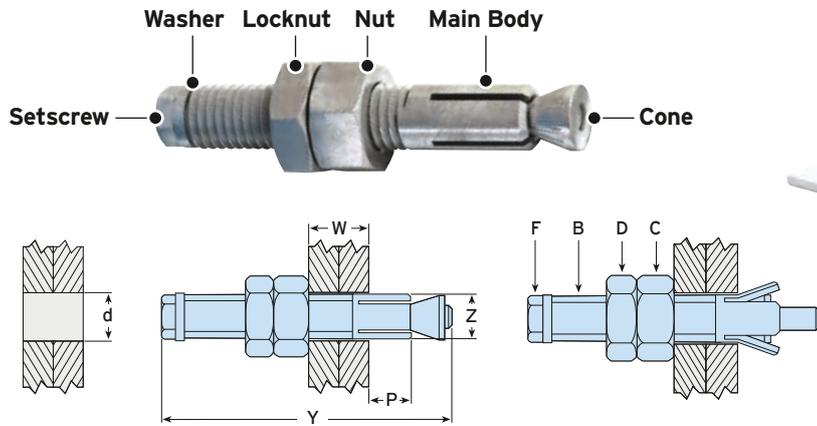


#### Notes:

- a) Before tightening, ensure that the materials that are to be connected together are touching. See page 42 for tightening torque.
- b) Power tools, such as an impact wrench, may be used to speed up the tightening of the Hollo-Bolt. However, when using power tools, always complete the tightening process with a calibrated torque wrench to ensure the correct torque is applied to the Hollo-Bolt.

# Type LB2 - Lindibolt® 2

Self-heading bolt suitable for connecting steelwork to hollow sections where access is only available from one side. The Lindibolt uses a standard clearance hole.



Material: Steel, zinc plated. Stainless steel grade 316.

Code	Lindibolt		Hole Ø		Safe Working Loads (FOS 5:1)				Main Body (B) and Nut (C and D)			Setscrew (F)		
	Bolt Z	Length Y	min d	max d	Tensile kN	Single Shear kN	Clamping Length W	Projection P	Thread Z	Tight. torque Nm	A/F mm	Bolt F	Tight. torque Nm	A/F mm
LB10	M10	74	11	11.5	3.0	3.4	7 - 30	7.5 - 10	M10	20	17	M5	6	8
LB12	M12	85	13	13.5	5.0	5.0	10 - 36	9 - 12	M12	31	19	M6	11	10
LB16	M16	105	17	17.5	8.0	9.8	12 - 48	12 - 16	M16	81	24	M8	23	13
LB20	M20	128	21	21.5	14.0	15.2	14 - 60	15 - 20	M20	129	30	M10	45	17
LB24	M24	158	25	25.5	20.0	22.5	18 - 72	18 - 24	M24	203	36	M12	80	19

The safe working loads, in both tension and shear shown, are applicable to the Lindibolt only. Failure of the section, particularly on those with thin walls and a wide chord face, could occur at a lower figure and its strength should be checked by a qualified Structural Engineer.

## Lindibolt Characteristic Resistances

The values below are to be used when designing bolted connections to Eurocode 3 only, they are **not** standard safe working loads. View the Declaration of Performance (DoP No.002) at [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)



### Lindibolt

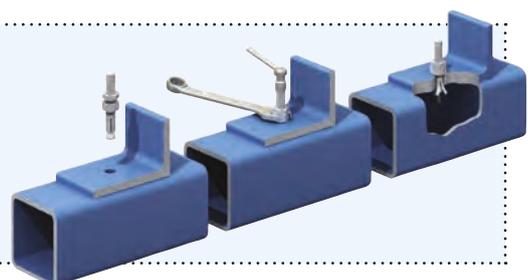
Product Code	Nominal Size	Tensile Ft,Rk kN	Shear Fv,Rk kN	Sleeve Material Strength N/mm <sup>2</sup>
LB10	M10	12.0	14.8	380
LB12	M12	17.7	21.4	380
LB16	M16	34.5	40.6	380
LB20	M20	54.5	64.1	380
LB24	M24	79.1	93.2	380

### Lindibolt Stainless Steel

Product Code	Nominal Size	Tensile Ft,Rk kN	Shear Fv,Rk kN	Sleeve Material Strength N/mm <sup>2</sup>
LBST10	M10	15.8	13.7	500
LBST12	M12	23.2	19.9	500
LBST16	M16	45.4	38.0	500
LBST20	M20	71.7	60.1	500
LBST24	M24	104.1	87.3	500

### How to install...

- 1) Set nut (C) at (W) plus projection (P) then tighten the locknut (D).
- 2) Align pre-drilled fixtures. Insert Lindibolt cone end first through both fixtures.
- 3) Hold nut (C) with a spanner and tighten the bolt (F). Loosen off the locknut (D) and tighten the nut (C). Secure by re-tightening the locknut (D).



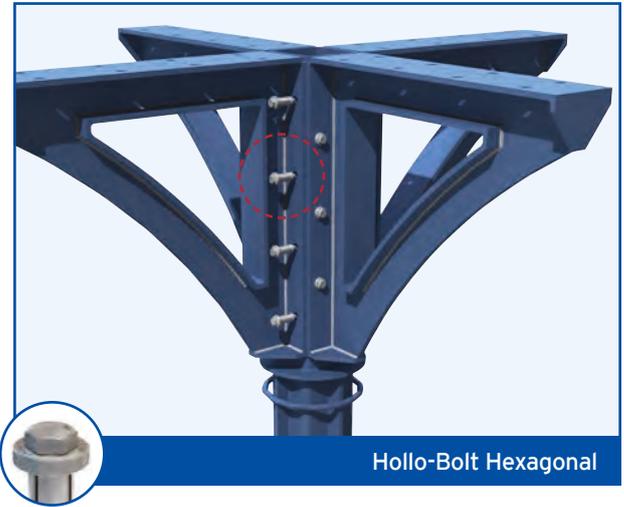
CIRCLER CLAMPS  
 RAIL FIXINGS  
 LIFTING POINTS  
 HOLLO-BOLT  
 FLOOR FIXINGS  
 SUPPORT FIXINGS  
 DECKING FIXINGS

## Typical Applications

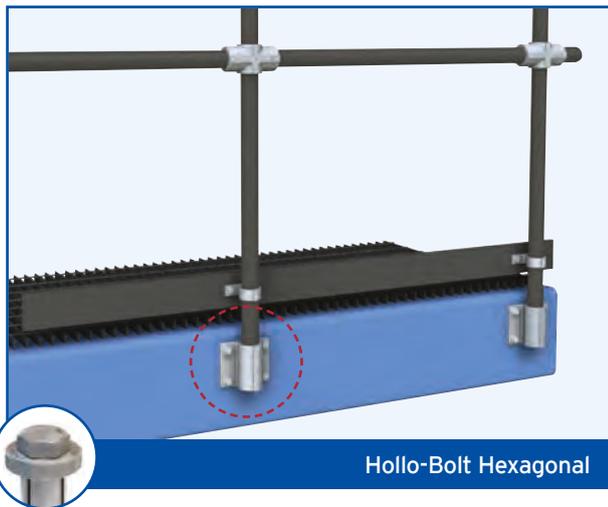
The Hollo-Bolt is a versatile product that is used in a variety of applications, in a range of industries. Some popular connections are shown below, however these examples show only a few of the possibilities. Please contact Lindapter to discuss your connection requirement.



Hollo-Bolt HCF Hexagonal



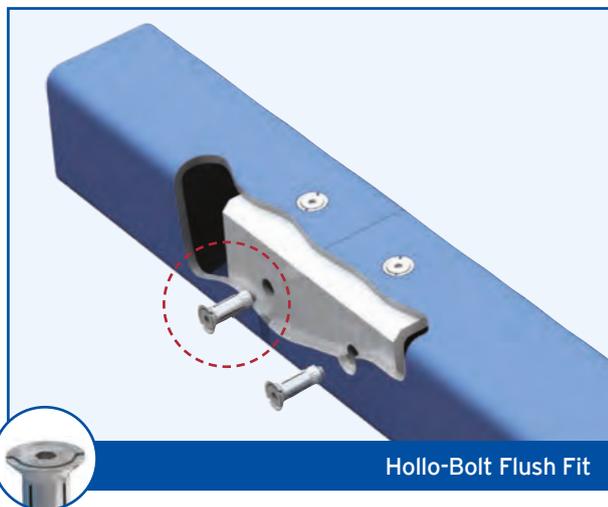
Hollo-Bolt Hexagonal



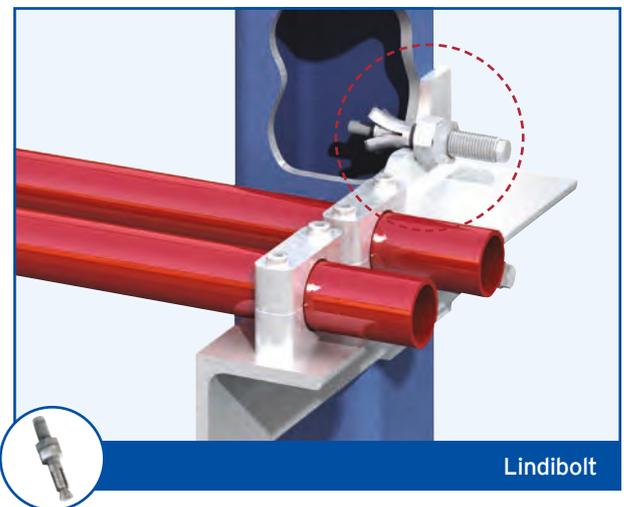
Hollo-Bolt Hexagonal



Hollo-Bolt Countersunk



Hollo-Bolt Flush Fit



Lindibolt

GIRDER CLAMPS

RAIL FIXINGS

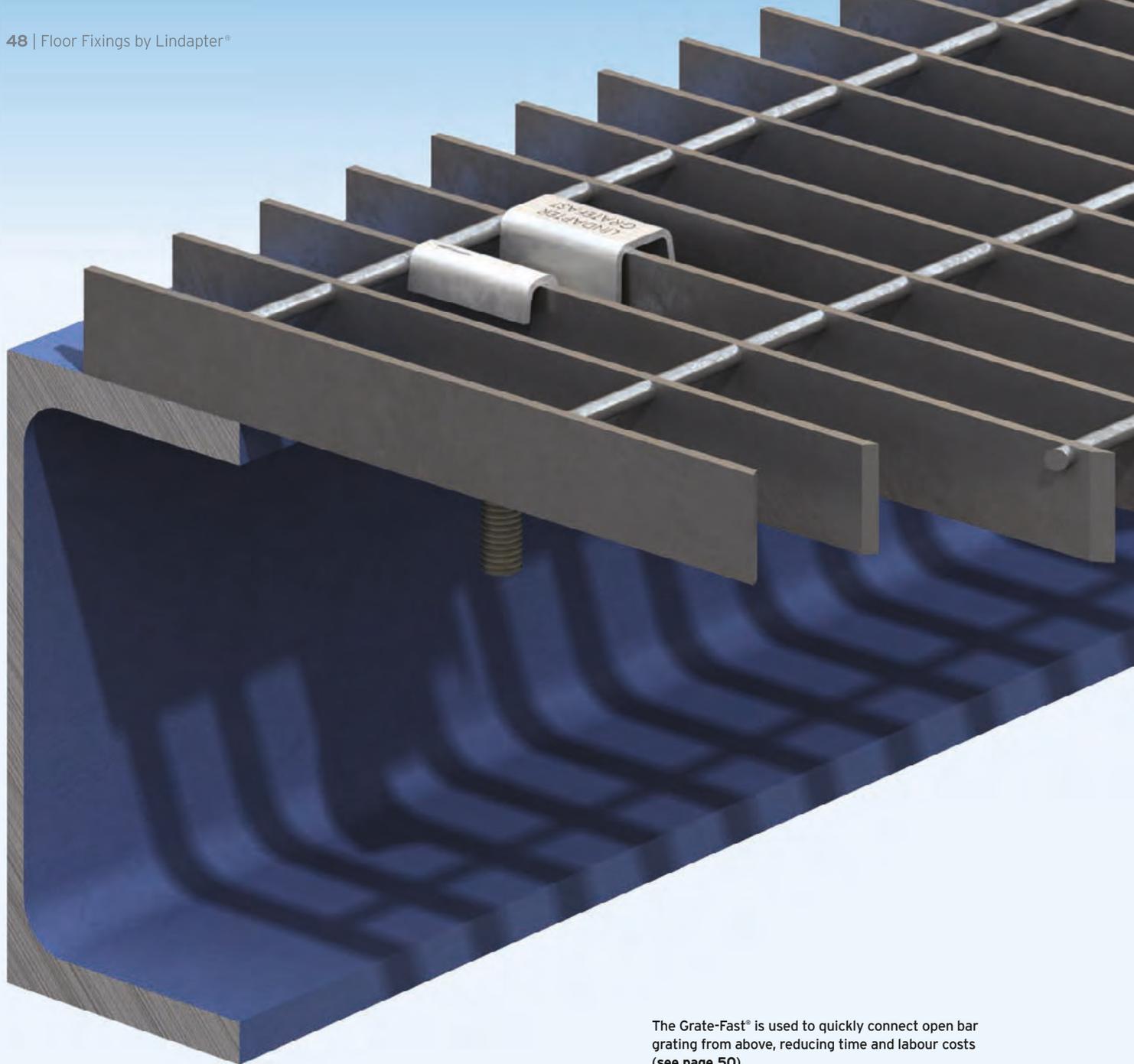
LIFTING POINTS

HOLLO-BOLT

FLOOR FIXINGS

SUPPORT FIXINGS

DECKING FIXINGS



The Grate-Fast® is used to quickly connect open bar grating from above, reducing time and labour costs (see page 50).

# Floor Fixings

A range of innovative fixings for securing steel flooring to the supporting steelwork without the need for on-site drilling or welding. Access to the underside of the flooring is not required, eliminating the need for costly scaffolding or elevated floors. Installation can be carried out quickly and safely from above, often by one person, significantly reducing costs.

**Type FF  
FloorFast®**  
page 49



**Type GF  
Grate-Fast®**  
page 50

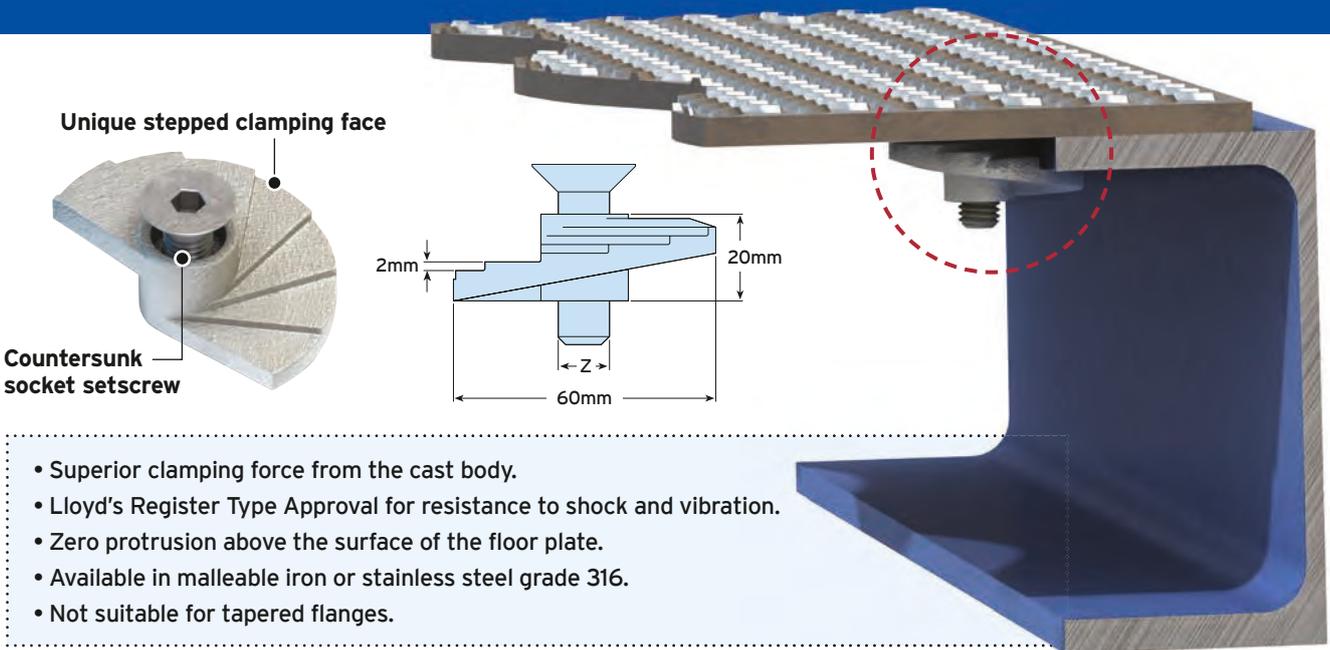


**Type  
1055**  
page 51

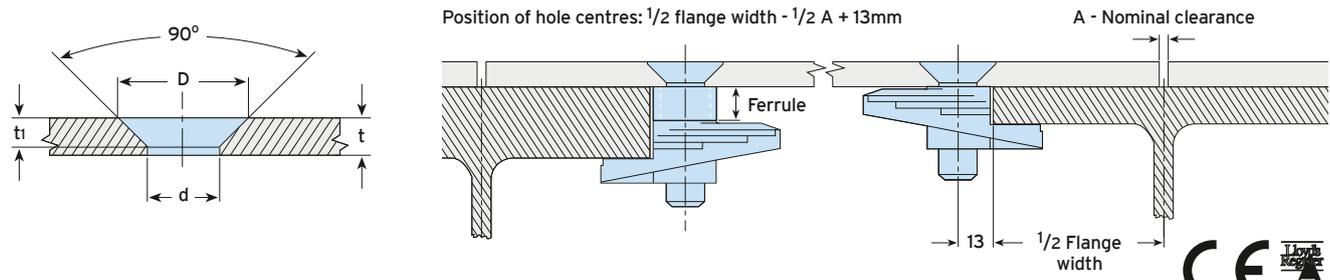


# Type FF - FloorFast®

Securing chequer plate flooring to supporting steelwork can be carried out quickly and safely from above, often by one person, significantly reducing costs. The stepped clamping face locks under the steelwork to provide a secure connection.



- Superior clamping force from the cast body.
- Lloyd's Register Type Approval for resistance to shock and vibration.
- Zero protrusion above the surface of the floor plate.
- Available in malleable iron or stainless steel grade 316.
- Not suitable for tapered flanges.



Material: Malleable iron, zinc plated or hot dip galvanised. Stainless steel grade 316.



Code	Bolt min 4.6 <sup>1)</sup> Z	Floorplate Thickness t mm	Standard - mm	Flange Thickness With Ferrule <sup>2)</sup>			Dimensions						
				10 mm	20 mm	30 mm	Hole Ø d mm	Countersunk Ø for Bolt		Countersunk Depth for Bolt		Tightening Torque Nm	Hexagon Key mm
							BZP D mm	HDG D mm	BZP t <sub>1</sub> mm	HDG t <sub>1</sub> mm			
FF08	M8	4.5 - 12	3 - 15	13 - 25	23 - 35	33 - 45	9	17	-	4	-	11	5
FF10	M10	5 - 12	3 - 15	13 - 25	23 - 35	33 - 45	11	21	19	5	4	22	6
FF12	M12	6 - 12	3 - 15	13 - 25	23 - 35	33 - 45	13.5	25	23	5.8	4.8	22	8

1) Hot dip galvanised M10 and M12 versions are supplied with a slotted countersunk screw.  
2) To order FloorFast with a ferrule, simply add ferrule size to product code.

➤ Designed for pedestrian walkways only.

**How to install...**

▶ Watch the installation video at [www.Lindapter.com](http://www.Lindapter.com)

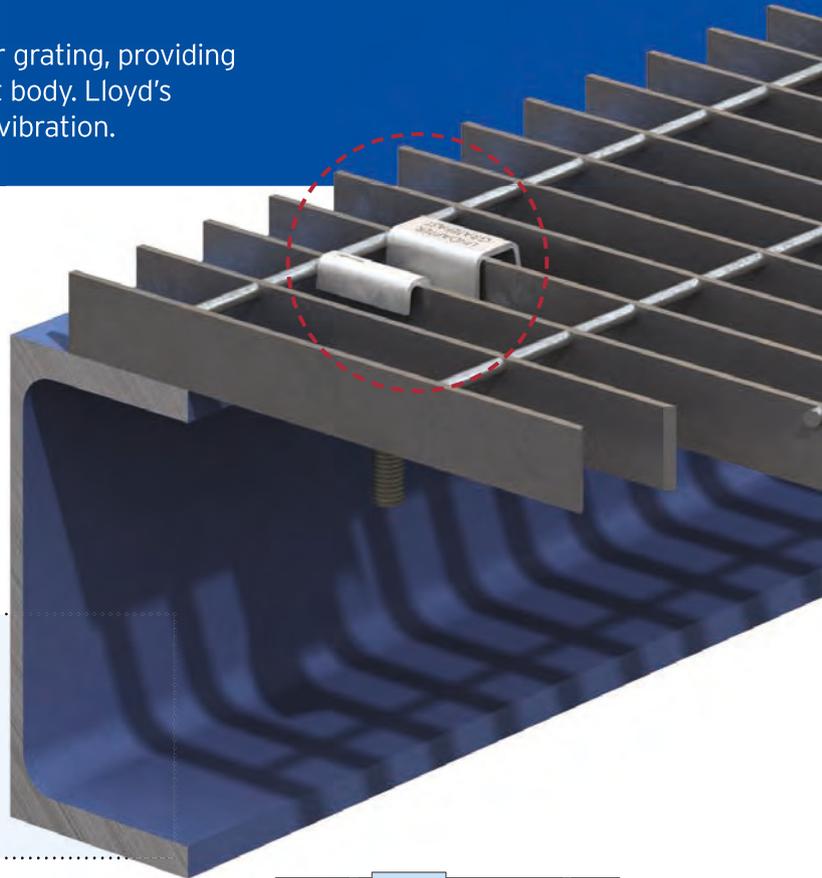
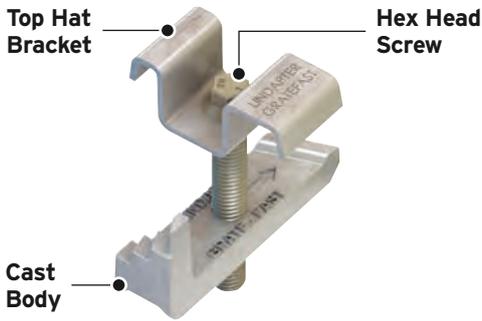
**Removal:** Using a hexagon key, give the FloorFast one full anti-clockwise turn to release the connection from the flange.

CE For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.013 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

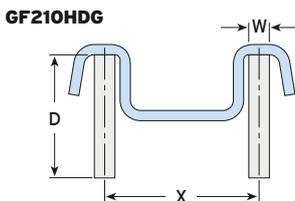
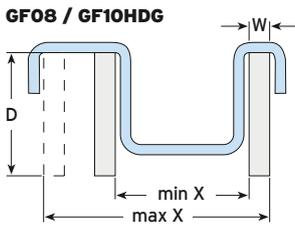
GIRDER CLAMPS  
RAIL FIXINGS  
LIFTING POINTS  
HOLLOW-BOLT  
FLOOR FIXINGS  
SUPPORT FIXINGS  
DECKING FIXINGS

# Type GF - Grate-Fast®

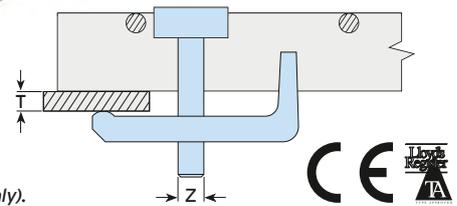
A high strength floor fixing for rectangular open bar grating, providing superior clamping force due to a malleable iron cast body. Lloyd's Register Type Approval for resistance to shock and vibration.



- **GF08** for GRP grating with stainless steel top hat bracket, Sheraplex coated body and socket head screw.
- **GF10HDG** is hot dip galvanised for increased corrosion resistance.
- **GF210HDG** is hot dip galvanised for use with 30mm width floor grating bars only.



**Material:**  
**Top Hat:** Stainless steel grade 304 (GF08 only).  
 Mild Steel, hot dip galvanised (GF10HDG & GF210HDG only).  
**Body:** Malleable iron, Sheraplex (GF08 only).  
 Malleable iron, hot dip galvanised (GF10HDG & GF210HDG only).



Product Code	Bolt 8.8 Z	Flange T mm	Grating Bar Depth D mm	Grating Bar Width W mm	Bar Distance X mm	Tightening Torque Nm	Across Flats mm
<b>GF08<sup>1)</sup></b>	M8	3 - 19	22 - 38	5 - 10	19 - 48	5	6
<b>GF10HDG<sup>2)</sup></b>	M10	3 - 19	20 - 50	3 - 7	25 - 45	11	10
<b>GF210HDG<sup>2)</sup></b>	M10	3 - 19	19 - 40	3 - 6.5	30	11	10

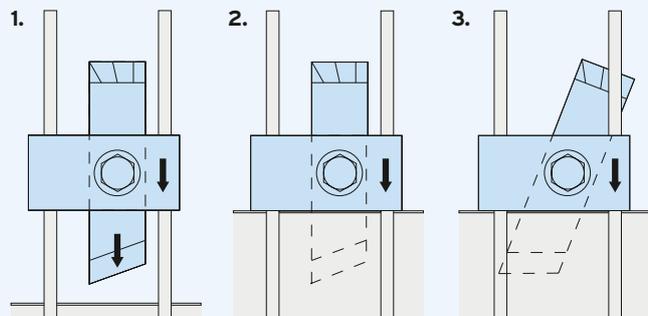
1) Supplied with socket head cap screw.  
 2) Supplied with hex head screw.

➤ Designed for pedestrian walkways only.

## How to install...

▶ Watch the installation video at [www.Lindapter.com](http://www.Lindapter.com)

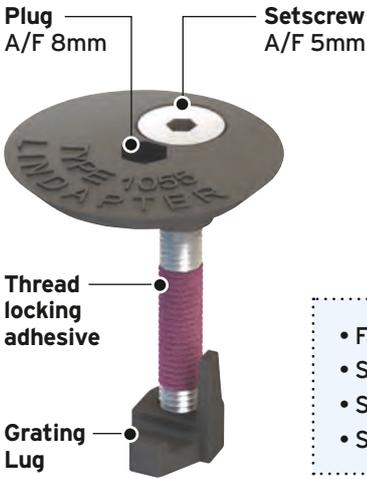
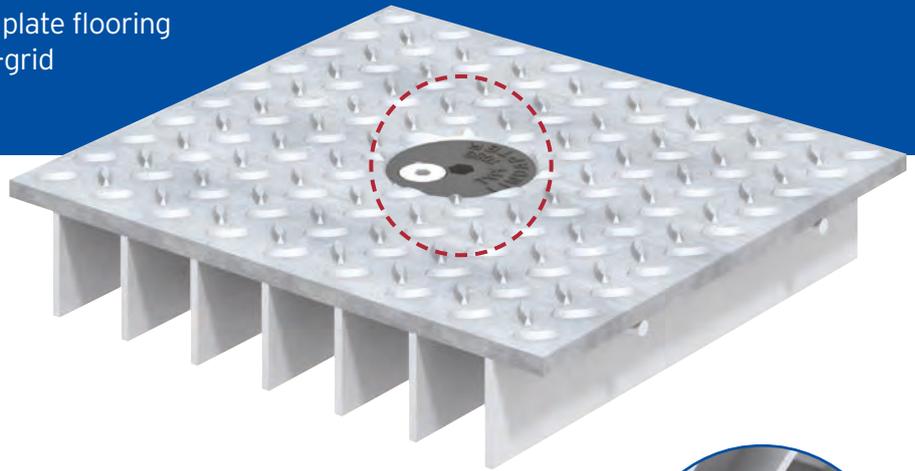
- 1) Position pre-assembled Grate-Fast with the body between the grating bars and the nose pointing towards the steelwork. The arrows on the top hat bracket should also be pointing towards the supporting steelwork and the bracket itself resting on the bearing bars.
- 2) Slide the Grate-Fast towards the steelwork until the nose fits under the beam flange. Where necessary adjust body / screw to the approximate flange thickness / grating depth.
- 3) Tighten the screw. The Grate-Fast body will automatically rotate until it locks under the bearing bar, with the nose under the flange. Tighten to the recommended torque.



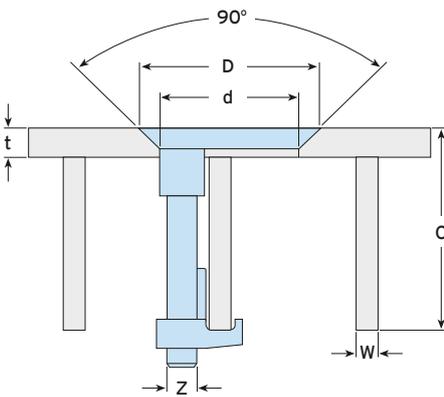
For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.014 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

# Type 1055

This unique solution enables solid plate flooring to be fitted to open-mesh or open-grid flooring using simple hand tools.



- Fast installation from above, no need for expensive scaffolding.
- Stainless steel for high corrosion resistance.
- Superior clamping force from high quality castings.
- Safely retrofit without welding, no need for hot work permits.



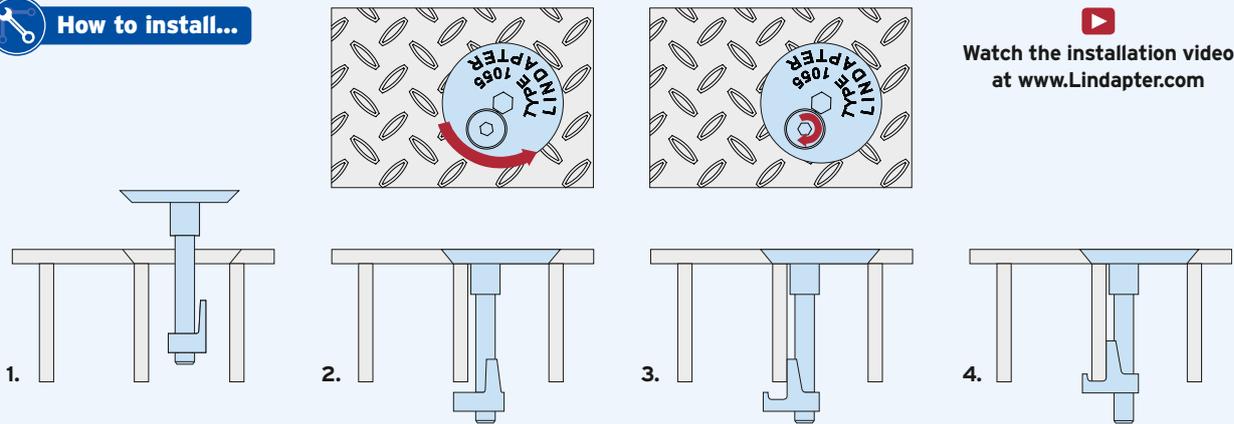
Material: Cast stainless steel, self colour.



Product Code	Bolt A4-70 Z	Floorplate Thickness t mm	Clamping Range C mm	Grating Bar Width W mm	Hole $\varnothing$ d mm	Counter-sunk $\varnothing$ D mm	Setscrew	
							Tight. Torque Nm	Hex. Key mm
<b>FG1055</b>	M8	min. 6	35 - 56	3 - 8	40	50	11	5

➔ Designed for pedestrian walkways only.

## How to install...



Watch the installation video at [www.Lindapter.com](http://www.Lindapter.com)

- 1) Insert the pre-assembled Type 1055 into the countersunk hole between the grating bars.
- 2) Use an 8mm hexagon key to rotate the plug anti-clockwise until the underside of the plug locates against the grating bar.
- 3) Use a 5mm hexagon key to rotate the countersunk setscrew clockwise until the grating lug makes contact with the grating bar.
- 4) Tighten the setscrew to 11Nm; the grating lug will be drawn up the screw and will activate the thread locking adhesive.

CE For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.015 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)



The Type F3 has a large clamping range to suit various flange thicknesses (see page 56).

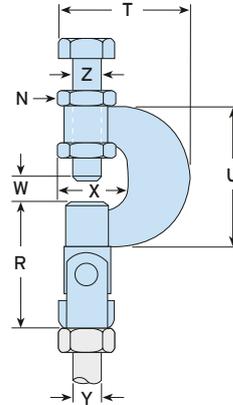
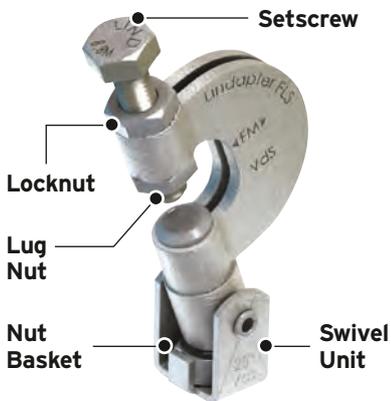
# Support Fixings

Easy-to-install connections for suspending building services from structural or secondary beams. Typical applications include supporting HVAC equipment, pipe work, fire protection and sprinkler systems. Adjustable to allow a fast and precise alignment of building services.

	<b>Type FLS</b> page 53		<b>Type F3</b> page 56
	<b>Type FL</b> page 54		<b>Type SH</b> page 57
	<b>Type LC</b> page 55		<b>Type HW/HC</b> page 57
	<b>Type SW</b> page 55		<b>Purlin Clips</b> pages 58-59

## Type FLS

A versatile flange clamp with a swivel unit for inclined applications. Supplied with a high tensile setscrew for a secure grip on both parallel and tapered flanges.

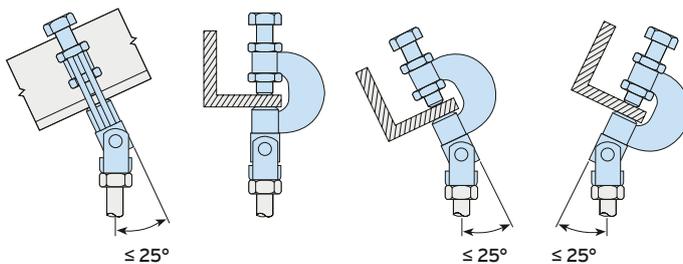


Material: High grade alloy steel, zinc plated.

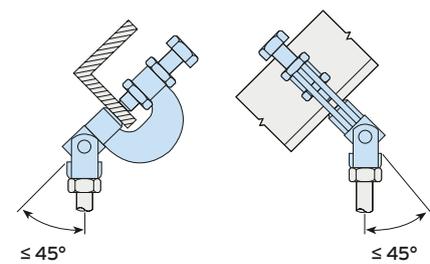


Product Code	Rod Y	Safe Working Load (FOS 4:1)		Clamping Range W mm	Setscrew Z	Tightening Torque		Dimensions				
		Tensile $\leq 25^\circ$ kN	Tensile $25^\circ$ to $45^\circ$ kN			Setscrew Z Nm	Locknut N Nm	R mm	T mm	U mm	X mm	Width mm
FLS08	M8	2.5	1.5	3 - 17	M10	18	18	55	53	58	27	28
FLS10	M10	2.5	1.5	3 - 17	M10	18	18	55	53	58	27	28

### Independently Approved Applications

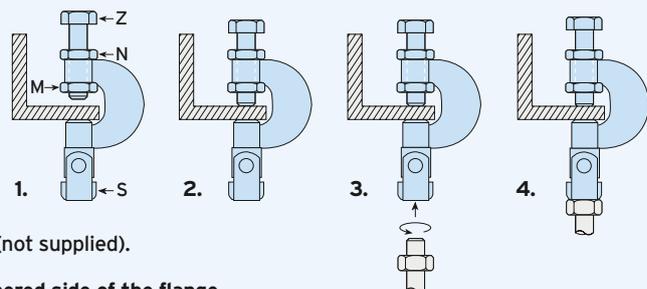


### General Applications (Parallel Flanges only)



#### How to install...

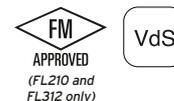
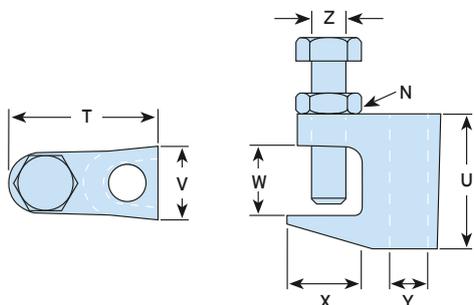
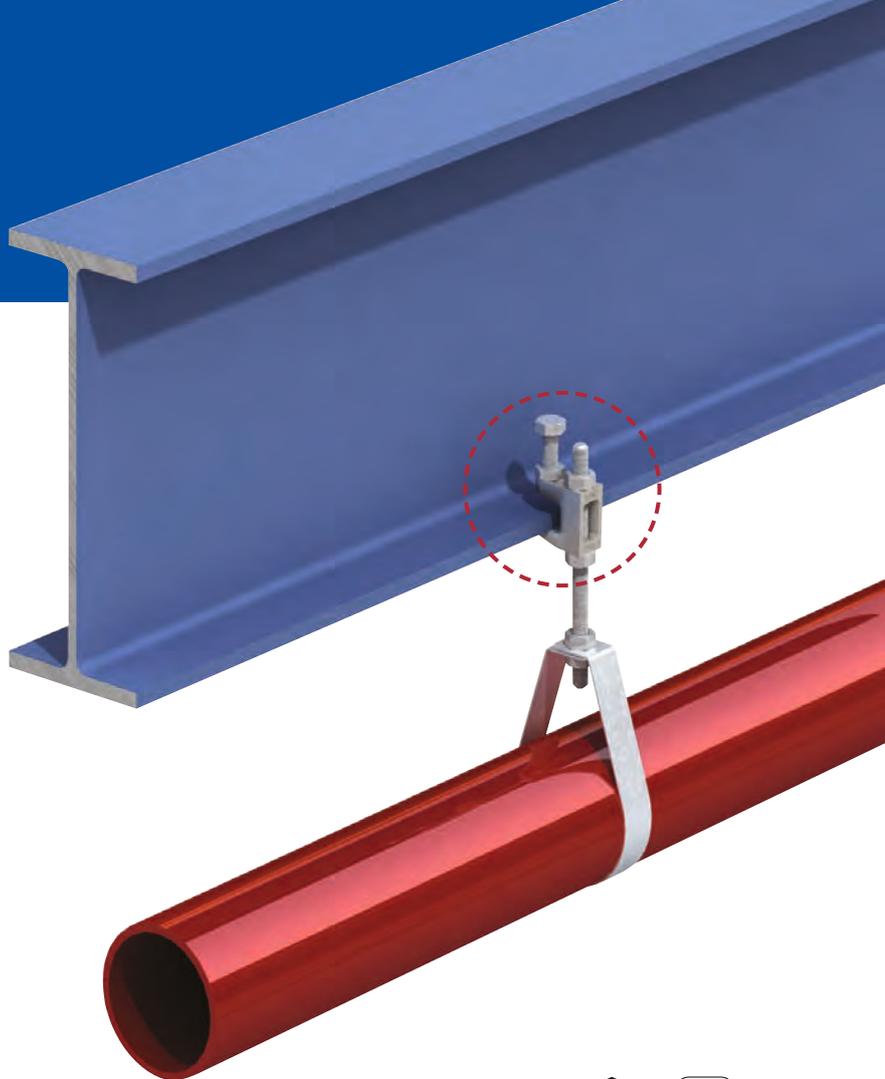
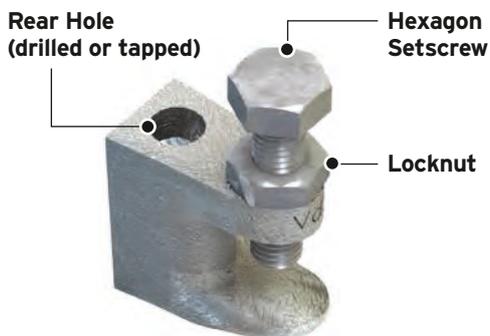
- 1) Locate the FLS onto the flange.
- 2) Ensuring the lug nut (M) locates into the main body, tighten down the setscrew (Z) and locknut (N).
- 3) Install the threaded rod by screwing into the nut located in the nut basket (S). Ensure full thread capture.
- 4) Secure assembly in nut basket (S) from beneath using a nut (not supplied).



➤ Ensure that the cup point setscrew always grips on the tapered side of the flange.

# Type FL

FM and VdS approved flange clamp for use with parallel or tapered flange beams, supplied with the rear hole drilled or tapped.



Material: Malleable iron, zinc plated.

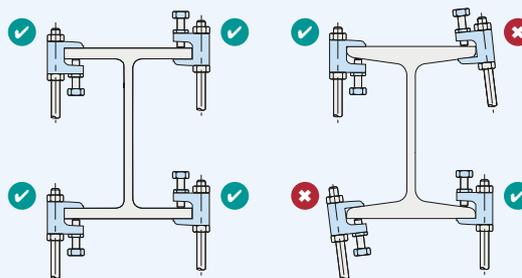
Product Code				Safe Working Load (FOS 4:1) Tensile kN	Clamping Range W mm	Setscrew Z	Tightening Torque		Dimensions			
Clear	Tapped	Clear Hole Ø Y mm	Tapped Thread Y				Setscrew Z Nm	Locknut N Nm	T mm	U mm	X mm	Width V mm
FL106D	FL106T	7	M6	1.1	3 - 17	M8	8	11	36	35	20	19
FL108D	FL108T	9	M8	1.1	3 - 17	M8	8	11	36	35	20	19
FL210D	FL210T	11	M10	2.4	3 - 19	M10	8	22	45	40	22	22
FL312D	FL312T	13	M12	3.1	3 - 23	M10	8	22	50	46	28	25
FL412D	FL410T	13	M10	3.1	9 - 28	M10	8	22	53	51	27	26

➤ The Type FL can be used with Type SW (page 55) when connecting to inclined sections.

## How to install...

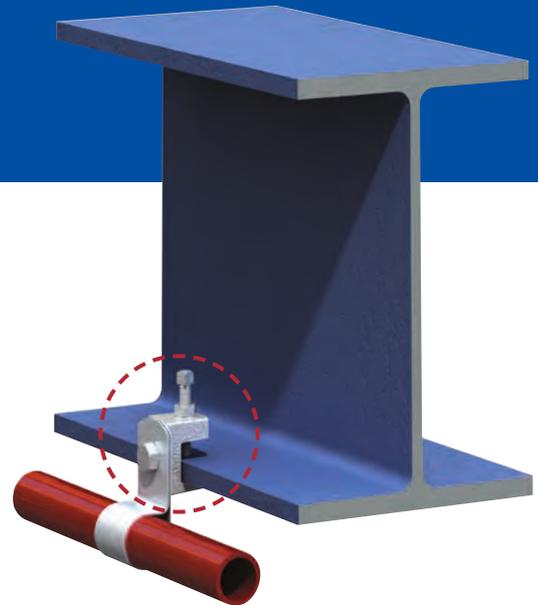
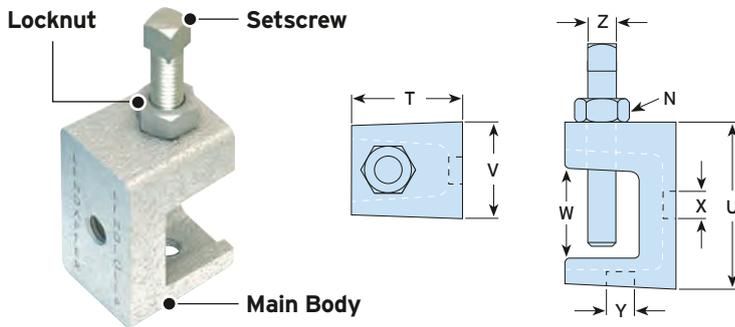
- 1) Slide the Type FL onto the beam flange and tighten setscrew to the recommended torque. As a guide, tighten the setscrew finger tight and then apply an additional quarter turn (90°) with spanner.
- 2) Tighten the locknut (N) to the recommended torque.

➤ On tapered flanges, the cup point setscrew has to grip on the inside of the flange.



## Type LC - LindiClip®

A flange clamp for parallel or tapered flanges with tapped holes to accept threaded rod or cable clips. Supplied with a high tensile cup point setscrew.



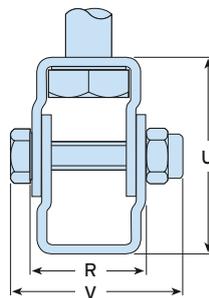
Material: Malleable iron, zinc plated.

➤ Installation is the same as Type FL (page 54).

Product Code	Thread		Safe Working Load (FOS 4:1)			Setscrew Z	Tightening Torque		Dimensions		
	X	Y	Tensile in Position X kN	Tensile in Position Y kN	Clamping Range W mm		Setscrew Z Nm	Locknut N Nm	T mm	U mm	Width V mm
LC06	M6	M6	0.18	0.59	3 - 20	M6	4	4	25	36	21
LC08	M8	M8	0.18	0.59	3 - 20	M6	4	4	25	36	21

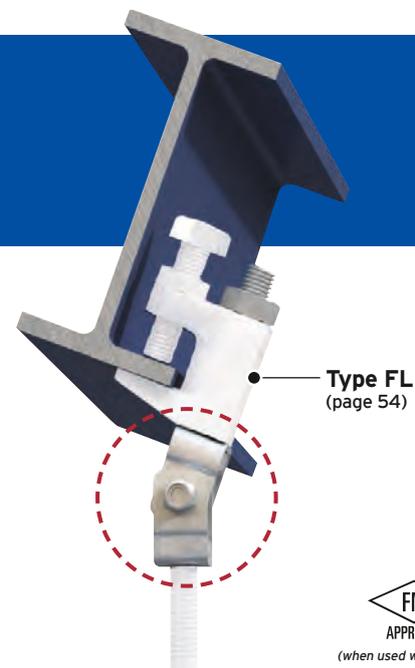
## Type SW

A swivel unit for applications on inclined beams complete with a M10 x 90mm (property class 8.8) setscrew and nut. Can be supplied with Type FL or Type Z10.



Material: High grade alloy steel, zinc plated.

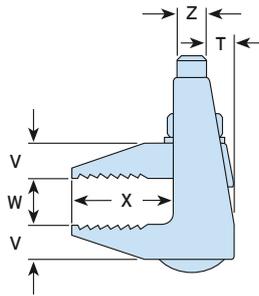
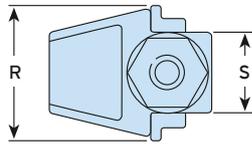
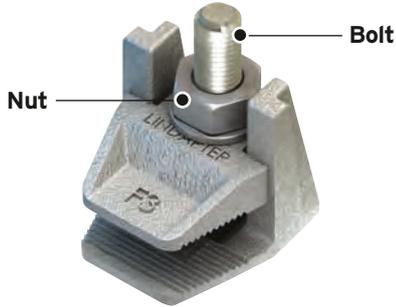
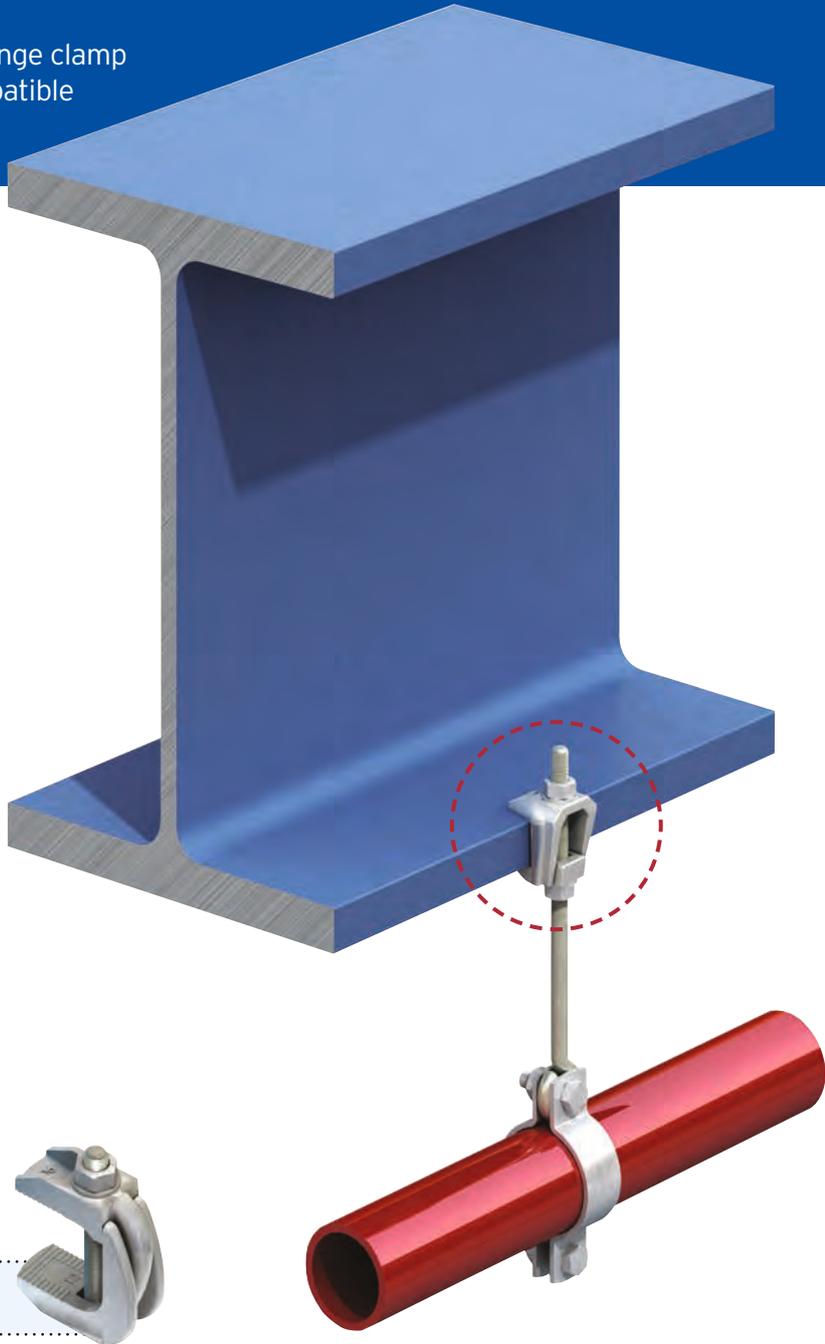
Product Code	Rod	Safe Working Load (FOS 4:1)		Rotation	Tightening Torque Nm	Dimensions		
		Tensile kN	Maximum Inclination			U mm	R mm	Width with Bolt V mm
SW10	M10	2.4	18°	360°	11	45	25	35



FM  
APPROVED  
(when used with Type FL)

# Type F3

An FM approved, high strength flange clamp with a large clamping range. Compatible with drop rods and J bolts.



For heavier loads or wider clamping range, please see the Type F9 on page 24.



Material: Malleable iron, hot dip galvanised.

Product Code			Safe Working Load (FOS 4:1) Tensile kN	Clamping Range W mm	Tightening Torque* Nm	Dimensions				
With Bolt	Without Bolt	Bolt 4.6 Z				S	T	V	X	Width R
						mm	mm	mm	mm	mm
F308NC	F308NB	M8	0.9	2 - 25	6	19	6	8	20	33
F310NC	F310NB	M10	1.2	2 - 30	20	22	7	10	25	38
F312NC	F312NB	M12	2.0	2 - 40	39	29	9	12	35	49
F316NC	F316NB	M16	4.0	3 - 55	93	36	12	16	46	60
F320NC	F320NB	M20	6.0	5 - 70	177	44	15	19	55	76

\* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 70.

➤ For parallel flanges only. Supplied with or without bolt.

SUPPORT FIXINGS

## Type SH

A strap hanger with LPCB and FM approval for use in fire sprinkler installations. Supplied with or without a hanger nut. Can be used with all Lindapter flange clamps.

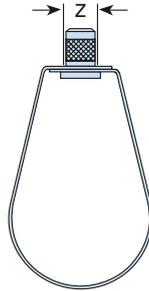
Hanger Nut



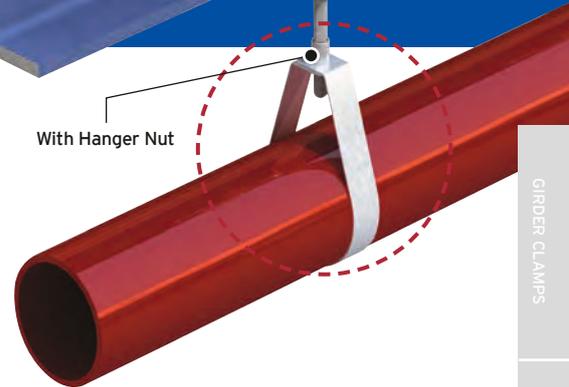
LPS1194 Issue 1.2  
Certificate No. 1171a-02  
(Up to Pipe Bore  
Size 150 only)



APPROVED  
(M10 and above)



With Hanger Nut



Material: Pre-galvanised strip.

WITHOUT HANGER NUT			
Code	Pipe Bore mm	Rod Z	Hole $\varnothing$ mm
SH025	25	M8 or M10	11
SH032	32	M8 or M10	11
SH040	40	M8 or M10	11
SH050	50	M8 or M10	11
SH065	65	M8 or M10	11
SH080	80	M8 or M10	11
SH100	100	M8 or M10	11
SH125	125	M12	13
SH150	150	M12	13
SH200	200	M16	18

WITH HANGER NUT			
Code	Pipe Bore mm	Rod Z	Hole $\varnothing$ mm
SH025N	25	M8 or M10	14
SH032N	32	M8 or M10	14
SH040N	40	M8 or M10	14
SH050N	50	M8 or M10	14
SH065N	65	M8 or M10	14
SH080N	80	M8 or M10	14
SH100N	100	M8 or M10	14
SH125N	125	M12	17
SH150N	150	M12	17
SH200N	200	M16	21.5

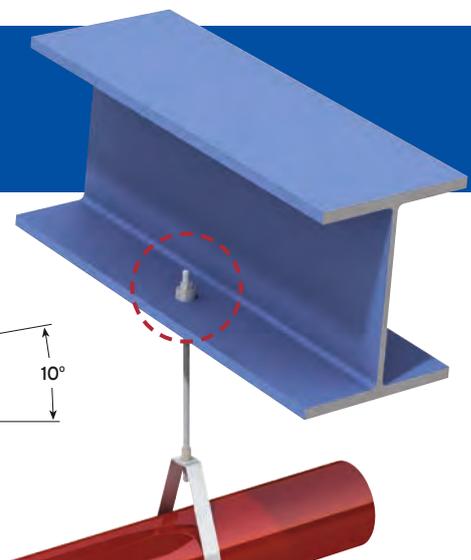
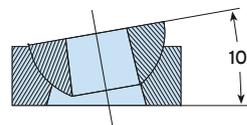
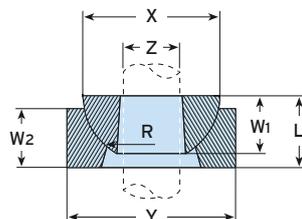
## Type HW / HC

For vertical suspension on angled surfaces of up to 10° swing either side of the vertical.

Washer



Cup

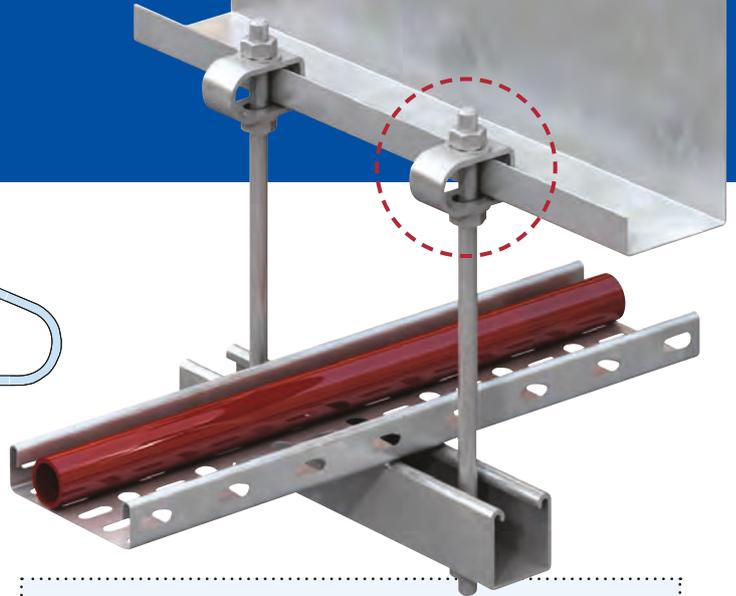
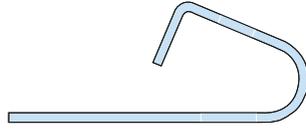


Material: Malleable iron, zinc plated or hot dip galvanised.

Product Code			Hemispherical Washer		Hemispherical Cup		Hemispherical Washer & Cup	
Hemispherical Washer (can be used without cup)	Hemispherical Cup	Rod Z	X	W <sub>1</sub>	Y	W <sub>2</sub>	R	L
			mm	mm	mm	mm	mm	mm
HW10	HC10	M10	25	12	32	12	13	14
HW12	HC12	M12	29	12	35	12	14	16
HW16	HC16	M16	34	16	41	16	17	19
HW20	HC20	M20	44	19	54	19	22	24

## Type Z10

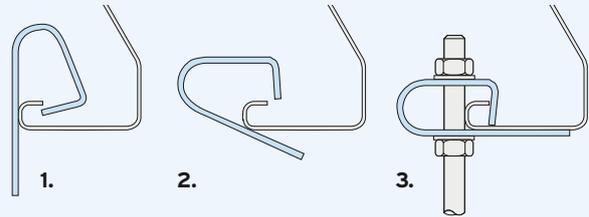
A purlin clip designed to suit a large range of purlin sections. Can be used with the Type SW for use on inclined purlins (see page 55).



Material: Mild steel, zinc plated.

Code	Purlins	Rod	Safe Working Load (FOS 3:1)	
			Tensile kN	Tightening Torque Nm
Z10	Kingspan Multibeam 2 and 3	M10	0.2	8
Z10	Metsec	M10	0.1 - 0.2	8
Z10	Zeta	M10	0.15	8

### How to install...



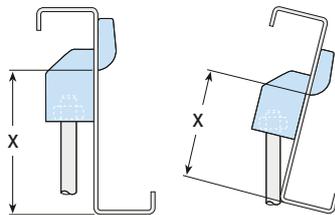
➔ Safe working loads are subject to the strength of the purlin. Please refer to the purlin manufacturer's literature.

## Type WF

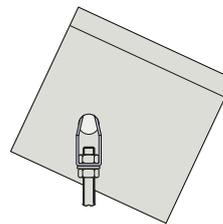
The Webfix allows a quick installation directly from the web of purlins.



**Hole Position: Canted Purlins**  
When purlins are connected to a sloping roof beam, the maximum allowable distance X (hole centre to the bottom edge of the purlin) must decrease.



**Hole Position: Inclined Purlins**  
Type WF adjusts to whatever angle is required. Hole position is not a limiting factor on product installation.

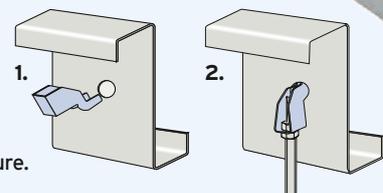


Material: Mild steel, zinc plated.

Code	Rod	Safe Working Load (FOS 5:1)		Hole Ø	Maximum Distance X at Angle of		
		Tensile kN	Maximum Purlin Thickness mm		10°	20°	30°
WF10	M10	1.0	4	18	103	94	74

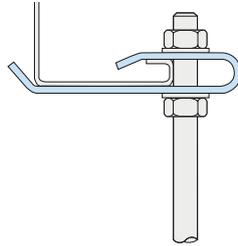
### How to install...

- 1) Squeeze the legs of the Type WF together and push through the hole until it clicks into place.
- 2) Assemble with the nut, ensuring full thread capture.



## Type HCW30

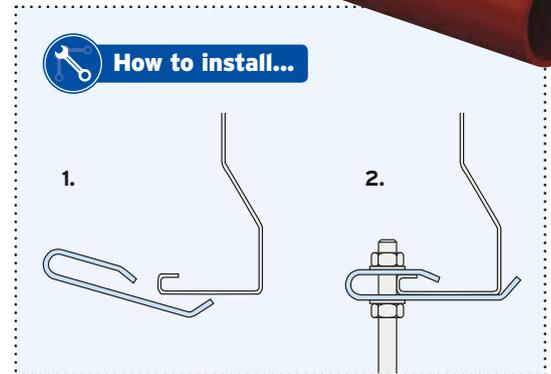
A purlin clip suitable for horizontal purlins.



Material: Pre-galvanised strip.

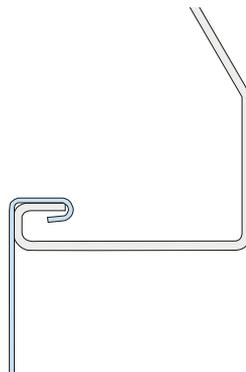
Code	Purlin	Rod	Safe Working Load (FOS 3:1)	
			Tensile kN	Tightening Torque Nm
HCW30	Kingspan Multibeam 3	M10	0.2	8

➤ Safe working loads are subject to the strength of the purlin. Please refer to the purlin manufacturer's literature.



## Type HCW31

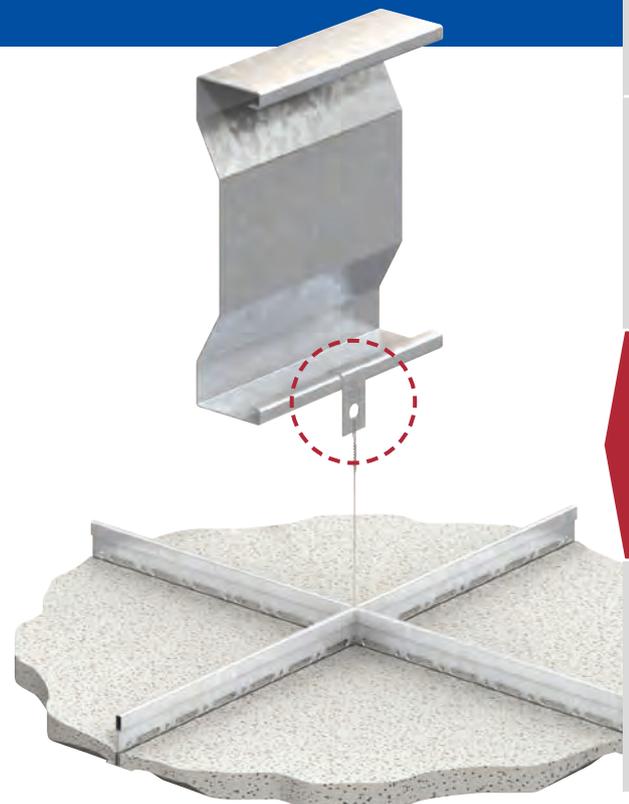
A universal purlin clip suitable for multiple applications.

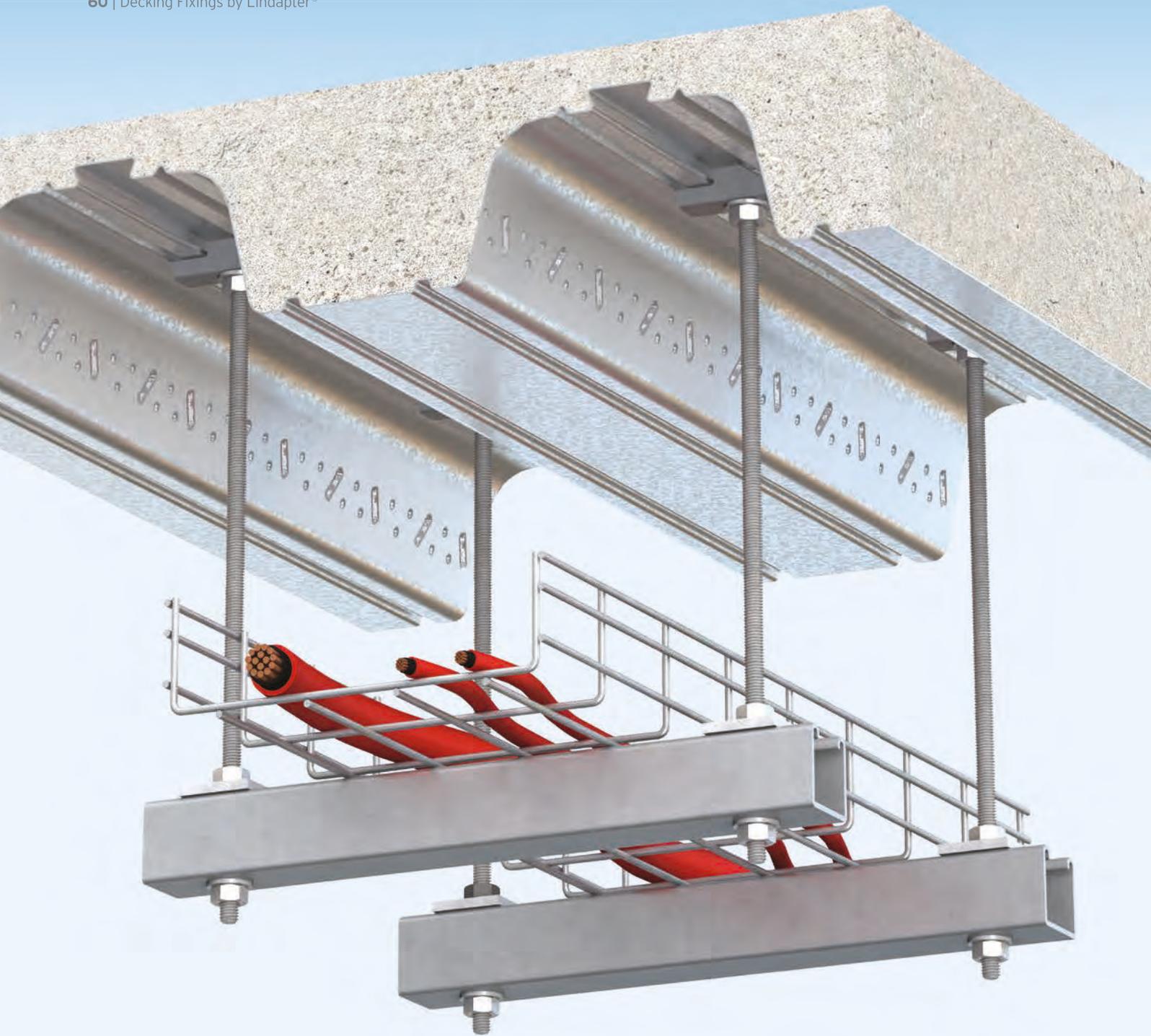


Material: Pre-galvanised strip.

Code	Purlin	Safe Working Load (FOS 3:1)
		Tensile kN
HCW31	Kingspan Multibeam 3	0.2

➤ Safe working loads are subject to the strength of the purlin. Please refer to the purlin manufacturer's literature.





# Decking Fixings

High quality, cost effective connections for securing building services. Designed to fit inside the dovetail re-entrant channels of popular composite decking profiles, Lindapter's fixings provide a zero-impact method that avoids delamination and damage to the decking.

## On-site capacity checks

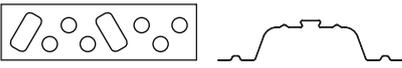
Lindapter's Engineers can provide tensile tests on the full range of decking fixings. Available on request and subject to application.



## Compatible Profiles

Lindapter has developed an extensive range of CE Marked decking fixings to ensure optimum compatibility with all major decking profiles.

### Components

Lindapter Decking Fixing	Compatible Composite Decking Profile(s)	
<p><b>Type TR60</b> page 62</p> 	<p><b>Structural Metal Decks (SMD)</b> TR60+ and TR80+</p>  	
<p><b>Type MF</b> page 63</p> 	<p><b>Composite Metal Flooring (CMF®)</b> MetFloor® 60 and MetFloor® 80</p>  	
<p><b>Type MW2 - Multiwedge 2</b> page 64</p> 	<p><b>Kingspan® Structural Products</b> Multideck® 60 and Multideck® 80</p>  	
<p><b>Type AW - Alphawedge</b> page 65</p> 	<p><b>Hare Decking (formerly Richard Lees®)</b> Ribdeck® E60</p>  	
<p><b>Type AMD</b> page 66</p> 	<p><b>Anglian Metal Deck</b> AMD60 and AMD80</p>  	
<p><b>Type SD2 - Slimdek 2</b> page 67</p> 	<p><b>Tata Steel® Europe</b> ComFlor® 225</p>  	
<p><b>Type VN</b> page 68</p> 	<p><b>Fits several profiles including:</b> AMD54 (AMD), R51+ (SMD), ComFlor® 51+ (Tata Steel®), Holorib® (Hare Decking), Superib® (Hare Decking), Multideck® 50 (Kingspan®) and MetFloor® 55 (CMF®)</p> 	

### Also available

**Type TC - Toggle Clamp**  
page 69



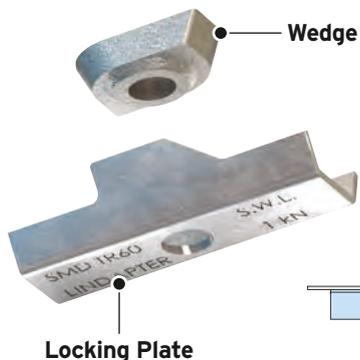
#### Designed for:

Service suspension from pre-cast hollow core slabs (minimum core depth of 75mm) as well as Structural Hollow Section (SHS), steel sheeting or purlins.



## Type TR60

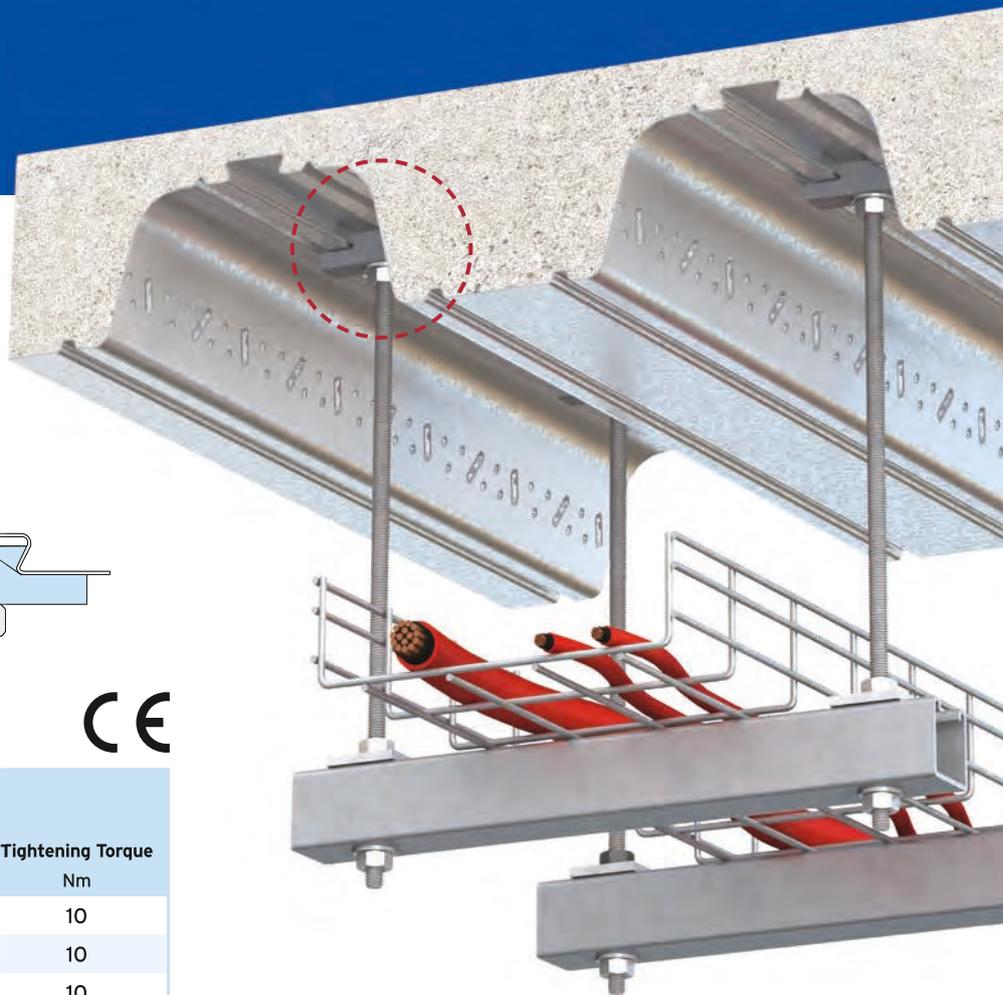
Designed for the TR60+ and TR80+ profiles manufactured by Structural Metal Decks (SMD).



Locking Plate: Pre-galvanised strip.  
Wedge: Malleable iron, bright zinc plated.

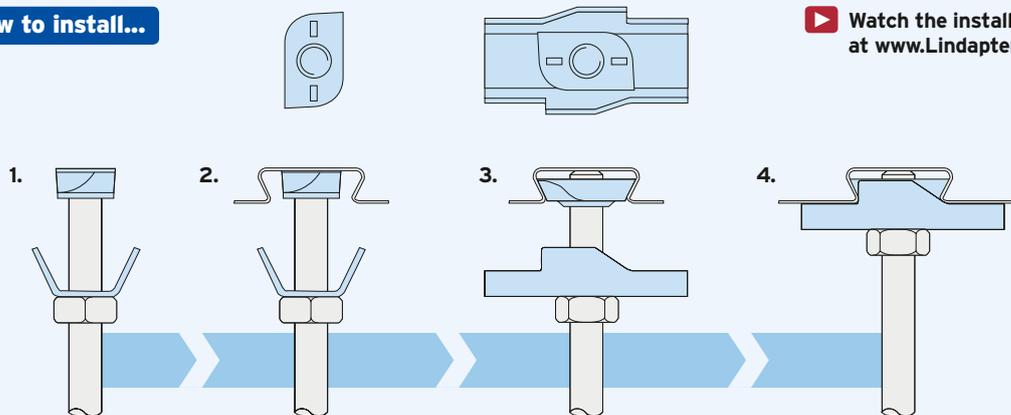


Product Code	Rod min 4.6	Safe Working Load (FOS 3:1)	
		Tensile / 1 Rod kN	Tightening Torque Nm
TR6006	M6	1.0	10
TR6008	M8	1.0	10
TR6010	M10	1.0	10



### How to install...

▶ Watch the installation video at [www.Lindapter.com](http://www.Lindapter.com)



- 1) Pre-assemble the locking plate and wedge (flat surface up) onto the threaded rod.
- 2) Insert the wedge into the re-entrant channel of the decking.
- 3) Rotate until the chamfered cams engage on the sides of the channel.
- 4) Slide the plate up the threaded rod and over the wedge to lock it into position. Tighten the locknut beneath the plate to hold the assembly in position.

- ▶ Install the decking fixings after the concrete has been poured and has reached full strength.
- ▶ If the decking profile is deformed or distorted, do not install the fixing. If in doubt, contact the Technical Support team for advice.

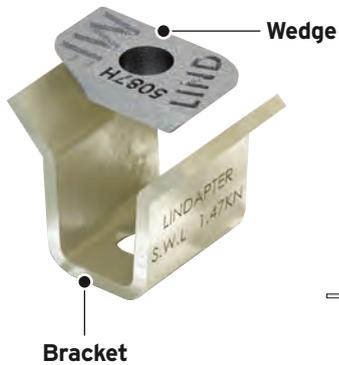


For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.020 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

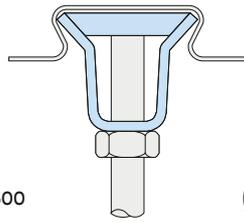


## Type MF

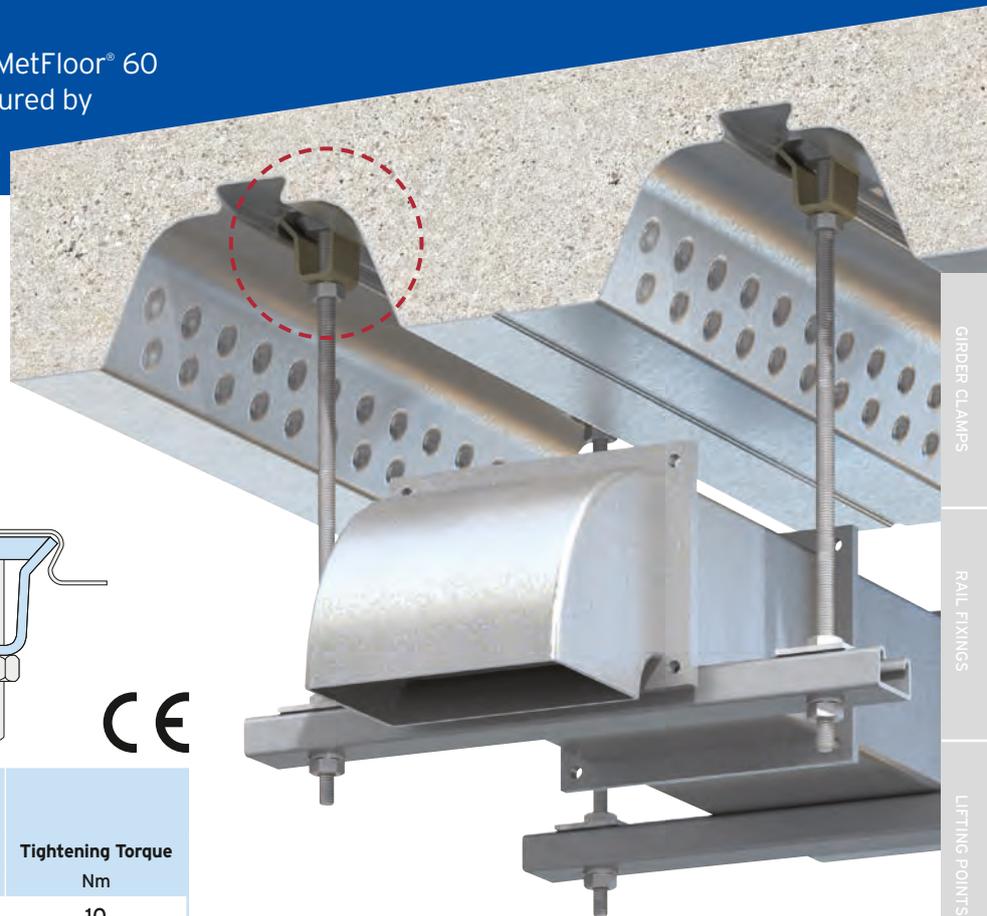
Specifically developed for use with MetFloor® 60 and MetFloor® 80 profiles manufactured by Composite Metal Flooring (CMF®).



Bracket: Steel strip, zinc plated + JS500  
Wedge: Malleable iron, zinc plated.

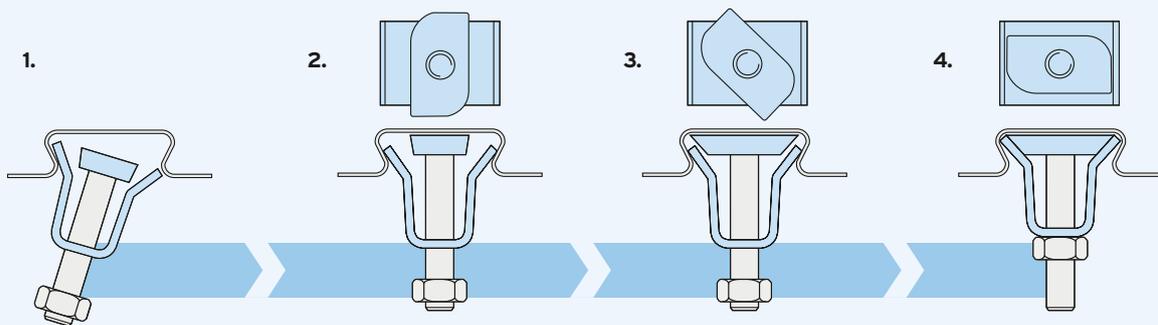


Product Code	Rod min 4.6	Safe Working Load (FOS 3:1)	Tightening Torque Nm
		Tensile / 1 Rod kN	
MF06	M6	1.47	10
MF08	M8	1.47	10
MF10	M10	1.47	10



➤ Although the Type MF is similar in appearance to the Type MW2 (page 64), it should NOT be used in profiles manufactured by Kingspan® Structural Products.

### How to install...



- 1) Pre-assemble the bracket and wedge (flat surface facing up) onto the threaded rod and insert one side of the bracket into the re-entrant channel of decking.
- 2) Insert the other side of the bracket into position inside the decking.
- 3) Turn the wedge clockwise until the position in Fig. 4 has been achieved.
- 4) Tighten the nut on the rod to a torque of 10Nm (prevent rod from rotating).

➤ Install the decking fixings after the concrete has been poured and has reached full strength.

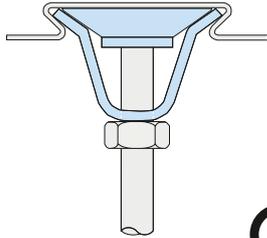
➤ If the decking profile is deformed or distorted, do not install the fixing. If in doubt, contact the Technical Support team for advice.



For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.017 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

## Type MW2 - Multiwedge 2

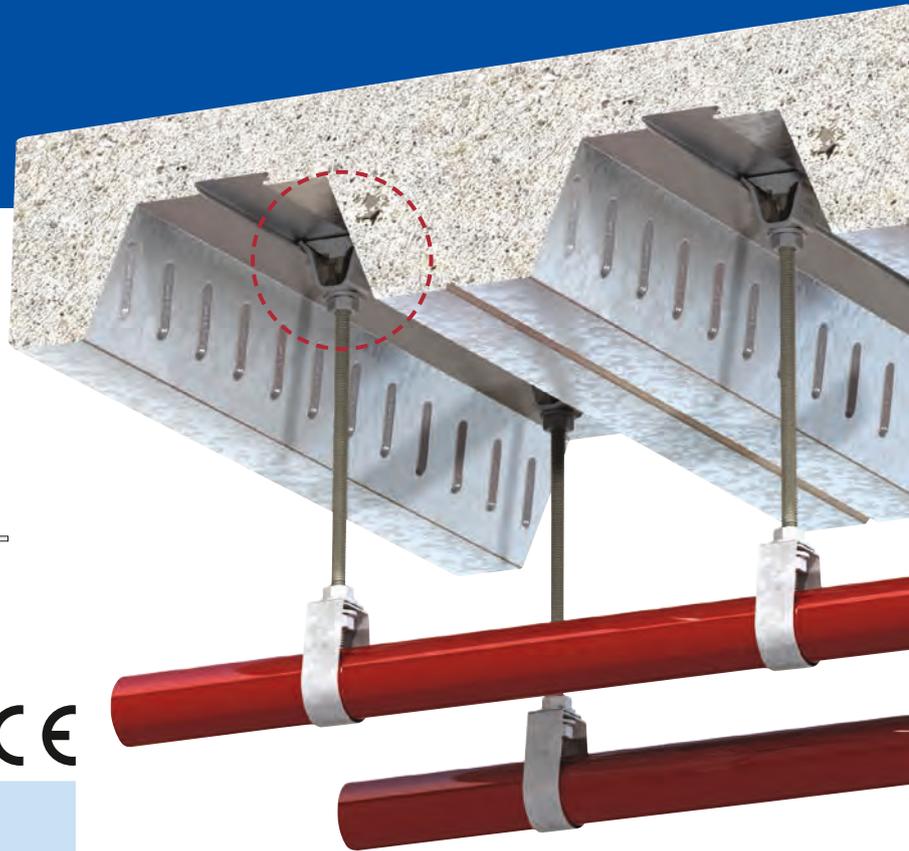
Designed for the Multideck® 60 and Multideck® 80 profiles manufactured by Kingspan® Structural Products.



Bracket: Pre-galvanised strip.  
Wedge: Malleable iron, bright zinc plated.

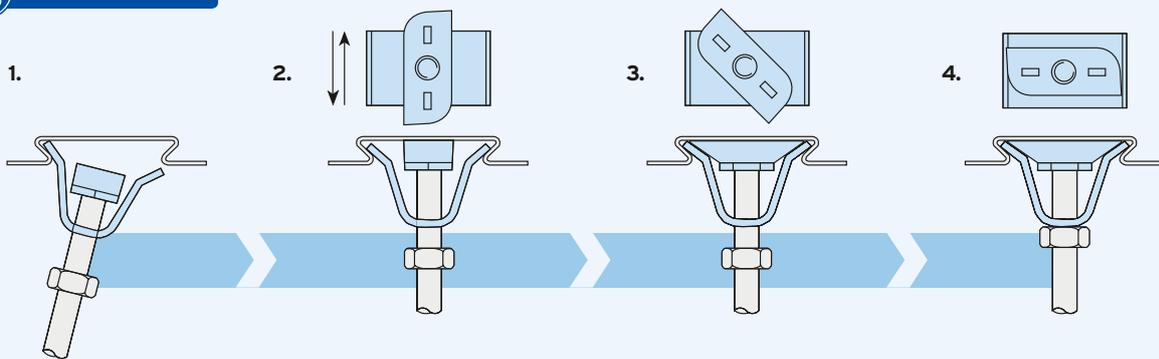


Product Code	Rod min 4.6	Safe Working Load (FOS 3:1)	
		Tensile / 1 Rod kN	Tightening Torque Nm
MW06	M6	1.47	10
MW08	M8	1.47	10
MW10	M10	1.47	10



▶ Although the Type MW2 is similar in appearance to the Type MF (page 63), it should NOT be used in profiles manufactured by CMF®.

### How to install...



- 1) Pre-assemble the bracket and wedge (flat surface facing up) onto the threaded rod and insert one side of the bracket into the re-entrant channel of the decking.
- 2) Click the other leg of the bracket into position inside the decking and slide the assembly to the desired position along the length of the re-entrant channel.
- 3) Push and turn the wedge clockwise until it locks into the channel walls.
- 4) Tighten the hexagon nut beneath the assembly.

▶ Install the decking fixings after the concrete has been poured and has reached full strength.

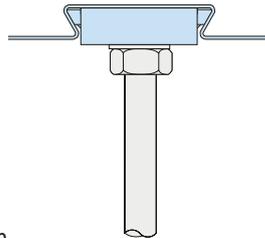
▶ If the decking profile is deformed or distorted, do not install the fixing. If in doubt, contact the Technical Support team for advice.



For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.019 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

## Type AW - Alphawedge

Designed for Ribdeck® E60 profiles manufactured by Hare Decking (formerly Richard Lees®).



Locking Plate: Pre-galvanised strip  
Wedge: Malleable iron, zinc plated.



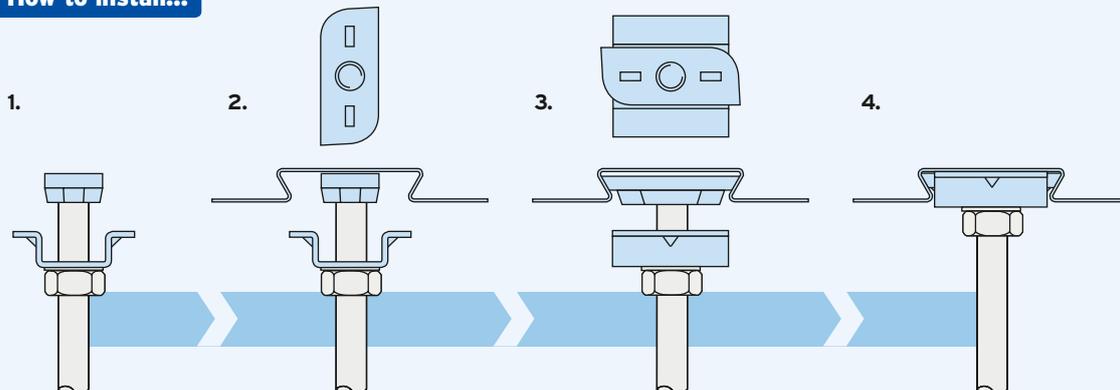
Product Code	Rod min 4.6	Safe Working Load (FOS 3:1)	
		Tensile / 1 Rod kN	Tightening Torque Nm
AW06	M6	1.0	10
AW08	M8	1.0	10
AW10	M10	1.0	10



➤ Although the Type AW is similar in appearance to Type AMD (page 66), it should NOT be used in profiles manufactured by Anglian Metal Deck.



### How to install...



- 1) Pre-assemble the locking plate and wedge (flat surface up) onto the threaded rod.
- 2) Insert the wedge into the re-entrant channel of the decking and rotate 90°.
- 3) Slide the plate up the threaded rod, over the wedge, to lock it in position into the channel.
- 4) Tighten the locknut beneath the plate to hold the assembly in position.

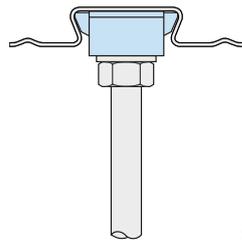
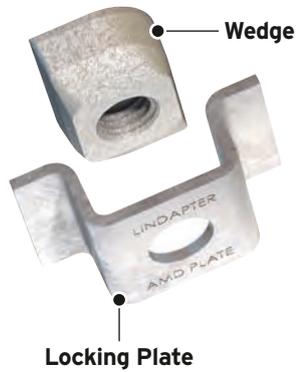
- Install the decking fixings after the concrete has been poured and has reached full strength.
- If the decking profile is deformed or distorted, do not install the fixing. If in doubt, contact the Technical Support team for advice.



For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.016 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

# Type AMD

Suitable for AMD60 and AMD80 decking profiles manufactured by Anglian Metal Deck.



Locking Plate: Pre-galvanised strip.  
Wedge: Malleable iron, bright zinc plated.

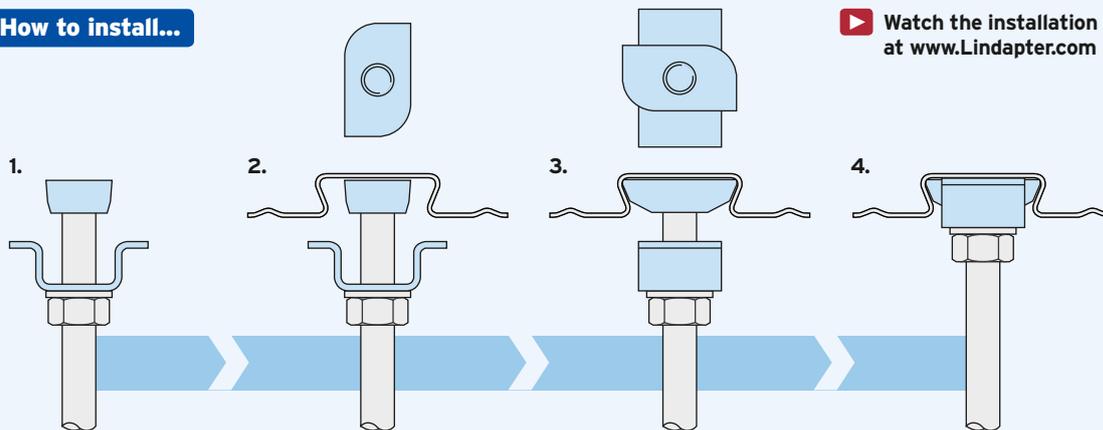


Product Code	Rod min 4.6	Safe Working Load (FOS 3:1)	
		Tensile / 1 Rod kN	Tightening Torque Nm
AMD06	M6	1.0	10
AMD08	M8	1.0	10
AMD10	M10	1.0	10

➤ Although the Type AMD is similar in appearance to the Type AW, it should NOT be used in profiles manufactured by Hare Decking.

## How to install...

▶ Watch the installation video at [www.Lindapter.com](http://www.Lindapter.com)



- 1) Pre-assemble the locking plate and wedge (flat surface facing up) onto the threaded rod.
- 2) Insert wedge into the re-entrant channel of the decking, rotate 90°.
- 3) Slide plate up the threaded rod, over the wedge, to lock it in position into the channel.
- 4) Tighten the locknut beneath the plate to hold the assembly in position.

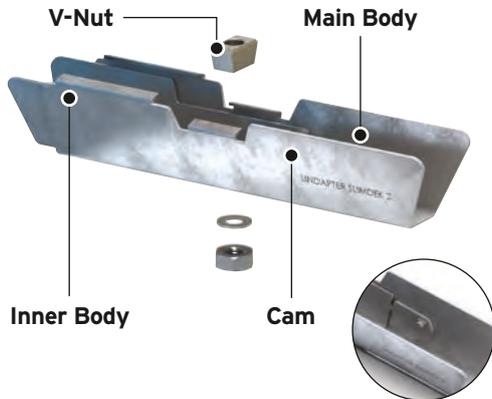
- Install the decking fixings after the concrete has been poured and has reached full strength.
- If the decking profile is deformed or distorted, do not install the fixing. If in doubt, contact the Technical Support team for advice.

CE For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.018 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

GIRDER CLAMPS  
 RAIL FIXINGS  
 LIFTING POINTS  
 HOLLO-BOLT  
 FLOOR FIXINGS  
 SUPPORT FIXINGS  
 DECKING FIXINGS

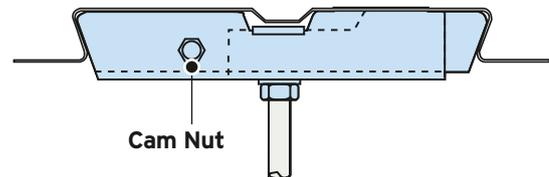
## Type SD2 - Slimdek 2

Designed for the ComFlor® 225 profiles manufactured by Tata Steel® Europe, the Type SD2 offers a fully flexible suspension position.



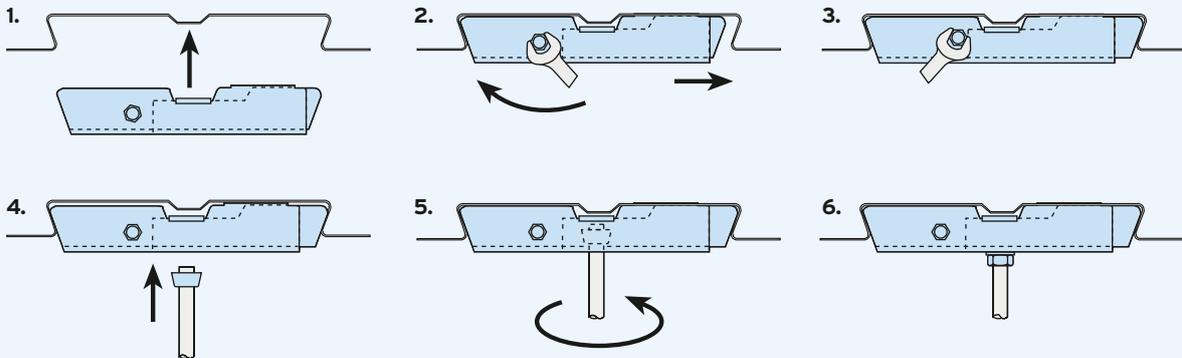
Material: Pre-galvanised strip.

Product Code	Rod min 4.6	Safe Working Load (FOS 3:1) Tensile / 1 Rod kN	Tightening Torque Nm
SD210	M10	1.0	12



### How to install...

▶ Watch the installation video at [www.Lindapter.com](http://www.Lindapter.com)



- 1) With Slimdek 2 (SD2) in its retracted position (as supplied) locate the fixing in the re-entrant channel.
- 2) Hold SD2 in position with one hand, then rotate the cam nut in the direction shown above with a spanner.
- 3) Tighten the cam nut until the inner body of the fixing locates against the re-entrant channel.
- 4) Offer the V-Nut on a threaded rod up to the main body.
- 5) Rotate the V-Nut through 90° to allow it to sit at the bottom of the SD2 body.
- 6) Secure the assembly with a nut.

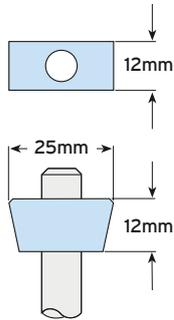
- ▶ Install the decking fixings after the concrete has been poured and has reached full strength.
- ▶ If the decking profile is deformed or distorted, do not install the fixing. If in doubt, contact the Technical Support team for advice.



For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.021 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

## Type VN

Fits inside the re-entrant channel of several composite floor decking profiles including AMD54, R51+, ComFlor® 51+, Holorib®, Superib®, Multideck® 50 and MetFloor® 55.



Material: Mild steel, zinc plated.



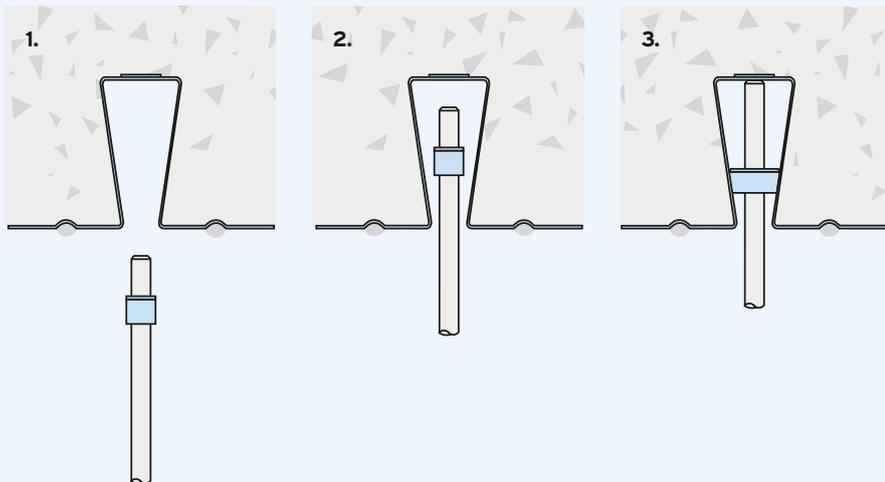
Product Code	Rod min 4.6	Safe Working Load (FOS 4:1)	
		Tensile / 1 Rod kN	Tightening Torque Nm
VN10	M10	2.1	10

- Install the decking fixings after the concrete has been poured and has reached full strength.
- If the decking profile is deformed or distorted, do not install the fixing. If in doubt, contact Technical Support for advice.



### How to install...

- 1) Screw the V-Nut (VN) onto the threaded rod.
- 2) Insert VN and rod into the decking channel.
- 3) Rotate rod and VN through 90° so that the tapered edges engage the sides of the re-entrant channel.



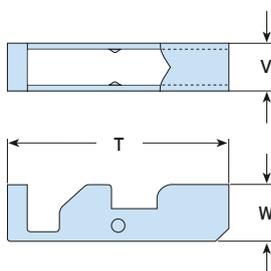
- Install the decking fixings after the concrete has been poured and has reached full strength.
- If the decking profile is deformed or distorted, do not install the fixing. If in doubt, contact the Technical Support team for advice.



For Characteristic Resistances when designing a connection to Eurocode 3, please refer to DoP No.022 on the website [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)

## Type TC - Toggle Clamp

Designed for service suspension from pre-cast hollow core slabs (minimum core depth 75mm) as well as SHS, steel sheeting or purlins.



Material: Steel strip, zinc plated.

Product Code	Rod min 8.8	Hole Ø mm	Safe Working Load (FOS 4:1)		Tightening Torque Nm	Dimensions		
			Tensile / 1 Rod kN			T mm	W mm	Width V mm
TC08	M8	22	2.45		10	68	16.5	13
TC10	M10	25	2.45		10	68	17.5	15

▶ Safe Working Loads subject to the strength of the supporting section.

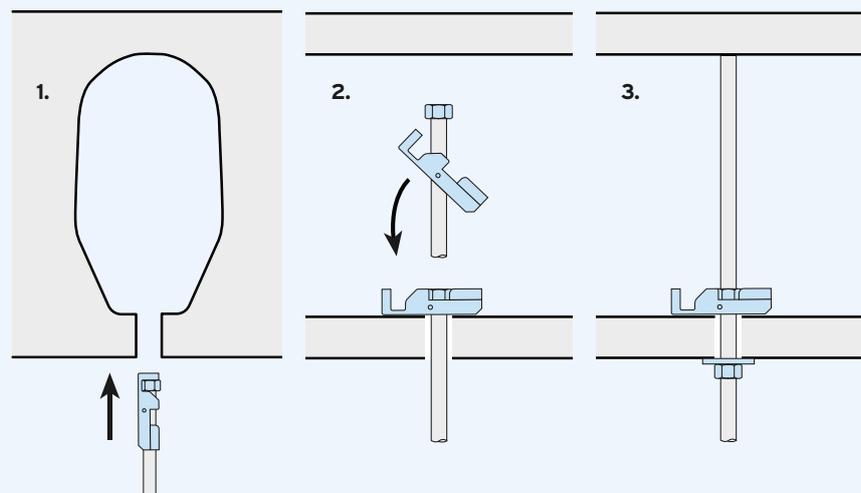


### How to install...

#### Instructions for hollow core slab:

- 1) Pre-assemble the clamp on the rod and insert into the hole (ensure it is central to the hollow core).
- 2) Shake the rod to allow the toggle body to locate horizontally across the hole, then lower the rod so that the nut locates in the toggle body.
- 3) Wind up the rod to the top of the section so it is as high as possible. Secure the assembly with a nut and washer.

▶ Watch the installation video at [www.Lindapter.com](http://www.Lindapter.com)



▶ Install the decking fixings after the concrete has been poured and has reached full strength.

▶ If the decking profile is deformed or distorted, do not install the fixing. If in doubt, contact the Technical Support team for advice.

## Tightening Torque and DTI Washers

Important information about the tightening torque values published in this catalogue can be found below. Additional information about the use of DTI Washers is also provided.

### All torque figures given in this catalogue are for fasteners in an unlubricated condition.

The use of these torque figures with lubricated or greased threaded fasteners and hexagon nuts will apply a much higher preload and may result in damage to the clamp and fastener.

When using **property class 8.8 or 10.9** lubricated fasteners with a Lindapter component, a reduced torque value should be used. Please contact your bolt and nut supplier for information on the alternative torque for the selected lubricant to ensure the correct preload is generated.

### Using DTI Washers

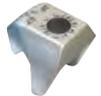
If preferred, DTI Washers can be used with the components shown in the table below. The use of this type of washer provides a visual indication that the correct preload has been achieved in the bolt.

For guidance on the use of DTI washers, please refer to EN14399-9 and DTI manufacturers' instructions.



### Suitability of component with DTI Washers (EN14399-9)



	Lindapter Product		
	Type AAF (page 12)	Type AF (page 14)	Type CF (page 15)
8.8 Bolts			
10.9 Bolts	✓	✓	✗

➤ Type A (page 8), Type B (page 9), Type LR (page 18) and Type LS (page 22) have lower torque values to limit the amount of preload on unlubricated bolts and cannot be used with DTI load indicating washers.

## FAQs about Lindapter Girder Clamps

Below you'll find answers to the questions we get asked the most about Lindapter Girder Clamps. If your question is not answered here please contact Lindapter's Technical Support team.

### Can location plates be made to any dimensions?

No. Details of the minimum sizes are shown in this catalogue.

### Are Lindapter assemblies reusable?

It is not advisable. The load bearing capabilities cannot be guaranteed because they may have been over tightened and therefore overstressed.

### Do tail length and packing combination calculations have to be exact?

The tables within the catalogue or on the website should be used for guidance on tail lengths and packing combinations; there is a tolerance which varies depending on the bolt diameter.

### Is it possible to use Lindapter products with proprietary concrete anchors?

Yes, but it may be necessary to reduce Lindapter's recommended bolt tightening torque to comply with the anchor bolt manufacturers figures; if so, this is likely to affect the connection capacity.

### Will clamps damage my steel surface coating?

The material from which Lindapter clamps are manufactured should not damage the structure although removal marks might be visible on some surface coatings.

### Can Lindapter connections be used in a combined tension and friction / slip resistance load?

Yes, although calculations are needed to determine the best size and Lindapter product to use.

### Why do location and end plates have to be made to a certain minimum thickness?

As well as positioning all the components, the location plate supports the tail of the clamp.

On girder clamp assemblies the plate does not have to be as thick as it does for end plates; the reason for this is that the tail of the clamp on the bottom beam is trying to bend the plate but this is counteracted by the clamp's tail on the top beam.

With end plates there is no counteracting clamp, hence the plate needs to be thicker to support the tail. Plate thicknesses may be able to be reduced by using higher grade/strength material.

### Are Lindapter assemblies affected by vibration?

Although tested and approved for situations where they will be subject to vibration conditions, we would recommend that, in circumstances where this could be extreme, a proprietary locking device / anti-vibration washer can be used.

### Can Lindapter Type F9 be used to connect beams together?

It is possible if the beams are running parallel to each other but they must be of the same type and width although a Lindapter Girder Clamp is a much better option; the Type F9 must never be used to connect beams together which are crossing at 90° to each other or have tapered flanges.

### Can Lindapter assemblies be used as permanent connections or are they only for temporary use?

They can be used in temporary and permanent applications. The company has details of applications that have been in situ for 40 years or more.

## FAQs about Lindapter Girder Clamps

Below you'll find more answers to the questions we get asked the most about Lindapter Girder Clamps. If your question is not answered here please contact Lindapter's Technical Support team.

### How long will Lindapter assemblies last in an exterior environment?

The best coating would be Hot Dip Galvanising. Longevity would depend on the background corrosion rate evident in the location it is intended they be used; guidance should be sought from the galvanisers association of the relevant country.

### Why is there such a high Factor of Safety, typically 5:1, on Lindapter connections?

This recommended Factor of Safety is to ensure that the components are subject to loads well within their capacity range in normal working condition but in event of an unintentional overload of the component / assembly there is sufficient strength within the clamps to avoid damage and / or failure of the connection. A lower FOS must not be used without first seeking advice.

### Do I need to use a torque wrench when assembling a Lindapter connection?

Yes, we always recommend the use of a calibrated torque wrench. It is important to tighten up the fasteners to our published torque figures to ensure it replicates test conditions so that the Safe Working Loads can be achieved.

### Is it possible to use Lindapter products either sub-sea or within the splash zone?

Yes, although consideration has to be given to the proposed material or coating used; splash zones can be more aggressive than total submersion.

### What should be considered when connecting a pre-drilled section to an existing beam?

Make sure the section is thick enough to counter the reaction from the tail of the clamp.

### Is it possible to use stainless steel fasteners with Lindapter products?

It is not recommended as it is likely to create a mechanism for the onset of bi-metallic corrosion.

They can however be used with the Lindapter Type LS which is manufactured in stainless steel.

### Why is the frictional Factor of Safety on Lindapter Type AF only 2:1 and not 5:1 as it is on the tensile Safe Working Loads?

The published safe working load and 2:1 factor of safety is a recognised method of determining slip and is defined according to the Eurocode as the load corresponding to 0.1mm of movement.

As the safe working load is based on movement of 0.1mm it is acceptable to use a reduced factor of safety of 2:1.

### Can I use Lindapter clamps in slotted hole connections?

Yes, but it is important that the slot is 'bridged' to ensure that the tail of the clamp does not fit into it. This can be done by using a product with a full width tail such as Types AAF, AF, LR or LS.

NSSS 6th Edition Section 6.1.5 recommends that Plate Washers shall be used under the head of the bolt or nut when using slotted holes.

### What is the recommended Lindapter safe working temperature range?

As a general rule -30°C to +350°C; however, this can increase or decrease in certain situations. For example, Type AAF clamp is tested to -60°C. Surface coating may reduce the temperature range.

## FAQs about Lindapter Holo-Bolts

Below you'll find answers to the questions we get asked the most about Lindapter Holo-Bolts. If your question is not answered here please contact Lindapter's Technical Support team.

### Can the Holo-Bolt be used in concrete?

No. It is designed as an expansion bolt for SHS or other steel sections where access is available from one side only.

### Is it possible to reuse the Holo-Bolt?

No, although a new Holo-Bolt can be inserted in the existing hole.

### Can I use slotted holes in Holo-Bolt connections?

Yes, as long as the slot is in the outer ply only and is perpendicular to any shear load.

### Is it necessary to seal the Holo-Bolt to prevent ingress of water?

Not always, especially on the size M16 and M20 Holo-Bolt HCFs where the rubber washer expands to fill the void. Sealing washers are available; however, it is important the interface between the SHS face and plate or bracket is not ignored.

### Can the maximum clamping thicknesses published in the catalogue be exceeded?

No. The figures are accurate depictions and should not be exceeded under any circumstances.

### Which Holo-Bolt load table should I use?

For connections to secondary steelwork, please refer to page 42. If designing structural connections to Eurocode 3, see the Characteristic Values on page 43. For structural connections using the 'Simple Method' i.e. braced frames where connections carry mainly shear and axial loads only, refer to the BCSA and SCI design guide 'Joints in Steel Construction - Simple Connections'.

### Can the Holo-Bolt be used in all shapes and sizes of SHS?

Yes. It can be used in square, rectangular, circular, and other profiles where access is restricted to the outer face. In all cases the suitability of the component is subject to the available void space, the total thickness of the material to be clamped and in the case of circular sections, the radius of the outer face.

### Why is there a minimum outer ply requirement when using M16 and M20 Holo-Bolts?

To ensure the rubber washer does not compromise the shear capacity of the Holo-Bolt by being within the shear plane.

### How do I remove a Holo-Bolt?

#### Sizes M8, M10 and M12 using a pneumatic tool to remove the Holo-Bolt:

- 1) Set the pneumatic hand tool to reverse mode (anti-clockwise rotation).
- 2) Place a suitable size spanner (depending on collar size) on the collar flats to hold in place.
- 3) Use the pneumatic hand tool to loosen the bolt.
- 4) Continue in reverse mode until the cone on the inside of the SHS at the other end of the bolt is released to drop inside the SHS.
- 5) The bolt can now be removed as can the sleeve by prying the collar with a pinch or crow bar.

#### Sizes M16 and M20 Holo-Bolt HCF) using a pneumatic tool to remove the Holo-Bolt:

Steps 1) to 3) same as above.

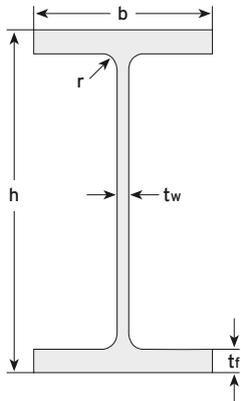
- 4) Continue in reverse mode until the cone, expanded sleeve, and rubber washer on the inside of the SHS, at the other end of the bolt are released to drop inside the SHS.
- 5) The bolt and loose collar can now be removed.

Note: Hand tools can be used to untighten the bolt. These methods can also be used to remove the Holo-Bolt Countersunk Head. The Holo-Bolt Flush Fit however cannot be removed once it is installed.

## Section Details

Lindapter's products are compatible with almost any type of steel section. Properties of popular beams and channels are included over the next four pages. While this is not a definitive list of all steel sections, it may be a convenient reference point for Engineers.

### Universal Beams (UB) Section Properties

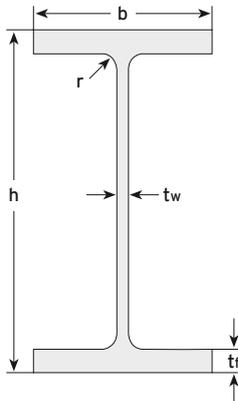


Section Designation	Mass per metre kg/m	Depth of section h mm	Width of section b mm	Thickness		Root Radius r mm
				Web tw mm	Flange tf mm	
<b>1016 x 305</b> x 584	584.0	1056.0	314.0	36.0	64.0	30.0
x 494	494.0	1036.0	309.0	31.0	54.0	30.0
x 438	438.0	1026.0	305.0	26.9	49.0	30.0
x 415	415.0	1020.0	304.0	26.0	46.0	30.0
x 393	392.7	1015.9	303.0	24.4	43.9	30.0
x 350	350.0	1008.0	302.0	21.1	40.0	30.0
x 314	314.3	999.9	300.0	19.1	35.9	30.0
x 272	272.3	990.1	300.0	16.5	31.0	30.0
x 249	248.7	980.1	300.0	16.5	26.0	30.0
x 222	222.0	970.3	300.0	16.0	21.1	30.0
<b>914 x 419</b> x 388	388.0	921.0	420.5	21.4	36.6	24.1
x 343	343.3	911.8	418.5	19.4	32.0	24.1
<b>914 x 305</b> x 576	576.0	993.0	322.0	36.1	65.0	19.0
x 521	521.0	981.0	319.0	33.0	58.9	19.0
x 474	474.0	971.0	316.0	30.0	54.1	19.0
x 425	425.0	961.0	313.0	26.9	49.0	19.0
x 381	381.0	951.0	310.0	24.4	43.9	19.0
x 345	345.0	943.0	308.0	22.1	39.9	19.0
x 313	313.0	932.0	309.0	21.1	34.5	19.0
x 289	289.1	926.6	307.7	19.5	32.0	19.1
x 271	271.0	923.0	307.0	18.4	30.0	19.0
x 253	253.4	918.4	305.5	17.3	27.9	19.1
x 238	238.0	915.0	305.0	16.5	25.9	19.0
x 224	224.2	910.4	304.1	15.9	23.9	19.1
x 201	200.9	903.0	303.3	15.1	20.2	19.1
<b>838 x 292</b> x 226	226.5	850.9	293.8	16.1	26.8	17.8
x 194	193.8	840.7	292.4	14.7	21.7	17.8
x 176	175.9	834.9	291.7	14.0	18.8	17.8
<b>762 x 267</b> x 197	196.8	769.8	268.0	15.6	25.4	16.5
x 173	173.0	762.2	266.7	14.3	21.6	16.5
x 147	146.9	754.0	265.2	12.8	17.5	16.5
x 134	133.9	750.0	264.4	12.0	15.5	16.5
<b>686 x 254</b> x 170	170.2	692.9	255.8	14.5	23.7	15.2
x 152	152.4	687.5	254.5	13.2	21.0	15.2
x 140	140.1	683.5	253.7	12.4	19.0	15.2
x 125	125.2	677.9	253.0	11.7	16.2	15.2
<b>610 x 305</b> x 238	238.1	635.8	311.4	18.4	31.4	16.5
x 179	179.0	620.2	307.1	14.1	23.6	16.5
x 149	149.2	612.4	304.8	11.8	19.7	16.5
<b>610 x 229</b> x 140	139.9	617.2	230.2	13.1	22.1	12.7
x 125	125.1	612.2	229.0	11.9	19.6	12.7
x 113	113.0	607.6	228.2	11.1	17.3	12.7
x 101	101.2	602.6	227.6	10.5	14.8	12.7
<b>610 x 178</b> x 100	100.3	607.4	179.2	11.3	17.2	12.7
x 92	92.2	603.0	178.8	10.9	15.0	12.7
x 82	81.8	598.6	177.9	10.0	12.8	12.7
<b>533 x 312</b> x 273	273.3	577.1	320.2	21.1	37.6	12.7
x 219	218.8	560.3	317.4	18.3	29.2	12.7
x 182	181.5	550.7	314.5	15.2	24.4	12.7
x 151	150.6	542.5	312.0	12.7	20.3	12.7
<b>533 x 210</b> x 138	138.3	549.1	213.9	14.7	23.6	12.7
x 122	122.0	544.5	211.9	12.7	21.3	12.7
x 109	109.0	539.5	210.8	11.6	18.8	12.7
x 101	101.0	536.7	210.0	10.8	17.4	12.7
x 92	92.1	533.1	209.3	10.1	15.6	12.7
x 82	82.2	528.3	208.8	9.6	13.2	12.7

# Section Details

(Continued).

## Universal Beams (UB) Section Properties

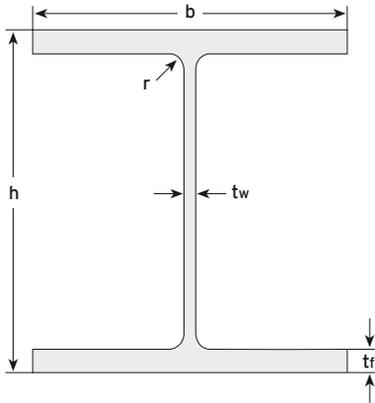


Section Designation	Mass per metre kg/m	Depth of section h mm	Width of section b mm	Thickness		Root Radius r mm	
				Web $t_w$ mm	Flange $t_r$ mm		
533 x 165	x 85	84.8	534.9	166.5	10.3	16.5	12.7
	x 75	74.7	529.1	165.9	9.7	13.6	12.7
	x 66	65.7	524.7	165.1	8.9	11.4	12.7
457 x 191	x 161	161.4	492.0	199.4	18.0	32.0	10.2
	x 133	133.3	480.6	196.7	15.3	26.3	10.2
	x 106	105.8	469.2	194.0	12.6	20.6	10.2
	x 98	98.3	467.2	192.8	11.4	19.6	10.2
	x 89	89.3	463.4	191.9	10.5	17.7	10.2
	x 82	82.0	460.0	191.3	9.9	16.0	10.2
	x 74	74.3	457.0	190.4	9.0	14.5	10.2
457 x 152	x 67	67.1	453.4	189.9	8.5	12.7	10.2
	x 82	82.1	465.8	155.3	10.5	18.9	10.2
	x 74	74.2	462.0	154.4	9.6	17.0	10.2
	x 67	67.2	458.0	153.8	9.0	15.0	10.2
	x 60	59.8	454.6	152.9	8.1	13.3	10.2
406 x 178	x 52	52.3	449.8	152.4	7.6	10.9	10.2
	x 85	85.3	417.2	181.9	10.9	18.2	10.2
	x 74	74.2	412.8	179.5	9.5	16.0	10.2
	x 67	67.1	409.4	178.8	8.8	14.3	10.2
	x 60	60.1	406.4	177.9	7.9	12.8	10.2
406 x 140	x 54	54.1	402.6	177.7	7.7	10.9	10.2
	x 53	53.3	406.6	143.3	7.9	12.9	10.2
	x 46	46.0	403.2	142.2	6.8	11.2	10.2
356 x 171	x 39	39.0	398.0	141.8	6.4	8.6	10.2
	x 67	67.1	363.4	173.2	9.1	15.7	10.2
	x 57	57.0	358.0	172.2	8.1	13.0	10.2
356 x 127	x 51	51.0	355.0	171.5	7.4	11.5	10.2
	x 45	45.0	351.4	171.1	7.0	9.7	10.2
	x 39	39.1	353.4	126.0	6.6	10.7	10.2
305 x 165	x 33	33.1	349.0	125.4	6.0	8.5	10.2
	x 54	54.0	310.4	166.9	7.9	13.7	8.9
305 x 127	x 46	46.1	306.6	165.7	6.7	11.8	8.9
	x 40	40.3	303.4	165.0	6.0	10.2	8.9
	x 48	48.1	311.0	125.3	9.0	14.0	8.9
305 x 102	x 42	41.9	307.2	124.3	8.0	12.1	8.9
	x 37	37.0	304.4	123.4	7.1	10.7	8.9
	x 33	32.8	312.7	102.4	6.6	10.8	7.6
254 x 146	x 28	28.2	308.7	101.8	6.0	8.8	7.6
	x 25	24.8	305.1	101.6	5.8	7.0	7.6
	x 43	43.0	259.6	147.3	7.2	12.7	7.6
254 x 102	x 37	37.0	256.0	146.4	6.3	10.9	7.6
	x 31	31.1	251.4	146.1	6.0	8.6	7.6
	x 28	28.3	260.4	102.2	6.3	10.0	7.6
203 x 133	x 25	25.2	257.2	101.9	6.0	8.4	7.6
	x 22	22.0	254.0	101.6	5.7	6.8	7.6
	x 30	30.0	206.8	133.9	6.4	9.6	7.6
203 x 102	x 25	25.1	203.2	133.2	5.7	7.8	7.6
	x 23	23.1	203.2	101.8	5.4	9.3	7.6
178 x 102	x 19	19.0	177.8	101.2	4.8	7.9	7.6
152 x 89	x 16	16.0	152.4	88.7	4.5	7.7	7.6
127 x 76	x 13	13.0	127.0	76.0	4.0	7.6	7.6

# Section Details

(Continued)..

## Universal Columns (UC) Section Properties

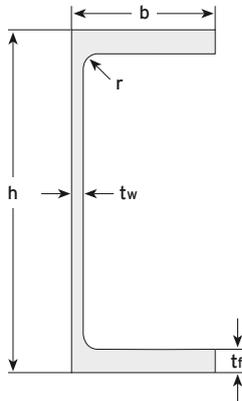


Section Designation		Mass per metre kg/m	Depth of section h mm	Width of section b mm	Thickness		Root Radius r mm
					Web tw mm	Flange tf mm	
<b>356 x 406</b>	x 1299	1299.0	600.0	476.0	100.0	140.0	15.4
	x 1202	1202.0	580.0	471.0	95.0	130.0	15.4
	x 1086	1086.0	569.0	454.0	78.0	125.0	15.0
	x 990	990.0	550.0	448.0	71.9	115.0	15.0
	x 900	900.0	531.0	442.0	65.9	106.0	15.0
	x 818	818.0	514.0	437.0	60.5	97.0	15.0
	x 744	744.0	498.0	432.0	55.6	88.9	15.0
	x 677	677.0	483.0	428.0	51.2	81.5	15.0
	x 634	633.9	474.6	424.0	47.6	77.0	15.2
	x 592	592.0	465.0	421.0	45.0	72.3	15.0
	x 551	551.0	455.6	418.5	42.1	67.5	15.2
	x 509	509.0	446.0	416.0	39.1	62.7	15.0
	x 467	467.0	436.6	412.2	35.8	58.0	15.2
x 393	393.0	419.0	407.0	30.6	49.2	15.2	
x 340	339.9	406.4	403.0	26.6	42.9	15.2	
x 287	287.1	393.6	399.0	22.6	36.5	15.2	
x 235	235.1	381.0	394.8	18.4	30.2	15.2	
<b>356 x 368</b>	x 202	201.9	374.6	374.7	16.5	27.0	15.2
	x 177	177.0	368.2	372.6	14.4	23.8	15.2
	x 153	152.9	362.0	370.5	12.3	20.7	15.2
	x 129	129.0	355.6	368.6	10.4	17.5	15.2
<b>305 x 305</b>	x 283	282.9	365.3	322.2	26.8	44.1	15.2
	x 240	240.0	352.5	318.4	23.0	37.7	15.2
	x 198	198.1	339.9	314.5	19.1	31.4	15.2
	x 158	158.1	327.1	311.2	15.8	25.0	15.2
	x 137	136.9	320.5	309.2	13.8	21.7	15.2
	x 118	117.9	314.5	307.4	12.0	18.7	15.2
	x 97	96.9	307.9	305.3	9.9	15.4	15.2
<b>254 x 254</b>	x 167	167.1	289.1	265.2	19.2	31.7	12.7
	x 132	132.0	276.3	261.3	15.3	25.3	12.7
	x 107	107.1	266.7	258.8	12.8	20.5	12.7
	x 89	88.9	260.3	256.3	10.3	17.3	12.7
	x 73	73.1	254.1	254.6	8.6	14.2	12.7
<b>203 x 203</b>	x 127	127.5	241.4	213.9	18.1	30.1	10.2
	x 113	113.5	235.0	212.1	16.3	26.9	10.2
	x 100	99.6	228.6	210.3	14.5	23.7	10.2
	x 86	86.1	222.2	209.1	12.7	20.5	10.2
	x 71	71.0	215.8	206.4	10.0	17.3	10.2
	x 60	60.0	209.6	205.8	9.4	14.2	10.2
	x 52	52.0	206.2	204.3	7.9	12.5	10.2
	x 46	46.1	203.2	203.6	7.2	11.0	10.2
<b>152 x 152</b>	x 51	51.2	170.2	157.4	11.0	15.7	7.6
	x 44	44.0	166.0	155.9	9.5	13.6	7.6
	x 37	37.0	161.8	154.4	8.0	11.5	7.6
	x 30	30.0	157.6	152.9	6.5	9.4	7.6
	x 23	23.0	152.4	152.2	5.8	6.8	7.6

# Section Details

(Continued).

## Parallel Flange Channels (PFC) Section Properties



Section Designation	Mass per metre kg/m	Depth of section h mm	Width of section b mm	Thickness		Root Radius r mm
				Web $t_w$ mm	Flange $t_f$ mm	
430 x 100 x 64	64.4	430	100	11.0	19.0	15
380 x 100 x 54	54.0	380	100	9.5	17.5	15
300 x 100 x 46	45.5	300	100	9.0	16.5	15
300 x 90 x 41	41.4	300	90	9.0	15.5	12
260 x 90 x 35	34.8	260	90	8.0	14.0	12
260 x 75 x 28	27.6	260	75	7.0	12.0	12
230 x 90 x 32	32.2	230	90	7.5	14.0	12
230 x 75 x 26	25.7	230	75	6.5	12.5	12
200 x 90 x 30	29.7	200	90	7.0	14.0	12
200 x 75 x 23	23.4	200	75	6.0	12.5	12
180 x 90 x 26	26.1	180	90	6.5	12.5	12
180 x 75 x 20	20.3	180	75	6.0	10.5	12
150 x 90 x 24	23.9	150	90	6.5	12.0	12
150 x 75 x 18	17.9	150	75	5.5	10.0	12
125 x 65 x 15	14.8	125	65	5.5	9.5	12
100 x 50 x 10	10.2	100	50	5.0	8.5	9

## Proven connection solutions

Lindapter products are used in multiple industries around the world in an extensive range of applications. The case studies below highlight the wide use of Lindapter fixings. To view more project examples, please visit the website [www.Lindapter.com](http://www.Lindapter.com)

### Tower Bridge, UK



**Product: Type A**

**Application: Type A clamps were used to attach the supporting steel frame of the new glass walkway to the original steel lattice.**

The new viewing platform spans 42m on the upper level of the bridge over the River Thames and features a glass floor to reveal the bridge deck and water below. The floor consists of six 80mm thick glass panels, each weighing 530kg and supported by a 1000kg carbon steel framework.

Lindapter's simple connection solution allowed the frame to be safely secured to the original steel lattice structure without on-site drilling or welding, ensuring that there was no damage to the bridge. The contractors completed the renovation inside six weeks without closing the site.



➔ See page 8 for Type A.

### Birmingham New Street, UK



**Product: Type TR60**

**Application: Suspending building services in the concourse and John Lewis store.**

The £750 million redevelopment of Birmingham New Street and Grand Central building required a method for suspending building services in the John Lewis store and the railway station concourse.

Lindapter TR60's quickly slotted into the dovetail shaped re-entrant channel of the metal decking, allowing a quick and easy installation of mechanical and fire protection systems without the need for on-site drilling or welding.

Installation only required the use of simple hand tools, saving time and labour costs as well as ensuring there was no damage to the decking.



➔ See page 62 for Type TR60.

## History Museum, Dresden, Germany



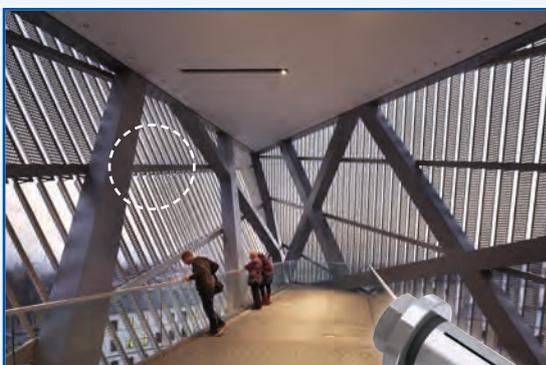
© Hulton &amp; Crow

**Product: Type HB Stainless Steel**  
**Application: Securing steel façade panels to the structural steel hollow section.**

The Lindapter Hollo-Bolt secured steel cladding panels to the structural steel hollow section in Daniel Libeskind's impressive five storey façade, allowing the arrow shaped extension, made from glass, concrete and steel, to intersect the original neo-classical arsenal building.

Contractors used over 2,000 M8 stainless steel Hollo-Bolts to quickly install the panels from just one side, avoiding on-site drilling or welding.

The discreet Hollo-Bolts were manufactured from grade 316 stainless steel for enhanced corrosion resistance.



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➤ See pages 39-45 for Hollo-Bolt.



## Hitachi Ashford Depot, UK

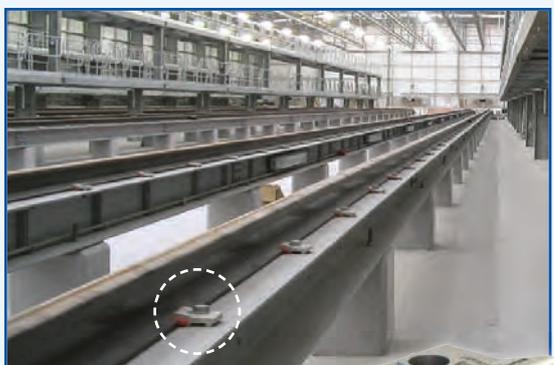
Image provided by Hitachi. URL: <http://www.hitachi-rail.com/uk/>

**Product: Type HD**  
**Application: Securing low speed rails to way beams in a train maintenance depot.**

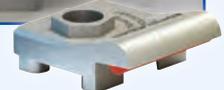
Lindapter's M20 Type HD rail clips were used to connect low speed lines at Hitachi's Ashford Train Maintenance Centre.

The product allowed contractors to safely secure FB rails along lengths of UKC way beam, in turn supported by reinforced concrete plinths. These low speed rails were installed in pairs down the entire length of the new depot building to give access for maintenance and repair work on the trains.

Type HD facilitated the precise rail alignment by allowing a high degree of lateral adjustability.



➤ See pages 32-33 for Type HD.



## Proven connection solutions

Lindapter products are used in multiple industries around the world in an extensive range of applications. The case studies below highlight the wide use of Lindapter fixings. To view more project examples, please visit the website [www.Lindapter.com](http://www.Lindapter.com)

### Splott Warehouse, Cardiff, UK



**Product: Type ALP**

**Application: Rigging lighting equipment to the overhead structural beams at the 'Color Festival'.**

Securing equipment weighing 6.3kN (642kg) from sloped beams at the Splott Warehouse required a safe rigging unit that would provide resistance to both tensile and frictional loading.

The Type ALP was chosen because it has a safe working load of 3 tonnes at an angle +/- 18° and adjusts to various beam sizes, meaning one type of rigging unit could be used throughout.

After the dance festival finished, the contractors simply reversed the installation procedure, which allowed them to quickly unclamp the lifting system without damaging the steel beams.



➤ See page 36 for Type ALP.

### St Pancras Station, London, UK



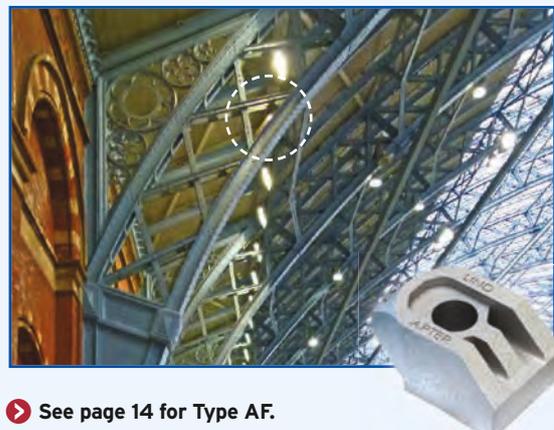
**Product: Type AF**

**Application: Connecting the steel framework of a new roof to the station's existing structure.**

The Type AF allowed a new steel framed roof to be secured to the existing structure of the Grade I listed shed designed by William Henry Barlow at St Pancras Station.

The product accommodated variations in height due to sagging in some areas of the original riveted beam structure, ensuring a secure load at varying angles.

Lindapter's high slip resistance clamp assembly avoided drilling or welding, thereby removing the risk of damaging the historic Victorian arches and the protective coatings.



➤ See page 14 for Type AF.

## Manhattan Bridge, New York, USA



**Product: Type F3**

**Application: Securing 450m pipework carrying an internet cable along the bridge.**

Lindapter Support Fixings are often specified for securing pipework due to the ease of installation and high adjustability. In this case, the Type F3 was used to connect a 100mm pipe, carrying fibre optic cable for high-speed internet across this iconic structure.

Using simple hand tools avoided on-site drilling and welding meaning that there was no need for hot work permits or a site closure.

This simplified the installation across the span of the iconic bridge and allowed the contractors to finish on time and on budget.



➤ See page 56 for Type F3.

## Arnside Viaduct, UK



**Product: Type FF - FloorFast**

**Application: Securing the maintenance walkway alongside the replacement viaduct deck.**

An upgrade of the 150 year old viaduct required the replacement of the entire deck.

Chequer plate flooring was quickly secured to supporting box girder sections along the entire length of the new deck using 8,000 of Lindapter's easy to install FloorFast fixings.

FloorFast allows installation to be easily carried out from above, without the need for drilling, welding or scaffolding. This meant the flooring could be fitted on the viaduct as the deck units were removed, helping the major renovation to be completed on schedule.



➤ See page 49 for Type FF - FloorFast.

## Passionate about safety

For over 85 years, Lindapter has manufactured to the highest standards, earning a multitude of independent approvals and a reputation synonymous with safety and reliability. Current accreditations are detailed below.

### Independent Product Approvals

These approvals reinforce Lindapter's extensive in-house testing procedures. Products are tested so that Engineers and Contractors can be confident Lindapter products will perform as detailed in this catalogue.



#### CE Mark

CE Marking provides additional assurance that a product complies with the Construction Product Regulation and will perform as stated in the corresponding Declaration of Performance (DoP).

DoPs list Characteristic Resistances for use when designing connections to Eurocode 3. For more information please visit [www.Lindapter.com/About/CE](http://www.Lindapter.com/About/CE)



#### Lloyd's Register Type Approval

Lloyd's Register Type Approved products have been subjected to tensile, frictional, vibration and shock tests, witnessed and verified by Lloyd's Register.



#### Verband der Schadenversicherer

VdS is a leading independent testing institution in Germany for products used in fire protection applications.



#### Factory Mutual

This American insurance organisation offers an approval that is recognised by the fire protection industry worldwide.



#### Loss Prevention Certification Board

The LPCB is a leading International Certification body in the field of security and fire protection.



#### TÜV Nord

TÜV is the certifying authority for safety, quality and environmental protection in Germany.



#### ICC-ES

North America's leading evaluation service has approved multiple Lindapter products to be compliant with the International Building Code.

### Quality and Environment

Accredited to ISO 9001 since 1986, Lindapter strictly enforces a quality management system that includes rigorous product testing to ensure consistently high manufacturing standards.

The company also operates an ISO 14001 certified environmental management system, constantly monitoring and improving aspects of the business that may impact on the environment, such as the use of natural resources as well as handling and treatment of waste and energy consumption.



Q 05143



EMS 546660

### Traceability

As part of Lindapter's ISO 9001 quality management system and in compliance with the Construction Products Regulation, Lindapter operates a comprehensive Factory Production Control system that ensures traceability of all Lindapter products throughout the manufacturing process.

### Associations

Lindapter is a member of the **British Constructional Steelwork Association (BCSA)**, **The Steel Construction Institute (SCI)**, **American Institute of Steel Construction (AISC)**, **Southern African Institute of Steel Construction (SAISC)** and the **Australian Steel Institute (ASI)**.



## Here to help you

Lindapter's team of experienced Engineers offer an unrivalled support service, including free connection design and bespoke product development. Lindapter's philosophy is to deliver the highest level of service from initial design through to installation guidance.

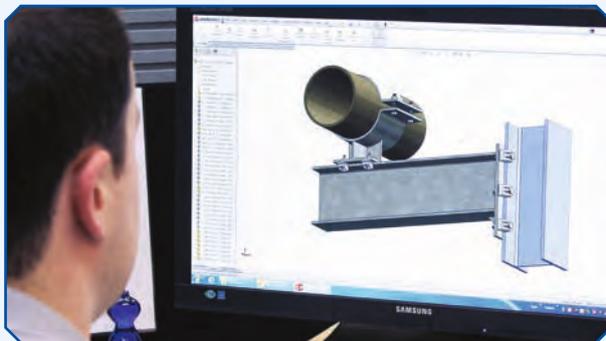
### The Lindapter Service includes:



#### FREE CONNECTION DESIGN

For your next project, Lindapter's team of experienced Engineers can advise the correct product and detail the connection for you free of charge, providing CAD drawings in 2D or 3D BIM compatible files that can be imported into all major software. Provide the details below and Lindapter will do the rest!

- Steel sizes to be used or flange width / thickness
- Loads to be resisted (e.g. 10kN tension + 15kN slip)
- General arrangement sketch or verbal description
- Project Name / Title / Location (optional)



#### ENGINEERED SOLUTIONS

Lindapter's Research & Development facility and unique expertise facilitates a bespoke product development service, passionately referred to as 'Engineered Solutions'.

Supported by the latest technology including 3D modelling, rapid prototyping with the aid of two in-house 1,000kN hydraulic test machines and finite element analysis, Lindapter's Engineers can develop solutions that satisfy your connection demands.



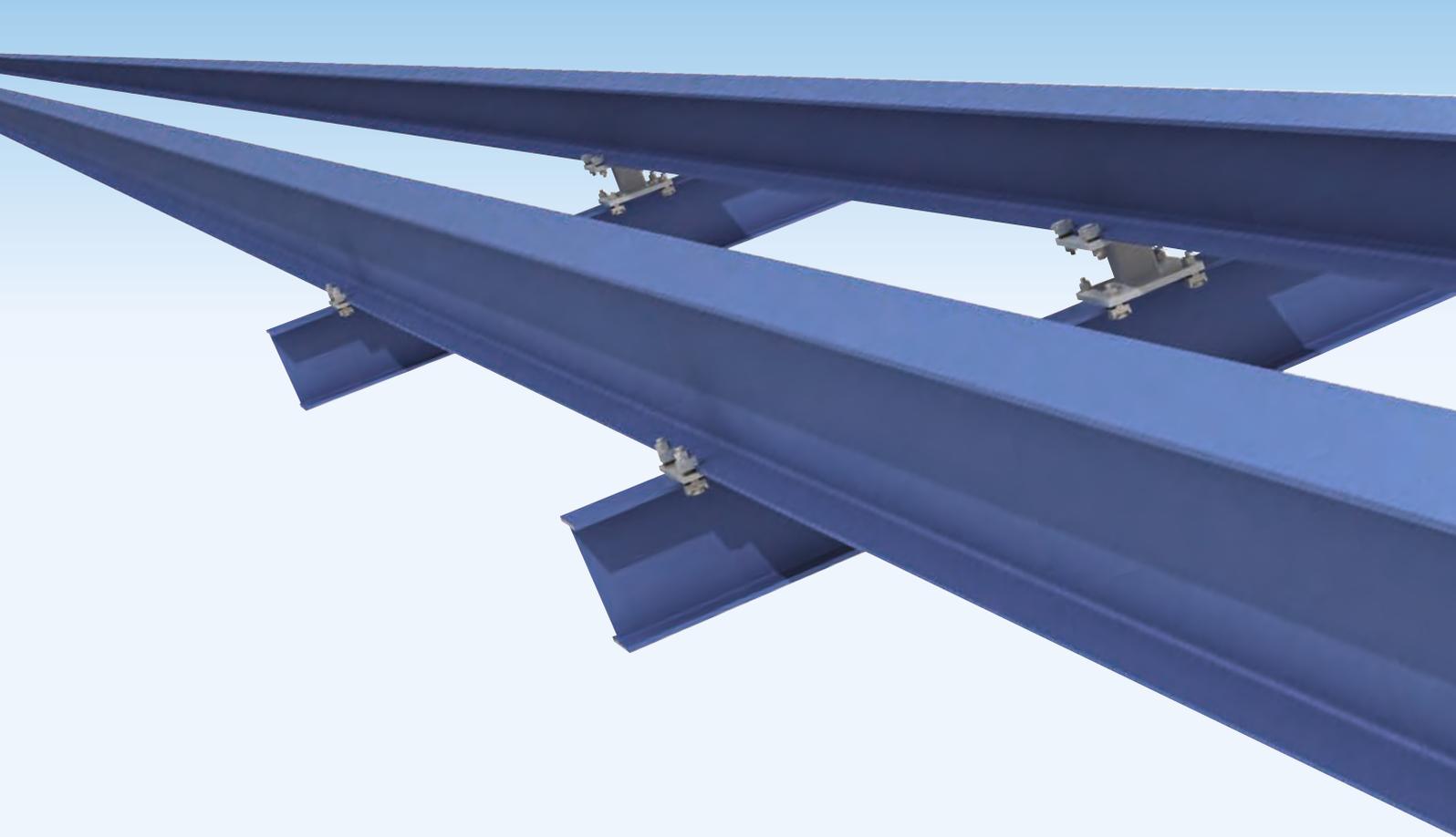
**Contact Lindapter to design a solution for your connection requirement.**  
 Email [support@Lindapter.com](mailto:support@Lindapter.com) or call +44 (0) 1274 521444 for more details.

#### Disclaimer

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