JUST LAUNCHED

lindapter®

ICC-ES approved Girder Clamps

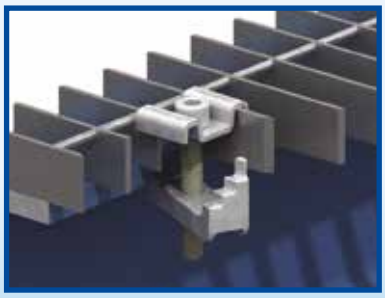
ICC ES ESR-3976

Click here for technical data

Inventor of the Girder Clamp Est. 1934 lindapter Accept no substitute and Hollo-Bolt®

lindapter®

Established 1934



Technical Innovation in Steel Connections

Welcome

For over 80 years Lindapter® has earned a respected reputation as the pioneer in the design and manufacture of steel 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 logo

THE LINDAPTER BOLT ADAPTERS

Lindapter's proud heritage began in 1934 when Engineer Henry Lindsay *(above)* invented an entirely new concept of connecting steel 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 trusted brand name. Today Lindapter remains true to its roots, by continuing to invent and manufacture high quality, safe products that save steel contractors time and money.

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

Girder Clamps

PAGES 4 - 27

Steel sections are clamped together using high strength connections configured to suit specific requirements without damaging the steel, for example, to resist 56,200lbs tensile / 15,736lbs slip.

Rail Connections

PAGES 28 - 31

Sections of rail are safely secured with easy-to-install products such as the **Type HD** that offers convenient lateral adjustability during installation.

Lifting Points

PAGES 32 - 35

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

- **Factors of safety (FOS) shown in this catalog 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, please contact Lindapter's Technical Support team.**

Connections for a range of industries...


Construction


Energy


Bridges


Rail


Telecom

Hollo-Bolt®

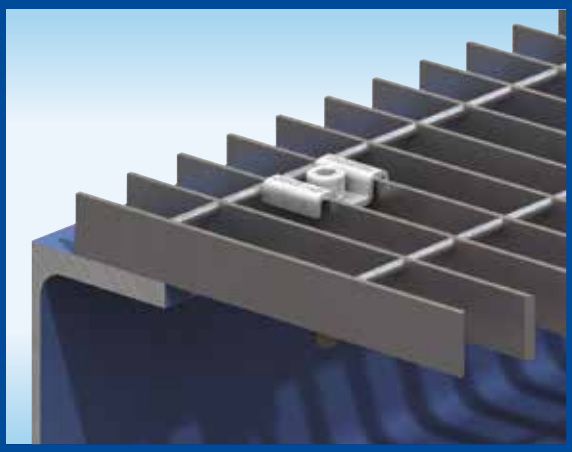
PAGES 36 - 45

A family of expansion bolts for quickly connecting steel sections to Hollow Structural Section (HSS) from one side. ICC-ES and LARR approved for all Seismic Design categories (SDC).

Steel Floor Connections

PAGES 46 - 49

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



Pipe / Conduit Supports

PAGES 50 - 57

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.

FAQs & Case Studies

PAGES 58 - 65

A list of Frequently Asked Questions about Girder Clamps and Hollo-Bolts, plus examples of projects such as the Wilshire Grand Center in Los Angeles can be found in this section.

See **pages 66 - 67** for more information about Lindapter's independent approvals and Technical Support service.

Girder Clamp - The Connection Concept

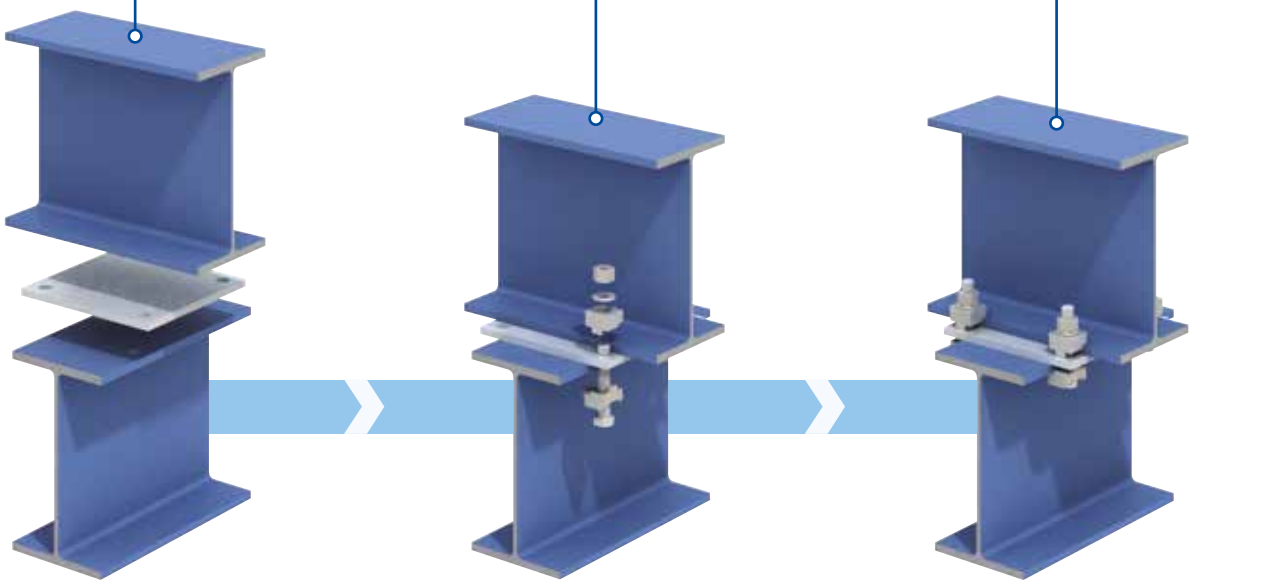
Lindapter products provide a faster, cost-effective alternative to drilling or welding in the field and are designed to reduce installation time and labor costs. A high strength, permanent (or temporary) connection is quickly achieved by clamping two steel sections together.

Quick and easy to install

1) Bring the location plate and the lower beam into position below the upper beam.

2) Fit the bolts with two Lindapter clamps, any packings required, a nut and a washer.

3) Using a torque wrench, simply tighten each bolt to the recommended torque.



REASONS TO USE...

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

Safer connections
Drilling and welding in the field is avoided, removing the need for hot work permits and encouraging safer site conditions.

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

Industry leading approvals
Lindapter has earned a reputation synonymous with safety and reliability, gaining multiple independent approvals. Further details can be found on **page 66**.

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

Free connection design
Lindapter's experienced Engineers can design a custom connection based on your specific requirements free of charge. See **page 67** for more details.

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

Watch how to install Girder Clamps at **www.LindapterUSA.com**

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 larger beams with increased flange thicknesses, packing pieces may be required to raise the height of the clamp to ensure the component is positioned correctly on the beam.

See the components of a Girder Clamp in more detail on **page 6.**

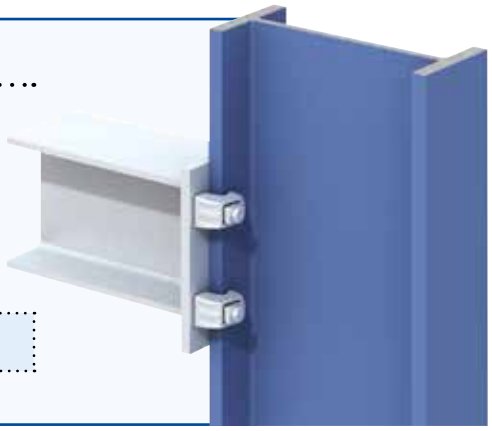
HIGH SLIP RESISTANCE

Beam-to-column (slip resistance)

This configuration utilizes a High Slip Resistance (HSR) clamp 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 8 - 13.**



ADJUSTABLE

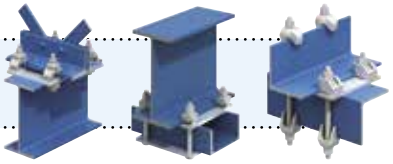
Inclined beam-to-beam (combined loading)

A fabricated assembly, optimized with Lindapter's adjustable High Slip Resistance clamps to resist both tensile loading and slip.

This solution is adjustable, allowing for a connection to 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 67.**

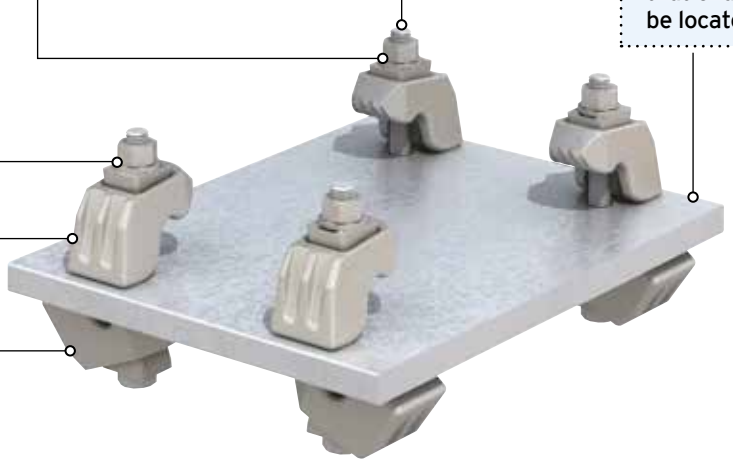
Lindapter has a solution for connecting almost any type of steel section including W beams, S beams, channels, angles and more. See **pages 24 - 27** for examples.



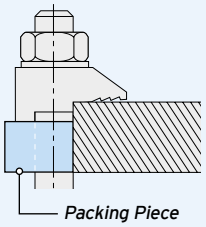
Girder Clamp Configuration

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.

Typical Girder Clamp Components



Packing Pieces (if required) increase the clamping range to suit increased flange thickness.



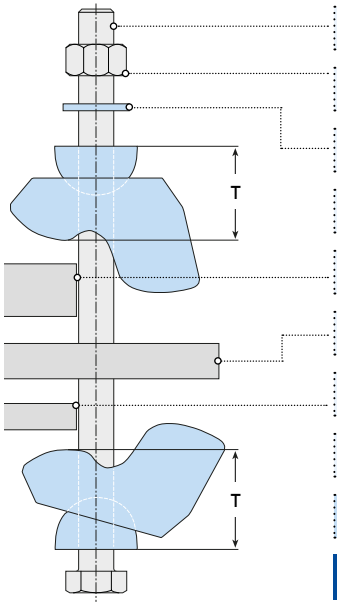
This example is configured with Lindapter AAF clamps (code LAAF075) and four A490 bolts.

› Safe working load up to 26,976lbs tensile or 11,240lbs slip resistance, see page 8 for details.

› For higher loads up to 56,200lbs tensile or 15,736lbs slip resistance, see the Type AF on page 10.

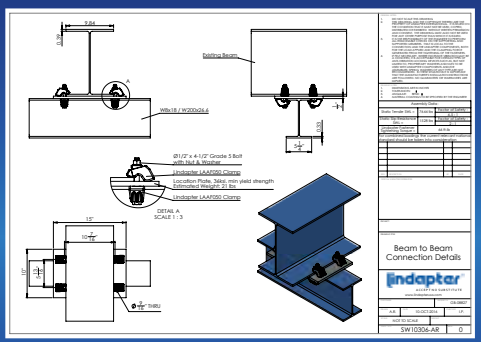
Bolt Length Calculator

To calculate bolt length, simply add up all parts the bolt will go through. The next standard bolt length should be used, see the example below (1/2" Type AAF to connect W12 x 26 below W14 x 61):



1/4"	0.5 bolt Ø as bolt protrusion
1/2"	Height of nut
1/8"	Washer
13/8"	T of top clamp
5/8"	Top section (W14 x 61)
1/2"	Plate thickness
3/8"	Lower section (W12 x 26)
13/8"	T of lower clamp
51/8"	= Total Length
51/2"	**Next standard bolt length**

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 drawings in 2D or 3D CAD files that can be imported into all major software. Please turn to **page 67** for more information.

Product Configuration

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 56,200lbs when used with four bolts (A490) in a Girder Clamp assembly.

Single Components

Product	Parallel Flanges	Tapered Flanges	Tensile	High Slip Resistance	Slotted Clearance Holes	Adjustable	Stainless Steel
Type AAF page 8 	✔	✔	✔	✔	✔	✔	-
Type AF page 10 	✔	✔	✔	✔	✔	-	-
Type CF page 11 	✔	✔	✔	✔	-	✔	-
Type LR page 14 	✔	✔	✔	-	✔	✔	-
Type A page 16 	✔	-	✔	-	-	-	-
Type B page 17 	✔	-	✔	-	-	-	-
Type LS page 20 	✔	✔	✔	-	✔	✔	✔

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

Product	Parallel Flanges	Tapered Flanges	Tensile	High Slip Resistance	Slotted Clearance Holes	Adjustable	Stainless Steel
Type FC page 22 	✔	✔	✔	-	-	✔	-
Type F9 page 23 	✔	-	✔	-	-	✔	-

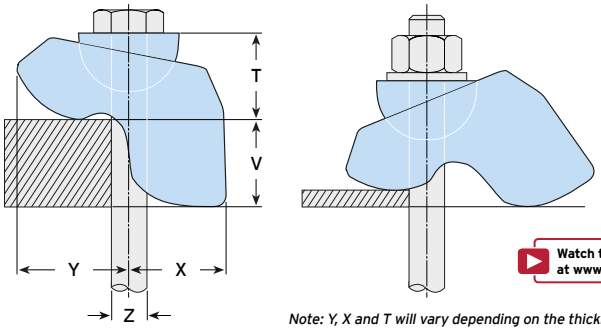
Also available

Lindapter Rail Connections
See **pages 28 - 31** for more information.


Lindapter Lifting Points
See **pages 32 - 35** for more information.

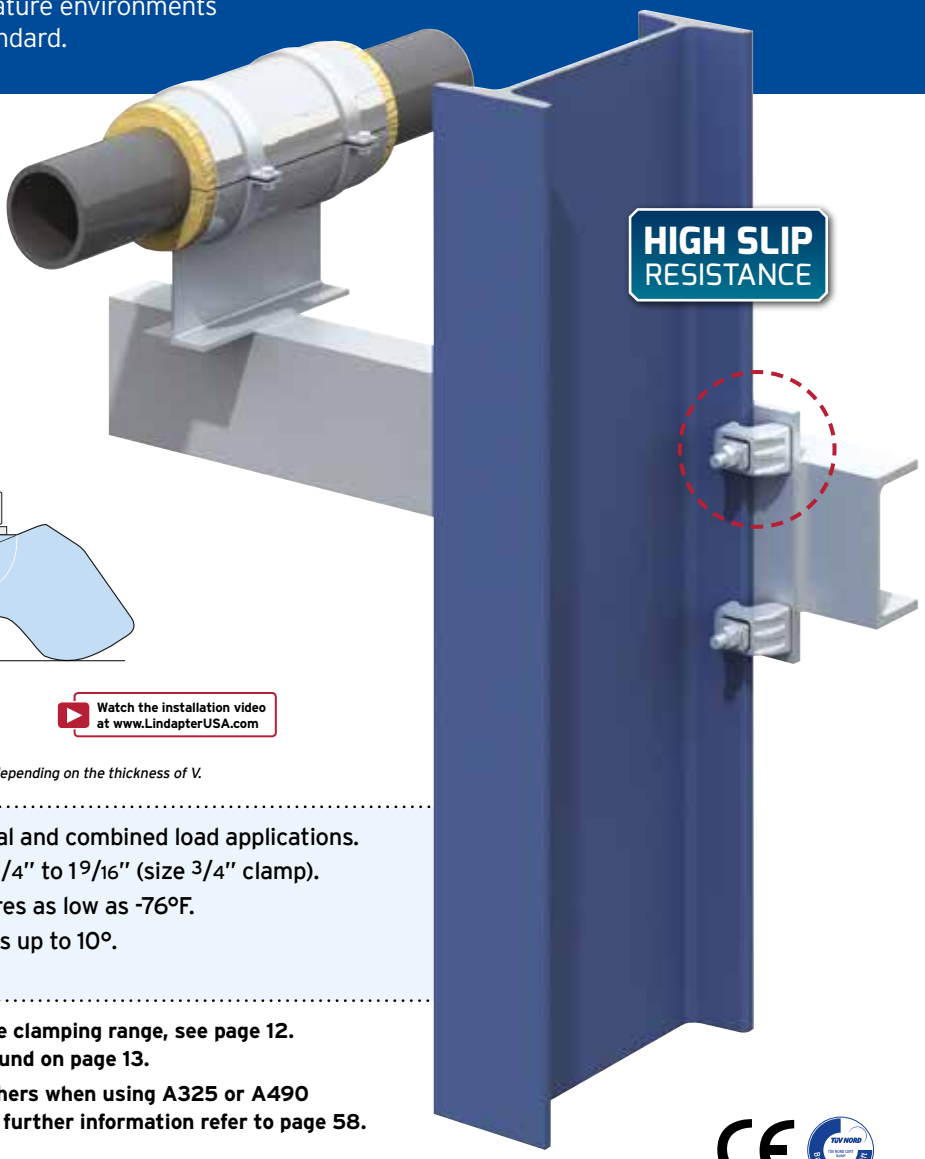

Type AAF

This adjustable High Slip Resistance clamp is easy to install and provides high load capacities even in low temperature environments down to -76°F. Hot dip galvanized as standard.



Watch the installation video at www.LindapterUSA.com

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 1/4" to 1 9/16" (size 3/4" clamp).
- Safe working loads apply in temperatures as low as -76°F.
- Suitable for parallel and tapered flanges up to 10°.
- The tail spans slotted clearance holes.

Packing pieces are available to increase the clamping range, see page 12.
Location plate / end plate details can be found on page 13.

Lindapter recommends the use of DTI Washers when using A325 or A490 structural bolts with the Type AF/AAF. For further information refer to page 58.

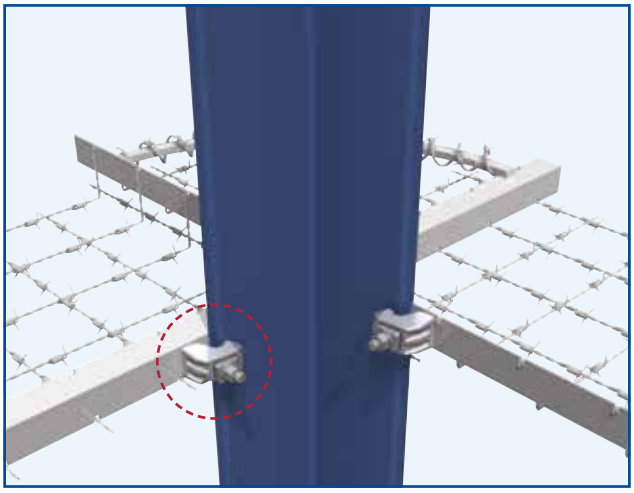
Material: Low temperature SG iron, hot dip galvanized.

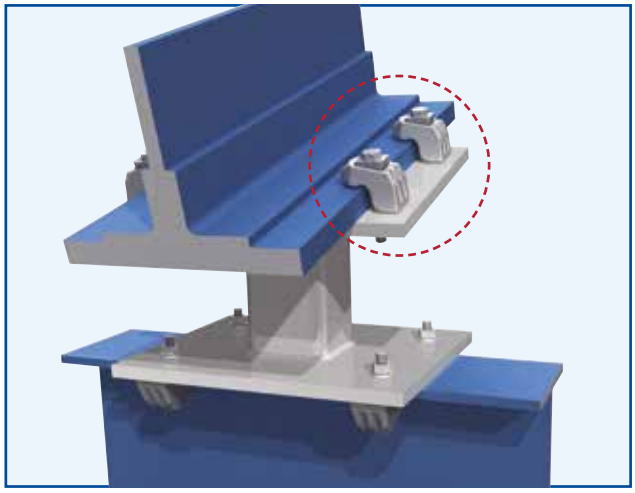
Product Code	Bolt Size Z	Bolt Grade	Safe Working Loads: Tensile Resistance / 1 Bolt (FOS 4.5:1) lbs	Slip Resistance[1] / 2 Bolts (FOS 2:1) Painted Steel[2] lbs	Slip Resistance[1] / 2 Bolts (FOS 2:1) Galvanized Steel lbs	Tightening Torque* ft lb	Dimensions: Clamping Range[3] V	Y	X	T	Width
LAAF050	1/2"	Gr. 5/A325	1911	764	877	66	3/16" - 1"	1" - 1 5/16"	1 1/16" - 1 15/16"	1 1/32" - 1 3/8"	1 5/8"
LAAF062	5/8"	Gr. 5/A325	3597	1798	2248	177	1/4" - 1 3/16"	1 5/16" - 2"	1 1/4" - 2 5/16"	1 3/8" - 1 13/16"	2 3/16"
LAAF075	3/4"	Gr. 5/A325	5901	2922	3597	347	1/4" - 1 9/16"	1 7/8" - 3 1/16"	1 15/16" - 2 1/2"	2 1/16" - 2 1/2"	3"
LAAF050	1/2"	A490	2248	899	1169	96	3/16" - 1"	1" - 1 5/16"	1 1/16" - 1 15/16"	1 1/32" - 1 3/8"	1 5/8"
LAAF062	5/8"	A490	4383	2473	2698	221	1/4" - 1 3/16"	1 5/16" - 2"	1 1/4" - 2 5/16"	1 3/8" - 1 13/16"	2 3/16"
LAAF075	3/4"	A490	6744	4496	5620	477	1/4" - 1 9/16"	1 7/8" - 3 1/16"	1 15/16" - 2 1/2"	2 1/16" - 2 1/2"	3"

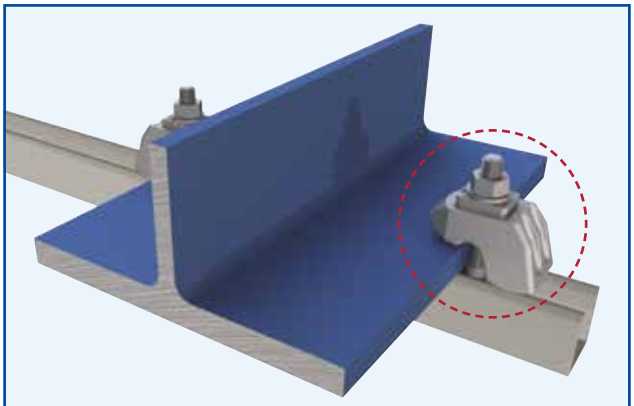
1) Slip Resistance figures are based on Type AAF and Location Plates in hot dip galvanized finish calculated against slip (movement exceeding 0.004" / 0.1mm).
2) Shot blast and painted steel.
3) For thicker flanges, see the packing pieces on page 12.
* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 58.

Typical Applications for the Type AAF

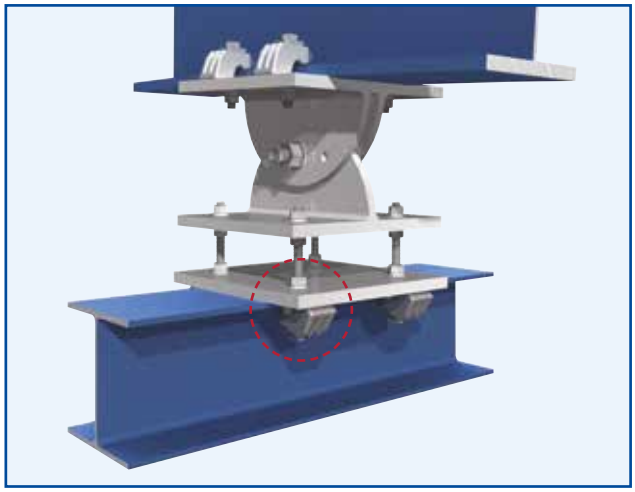
The Type AAF is one of three products in Lindapter's range of High Slip Resistance (HSR) clamps, designed specifically for frictional applications and high tensile loading. This heavy duty clamp is used in many diverse industries and situations, here are some application examples:

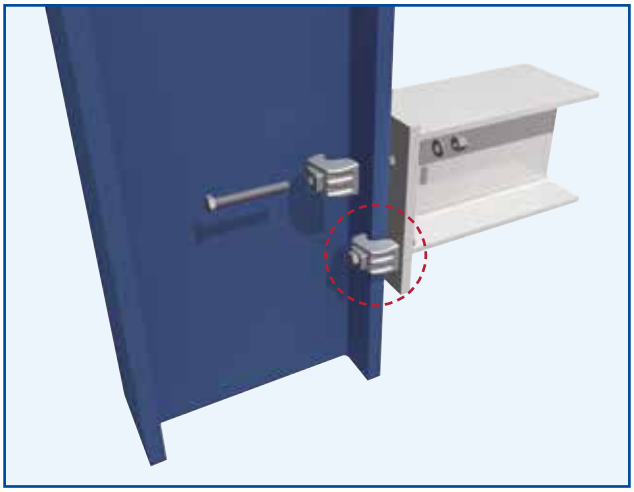


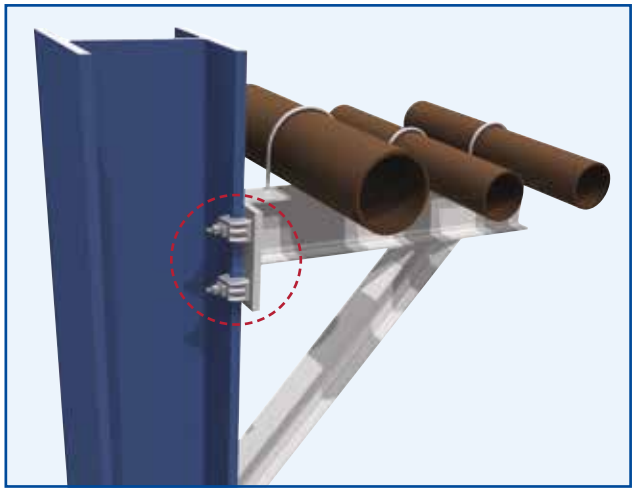




Note: Can be used with strut / metal framing with reduced torque, please contact Lindapter to ensure suitability of the component for application.

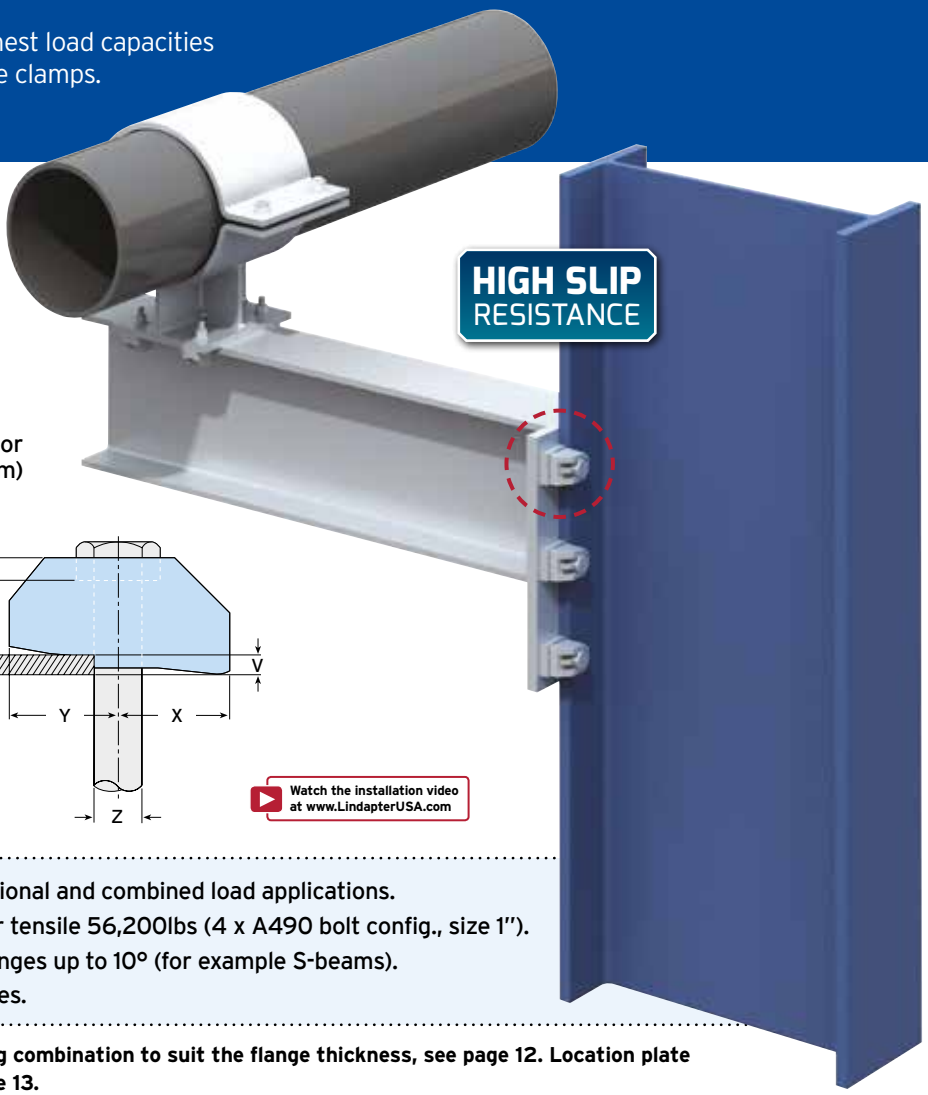




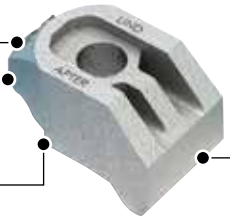


Type AF

A heavy duty clamp offering the highest load capacities of all Lindapter's High Slip Resistance clamps. Hot dip galvanized as standard.



Recess - holds bolt head captive
(Grd. 5 bolts, sizes 1/2" - 3/4" only)



Type AF (with Type AFW washer)

Note: Type AFW (page 12) converts the recess to a flat top and is required for A325, A490 and 1" Grd. 5 structural bolts.

Watch the installation video at www.LindapterUSA.com

- High slip resistance for tensile, frictional and combined load applications.
- Static slip resistance of 15,736lbs or tensile 56,200lbs (4 x A490 bolt config., size 1").
- Suitable for parallel and tapered flanges up to 10° (for example S-beams).
- The tail spans slotted clearance holes.

Choose the correct tail length / packing combination to suit the flange thickness, see page 12. Location plate / end plate details can be found on page 13.

Lindapter recommends the use of DTI Washers when using A325 or A490 structural bolts with the Type AF / AAF. For further information refer to page 58.

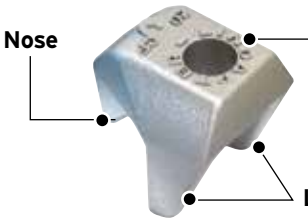
Material: SG iron, hot dip galvanized.

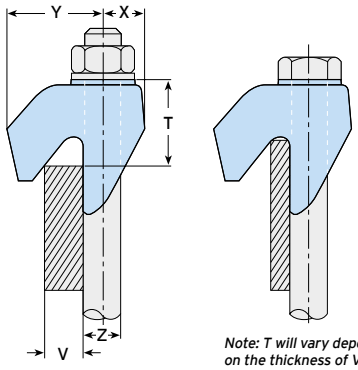
Product Code	Bolt		Safe Working Loads			Tightening Torque*	Dimensions					
	Size Z	Grade	Tensile Resistance / 1 Bolt (FOS 5:1)	Slip Resistance [1] / 2 Bolts (FOS 2:1)			Tail Length V		Y	X	T1	T2	Width
				Painted Steel [2]	Galvanized Steel		short	medium			AF	AF + AFW	
			lbs	lbs	lbs	ft lb							
LAF050	1/2"	Gr. 5 / A325	1911	764	877	66	3/16"	1/2"	1 1/8"	1 1/16"	11/16"	7/8"	1 9/16"
LAF062	5/8"	Gr. 5 / A325	3597	1798	2248	177	5/16"	9/16"	1 3/8"	1 1/2"	7/8"	1 1/16"	1 15/16"
LAF075	3/4"	Gr. 5 / A325	5901	2922	3597	347	3/8"	11/16"	1 9/16"	1 9/16"	1"	1 1/4"	2 3/16"
LAF100	1"	Gr. 5 / A325	8892	5395	6774	590	9/16"	1 1/8"	1 7/8"	2 3/8"	1 1/4"	1 5/8"	3 1/4"
LAF050	1/2"	A490	2248	899	1169	96	3/16"	1/2"	1 1/8"	1 1/16"	11/16"	7/8"	1 9/16"
LAF062	5/8"	A490	4383	2473	2698	221	5/16"	9/16"	1 3/8"	1 1/2"	7/8"	1 1/16"	1 15/16"
LAF075	3/4"	A490	6744	4496	5620	477	3/8"	11/16"	1 9/16"	1 9/16"	1"	1 1/4"	2 3/16"
LAF100	1"	A490	14050 [3]	6295	7868	737	9/16"	1 1/8"	1 7/8"	2 3/8"	1 1/4"	1 5/8"	3 1/4"

1) Slip Resistance figures are based on Type AF and Location Plates in hot dip galvanized finish calculated against slip (movement exceeding 0.004" / 0.1mm).
2) Shot blast and painted steel.
3) 3.2:1 Factor of Safety.
* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 58.

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.

Watch the installation video at www.LindapterUSA.com

- New options available to suit larger steel sections with thicker flanges.
- Can also be used with Grd. B7 or A449 rods.
- Suitable for parallel and tapered flanges up to 8°.
- Can be combined with other Lindapter High Slip Resistance clamps (Grd. 5 or A325 bolts only); see table below for safe working loads.

Location plate / end plate details can be found on page 13.

Material: SG iron, hot dip galvanized.

	Product Code	Bolt Grd. 5 / A325 Z	Safe Working Loads: Tensile Resistance / 1 Bolt (FOS 5:1) lbs	Slip Resistance[1] / 2 Bolts (FOS 2:1) Painted Steel[2] lbs	Slip Resistance[1] / 2 Bolts (FOS 2:1) Galvanized Steel lbs	Tightening Torque* ft lb	Dimensions: Clamping Range V	Y	X	T	Width
	LCF050	1/2"	1911	764	877	66	1/4" - 1/2"	1 1/4"	9/16"	13/16" - 1 1/8"	1 13/16"
NEW	LCF2050	1/2"	1911	764	877	66	1/2" - 3/4"	1 9/16"	5/8"	1 1/8" - 1 1/2"	1 7/8"
	LCF062	5/8"	3597	1798	2248	177	5/16" - 5/8"	1 3/4"	11/16"	1" - 1 1/4"	2 3/16"
NEW	LCF2062	5/8"	3597	1798	2248	177	5/8" - 1"	2"	13/16"	1 3/8" - 1 7/8"	2 7/16"
	LCF075	3/4"	5901	2922	3597	347	3/8" - 3/4"	2 1/16"	7/8"	1 3/16" - 1 9/16"	2 9/16"
NEW	LCF2075	3/4"	5901	2922	3597	347	3/4" - 1 3/16"	2 1/2"	1 1/16"	1 5/8" - 2 3/16"	2 3/4"
CF combinations with other Lindapter clamps	CF+A[3]	1/2"	1300	157	157	50					
	CF+A[3]	5/8"	1640	337	337	108					
	CF+A[3]	3/4"	3300	674	674	210					
	CF+AF / AAF	1/2"	1911	764	877	66					
	CF+AF / AAF	5/8"	3597	1798	2248	177					
	CF+AF / AAF	3/4"	5901	2922	3597	347					

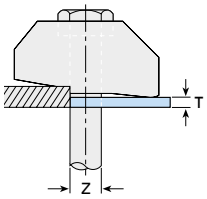
1) Slip Resistance figures are based on Type CF and Location Plates in hot dip galvanized finish calculated against slip (movement exceeding 0.004" / 0.1mm).
2) Shot blast and painted steel.
3) Also applies to Type B, Type LR and Type BR.
* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 58.

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



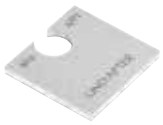
Mild steel, hot dip galvanized.

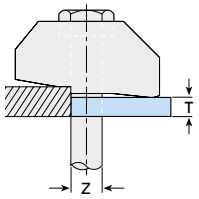
Product Code	Bolt Size Z	Dimension T
LAF050CW*	1/2"	1/16"
LAF062CW*	5/8"	1/16"
LAF075CW	3/4"	1/16"

*** Also compatible with Type AAF clamp.**

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

Type AFP1 / AFP2 / AAFP3





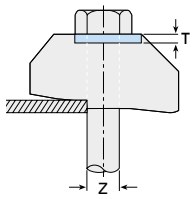
Mild steel, hot dip galvanized.

Product Code	Bolt Size Z	Dimension T
LAF050P1*	1/2"	3/16"
LAF062P1*	5/8"	3/16"
LAF075P1	3/4"	3/16"
LAF100P1	1"	3/16"
LAF050P2*	1/2"	3/8"
LAF062P2*	5/8"	3/8"
LAF075P2	3/4"	3/8"
LAF100P2	1"	3/8"
LAAF075P3*	3/4"	13/16"

*** Also compatible with Type AAF clamp.**

Also Available

Type AFW



SG iron, mild steel, hot dip galvanized.

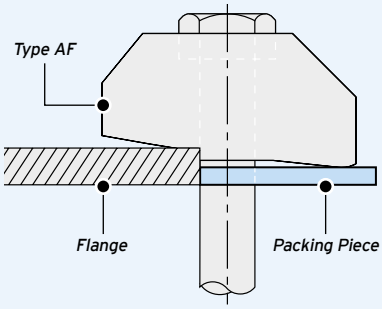
Product Code	Bolt Size Z	Dimension T
LAF050W	1/2"	3/16"
LAF062W	5/8"	3/16"
LAF075W	3/4"	1/4"
LAF100W	1"	3/8"

Note: Type AFW converts the recess to a flat top and is required for A325, A490 and 1" Grade 5 structural bolts.

Tail Length / Packing Piece Combinations for Type AF

Choose the correct combination for your configuration using the table on the right. **Please note these calculations are for parallel flanges and beams up to 10° slopes only.**

For example, a 3/4" Type AF on a 1 9/16" flange requires 1 x Type AF medium tail (M), 1 x Type AFCW and 2 x Type AFP2.



Flange Thickness	1/2"				5/8"				3/4"				1"			
	AF	AFCW	AFP1	AFP2	AF	AFCW	AFP1	AFP2	AF	AFCW	AFP1	AFP2	AF	AFCW	AFP1	AFP2
3/16"	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/4"	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5/16"	S	1	-	-	S	-	-	-	-	-	-	-	-	-	-	-
3/8"	S	-	1	-	S	1	-	-	S	-	-	-	-	-	-	-
7/16"	S	-	1	-	S	1	-	-	S	-	-	-	-	-	-	-
1/2"	M	-	-	-	S	-	1	-	S	1	-	-	S	-	-	-
9/16"	M	1	-	-	M	-	-	-	S	2	-	-	S	-	-	-
5/8"	S	-	-	1	M	-	-	-	S	-	1	-	S	-	-	-
11/16"	M	-	1	-	M	1	-	-	M	-	-	-	S	-	-	-
3/4"	S	2	-	1	M	2	-	-	M	-	-	-	S	-	1	-
13/16"	S	-	1	1	M	-	1	-	S	-	-	1	S	-	1	-
7/8"	M	-	-	1	M	1	1	-	M	2	-	-	S	-	1	-
15/16"	M	1	-	1	M	2	1	-	M	-	1	-	S	-	-	1
1"	S	-	-	2	M	-	-	1	M	1	1	-	S	-	-	1
1 1/16"	S	1	-	2	M	1	-	1	M	2	1	-	S	-	-	1
1 1/8"	M	3	-	1	S	-	-	2	M	-	-	1	S	-	-	1
1 3/16"	S	-	1	2	M	-	1	1	M	1	-	1	M	-	-	-
1 1/4"	S	1	1	2	M	1	1	1	M	2	-	1	M	-	-	-
1 5/16"	M	-	-	2	S	-	1	2	M	-	1	1	M	-	-	-
1 3/8"	S	-	-	3	M	-	-	2	M	1	1	1	M	-	1	-
1 7/16"	M	2	-	2	M	1	-	2	M	2	1	1	M	-	1	-
1 1/2"	M	-	1	2	S	-	-	3	M	-	-	2	M	-	-	1
1 9/16"	M	1	1	2	M	-	1	2	M	1	-	2	M	-	-	1
1 5/8"	M	2	1	2	M	1	1	2	M	1	-	2	M	-	-	1
1 11/16"	M	-	-	3	S	-	1	3	M	-	1	2	M	-	1	1
1 3/4"	M	1	-	3	M	2	1	2	M	1	1	2	M	-	1	1
1 13/16"	S	3	1	3	S	4	-	3	S	3	-	3	M	-	1	1
1 7/8"	S	1	-	4	M	1	-	3	M	-	-	3	M	-	1	1
1 15/16"	M	1	1	3	M	2	-	3	S	2	1	3	M	-	-	2
2"	S	-	1	4	M	3	-	3	S	3	1	3	M	-	-	2

For thicker flanges contact Lindapter.

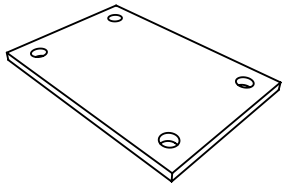
AF = Type AF | **AFCW** = Type AFCW | **AFP1** = Type AFP1 | **AFP2** = Type AFP2 | **S** = AF short | **M** = AF medium

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 steel. 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 centers.



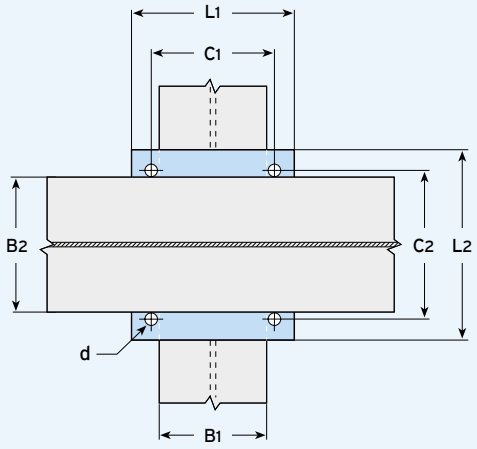
Material: Structural steel A572 Grade 50.
For other grades contact Lindapter.

Bolt Size	Hole Ø d	Plate Thickness Grd. 5 / A325	Plate Thickness A490	Hole Centers C1	Length / Width min L1	Hole Centers C2	Length / Width min L2
1/2"	9/16"	1/2"	1/2"	B1 + 9/16"	B1 + 4"	B2 + 9/16"	B2 + 4"
5/8"	11/16"	5/8"	5/8"	B1 + 11/16"	B1 + 4"	B2 + 11/16"	B2 + 4"
3/4"	13/16"	3/4"	3/4"	B1 + 13/16"	B1 + 6"*	B2 + 13/16"	B2 + 6"*
1"	1 1/8"	1"	1"	B1 + 1 1/8"	B1 + 7"	B2 + 1 1/8"	B2 + 7"

*** Plate width for Type AF size 3/4" can be reduced to 5" if required.**

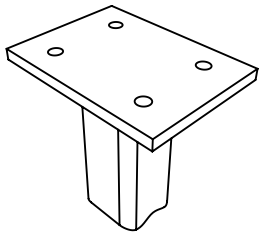
LOCATION PLATE DIMENSIONS

L1 = Location Plate Length, **L2** = Location Plate Width,
B1, B2 = Flange Width, **C1, C2** = Hole Centers, **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: Structural steel A572 Grade 50.
For other grades contact Lindapter.

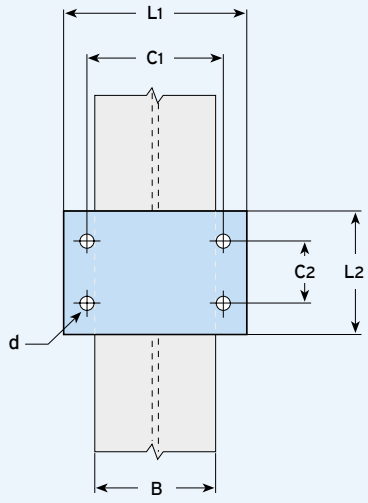
Bolt Size	Hole Ø d	Plate Thickness[1] Grd. 5 / A325	Plate Thickness A490	Hole Centers C1	Length min L1	Hole Centers C2	Width min L2
1/2"	9/16"	5/8"	5/8"	B + 9/16"	B + 4"	3 1/8"	C2 + 3 1/8"
5/8"	11/16"	3/4"	1"	B + 11/16"	B + 4"	4"	C2 + 4"
3/4"	13/16"	1"	1"	B + 13/16"	B + 6"*	7"	C2 + 7"
1"	1 1/8"	1 1/4"	1 1/4"	B + 1 1/8"	B + 7"	7 7/8"	C2 + 7 7/8"

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.

*** Plate width for Type AF size 3/4" can be reduced to 5" if required.**

END PLATE DIMENSIONS

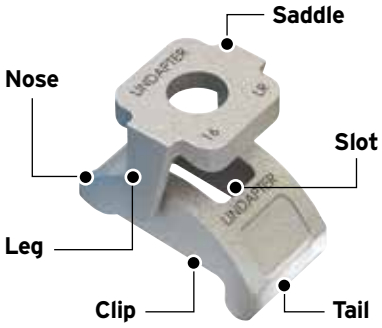
L1 = End Plate Length, **L2** = End Plate Width,
B = Flange Width, **C1, C2** = Hole Centers, **d** = Hole Ø

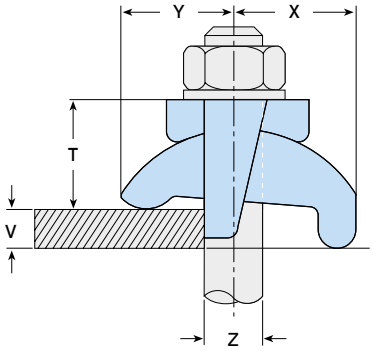


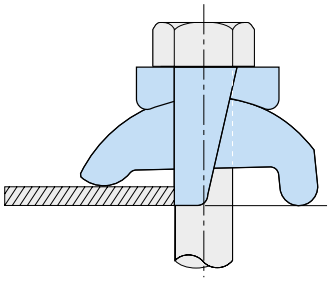
Use Lindapter's Bolt Length Calculator on **page 6** to calculate the correct bolt length for your application.

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.

Watch the installation video at www.LindapterUSA.com

- Clamping ranges from 1/8" - 1" (size 1").
- For parallel and tapered flanges up to 15°.
- The leg of the saddle prevents the clamp from rotating.
- The tail spans slotted clearance holes.

Packing pieces are available to increase the clamping range, see page 15.
Location plate / end plate details can also be found on page 15.

Material: Malleable iron, zinc plated / hot dip galvanized.

Product Code	Bolt Grd. 5 / A325 Z	Safe Working Loads (FOS 5:1) Tensile Resistance / 1 Bolt lbs	Safe Working Loads (FOS 5:1) Slip Resistance / 2 Bolts lbs	Tightening Torque* ft lb	Dimensions Clamping Range[1] V	Dimensions Y	Dimensions X	Dimensions T	Dimensions Width with Saddle
LLR037	3/8"	330	-	15	1/8" - 3/8"	13/16" - 15/16"	15/16" - 1"	13/16" - 15/16"	15/16"
LLR050	1/2"	1300	157	50	1/8" - 1/2"	1" - 1 1/8"	1" - 1 1/4"	1" - 1 1/8"	1 9/16"
LLR062	5/8"	1640	337	108	1/8" - 5/8"	1 3/16" - 1 3/8"	1 5/16" - 1 7/16"	1 3/16" - 1 7/16"	1 13/16"
LLR075	3/4"	3300	674	210	1/8" - 3/4"	1 5/8" - 1 15/16"	1 13/16" - 2"	1 5/8" - 1 7/8"	2 1/4"
LLR100	1"	4430	1012	362	1/8" - 1"	1 7/8" - 2 1/4"	2 1/16" - 2 1/4"	1 3/4" - 2 1/8"	3"

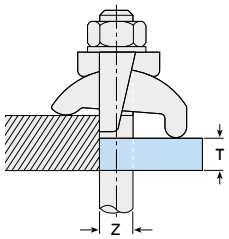
1) For thicker flanges, see the packing pieces on page 15.
* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 58.

Packing Pieces and Plate details for Type LR

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

Packing Pieces

Type P1 long / Type P2 long



Mild steel, malleable iron, zinc plated / hot dip galvanized.

Product Code	Bolt Size Z	Dimension T
LP1037L	3/8"	3/16"
LP1050L	1/2"	1/4"
LP1062L	5/8"	5/16"
LP1075L	3/4"	3/8"
LP1100L	1"	1/2"
LP2037L	3/8"	3/8"
LP2050L	1/2"	1/2"
LP2062L	5/8"	5/8"
LP2075L	3/4"	3/4"
LP2100L	1"	1"

Tail Length / Packing Combinations

For beams up to and including 8° slope. For thicker flanges contact Lindapter.

Flange Thickness	3/8"		1/2"		5/8"		3/4"		1"	
	P1L	P2L	P1L	P2L	P1L	P2L	P1L	P2L	P1L	P2L
3/16"	-	-	-	-	-	-	-	-	-	-
1/4"	-	-	-	-	-	-	-	-	-	-
5/16"	-	-	-	-	-	-	-	-	-	-
3/8"	-	-	-	-	-	-	-	-	-	-
7/16"	1	-	-	-	-	-	-	-	-	-
1/2"	1	-	-	-	-	-	-	-	-	-
9/16"	1	-	1	-	-	-	-	-	-	-
5/8"	-	1	1	-	-	-	-	-	-	-
11/16"	-	1	1	-	1	-	-	-	-	-
3/4"	-	1	-	1	1	-	-	-	-	-
13/16"	1	1	-	1	1	-	1	-	-	-
7/8"	1	1	-	1	1	-	1	-	-	-
15/16"	1	1	-	1	1	-	1	-	-	-
1"	1	1	1	1	-	1	1	-	-	-
1 1/16"	-	2	1	1	-	1	1	-	1	-
1 1/8"	-	2	1	1	-	1	1	-	1	-
1 3/16"	-	2	1	1	-	1	-	1	1	-
1 1/4"	1	2	-	2	-	1	-	1	1	-

P1L = Type P1 long | **P2L** = Type P2 long

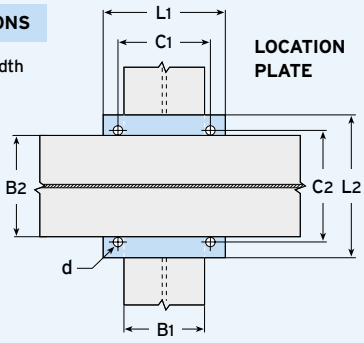
Location and End Plates for Type LR

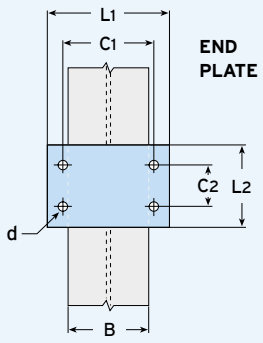
Location Plates are fabricated items designed to sit between the two sections to be clamped together to ensure the bolts are fixed at the correct centers.

End Plates are pre-welded to support frames, bracket or sections, allowing connection to the supporting structure with standard Lindapter clamps.

PLATE DIMENSIONS

B, B1, B2 = Flange Width
C1, C2 = Hole Centers
L1 = Plate Length
L2 = Plate Width
d = Hole Ø





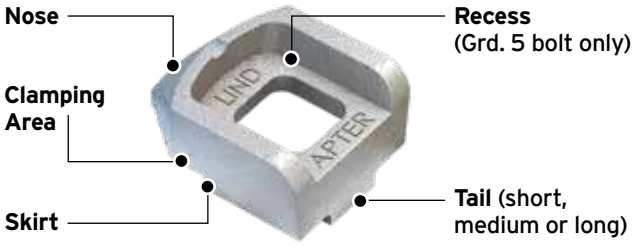
Material: Structural steel grade A572 Grade 50. For other grades contact Lindapter.

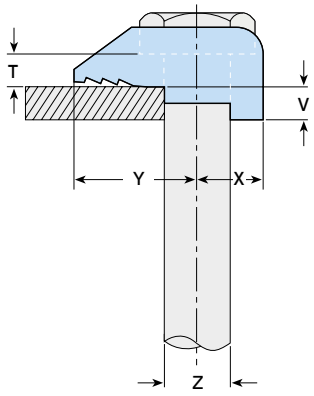
Bolt Size	Hole Ø d	Plate Thickness[1]	LOCATION PLATE				END PLATE			
			Hole Centers C1	Length / Width min L1	Hole Centers C2	Length / Width min L2	Hole Centers C1	Length min L1	Hole Centers C2	Width min L2
3/8"	7/16"	5/16"	B1 + 7/16"	B1 + 2 5/8"	B2 + 7/16"	B2 + 2 5/8"	B + 7/16"	B + 2 5/8"	2 3/4"	C2 + 2"
1/2"	9/16"	1/2"	B1 + 9/16"	B1 + 3 3/8"	B2 + 9/16"	B2 + 3 3/8"	B + 9/16"	B + 3 3/8"	3 1/8"	C2 + 2 3/8"
5/8"	11/16"	5/8"	B1 + 11/16"	B1 + 4 1/8"	B2 + 11/16"	B2 + 4 1/8"	B + 11/16"	B + 4 1/8"	4"	C2 + 2 3/4"
3/4"	13/16"	3/4"	B1 + 13/16"	B1 + 4 7/8"	B2 + 13/16"	B2 + 4 7/8"	B + 13/16"	B + 4 7/8"	4 3/4"	C2 + 3 1/2"
1"	1 1/8"	3/4"	B1 + 1 1/8"	B1 + 6 3/4"	B2 + 1 1/8"	B2 + 6 3/4"	B + 1 1/8"	B + 6 3/4"	6"	C2 + 4 1/4"

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 A

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





Watch the installation video at www.LindapterUSA.com

- CE Mark, DIBt, Lloyd's Register and TÜV approved.
- Recessed top holds the bolt captive while the nut is tightened (Grd. 5 bolt only).
- Ideal for parallel flanges.
- Supports up to 17,720lbs tensile load in a four bolt configuration.
- For higher loads the Type AF should be used, see **page 10.**

Packing pieces are available to increase the clamping range, see page 18.
Location plate / end plate details can be found on page 19.

Material: Malleable iron, zinc plated / hot dip galvanized.

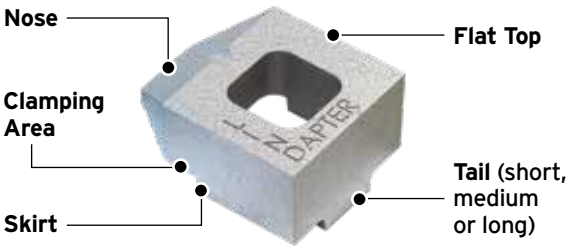
Product Code	Bolt Grd. 5 Z	Safe Working Loads (FOS 5:1) Tensile Resistance / 1 Bolt lbs	Slip Resistance / 2 Bolts lbs	Tightening Torque* ft lb	Dimensions Y	X	Tail Length V short	Tail Length V medium	Tail Length V long	T	Width
LA037[1)]	3/8"	330	-	15	13/16"	7/16"	5/32"	3/16"	9/32"	3/16"	1"
LA050	1/2"	1300	157	50	1"	1/2"	3/16"	1/4"	3/8"	1/4"	1 1/8"
LA062	5/8"	1640	337	108	1 3/16"	5/8"	1/4"	5/16"	7/16"	5/16"	1 3/8"
LA075	3/4"	3300	674	210	1 7/16"	3/4"	5/16"	3/8"	1/2"	3/8"	1 13/16"
LA100	1"	4430	1012	362	1 7/8"	1"	3/8"	1/2"	5/8"	1/2"	2 1/8"

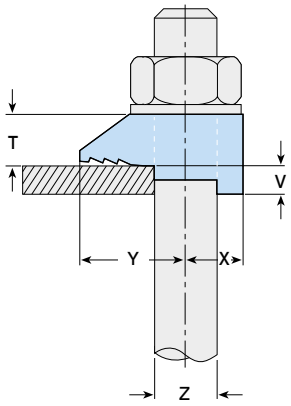
1) Requires Type W washer (product code LW037), see page 18.
* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 58.

If using A325 bolts, the Type B should be used (see page 17).

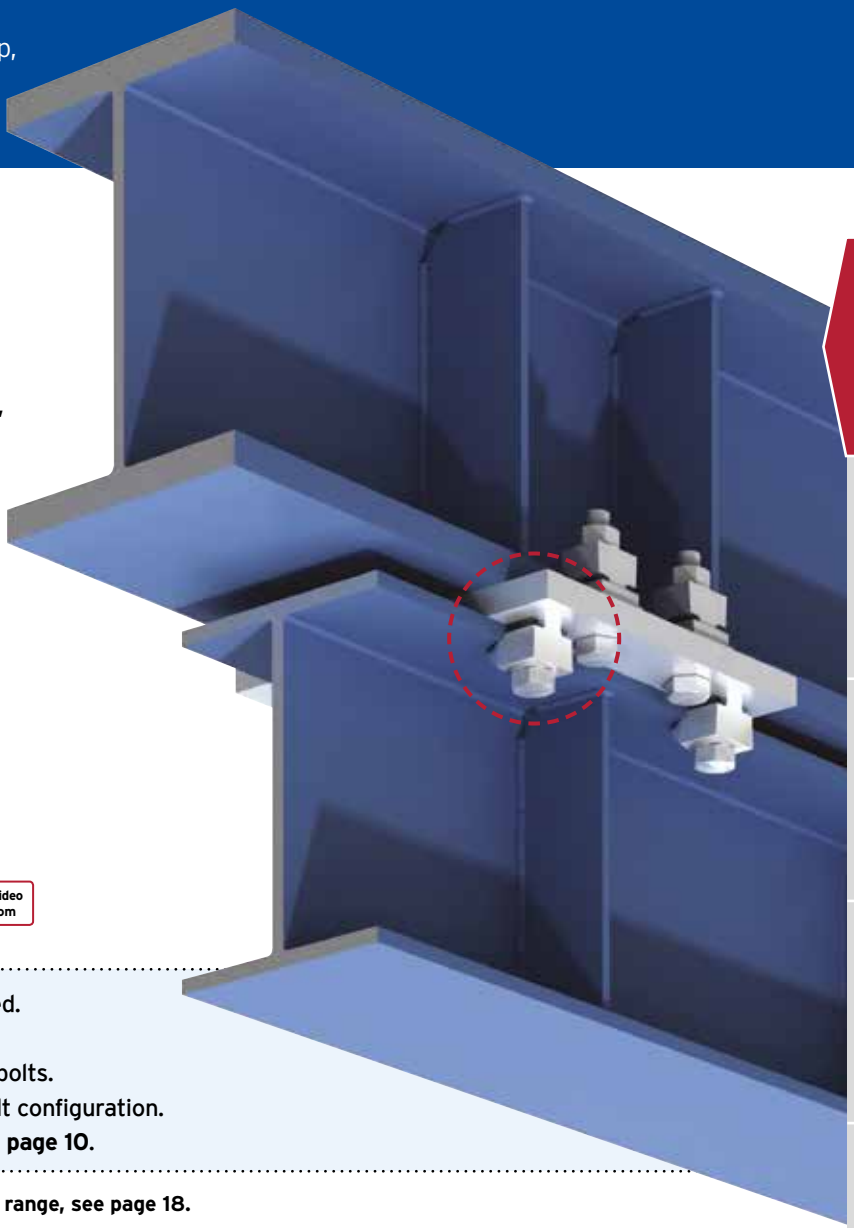
Type B

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.





Watch the installation video at www.LindapterUSA.com



- CE Mark, DIBt, Lloyd's Register and TÜV approved.
- Flat top allows the bolt head or nut to rotate.
- Suitable for use with bolts, studs, tie rods and J-bolts.
- Supports up to 17,720lbs tensile load in a four bolt configuration.
- For higher loads the Type AF should be used, see **page 10**.

Packing pieces are available to increase the clamping range, see page 18.
Location plate / end plate details can be found on page 19.

Material: Malleable iron, zinc plated / hot dip galvanized.

Product Code	Bolt Grd. 5 / A325 Z	Safe Working Loads (FOS 5:1) Tensile Resistance / 1 Bolt lbs	Safe Working Loads (FOS 5:1) Slip Resistance / 2 Bolts lbs	Tightening Torque* ft lb	Dimensions Y	X	Tail Length V short	Tail Length V medium	Tail Length V long	T	Width
LB037[1)]	3/8"	330	-	15	13/16"	7/16"	5/32"	3/16"	9/32"	3/8"	1"
LB050	1/2"	1300	157	50	1"	1/2"	3/16"	1/4"	3/8"	1/2"	1 1/8"
LB062	5/8"	1640	337	108	1 3/16"	5/8"	1/4"	5/16"	7/16"	5/8"	1 3/8"
LB075	3/4"	3300	674	210	1 7/16"	3/4"	5/16"	3/8"	1/2"	3/4"	1 13/16"
LB100	1"	4430	1012	362	1 7/8"	1"	3/8"	1/2"	5/8"	1"	2 1/8"

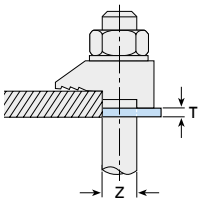
1) Requires a hardened washer under the bolt head.
* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 58.

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

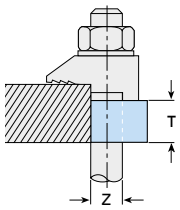
Type CW



Mild steel, zinc plated / hot dip galvanized.

Product Code	Bolt Size Z	Dimension T
LCW037	3/8"	1/16"
LCW050	1/2"	1/8"
LCW062	5/8"	1/8"
LCW075	3/4"	3/16"
LCW100	1"	3/16"

Type P1 short / Type P2 short

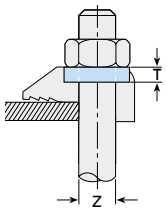


Mild steel, malleable iron, zinc plated / hot dip galv.

Product Code	Bolt Size Z	Dimension T
LP1037S	3/8"	3/16"
LP1050S	1/2"	1/4"
LP1062S	5/8"	5/16"
LP1075S	3/4"	3/8"
LP1100S	1"	1/2"
LP2037S	3/8"	3/8"
LP2050S	1/2"	1/2"
LP2062S	5/8"	5/8"
LP2075S	3/4"	3/4"
LP2100S	1"	1"

Also Available

Type W



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

Product Code	Bolt Size Z	Dimension T
LW037	3/8"	3/16"
LW050	1/2"	1/4"
LW062	5/8"	5/16"
LW075	3/4"	3/8"

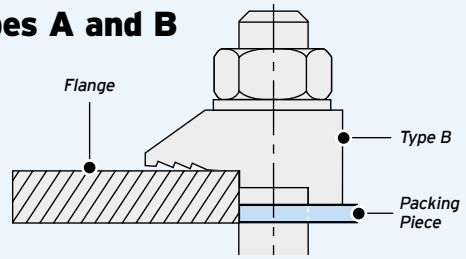
Note: Type W is used to fill the recess in the Type A to convert it into a flat top clamp which enables an A325 structural bolt head or nut to be rotated.

Tail Length / Packing Piece Combinations for Types A and B

Choose the correct combination for your Type A/B configuration using the table below. **Please note these calculations are for beams up to and including 5° slopes only.**

For example, a 5/8" Type A/B on a 1 1/8" flange requires 1 x Type A/B short tail (S), 2 x Type CW and 1 x Type P2S.

For thicker flanges contact Lindapter.



Flange Thickness	3/8"				1/2"				5/8"				3/4"				1"			
	A/B	CW	P1S	P2S	A/B	CW	P1S	P2S	A/B	CW	P1S	P2S	A/B	CW	P1S	P2S	A/B	CW	P1S	P2S
3/16"	M	-	-	-	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1/4"	S	1	-	-	M	-	-	-	S	-	-	-	S	-	-	-	-	-	-	-
5/16"	L	-	-	-	M	1	-	-	M	-	-	-	S	-	-	-	S	-	-	-
3/8"	S	-	1	-	L	-	-	-	S	1	-	-	M	-	-	-	S	-	-	-
7/16"	L	2	-	-	M	2	-	-	L	-	-	-	S	1	-	-	M	-	-	-
1/2"	L	3	-	-	S	1	1	-	S	2	-	-	L	-	-	-	M	-	-	-
9/16"	S	-	-	1	L	2	-	-	L	1	-	-	M	1	-	-	S	1	-	-
5/8"	S	1	-	1	L	-	1	-	M	-	1	-	L	1	-	-	L	-	-	-
11/16"	L	-	-	1	M	2	1	-	L	2	-	-	S	-	1	-	S	2	-	-
3/4"	S	-	1	1	S	1	-	1	L	-	1	-	S	3	-	-	L	1	-	-
13/16"	M	-	1	1	M	1	-	1	L	3	-	-	M	-	1	-	L	1	-	-
7/8"	L	-	1	1	S	-	1	1	M	2	1	-	M	3	-	-	S	-	1	-
15/16"	S	-	-	2	M	-	1	1	M	-	-	1	M	1	1	-	M	-	1	-
1"	M	-	-	2	S	1	1	1	L	2	1	-	S	2	1	-	S	1	1	-
1 1/16"	L	-	-	2	M	1	1	1	L	-	-	1	S	-	-	1	L	-	1	-
1 1/8"	L	1	-	2	S	-	-	2	S	2	-	1	M	2	1	-	L	-	1	-
1 3/16"	-	-	-	-	M	-	-	2	L	1	-	1	M	-	-	1	S	2	1	-
1 1/4"	-	-	-	-	S	1	-	2	M	-	1	1	S	1	-	1	L	1	1	-

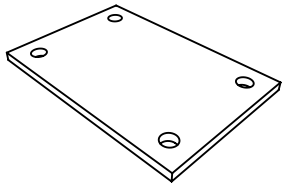
A/B = Type A/B | **S** = Type A/B short | **M** = Type A/B medium | **L** = Type A/B long | **CW** = Type CW | **P1S/P2S** = Type P1/P2 short

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 steel. 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 centers.

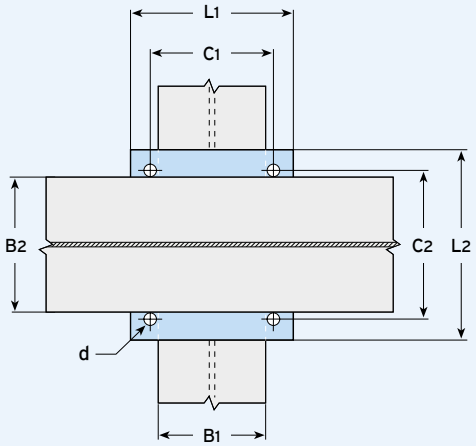


Material: Structural steel grade A36.
For other grades contact Lindapter.

Bolt Size	Hole Ø d	Plate Thickness	Hole Centers C1	Length / Width min L1	Hole Centers C2	Length / Width min L2
3/8"	7/16"	5/16"	B1 + 7/16"	B1 + 1 3/4"	B2 + 7/16"	B2 + 1 3/4"
1/2"	9/16"	3/8"	B1 + 9/16"	B1 + 2 1/4"	B2 + 9/16"	B2 + 2 1/4"
5/8"	11/16"	3/8"	B1 + 11/16"	B1 + 2 3/4"	B2 + 11/16"	B2 + 2 3/4"
3/4"	13/16"	1/2"	B1 + 13/16"	B1 + 3 1/2"	B2 + 13/16"	B2 + 3 1/2"
1"	1 1/8"	5/8"	B1 + 1 1/8"	B1 + 4 1/4"	B2 + 1 1/8"	B2 + 4 1/4"

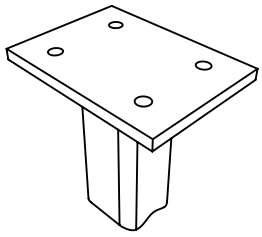
LOCATION PLATE DIMENSIONS

L1 = Location Plate Width, **L2** = Location Plate Length,
B1, B2 = Flange Width, **C1, C2** = Hole Centers, **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.

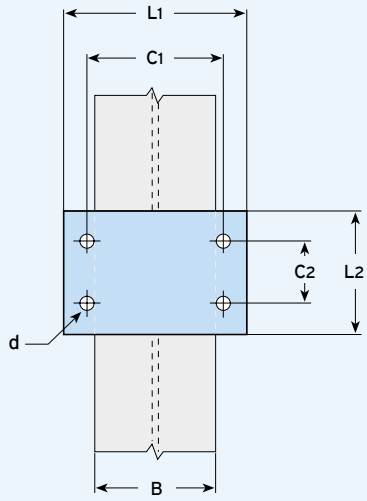


Material: Structural steel grade A36.
For other grades contact Lindapter.

Bolt Size	Hole Ø d	Plate Thickness	Hole Centers C1	Length min L1	Hole Centers min C2	Width min L2
3/8"	7/16"	1/2"	B + 7/16"	B + 1 3/4"	2"	C2 + 1 5/8"
1/2"	9/16"	1/2"	B + 9/16"	B + 2 1/4"	2 3/8"	C2 + 2"
5/8"	11/16"	5/8"	B + 11/16"	B + 2 3/4"	2 7/8"	C2 + 2 3/8"
3/4"	13/16"	7/8"	B + 13/16"	B + 3 1/2"	3 5/8"	C2 + 2 3/4"
1"	1 1/8"	1"	B + 1 1/8"	B + 4 1/4"	4 3/8"	C2 + 3 5/8"

END PLATE DIMENSIONS

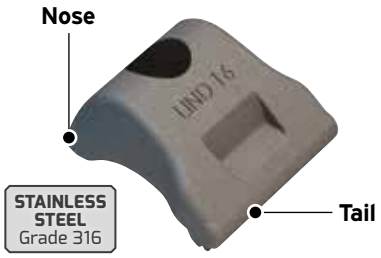
L1 = End Plate Width, **L2** = End Plate Length,
B = Flange Width, **C1, C2** = Hole Centers, **d** = Hole Ø

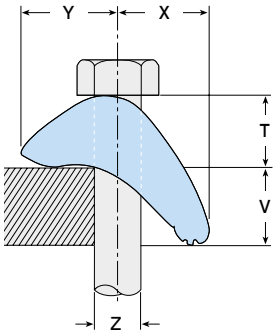


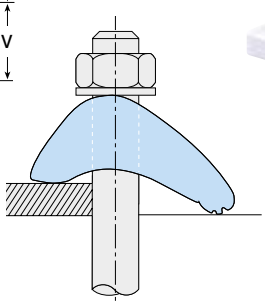
Use Lindapter's Bolt Length Calculator on **page 6** to calculate the correct bolt length for your application.

Type LS

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







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

Watch the installation video at www.LindapterUSA.com

- Made from high strength stainless steel grade 316.
- Self-adjusts to suit a range of flange thicknesses.
- For parallel and tapered flanges up to 10°.
- The tail spans slotted clearance holes.

See page 21 for the packing pieces available to increase the clamping range, as well as location and end plate details.

Material: Cast stainless steel grade 316.

Product Code	Bolt A4-70 Z	Safe Working Loads: Tensile Resistance / 1 Bolt (FOS 5:1) lbs	Safe Working Loads: Slip Resistance[1] / 2 Bolts (FOS 2:1) lbs	Tightening Torque* ft lb	Dimensions: Clamping Range[2] V	Dimensions: Y	Dimensions: X	Dimensions: T	Dimensions: Width
LLS037	3/8"	675	337	30	1/8" - 9/16"	5/8" - 3/4"	11/16" - 15/16"	5/8" - 13/16"	1 1/2"
LLS050	1/2"	1574	450	60	1/8" - 13/16"	5/8" - 7/8"	11/16" - 1 1/8"	5/8" - 7/8"	1 9/16"
LLS062	5/8"	2248	675	148	1/8" - 1"	7/8" - 1"	1 1/16" - 1 7/16"	3/4" - 1 1/8"	2 3/16"
LLS075	3/4"	4047	1124	295	1/8" - 1 3/16"	15/16" - 1 1/4"	1" - 1 5/8"	7/8" - 1 1/4"	2 3/8"

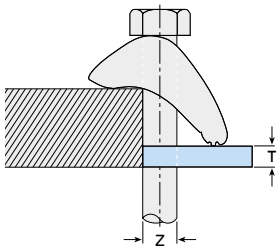
1) Slip resistance loads calculated against slip (movement exceeding 0.004" / 0.1mm).
2) For thicker flanges, see the packing pieces on page 21.
* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 58.

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

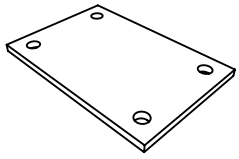


Material: Stainless steel grade 316.

Product Code	Bolt Size Z	Dimension T
LLS037P2	3/8"	3/8"
LLS050P2	1/2"	3/8"
LLS062P2	5/8"	3/8"
LLS075P2	3/4"	3/8"

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 centers.

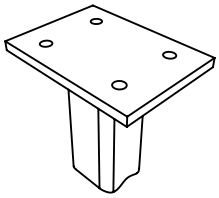


Material: Stainless steel grade 316.

Bolt Size	Hole Ø d	Plate Thickness	Hole Centers C1	Length / Width min L1	Hole Centers C2	Length / Width min L2
3/8"	7/16"	3/8"	B1 + 7/16"	B1 + 2 3/4"	B2 + 7/16"	B2 + 2 3/4"
1/2"	9/16"	1/2"	B1 + 9/16"	B1 + 3 1/8"	B2 + 9/16"	B2 + 3 1/8"
5/8"	11/16"	5/8"	B1 + 11/16"	B1 + 4"	B2 + 11/16"	B2 + 4"
3/4"	13/16"	3/4"	B1 + 13/16"	B1 + 5 1/8"	B2 + 13/16"	B2 + 5 1/8"

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.

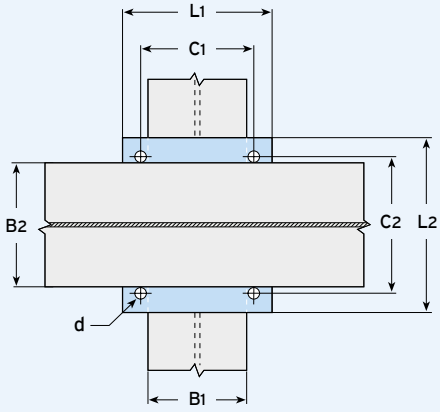


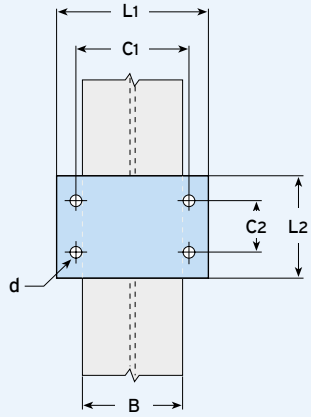
Material: Stainless steel grade 316.

Bolt Size	Hole Ø d	Plate Thickness[1)]	Hole Centers C1	Length / Width min L1	Hole Centers C2	Length / Width min L2
3/8"	7/16"	3/8"	B + 7/16"	B + 2 3/4"	3 1/8"	C2 + 2 3/8"
1/2"	9/16"	5/8"	B + 9/16"	B + 3 1/8"	3 1/8"	C2 + 2 3/8"
5/8"	11/16"	3/4"	B + 11/16"	B + 4"	4 3/8"	C2 + 3 1/8"
3/4"	13/16"	1"	B + 13/16"	B + 5 1/8"	4 3/4"	C2 + 3 9/16"

PLATE DIMENSIONS

L1 = Plate Width, **L2** = Plate Length, **B, B1, B2** = Flange Width, **C1, C2** = Hole Centers, **d** = Hole Ø



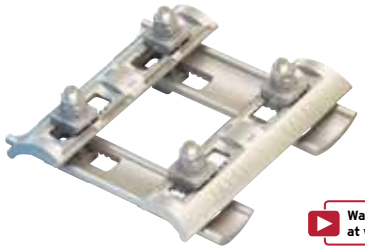


1) Depending on the type of connection and associated end plate use, the thickness may need to be modified to comply with accepted local design codes.

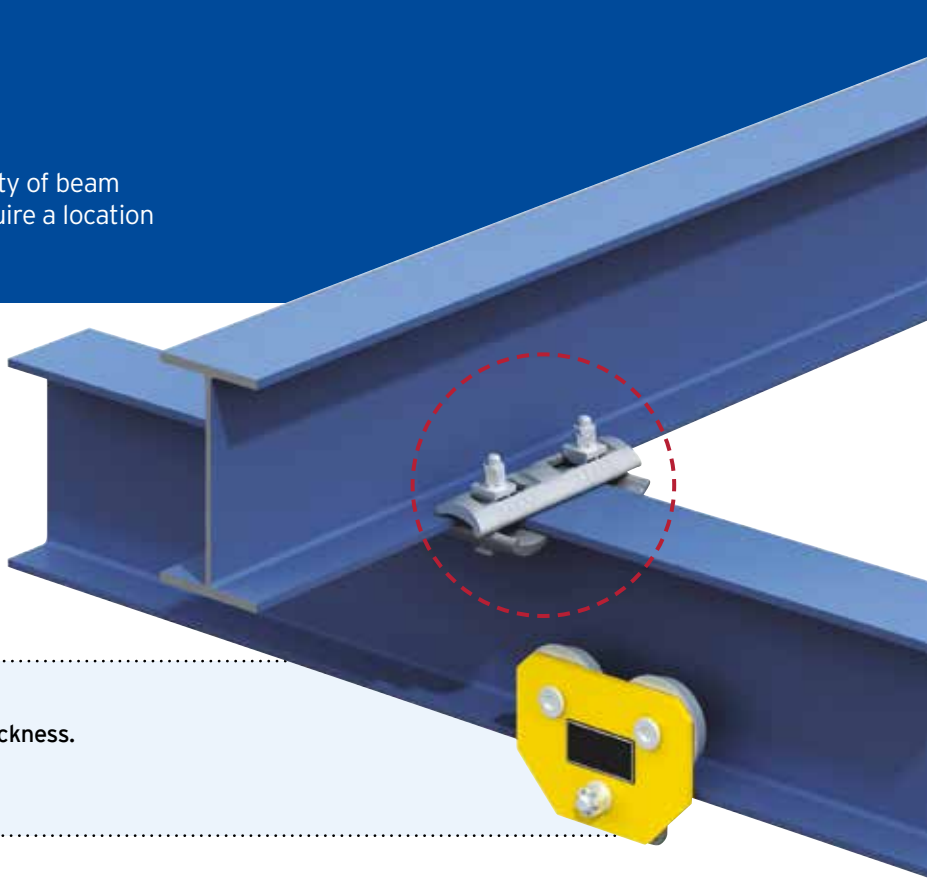
Use Lindapter's Bolt Length Calculator on **page 6** to calculate the correct bolt length for your application.

Type FC - Flush Clamp

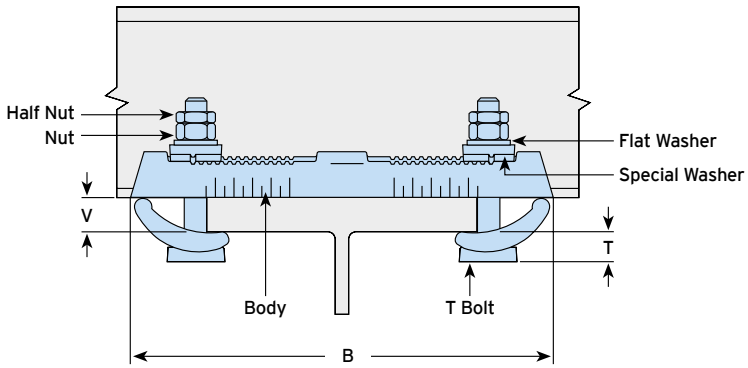
A full connection system that adjusts to fit a variety of beam types. This pre-configured assembly does not require a location plate and is ready for assembly 'out of the box'.

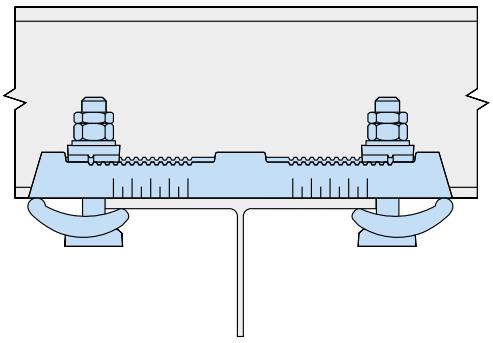


Watch the installation video at www.LindapterUSA.com



- '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°.





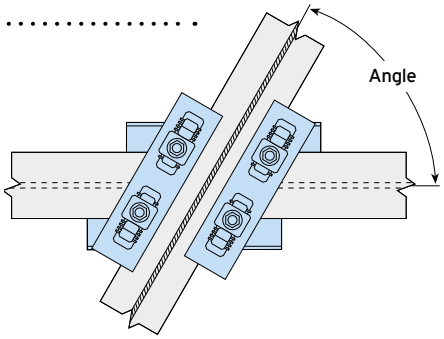
Material: Forged steel, zinc plated plus JS500.

Product Code	Special Bolt Size Z	Safe Working Loads (FOS 5:1) Tensile Resistance / 4 Bolts lbs	Slip Resistance / 4 Bolts lbs	Tightening Torque* ft lb	Clamping Range Flange Thickness V	Flange Width[1)]	Dimensions T	B
LFCM16	M16 ($^5/_8$")	6744	1686	108	$^3/_{16}$" - $^3/_4$"	3" - 7"	$^7/_8$" - $1^1/_{16}$"	12"

1) Depending on beam connection angles (see table below).

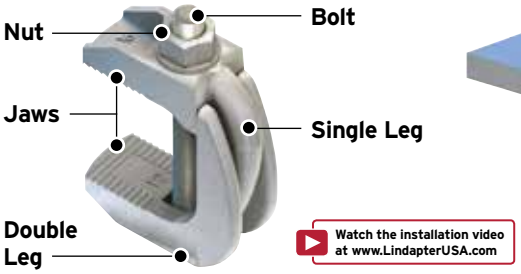
Minimum Possible Beam Connection Angles

Bottom Beam \ Top Beam	3"	4"	5"	6"	7"
3"	45°	50°	55°	65°	75°
4"	50°	50°	55°	65°	75°
5"	55°	55°	55°	65°	75°
6"	65°	65°	65°	65°	75°
7"	75°	75°	75°	75°	80°

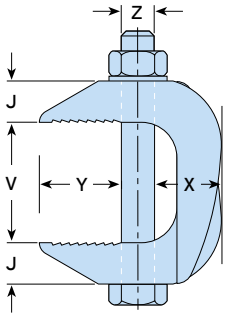


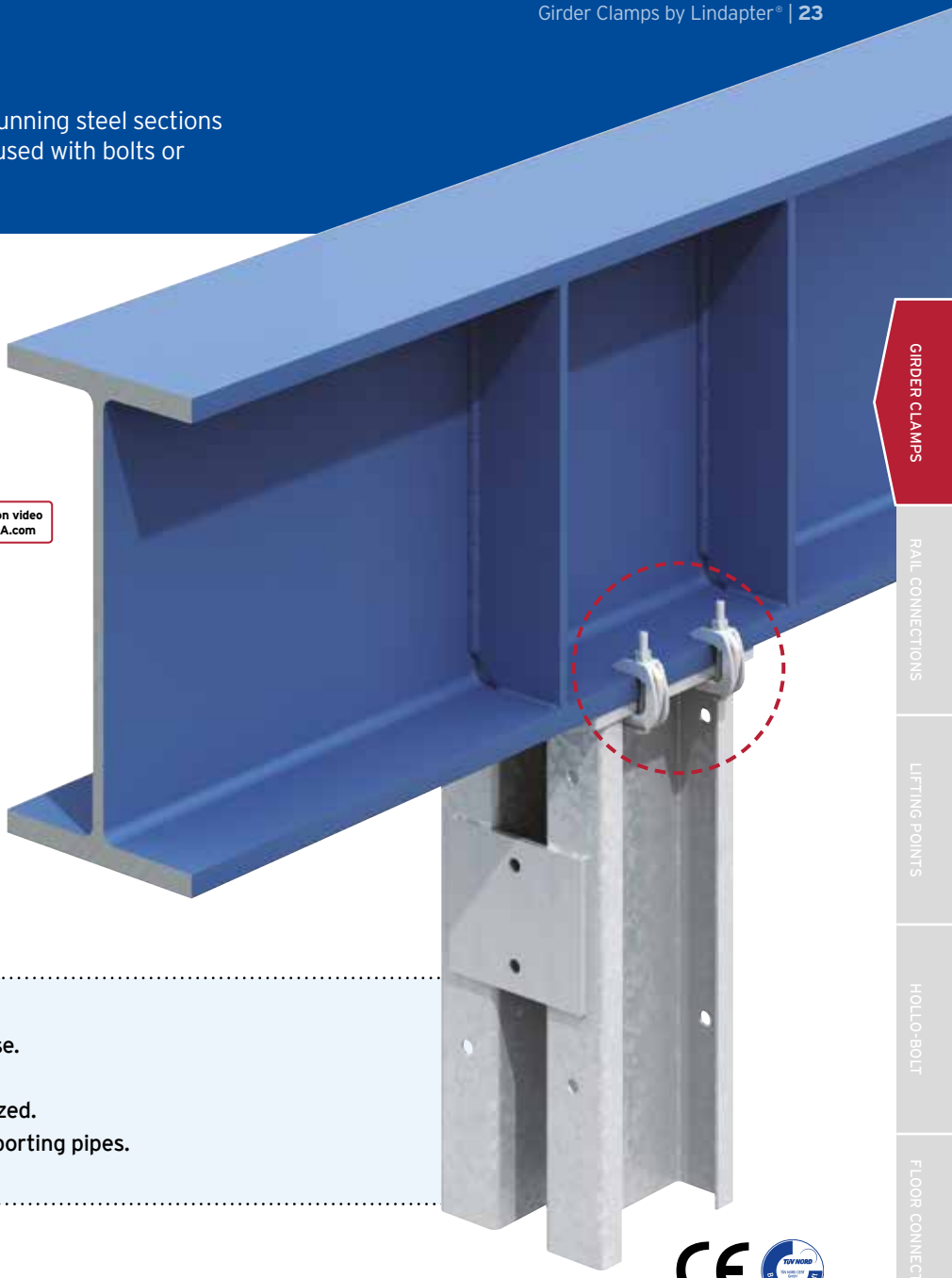
Type F9

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



Watch the installation video at www.LindapterUSA.com





- Fast, cost effective installation.
- Perfect for temporary or permanent use.
- Large clamping range.
- Available zinc plated or hot dip galvanized.
- Can be used with threaded rod for supporting pipes.
- Supplied with or without a metric bolt.

Material: Malleable iron, zinc plated / hot dip galvanized.

Without Bolt		With Bolt		Safe Working Loads (FOS 5:1)		Dimensions				
Product Code	Bolt / Rod Z	Product Code	Bolt Z	Tensile Resistance / 1 Bolt lbs	Tightening Torque* ft lb	Clamping Range V	Y	J	X	Width
LF9037NB	3/8"	LF9037WB	M10 (3/8")	440	15	3/4" - 1 11/16"	1"	1/2"	3/4"	15/16"
LF9050NB	1/2"	LF9050WB	M12 (1/2")	630	29	1" - 2 3/8"	1 3/8"	11/16"	15/16"	1 3/16"
LF9062NB	5/8"	LF9062WB	M16 (5/8")	1260	69	1 1/8" - 2 3/4"	1 11/16"	1 3/16"	1 1/8"	1 3/8"
LF9075NB	3/4"	LF9075WB	M20 (3/4")	1880	131	1 1/4" - 3 1/4"	2"	1"	1 3/8"	1 3/4"
LF9100NBHDG[1)]	1"	LF9100WBHDG[1)]	M24 (1")	3147	173	1 3/4" - 3 3/4"	3"	1 1/2"	2 3/16"	2 1/2"

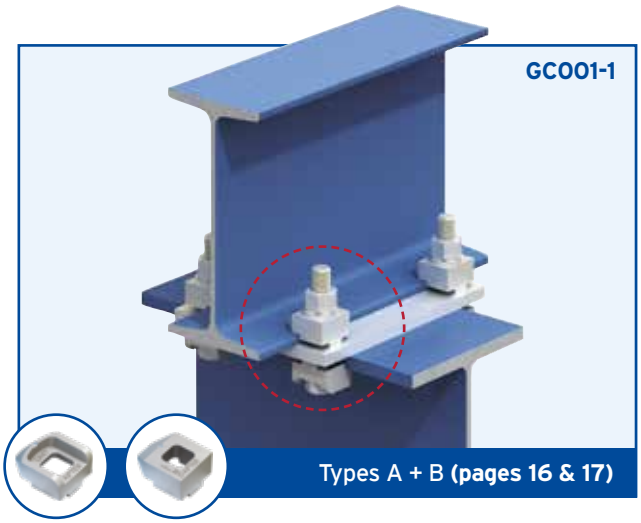
1) Available in Hot Dip Galvanized only.
* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 58.

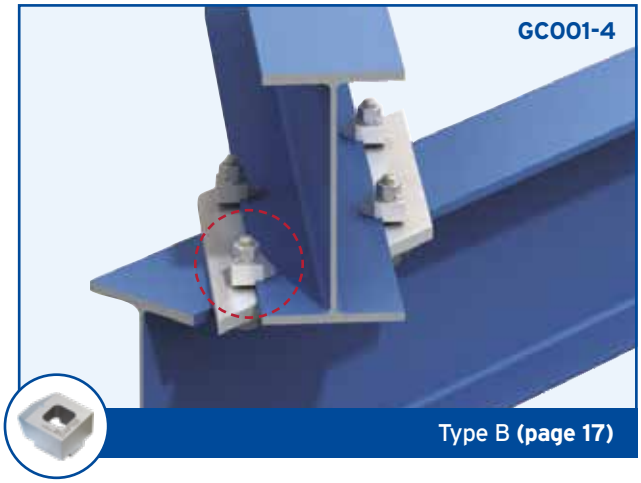
Not suitable for tapered flanges.

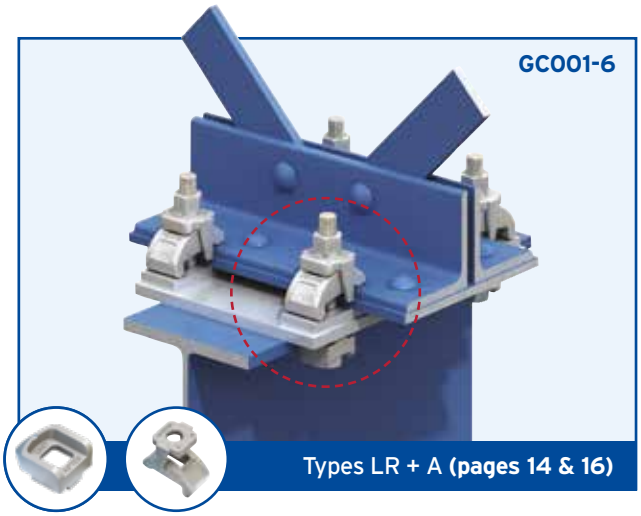
Supplied without bolt or with bolt (contact your local distributor for details / options).

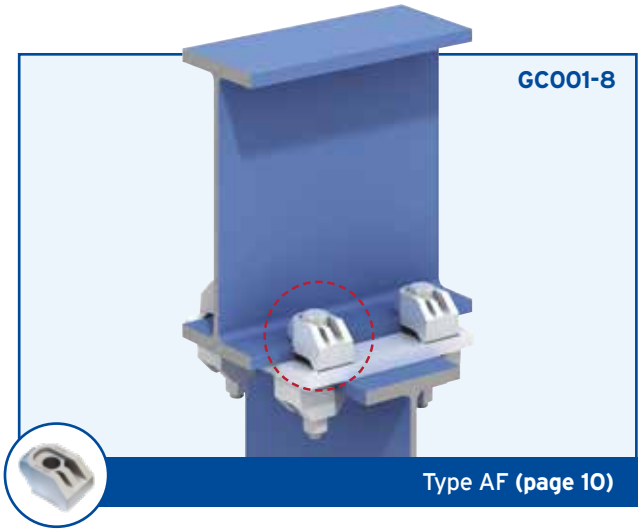
Typical Applications for Girder Clamps

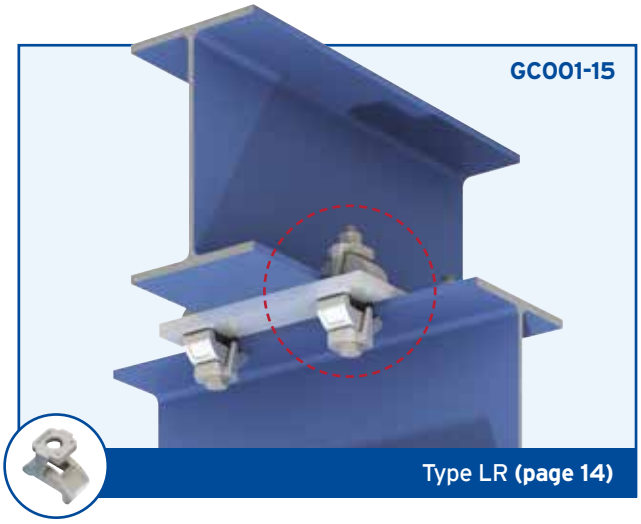
Popular connection assemblies are shown below. They represent a fraction of the possibilities as Lindapter's clamps are used all over the world to connect almost every type of steel section. Please contact Lindapter to discuss your connection requirement.

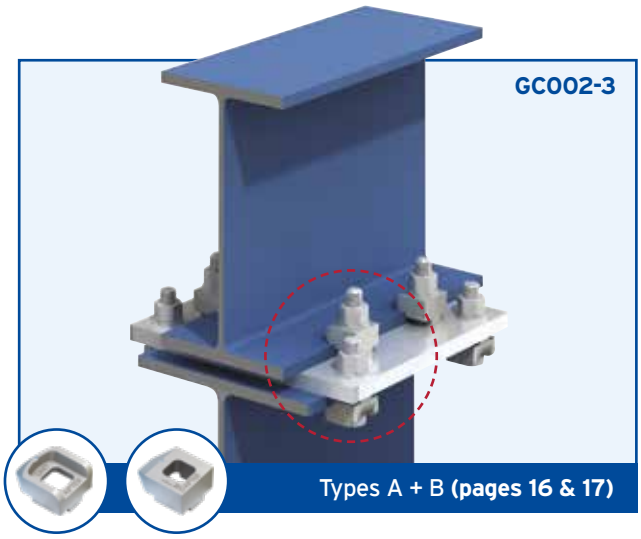






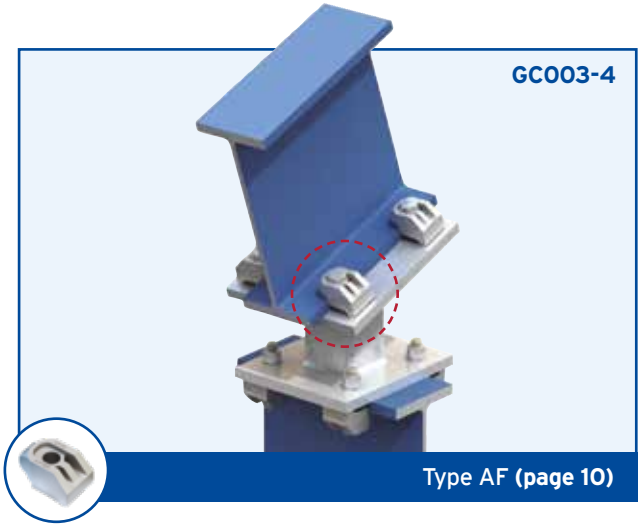






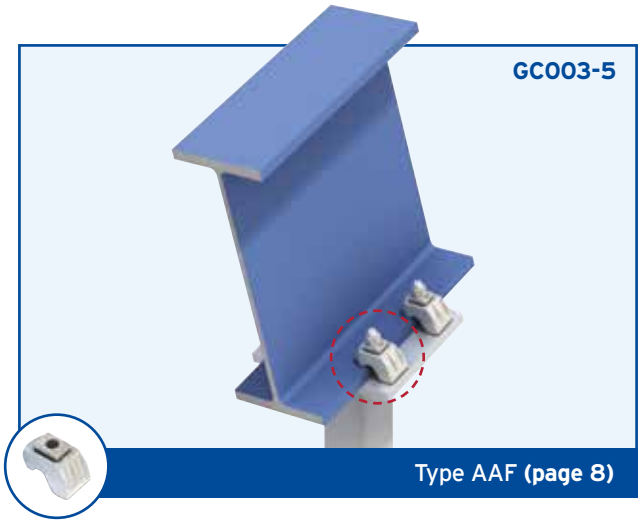
Typical Applications for Girder Clamps

Examples of popular connection arrangements are continued below:



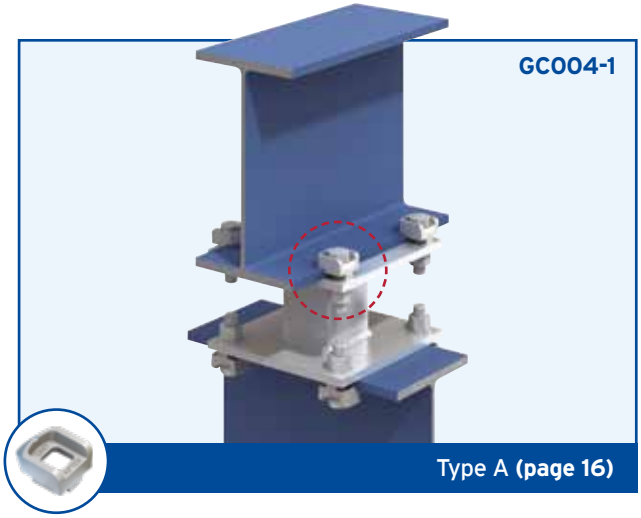
GC003-4

Type AF **(page 10)**



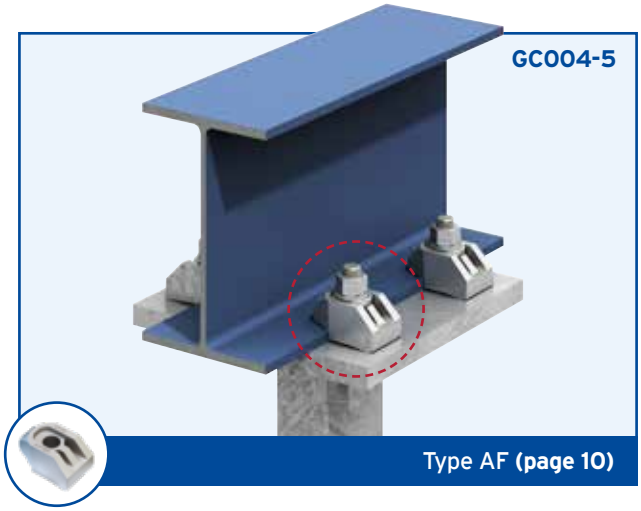
GC003-5

Type AAF **(page 8)**



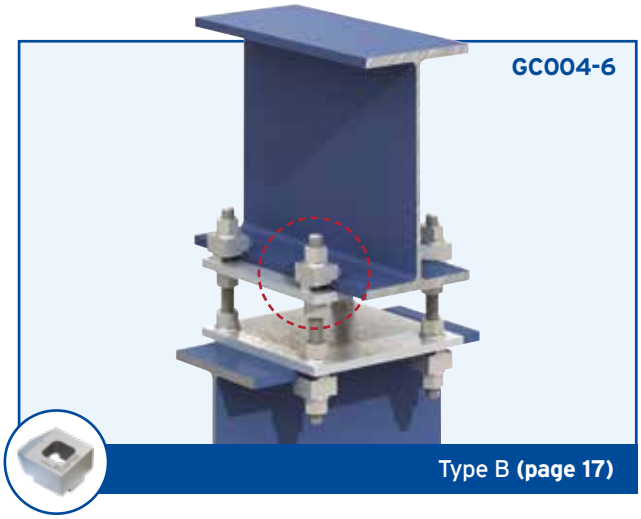
GC004-1

Type A **(page 16)**



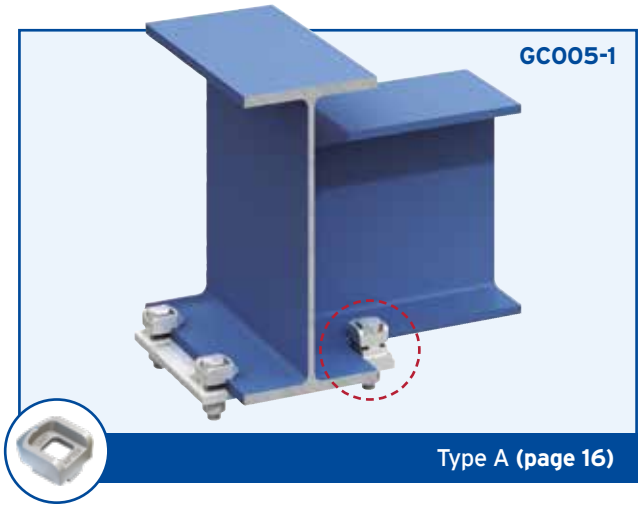
GC004-5

Type AF **(page 10)**



GC004-6

Type B **(page 17)**

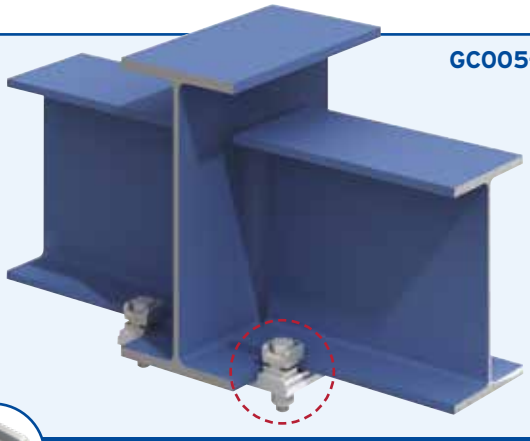


GC005-1

Type A **(page 16)**

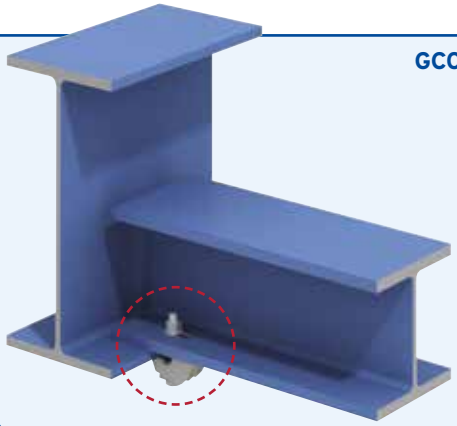
Typical Applications for Girder Clamps

More examples of popular connection assemblies are shown below:



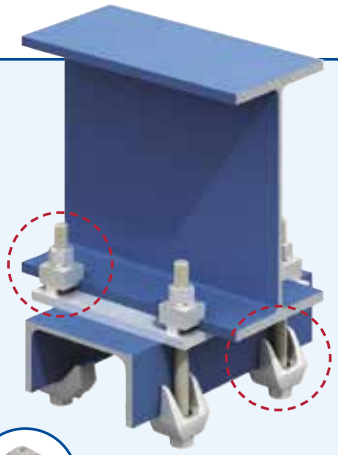
GC005-2

Type A **(page 16)**



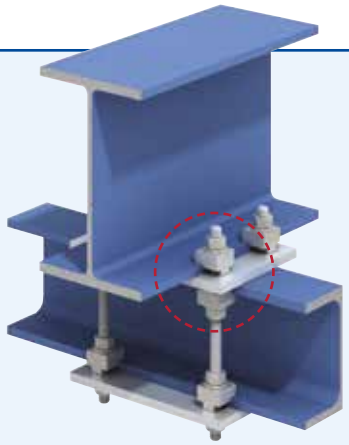
GC005-3

Type AAF **(page 8)**



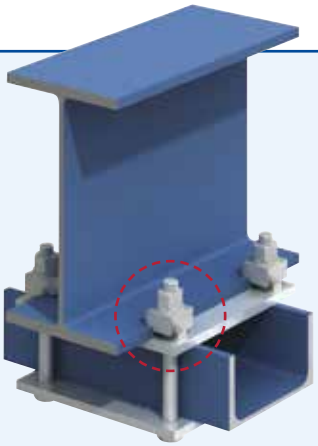
GC006-1

Types CF + B **(pages 11 & 17)**



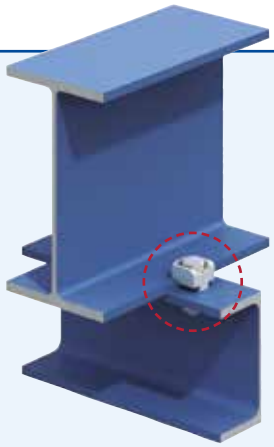
GC006-2

Type B **(page 17)**



GC006-3

Type B **(page 17)**

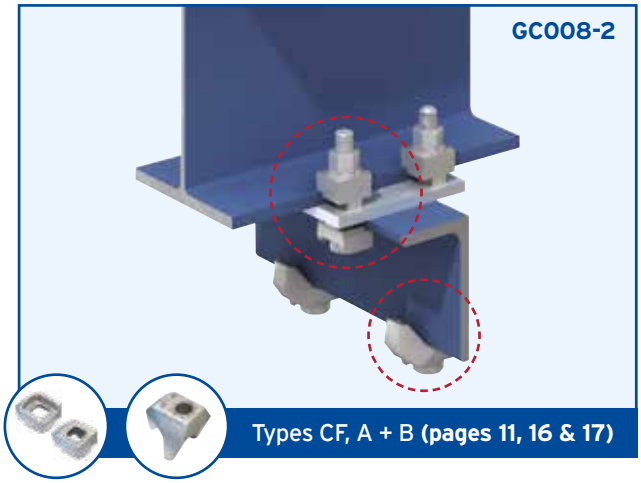


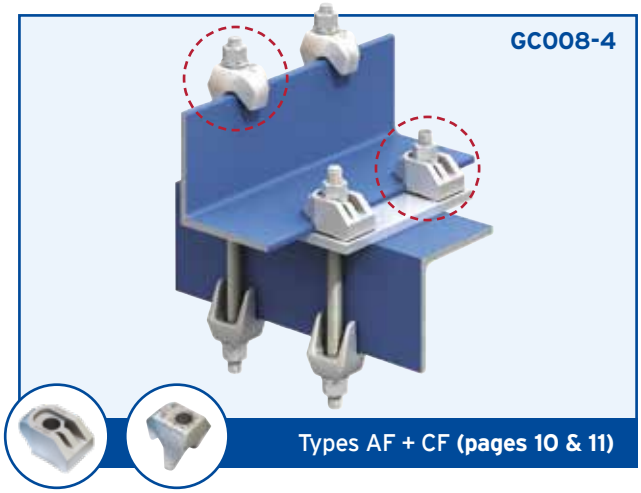
GC006-6

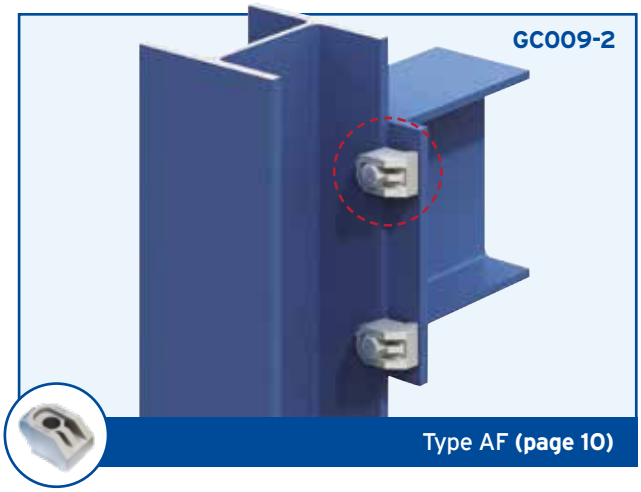
Type A **(page 16)**

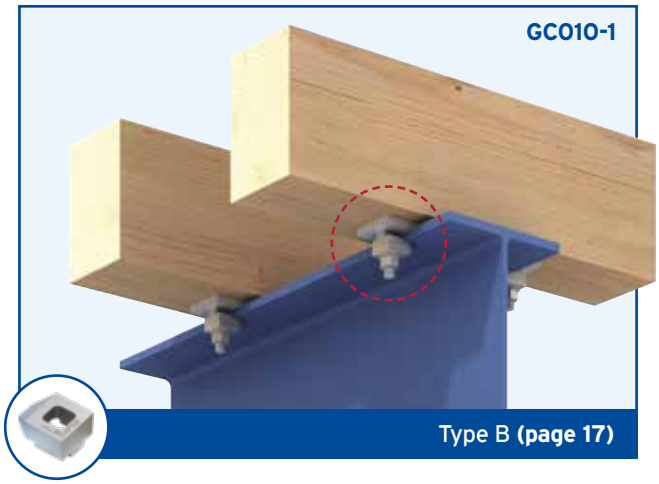
Typical Applications for Girder Clamps

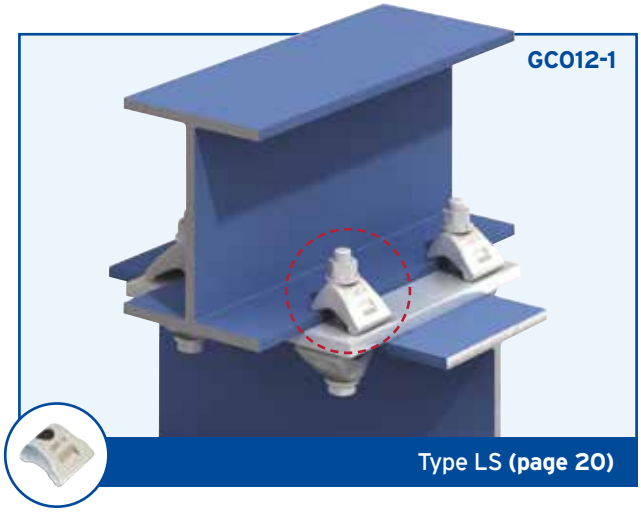
Examples of popular connection arrangements are continued below.
Please contact Lindapter to discuss your connection requirement.











The popular Type HD provides lateral adjustability to allow the quick and precise alignment of rails **(see page 30).**

Rail Connections

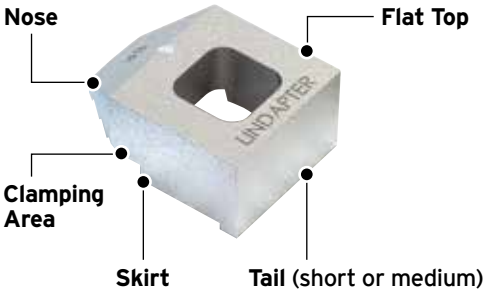
For securing rails or crane lines in low speed applications such as ground track, elevated rail and overhead gantries. These connections are used in a wide range of environments including train maintenance depots, industrial facilities, water treatment plants, dam/dockside cranes, automated warehouses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

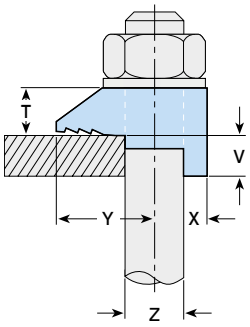
Type BR
page 29

Type HD
page 30

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 / hot dip galvanized.

Product Code	Bolt Grd. 5 / A325 Z	Safe Working Loads (FOS 5:1) Tensile Resistance / 1 Bolt lbs	Slip Resistance / 2 Bolts lbs	Tightening Torque ft lb	Dimensions Y	X	Tail Length V short	Tail Length V medium	T	Width
LBR050	1/2"	1300	157	50	1"	1/2"	5/32"	1/4"	1/2"	1 1/8"
LBR062	5/8"	1640	337	108	1 3/16"	5/8"	1/4"	5/16"	5/8"	1 3/8"
LBR075	3/4"	3300	674	210	1 3/8"	3/4"	9/32"	3/8"	3/4"	1 5/8"

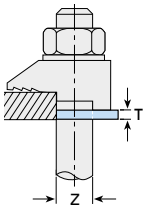
* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 58.

Please contact Lindapter to ensure suitability of the component for the application.

Packing Pieces

Type CW

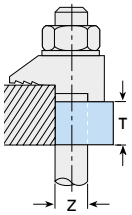
Mild steel, zinc plated / hot dip galvanized.



Product Code	Bolt Size Z	Dimension T
LCW050	1/2"	1/8"
LCW062	5/8"	1/8"
LCW075	3/4"	3/16"

Type P1 / P2 short

Mild steel, malleable iron, zinc plated / hot dip galvanized.



Product Code	Bolt Size Z	Dimension T
LP1050S	1/2"	1/4"
LP1062S	5/8"	5/16"
LP1075S	3/4"	3/8"
LP2050S	1/2"	1/2"
LP2062S	5/8"	5/8"
LP2075S	3/4"	3/4"

Packing Combinations

For rails up to and including 8° slope.

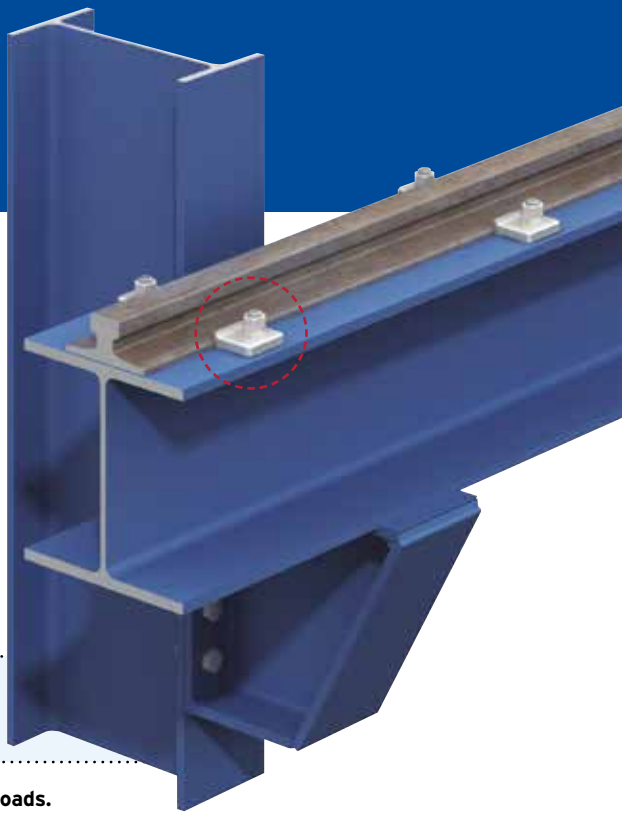
Flange Thickness	1/2" BR	1/2" CW	1/2" P1S	1/2" P2S	5/8" BR	5/8" CW	5/8" P1S	5/8" P2S	3/4" BR	3/4" CW	3/4" P1S	3/4" P2S
3/16"	S	-	-	-	-	-	-	-	-	-	-	-
1/4"	M	-	-	-	S	-	-	-	S	-	-	-
5/16"	M	1	-	-	M	-	-	-	S	-	-	-
3/8"	S	2	-	-	S	1	-	-	M	-	-	-
7/16"	M	2	-	-	M	1	-	-	S	1	-	-
1/2"	S	1	1	-	S	2	-	-	S	1	-	-
9/16"	M	1	1	-	S	-	1	-	M	1	-	-
5/8"	S	2	1	-	M	-	1	-	S	2	-	-
11/16"	M	2	1	-	S	1	1	-	S	-	1	-
3/4"	S	1	-	1	M	1	1	-	S	3	-	-
13/16"	M	1	-	1	S	2	1	-	M	-	1	-
7/8"	S	-	1	1	M	2	1	-	M	3	-	-
15/16"	M	-	1	1	M	-	-	1	M	1	1	-
1"	S	1	1	1	S	1	-	1	S	2	1	-
1 1/16"	M	1	1	1	M	1	-	1	S	-	-	1
1 1/8"	S	-	-	2	S	2	-	1	M	2	1	-
1 3/16"	M	-	-	2	M	2	-	1	M	-	-	1
1 1/4"	S	1	-	2	M	-	1	1	S	1	-	1

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

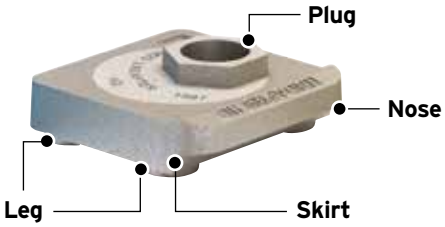
For thicker flanges contact Lindapter.

Type HD

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



Type HD Hard / Soft Clip



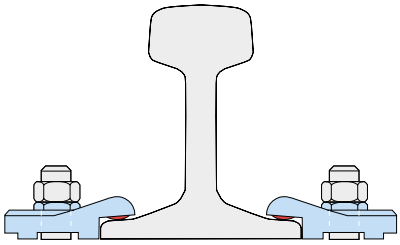
Type HD Spring Clip

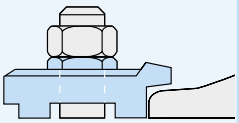
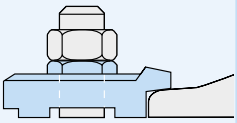
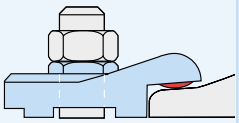
- Suitable for all rails with tapered flanges and crane speeds up to 200ft/min.
- Safely and easily secures rail using only hand tools.

Contact Lindapter for wheel loads above 89.9 kips or lateral loads higher than wheel loads.

Type HD Product Comparison

The table shows the three options available. Each product has specific properties, please contact Lindapter for more details.

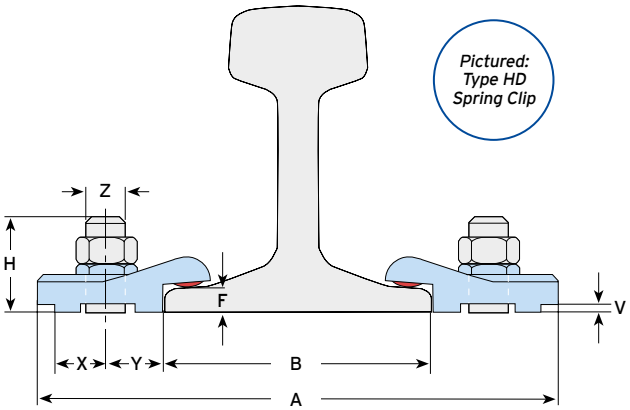


	Product Variants		
	Type HD Soft Allows rail wave Code: LHD075H	**Type HD Hard** Clamps rail down tightly Code: LHD075S	**Type HD Spring** Includes elastomer spring Code: LHD075SP
			
Precise lateral adjustability	✔	✔	✔
High strength SG Iron material	✔	✔	✔
Various corrosion protection options	✔	✔	✔
High resistance to lateral loads	✔	✔	✔
Allows vertical rail / rail wave movement	✔	-	✔*
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

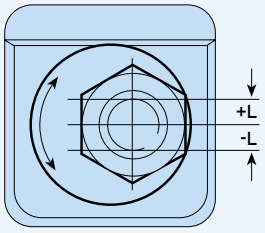
Type HD is suitable for all rails with tapered flanges and crane speeds up to 200 feet per minute. Please contact Lindapter for wheel loads above 89.9 kips or lateral loads higher than wheel loads.



Type HD Preparation

Before installing, ensure the hexagon on the plug is at the 3 o'clock position before tightening.

Doing so allows lateral adjustment (L) towards and away from the rail.



The nut shown is in the 3 o'clock position.

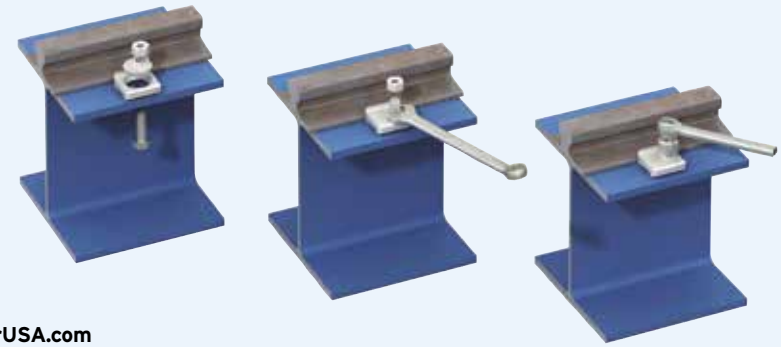
Material: SG iron, corrosion protection as requested.

Clip Type	Product Code	Bolt Grd.5 Z	Normal Lateral Conditions SWL (FOS 4:1) lbs	Normal Lateral Conditions Tight. Torque* ft lb	High Lateral Conditions SWL (FOS 4:1) lbs	High Lateral Conditions Tight. Torque* ft lb	Leg Length[3] V	Stud Length[3] H	Dimensions Lateral Adjust. L	Dimensions Plate Width min. A	Distances[1] Y	Distances[1] X	Width W
Hard	**LHD075H**[2]	3/4"	5060	136	10340	332	F - 5/16"	F + 11/2"	+/- 7/16"	B + 5 3/8"	1 3/16"	1 1/16"	2 15/16"
Soft	**LHD075S**	3/4"	5060	136	10340	332	F - 3/16"	F + 1 9/16"	+/- 7/16"	B + 5 3/8"	1 3/16"	1 1/16"	2 15/16"
Spring	**LHD075SP**	3/4"	5060	136	10340	332	F - 5/16"	F + 1 9/16"	+/- 7/16"	B + 5 3/8"	1 3/16"	1 1/16"	2 15/16"

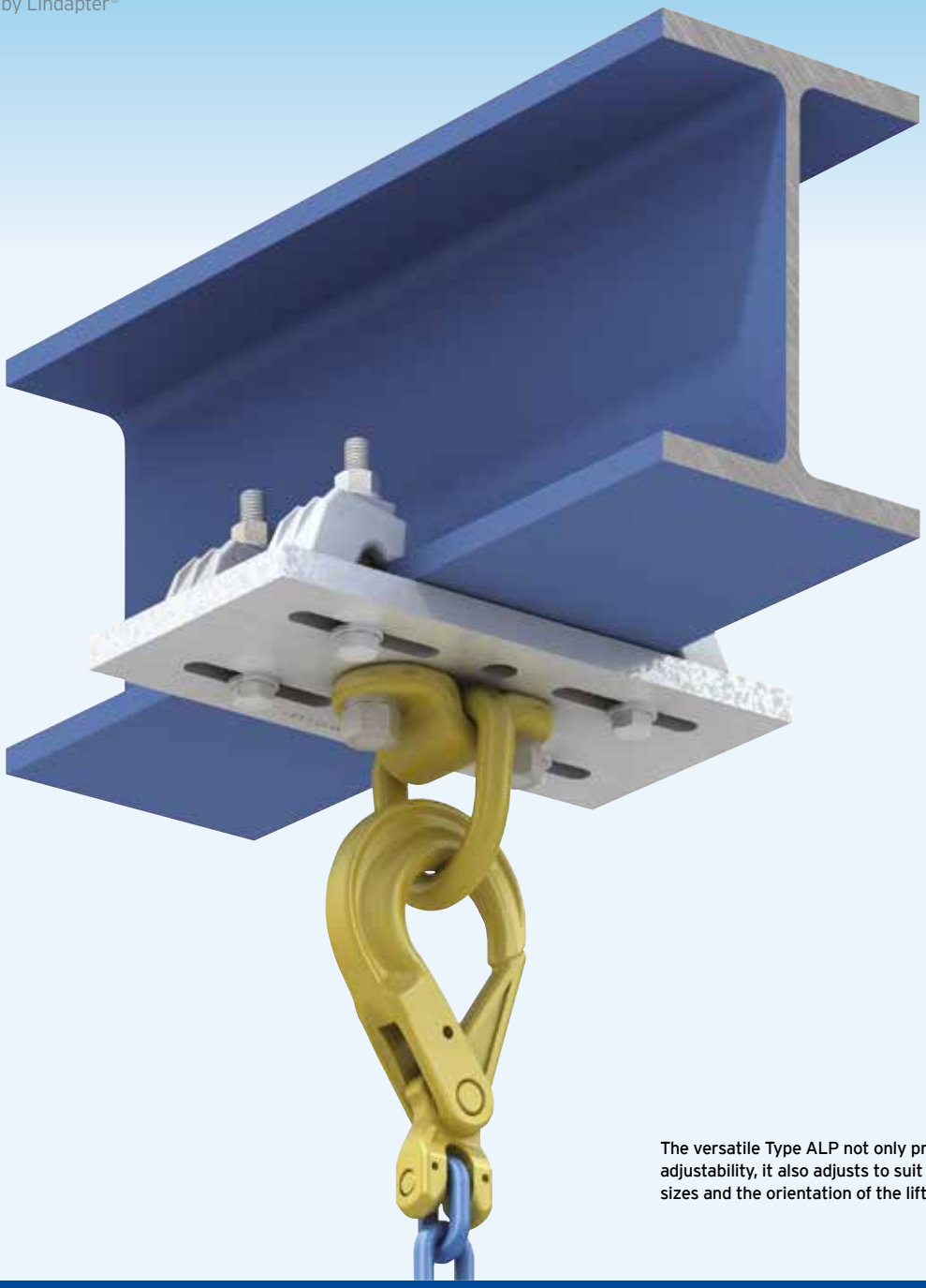
1) Based on plug set at 3 o'clock position.
2) Not suitable for use with a resilient pad.
3) Please specify the required leg length (V) when ordering. If you are using the resilient pad, increase the leg length and stud length (H) by the thickness of the pad.
* Torque figures based on bolts / setscrews in an unlubricated condition. For further information on lubricated fasteners see page 58.

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.LindapterUSA.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 34**).

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 theaters to lifting drilling risers onto offshore oil platforms.

Type ALP (Standard)
page 34

Type LP (Custom)
page 35

Lifting Point Configuration

Lindapter manufactures Lifting Points that are configured with adjustable, high strength components to suit heavy loads up to 45,000lbs SWL. Take advantage of the free connection design service for advice on the best solution for your connection.

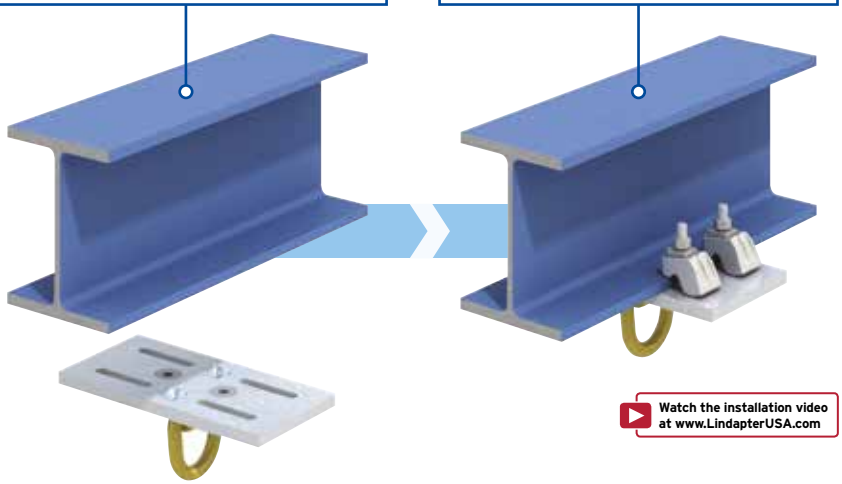
Quick and easy to install

Step 1

Offer the pre-assembled location plate up to the beam ensuring it is positioned centrally to it.

Step 2

Assemble the clamps and tighten to the recommended torque.



Watch the installation video at www.LindapterUSA.com

6 reasons to use

- ✔ Quick and easy to install using standard hand tools.
- ✔ Easy to align and reposition.
- ✔ Maximum safe working load up to 45,000lbs (Type LP).
- ✔ For parallel and tapered flanges up to 10°.
- ✔ Utilizes Lindapter clamps approved by TÜV.
- ✔ Free Connection Design service available.

Email your connection details to **support@LindapterUSA.com** and Lindapter's experienced Engineers will do the rest!

STANDARD

Type ALP

Ideal for most applications up to 6,600lbs, 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 34**.

CUSTOM

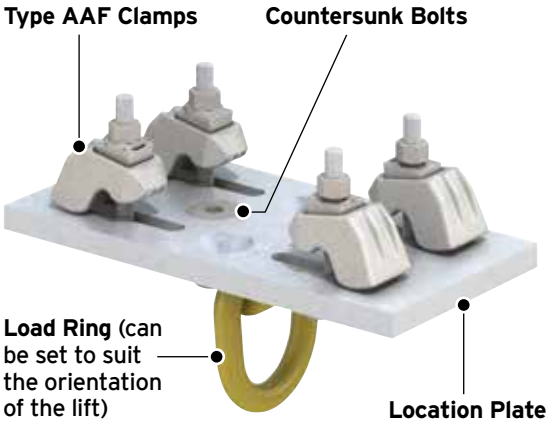
Type LP

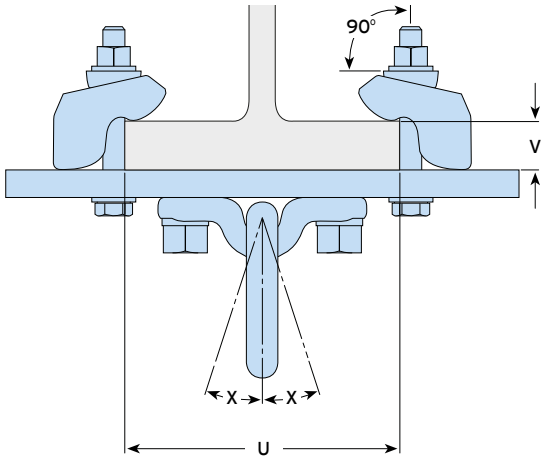
For large steel sections or loads up to 45,000lbs, Lindapter manufactures custom-made solutions for specific application requirements. Whatever the application, Lindapter's durable products are valued for their quality and reliability, and provide contractors with a safe, quick and convenient lifting system.

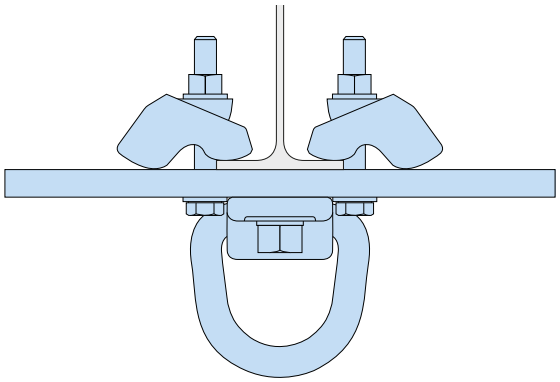
See the Type LP and its components in more detail on **page 35**.

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 6,600lbs.







- Available 'off-the-shelf' with a safe working load up to 6,600lbs.
- Adjusts to fit different sized beams and can be easily repositioned.
- Suitable for parallel and tapered beams up to 10°.
- Large load ring can be rotated 90° to suit the orientation of the lift.

Ensure that the supporting steel is suitable for the applied load.

For larger steel sections or heavier loads, please refer to Type LP (page 35), Lindapter's custom Lifting Points manufactured to suit individual applications.

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

Product Code	Torque Figures				Clamping Range		Safe Working Loads[1] (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 ft lb	8.8 Bolt	Torque ft lb			lbs	
LALP 3T-1	M16 (5/8")	74	M12 (1/2")	66	3/16" - 1"	2 3/4" - 8 1/4"	6600	18°
LALP 3T-2	M16 (5/8")	74	M12 (1/2")	66	3/16" - 1"	7 1/2" - 13"	6600	18°
LALP 3T-3	M16 (5/8")	74	M12 (1/2")	66	3/16" - 1"	12 3/16" - 17 3/4"	6600	18°

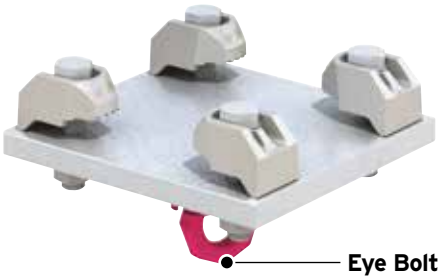
1) The Type ALP safe working load is limited to the capacity stamped on the load ring.
* Metric bolts, nearest imperial / UNC equivalent shown in brackets.

Type LP

Utilizing Lindapter's high strength Type AF clamps for heavy loads, the Type LP is available in custom configurations up to 45,000lbs SWL.

LP4 (up to 10,000lbs SWL*)

Lifting Point with 4 Type AF clamps



Eye Bolt

LP6 (up to 22,500lbs SWL*)

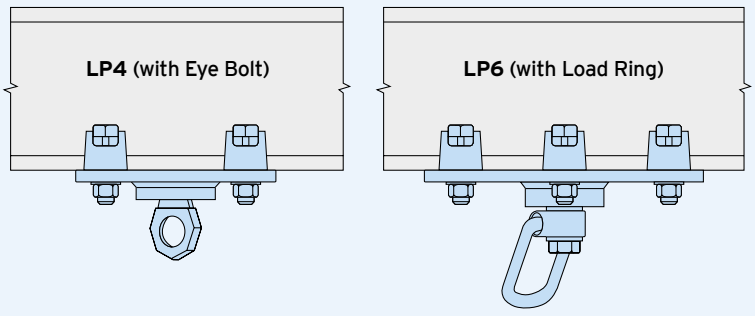
Lifting Point with 6 Type AF clamps

Load Ring (can be supplied with rings that can rotate under the load)

The Type LP can be supplied with either an Eye Bolt or Load Ring. Please state your requirement when ordering.

Custom configurations up to 45,000lbs are also available

Lindapter manufactures customized Lifting Points to meet individual requirements, two examples are shown on the right. These custom 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 up to 22,500lbs (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.

* The Type LP safe working load is limited to the capacity stamped on the load ring/eye bolt.

"We recommend using Hollo-Bolts due to the ICC-ES approved capacities for use in **all** Seismic Design Categories."

ICC ES ESR - 3330 Seismic Approved

John S. McDonald, Principal at Catena Consulting Engineers
Project: Wilshire Grand Center, LA (see the case study on page 62)

Hollo-Bolt®

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

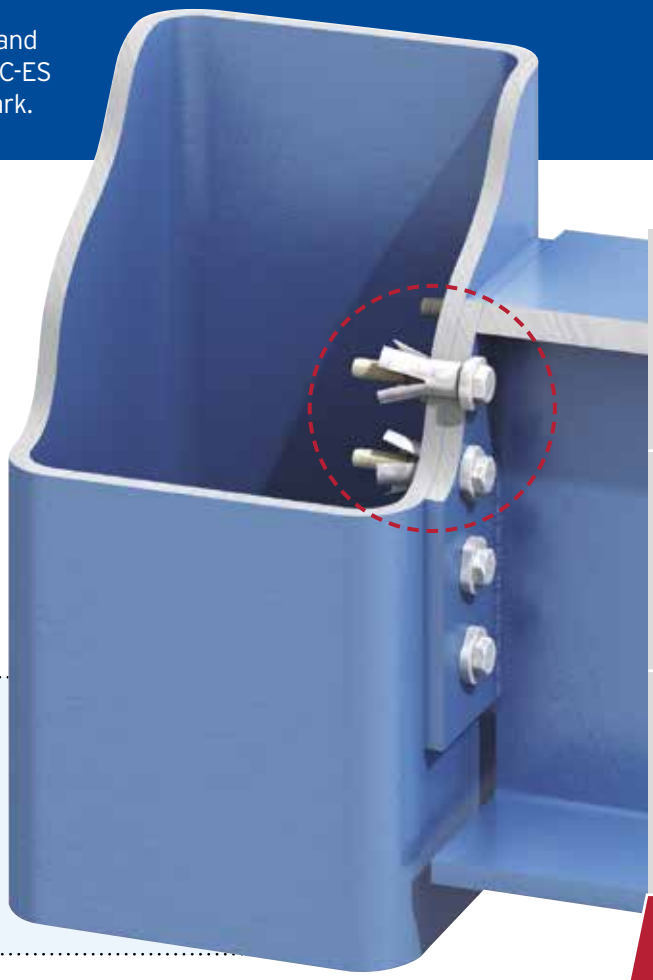
The Hollo-Bolt is independently approved for primary structural connections (see pages 37 - 42). The Lindibolt is ideal for applications in standard clearance holes (page 43).

Hollo-Bolt®
pages 37 - 42

Lindibolt®
page 43

Hollo-Bolt® by Lindapter®

Installation is quickly carried out by inserting into pre-drilled steel and tightening with a torque wrench. Independent approvals include ICC-ES seismic accreditation, the Los Angeles Research Report and CE Mark.



Hollo-Bolt HCF (High Clamping Force)

Standard Hollo-Bolt

* See page 40 for details.

Hollo-Bolt is the original and strongest HSS expansion bolt. It is ICC-ES and LARR approved for all Seismic Design categories (SDC) A through F, in compliance with the International Building Code.

- Fast, cost saving installation from one side.
- For square, rectangular and circular hollow sections.
- High resistance to tensile and shear loads.
- High Clamping Force design (sizes 5/8" and 3/4").

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	5/16"	✔	✔	✔
	3/8"	✔	✔	✔
	1/2"	✔	✔	✔
	5/8" High Clamping Force	✔	✔	-
	3/4" High Clamping Force	✔	-	-
Corrosion Protection	Zinc Plated plus JS500	✔	✔	✔
	Hot Dip Galvanized	✔	-	-
	Sheraplex	✔	✔	✔
	Stainless Steel	✔	✔	✔

Sizes 5/8" and 3/4", 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. The significance of clamping force to achieve a high strength connection is demonstrated on **pages 38 and 39**.

Hollo-Bolt Clamping Force

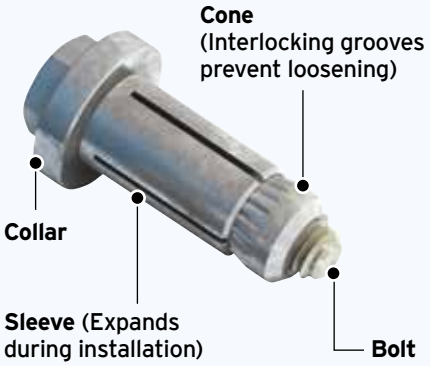
Lindapter Hollo-Bolts are available in two versions; the original standard design for general hollow section connections and the larger sized High Clamping Force (HCF) for higher strength structural connections.

Sizes 5/16", 3/8" and 1/2"

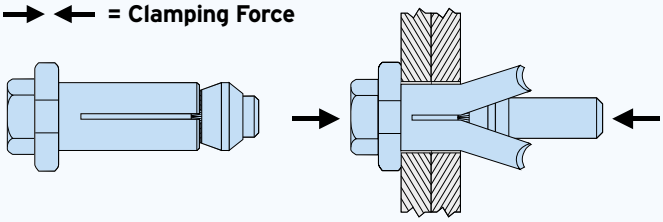
Standard Hollo-Bolt

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.

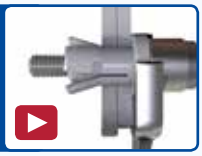
At full tightening torque, a clamping force is established between the fixture and the steel section to form a secure connection. Once installed, only the head and the collar are visible.



→ ← = Clamping Force



See how to install Hollo-Bolt on **page 42** or watch the video on Lindapter's website.

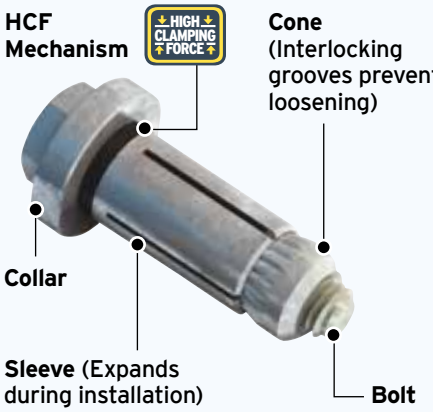


Sizes 5/8" and 3/4"

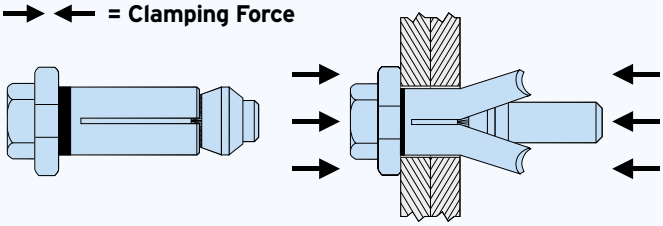
Hollo-Bolt HCF

By working closely with Structural Engineers and Steel Fabricators, Lindapter identified the need for the larger 5/8" and 3/4" 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, optimized for superior performance.

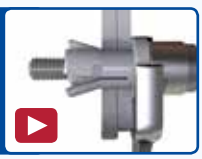
The HCF mechanism consists of a special rubber washer that compresses during installation to significantly increase the clamping force between the connecting steel, thereby reducing displacement to achieve a higher strength connection. See page 39 for more information.



→ ← = Clamping Force



See how to install Hollo-Bolt on **page 42** or watch the video on Lindapter's website.

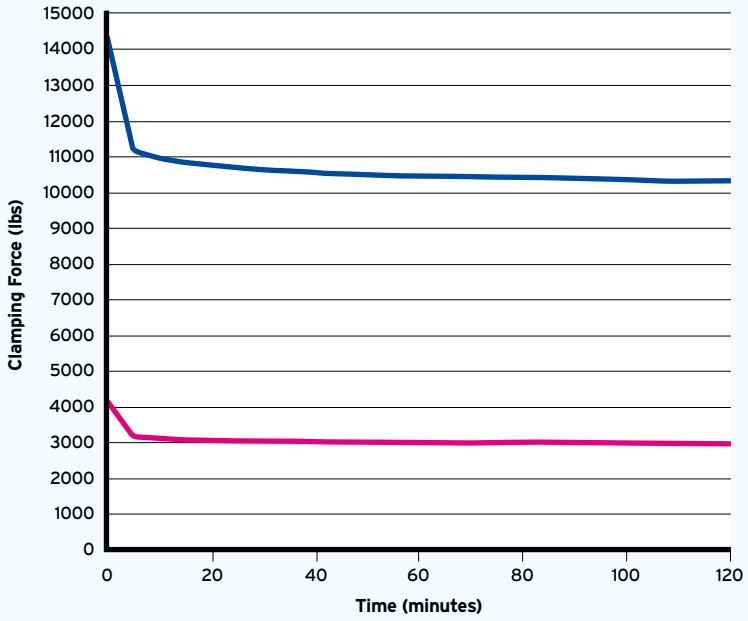


Hollo-Bolt Clamping Force

The Hollo-Bolt HCF is optimized for high strength structural connections and features a High Clamping Force (HCF) mechanism. The graphs below compare the performance of a Hollo-Bolt HCF and an expansion bolt of the same size without the mechanism.

Clamping Force for Hollo-Bolt HCF (size 3/4")

Graph for illustration purposes only, see pages 40 and 41 for connection design.



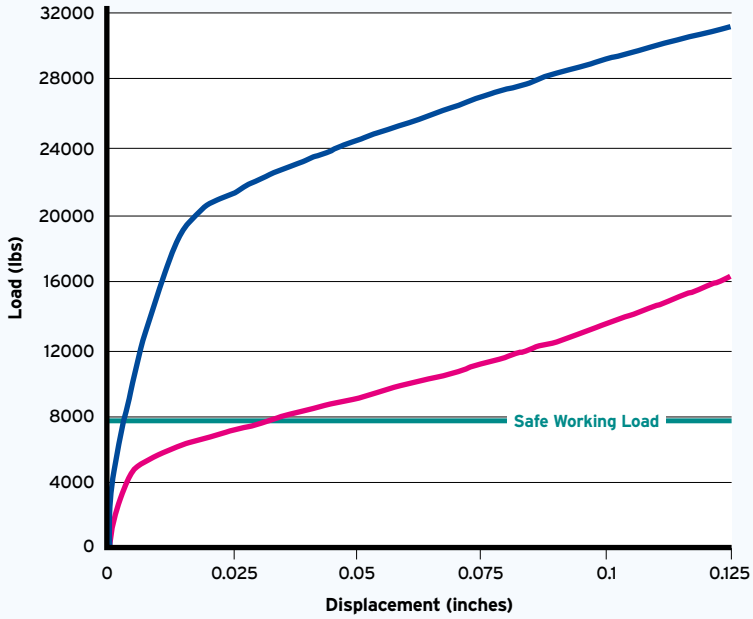
Hollo-Bolt HCF (With Mechanism)
Hot Dip Galvanized, Size 2

(Without Mechanism)
Hot Dip Galvanized, Size 2

Typical Performance Increase
As with any structural bolt, immediately after installation the bolt relaxes until a typical clamping force is reached. Typical clamping force of the size 3/4" Hollo-Bolt HCF is over **three and a half 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 3/4")

Graph for illustration purposes only, see pages 40 and 41 for connection design.



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

(Without Mechanism)
Hot Dip Galvanized, 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 3/4" sized products without Lindapter's unique mechanism. At Safe Working Load, displacement (movement in the connection) is minimized when using the Hollo-Bolt HCF for a safer and more secure connection.

Hollo-Bolt Allowable Loading

Hollo-Bolt is the original and strongest HSS expansion bolt. It is ICC-ES and LARR approved for all Seismic Design categories (SDC) A through F, in compliance with the International Building Code.

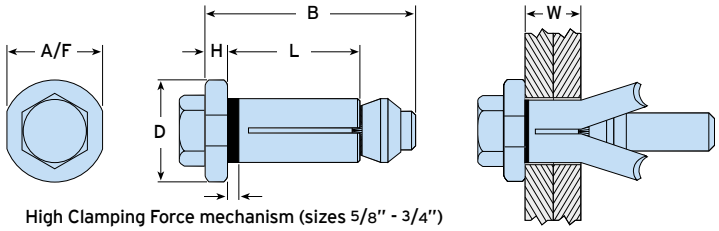
LRFD and ASD Methods

The Hollo-Bolt LRFD and ASD Design Strengths (taken from ESR 3330) are to be used only when designing a bolted connection to AISC 360, AISC 341 and AISI S-100 as referenced in Section 2205 of the IBC.

ICC ES ESR-3330 Seismic Approved

LA DBS Research Report: RR 26037 (based on ESR-3330)

(Hexagonal head, HDG finish only)



High Clamping Force mechanism (sizes 5/8" - 3/4")

Download the full Evaluation Report ESR-3330 from **www.LindapterUSA.com**

	Product Code	Bolt B	Max. Clamping Range W	Sleeve Length L	Collar Height H	Collar Ø D	Collar A/F	Tightening Torque ft lb	Allowable Loading: Static and Seismic Design Categories A, B, C — LRFD Method Tensile lbs	LRFD Method Shear lbs	ASD Method Tensile lbs	ASD Method Shear lbs	Seismic Design Categories D, E, F — LRFD Method Tensile lbs	LRFD Method Shear lbs	ASD Method Tensile lbs	ASD Method Shear lbs
	LHBM08#1	5/16" x 2"	1/4" - 7/8"	1 3/16"	3/16"	7/8"	3/4"	17	3775	3215	2340	2000	3305	2675	2045	1665
	LHBM08#2	5/16" x 2 3/4"	7/8" - 1 5/8"	1 15/16"	3/16"	7/8"	3/4"	17	3775	3215	2340	2000	3305	2675	2045	1665
	LHBM08#3	5/16" x 3 9/16"	1 5/8" - 2 3/8"	2 11/16"	3/16"	7/8"	3/4"	17	3775	3215	2340	2000	3305	2675	2045	1665
	LHBM10#1	3/8" x 2 3/16"	5/16" - 7/8"	1 3/16"	1/4"	1 1/8"	15/16"	33	6160	5485	3820	3415	5485	4565	3395	2830
	LHBM10#2	3/8" x 2 3/4"	7/8" - 1 5/8"	1 7/8"	1/4"	1 1/8"	15/16"	33	6160	5485	3820	3415	5485	4565	3395	2830
	LHBM10#3	3/8" x 3 9/16"	1 5/8" - 2 3/8"	2 5/8"	1/4"	1 1/8"	15/16"	33	6160	5485	3820	3415	5485	4565	3395	2830
	LHBM12#1	1/2" x 2 3/8"	5/16" - 1"	1 3/8"	1/4"	1 1/4"	1 3/16"	59	8545	7485	5305	4675	7465	6250	4630	3890
	LHBM12#2	1/2" x 3 5/32"	1" - 1 13/16"	2 1/4"	1/4"	1 1/4"	1 3/16"	59	8545	7485	5305	4675	7465	6250	4630	3890
	LHBM12#3	1/2" x 4"	1 13/16" - 2 3/4"	3 1/8"	1/4"	1 1/4"	1 3/16"	59	8545	7485	5305	4675	7465	6250	4630	3890
Hollo-Bolt HCF	LHBM16#1	5/8" x 3"	1/2" - 1 1/8"	1 5/8"	5/16"	1 1/2"	1 7/16"	140	13915	11645	8635	7285	13330	9780	8270	6090
Hollo-Bolt HCF	LHBM16#2	5/8" x 4"	1 1/8" - 2"	2 1/2"	5/16"	1 1/2"	1 7/16"	140	13915	11645	8635	7285	13330	9780	8270	6090
Hollo-Bolt HCF	LHBM16#3	5/8" x 4 3/4"	2" - 2 13/16"	3 5/16"	5/16"	1 1/2"	1 7/16"	140	13915	11645	8635	7285	13330	9780	8270	6090
	LHBM20#1	3/4" x 3 9/16"	1/2" - 1 5/16"	1 15/16"	3/8"	2"	1 13/16"	221	19985	18390	12410	11490	19355	15330	12005	9555
	LHBM20#2	3/4" x 4 3/4"	1 5/16" - 2 3/8"	3"	3/8"	2"	1 13/16"	221	19985	18390	12410	11490	19355	15330	12005	9555
	LHBM20#3	3/4" x 5 7/8"	2 3/8" - 3 3/8"	4"	3/8"	2"	1 13/16"	221	19985	18390	12410	11490	19355	15330	12005	9555

Hollo-Bolts can be used on a variety of steel hollow sections and shapes. 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.

ICC-ES approved use

ICC-ES is North America's leading evaluation service for innovative building products, providing evidence that products meet the requirements of building codes and technical standards. Evaluation report ESR-3330 states:

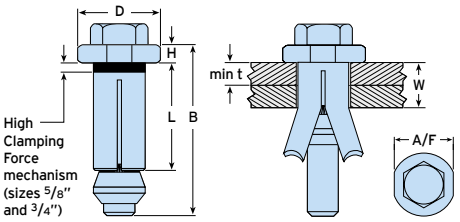
"Hollo-Bolt fasteners are designed for connecting structural steel to hollow structural section (HSS) steel members and other structural steel elements where access is difficult or restricted to one side only."

"Hollo-Bolt fasteners may be used to resist wind loads, and seismic loads in Seismic Design categories A through F."

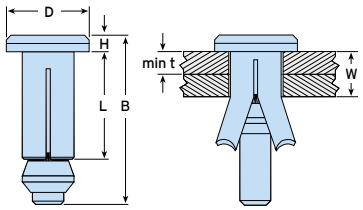
Hollo-Bolt Safe Working Loads

For connections to secondary steel, please refer to the safe working loads in the tables below:

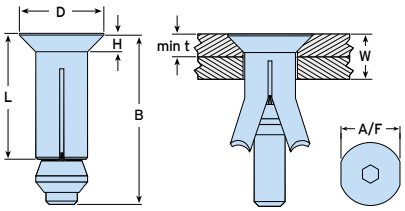
a) Hexagonal



b) Countersunk



c) Flush Fit



	a) Hexagonal		b) Countersunk				Sleeve	Collar				Safe Working Loads (FOS 5:1)	
	Product Code	Bolt B	Product Code	Bolt B	Clamping Thickness W	Outer Ply min t	Length L	Height H	Ø D	A/F	Tightening Torque ft lb	Tensile lbs	Single Shear lbs
	LHBM08#1	5/16" x 2"	LHBCSKM08#1	5/16" x 2"	1/8" - 7/8"	-	1 3/16"	3/16"	7/8"	3/4"	17	899	1124
	LHBM08#2	5/16" x 2 3/4"	LHBCSKM08#2	5/16" x 2 3/4"	7/8" - 1 5/8"	-	1 15/16"	3/16"	7/8"	3/4"	17	899	1124
	LHBM08#3	5/16" x 3 9/16"	LHBCSKM08#3	5/16" x 3 9/16"	1 5/8" - 2 3/8"	-	2 11/16"	3/16"	7/8"	3/4"	17	899	1124
	LHBM10#1	3/8" x 2 3/16"	LHBCSKM10#1	3/8" x 2"	1/8" - 7/8"	-	1 3/16"	1/4"	1 1/8"	15/16"	33	1910	2248
	LHBM10#2	3/8" x 2 3/4"	LHBCSKM10#2	3/8" x 2 3/4"	7/8" - 1 5/8"	-	1 7/8"	1/4"	1 1/8"	15/16"	33	1910	2248
	LHBM10#3	3/8" x 3 9/16"	LHBCSKM10#3	3/8" x 3 9/16"	1 5/8" - 2 3/8"	-	2 5/8"	1/4"	1 1/8"	15/16"	33	1910	2248
	LHBM12#1	1/2" x 2 3/8"	LHBCSKM12#1	1/2" x 2 3/16"	1/8" - 1"	-	1 3/8"	1/4"	1 1/4"	1 3/16"	59	2360	3372
	LHBM12#2	1/2" x 3 5/32"	LHBCSKM12#2	1/2" x 3 1/8"	1" - 1 13/16"	-	2 1/4"	1/4"	1 1/4"	1 3/16"	59	2360	3372
	LHBM12#3	1/2" x 4"	LHBCSKM12#3	1/2" x 4"	1 13/16" - 2 3/4"	-	3 1/8"	1/4"	1 1/4"	1 3/16"	59	2360	3372
Hollo-Bolt HCF	LHBM16#1	5/8" x 3"	LHBCSKM16#1	5/8" x 2 3/4"	1/2" - 1 1/8"	5/16"	1 5/8"	5/16"	1 1/2"	1 7/16"	140	4720	6744
Hollo-Bolt HCF	LHBM16#2	5/8" x 4"	LHBCSKM16#2	5/8" x 4"	1 1/8" - 2"	5/16"	2 1/2"	5/16"	1 1/2"	1 7/16"	140	4720	6744
Hollo-Bolt HCF	LHBM16#3	5/8" x 4 3/4"	LHBCSKM16#3	5/8" x 4 3/4"	2" - 2 13/16"	5/16"	3 5/16"	5/16"	1 1/2"	1 7/16"	140	4720	6744
Hollo-Bolt HCF	LHBM20#1	3/4" x 3 9/16"	-	-	1/2" - 1 5/16"	5/16"	1 15/16"	3/8"	2"	1 13/16"	221	7868	8992
Hollo-Bolt HCF	LHBM20#2	3/4" x 4 3/4"	-	-	1 5/16" - 2 3/8"	5/16"	3"	3/8"	2"	1 13/16"	221	7868	8992
Hollo-Bolt HCF	LHBM20#3	3/4" x 5 7/8"	-	-	2 3/8" - 3 3/8"	5/16"	4"	3/8"	2"	1 13/16"	221	7868	8992

HIGH CLAMPING FORCE

Sizes 5/8" and 3/4", 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. The significance of clamping force to achieve a high strength connection is demonstrated on **pages 38 and 39**.

c) Flush Fit				Sleeve	Collar				Safe Working Loads (FOS 5:1)	
Product Code	Countersunk Bolt B	Clamping Thickness W	Outer Ply min t	Length L	Height H	Ø D	Installation Nut A/F	Tightening Torque ft lb	Tensile lbs	Single Shear lbs
LHBFF08#1	5/16" x 2"	3/8" - 1 1/16"	5/16"	1 3/8"	3/16"	15/16"	3/4"	17	899	1124
LHBFF08#2	5/16" x 2 3/4"	1 1/16" - 1 3/4"	5/16"	2 1/8"	3/16"	15/16"	3/4"	17	899	1124
LHBFF08#3	5/16" x 3 9/16"	1 3/4" - 2 1/2"	5/16"	2 7/8"	3/16"	15/16"	3/4"	17	899	1124
LHBFF10#1	3/8" x 2"	1/2" - 1 1/16"	3/8"	1 7/16"	1/4"	1 3/16"	15/16"	33	1910	2248
LHBFF10#2	3/8" x 2 3/4"	1 1/16" - 1 3/4"	3/8"	2 1/8"	1/4"	1 3/16"	15/16"	33	1910	2248
LHBFF10#3	3/8" x 3 9/16"	1 3/4" - 2 1/2"	3/8"	2 7/8"	1/4"	1 3/16"	15/16"	33	1910	2248
LHBFF12#1	1/2" x 2 3/16"	1/2" - 1 3/16"	3/8"	1 5/8"	1/4"	1 5/16"	1 3/16"	59	2360	3372
LHBFF12#2	1/2" x 3 1/8"	1 3/16" - 2 1/32"	3/8"	2 1/2"	1/4"	1 5/16"	1 3/16"	59	2360	3372
LHBFF12#3	1/2" x 4"	2 1/32" - 2 7/8"	3/8"	3 3/8"	1/4"	1 5/16"	1 3/16"	59	2360	3372

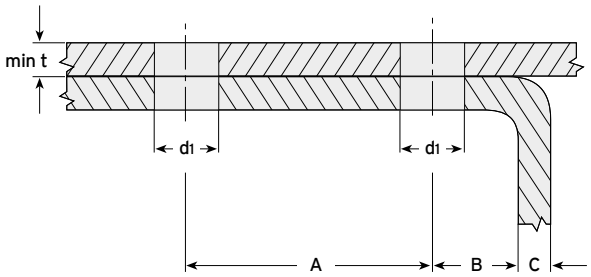
Hollo-Bolts can be used on a variety of steel hollow sections and shapes. Safe working loads shown are based on use in A36 structural tube and are applicable to the Hollo-Bolt only in both tension and shear. Failure of the section, particularly on those with thin walls and a wide chord face, could occur at a lower figure and its strength should be checked by a qualified Structural Engineer.

Hollo-Bolt Preparation and Installation

To comply with ICC-ES ESR-3330 Section 4.2 ensure that the holes are drilled into both the fixture and the section according to the drilling guidelines below. Please note that the holes are slightly larger than standard bolt drill diameters to accommodate the sleeve and cone.

Hexagonal and Countersunk

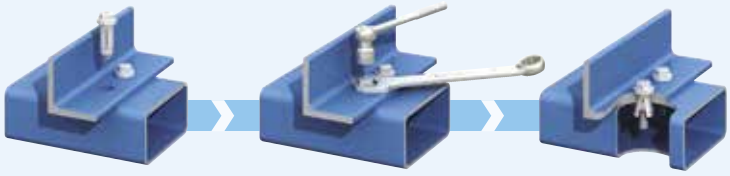
Type		Outer Ply	Drill Diameter Ø	Hole Distances		Edge Distances
Hexagonal	Countersunk	min t	d1	min A	min B	B + C
LHBM08	LHBCSKM08	-	9/16"	1 3/8"	1/2"	>11/16"
LHBM10	LHBCSKM10	-	3/4"	1 9/16"	9/16"	>7/8"
LHBM12	LHBCSKM12	-	13/16"	2"	11/16"	>1"
LHBM16	LHBCSKM16	5/16"	1 1/16"	2 3/16"	13/16"	>1 5/16"
LHBM20	-	5/16"	1 5/16"	2 3/4"	1"	>1 5/16"



Sizes 5/8" and 3/4" require outer ply thickness (min t) to be at least 5/16".

How to install...

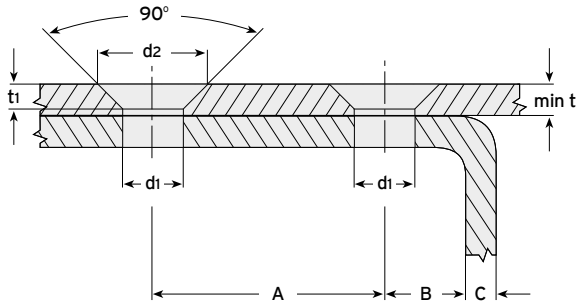
1) Align pre-drilled fixture and section then insert the Hollo-Bolt[a].
2) Grip Hollo-Bolt collar with an open ended wrench.
3) Using a calibrated torque wrench, tighten the central bolt to the recommended torque[b].



Watch the Hollo-Bolt installation video at www.LindapterUSA.com

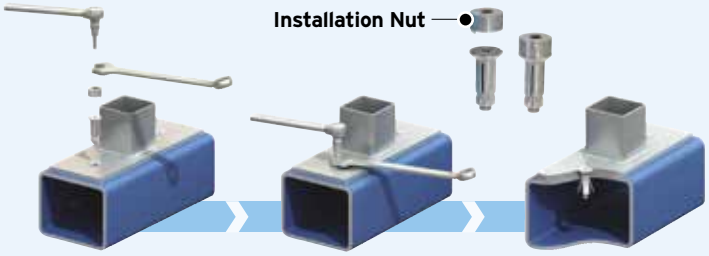
Flush Fit

Type	Outer Ply	Drill Diameter Ø	Countersunk		Hole Distances		Edge Distances
	min t	d1	d2	t1	min A	min B	B + C
LHBM08FF	5/16"	9/16"	1 1/16"	1/4"	1 3/8"	1/2"	>11/16"
LHBM10FF	3/8"	3/4"	1 1/4"	1/4"	1 9/16"	9/16"	>7/8"
LHBM12FF	3/8"	13/16"	1 3/8"	5/16"	2"	11/16"	>1"



How to install...

1) Align pre-drilled fixture and section then insert the Hollo-Bolt[a].
2) Apply the installation nut and grip with an open ended wrench.
3) Using a calibrated torque wrench, tighten the central countersunk bolt to the recommended torque[b].



Notes:

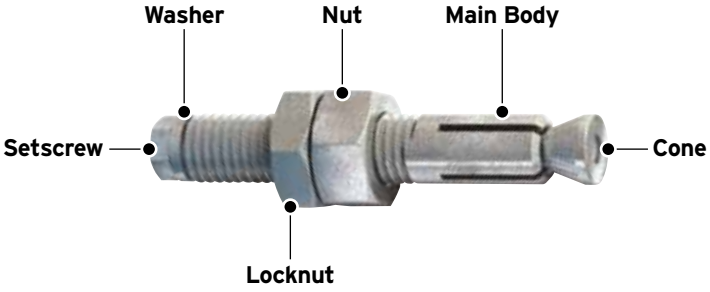
a) Before tightening, ensure that the materials that are to be connected together are touching. See **page 41** for tightening torque.

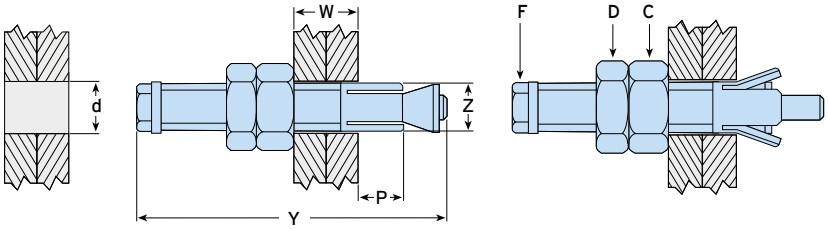
b) Power tools, such as an impact wrench, may be used to speed up the tightening of the Hollo-Bolt. However, when using power tools always complete the tightening process with a calibrated torque wrench to ensure the correct torque is applied to the Hollo-Bolt.

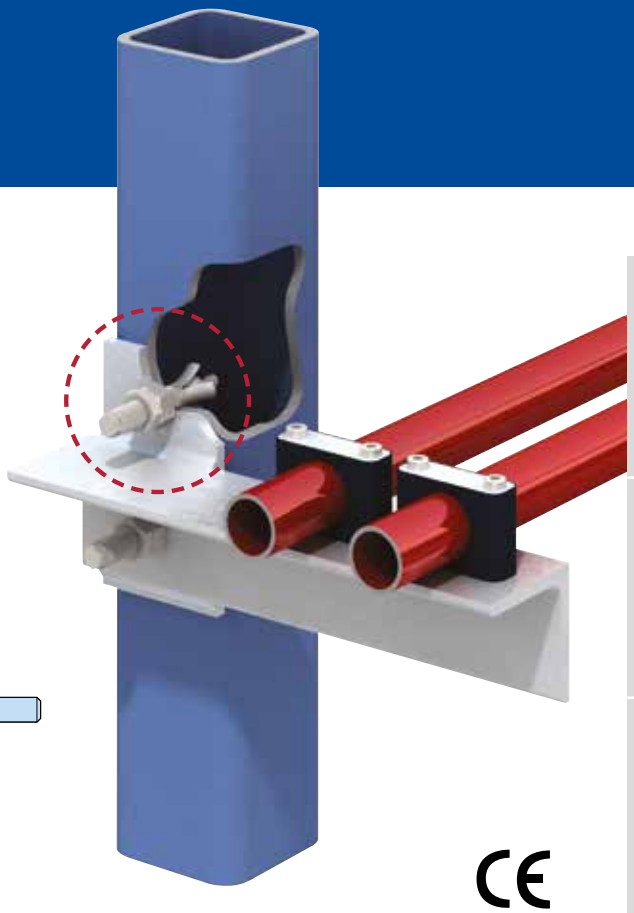
For further installation and equipment information please visit www.LindapterUSA.com or contact Lindapter.

Type LB2 - Lindibolt® 2

A self-heading bolt suitable for connecting steel to hollow sections where access is only available from one side. The Lindibolt uses a standard metric drill diameter.







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

Code	Lindibolt Bolt* Z	Lindibolt Length Y	Drill Diameter Ø d	Safe Working Loads (FOS 5:1) Tensile lbs	Safe Working Loads (FOS 5:1) Single Shear lbs	Clamping Length W	Projection P	Nut (C) and Locknut (D) Torque ft lb	Nut (C) and Locknut (D) Nut A/F	Setscrew (F) Torque ft lb	Setscrew (F) Nut A/F
LLB037	M10 (3/8")	2 15/16"	7/16"	674	764	1/4" - 1 3/16"	5/16" - 3/8"	15	11/16"	4	3/8"
LLB050	M12 (1/2")	3 3/8"	9/16"	1124	1124	3/8" - 1 7/16"	3/8" - 1/2"	23	3/4"	8	7/16"
LLB062	M16 (5/8")	4 1/8"	11/16"	1798	2203	1/2" - 1 7/8"	1/2" - 5/8"	60	1"	17	9/16"
LLB075	M20 (3/4")	5 1/16"	13/16"	3147	3417	9/16" - 2 3/8"	9/16" - 13/16"	95	1 3/16"	33	11/16"
LLB100	M24 (1")	6 1/4"	1"	4496	5058	11/16" - 2 13/16"	11/16" - 15/16"	150	1 7/16"	59	3/4"

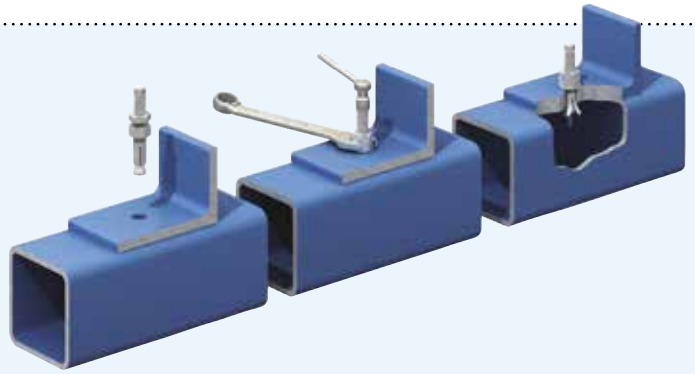
* Metric bolts, nearest equivalent shown in brackets.

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.

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).

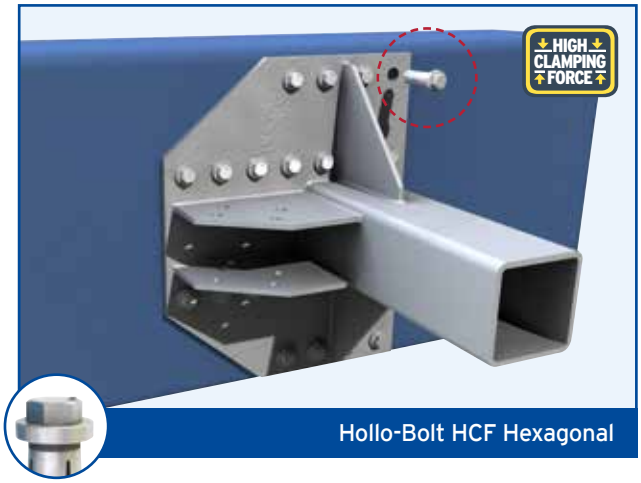
Watch the installation at www.LindapterUSA.com



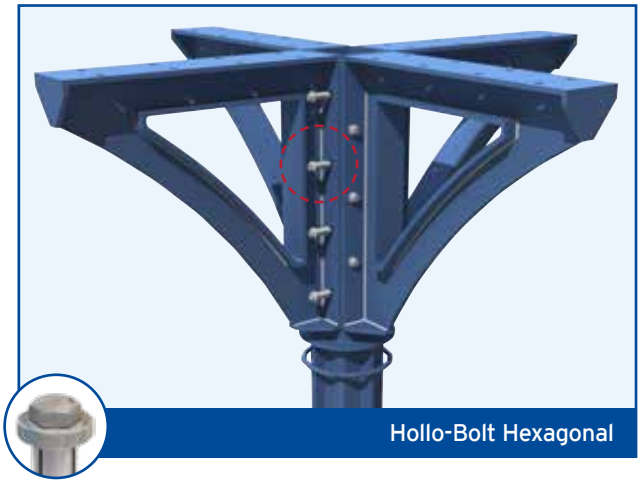
Typical Applications for Hollo-Bolt

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.

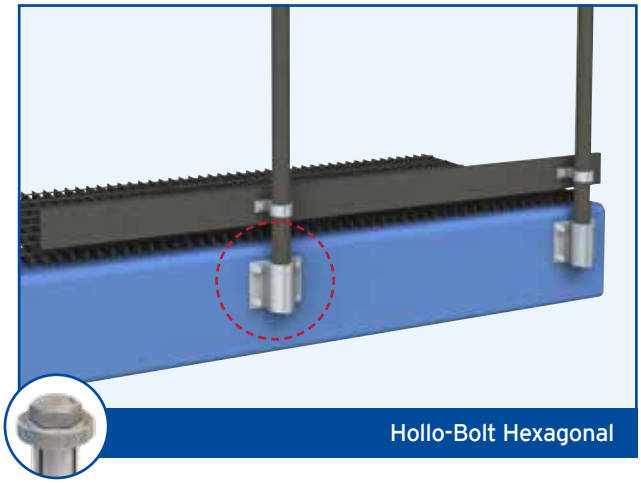
Hollo-Bolt HCF Hexagonal



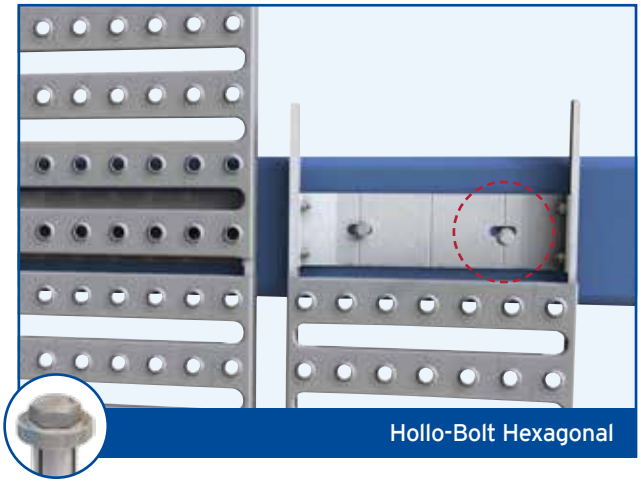
Hollo-Bolt HCF Hexagonal



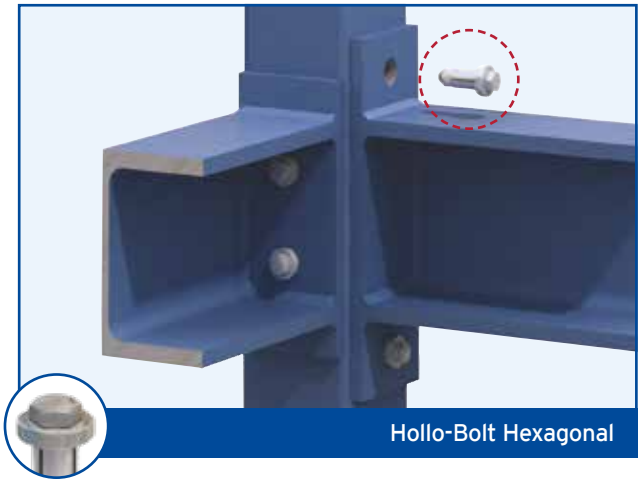
Hollo-Bolt Hexagonal



Hollo-Bolt Hexagonal



Hollo-Bolt Hexagonal



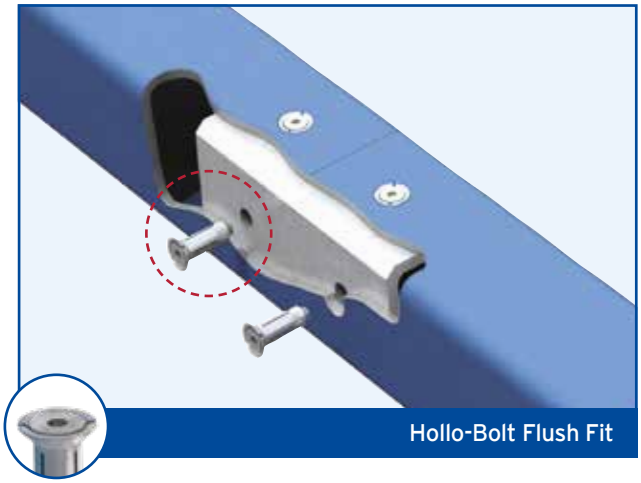
Hollo-Bolt Hexagonal

Typical Applications for Hollo-Bolt

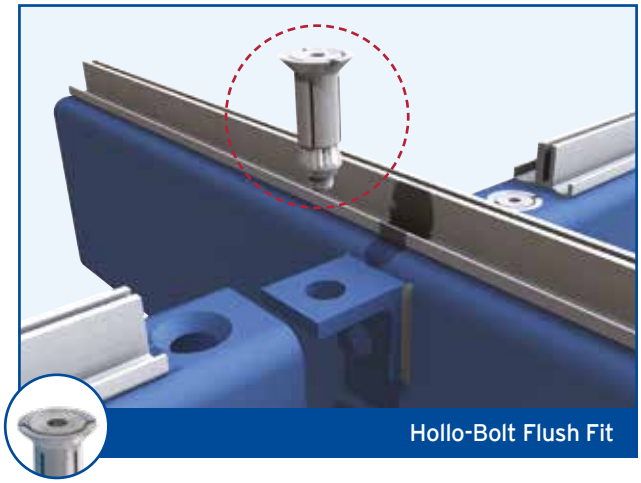
Examples of popular connection arrangements are continued below:

Hollo-Bolt Hex. + Countersunk

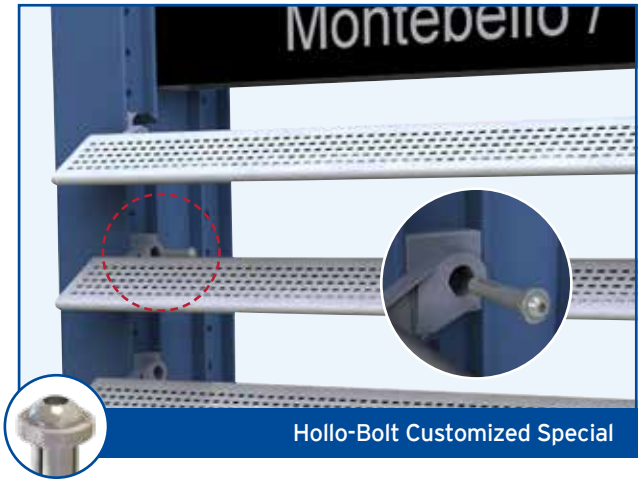
Hollo-Bolt Countersunk



Hollo-Bolt Flush Fit



Hollo-Bolt Flush Fit



Hollo-Bolt Customized Special

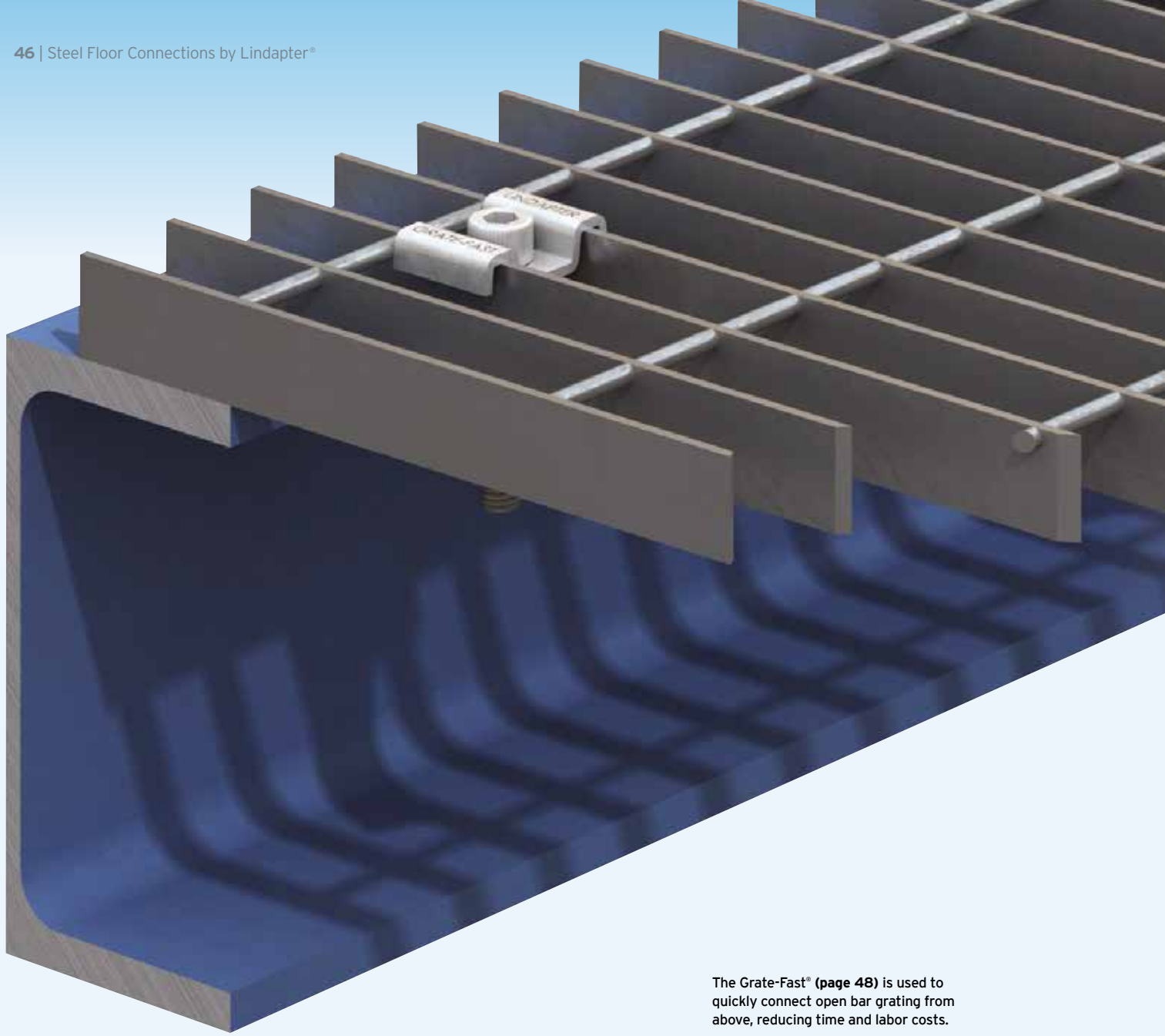
Hollo-Bolt®
by **lindapter**

BROCHURE AVAILABLE NOW!

Request a Hollo-Bolt brochure for more project examples and Frequently Asked Questions.

For hard copies please email:
inquiries@LindapterUSA.com

Or download it from:
www.LindapterUSA.com



The Grate-Fast® **(page 48)** is used to quickly connect open bar grating from above, reducing time and labor costs.

Steel Floor Connections

A range of innovative connections for securing steel flooring to supporting steel without drilling or welding in the field. Access to the underside is not required, eliminating the need for costly scaffolding or elevated floors.

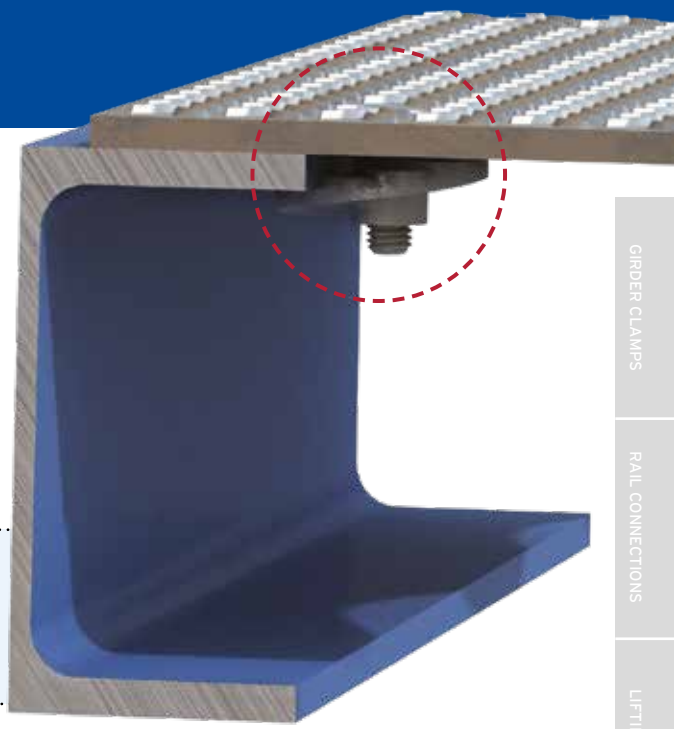
Type FF FloorFast®
page 47

Type GF Grate-Fast®
page 48

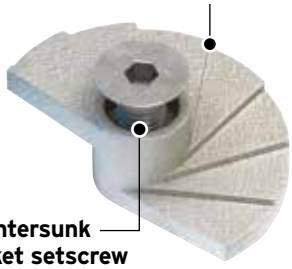
Type 1055
page 49

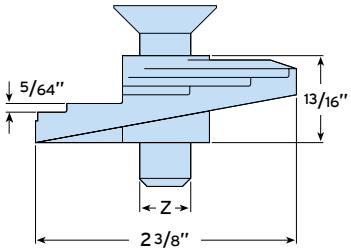
Type FF - FloorFast®

An innovative product for connecting checker plate flooring to the supporting steel. The stepped clamping face locks under the steel to provide a secure connection.

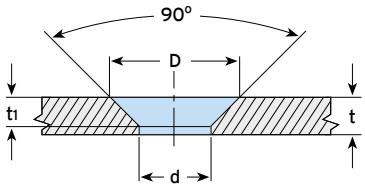


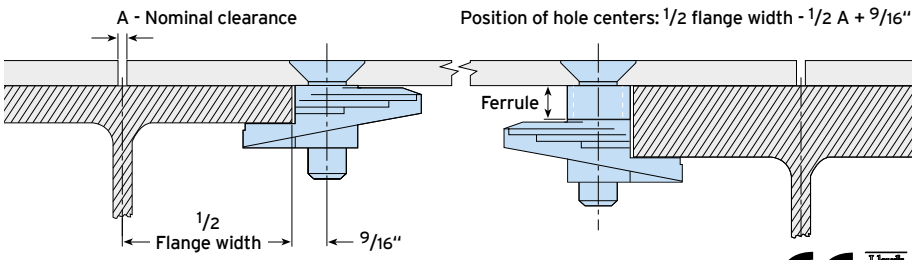
Unique stepped clamping face





- 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.





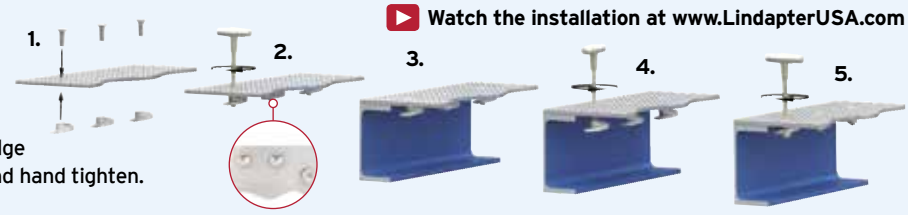
Material: Malleable iron, zinc plated / hot dip galvanized. Also available in stainless steel grade 316.

Product Code	Bolt [1]	Floorplate Thickness	Flange Thickness: Floorfast	Flange Thickness: Floorfast with Ferrule [2]			Dimensions: Hole Ø	Dimensions: Countersunk Ø for Bolt		Dimensions: Countersunk Depth for Bolt		Tight. Torque	Hexagon Key
				10mm (3/8")	20mm (13/16")	30mm (13/16")		BZP	HDG	BZP	HDG		
	Z	t					d	D	D	t1	t1	ft lb	mm
LFF031	M8 (5/16")	3/16" - 1/2"	1/8" - 5/8"	1/2" - 1"	7/8" - 1 3/8"	1 5/16" - 1 13/16"	3/8"	11/16"	-	3/16"	-	8	5 (3/16")
LFF037	M10 (3/8")	3/16" - 1/2"	1/8" - 5/8"	1/2" - 1"	7/8" - 1 3/8"	1 5/16" - 1 13/16"	7/16"	13/16"	3/4"	3/16"	3/16"	16	6 (7/32")
LFF050	M12 (1/2")	1/4" - 1/2"	1/8" - 5/8"	1/2" - 1"	7/8" - 1 3/8"	1 5/16" - 1 13/16"	9/16"	1"	15/16"	1/4"	3/16"	16	8 (5/16")

1) Hot dip galvanized 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 (eg. LLFF050 with 10mm (3/8") ferrule).

How to install...

1) Assemble bolt and FloorFast through the checker plate.
2) Align castings with the straight edge parallel to the edge of the plate and hand tighten.
3) Lay the floorplate into position.
4) Using a hexagon key release countersunk screw one full turn.
5) Tighten down the countersunk socket screw.



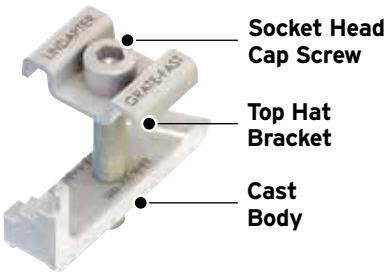
Watch the installation at www.LindapterUSA.com

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

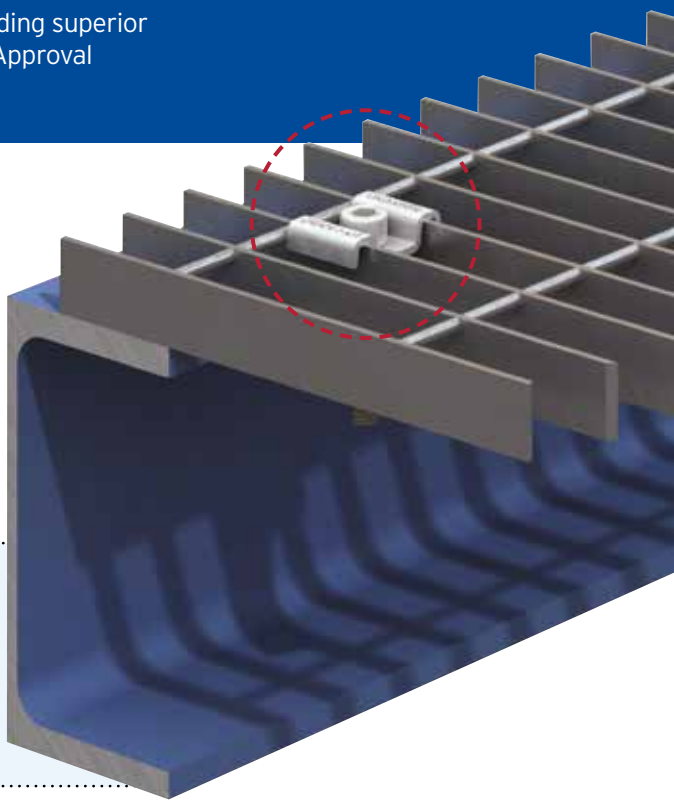
Type GF - Grate-Fast®

A high strength floor connection 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.

LGF037

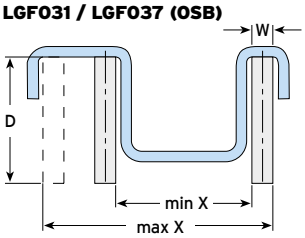


LGF025-11W

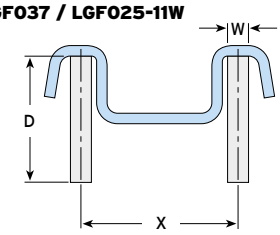


- **LGF025-11W** for 11-W or 11-P series of close mesh bar grating.
- **LGF031** for GRP grating with stainless steel top hat bracket, Sheraplex coated body and socket head screw.
- **LGF037 (OSB)** is hot dip galvanized for increased corrosion resistance.
- **LGF037** is hot dip galvanized for use with 1 3/16" width floor grating bars only.

LGF031 / LGF037 (OSB)

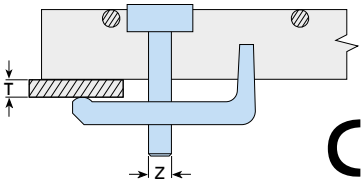


LGF037 / LGF025-11W



Top Hat Material:
Stainless steel (LGF031 only). Mild Steel, hot dip galvanized (LGF025-11W, LGF037 (OSB) and LGF037 only).

Body Material:
Malleable iron, Sheraplex (LGF031 only). Malleable iron, hot dip galvanized (LGF025-11W, LGF037 (OSB) and LGF037 only).



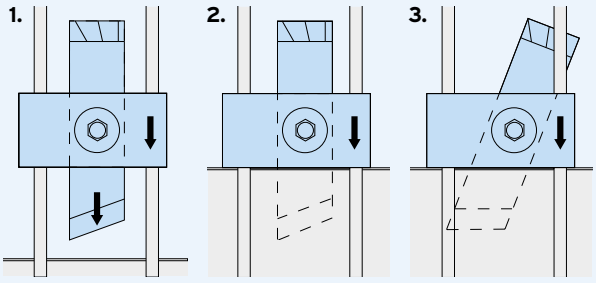
Product Code	Bolt Z	Flange T	Grating Bar Depth D	Grating Bar Width W	Bar Distance X	Tight. Torque ft lb	Hexagon Key / Socket mm
LGF025-11W	M6 (1/4")	1/4" - 3/4"	1" - 2"	1/8" - 3/16"	11/16"	3	5 (3/16")
LGF031[1]	M8 (5/16")	1/8" - 3/4"	7/8" - 11/2"	3/16" - 3/8"	3/4" - 17/8"	4	6 (7/32")
LGF037 (OSB)[2]	M10 (3/8")	1/8" - 3/4"	13/16" - 2"	1/8" - 1/4"	1" - 13/4"	8	10 (3/8")
LGF037[1]	M10 (3/8")	1/8" - 3/4"	3/4" - 19/16"	1/8" - 1/4"	13/16"	8	8 (5/16")

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

How to install...

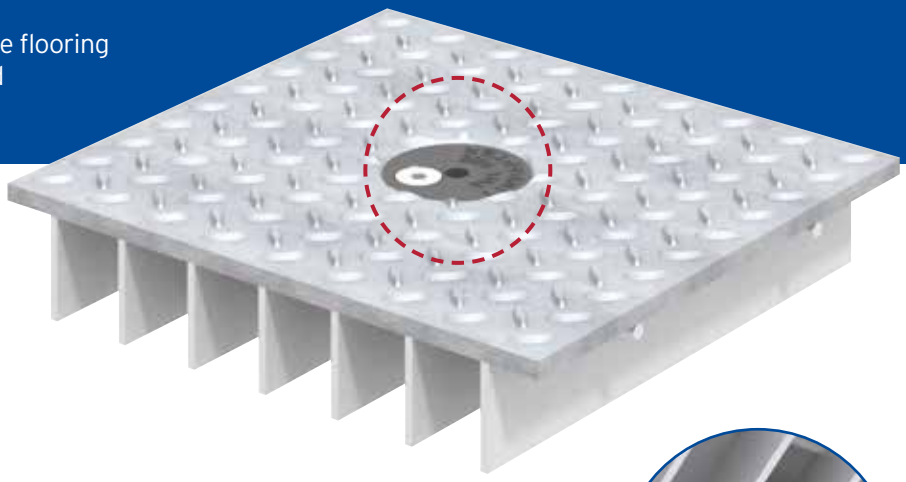
Watch the installation video at www.LindapterUSA.com

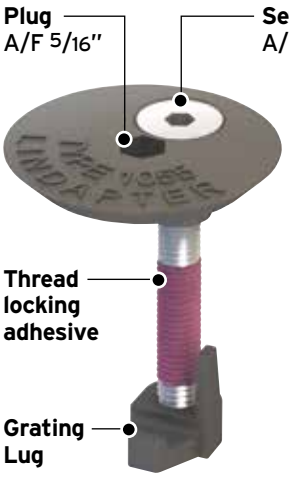
1) Position pre-assembled Grate-Fast with the body between the grating bars and the nose pointing towards the steel. The arrows on the top hat bracket should also be point towards the supporting steel and the bracket itself resting on the bearing bars.
2) Slide the Grate-Fast towards the steel until the nose fits under the beam flange. Where necessary adjust the 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.



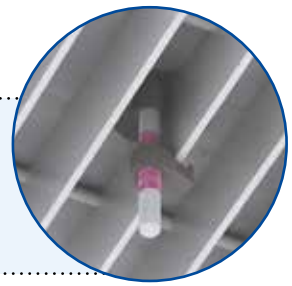
Type 1055

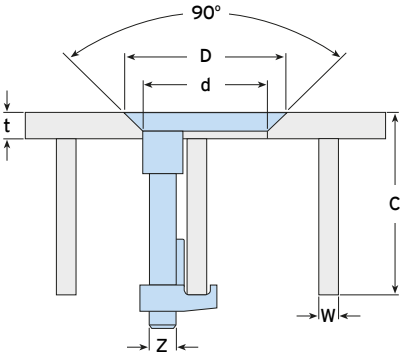
This unique solution enables solid plate flooring to be fitted to open-mesh or open-grid flooring using simple hand tools.





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



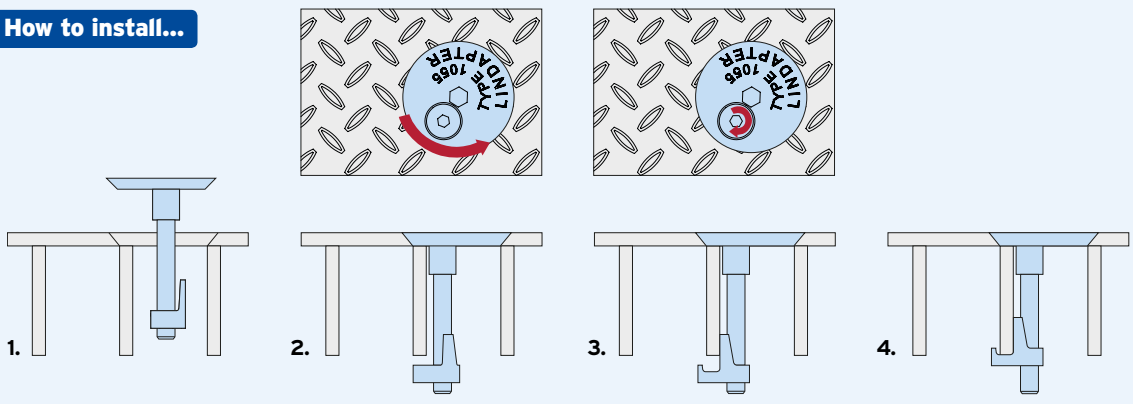


Material: Cast stainless steel, self colour.

CE

Product Code	A4-70 Bolt Z	Floorplate Thickness t	Clamping Range C	Grating Bar Width W	Hole Ø d	Csk Ø D	Setscrew Tight. Torque ft lb	Setscrew Hexagon Key mm
LFG1055	M8 (5/16")	min 1/4"	1 3/8" - 2 3/16"	1/8" - 5/16"	1 5/8"	2"	8	5 (3/16")

How to install...



1) Insert the pre-assembled Type 1055 into the countersunk hole between the grating bars.
2) Use an 5/16" hexagon key to rotate the plug anti-clockwise until the underside of the plug locates against the grating bar.
3) Use a 3/16" hexagon key to rotate the countersunk setscrew clockwise until the grating lug makes contact with the grating bar.
4) Tighten the setscrew to 8ft lb; the grating lug will be drawn up the screw and will activate the thread locking adhesive.

Watch the installation video at www.LindapterUSA.com

The Type F3 has a large clamping range to suit various flange thicknesses (**see page 54**).

Pipe / Conduit Supports

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, precise alignment of building services.


Type FLS page 51


Type F3 page 54


Type FL page 52


Type HW/HC page 55

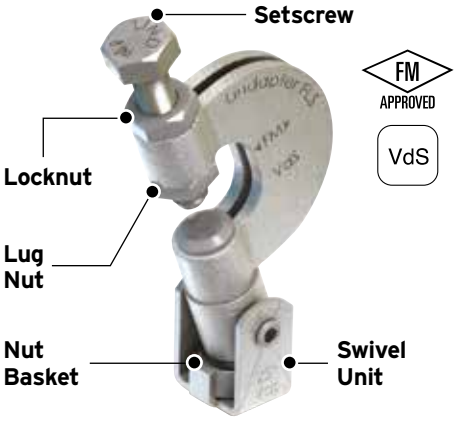

Type LC page 53


Type TC page 56


Type SW page 53

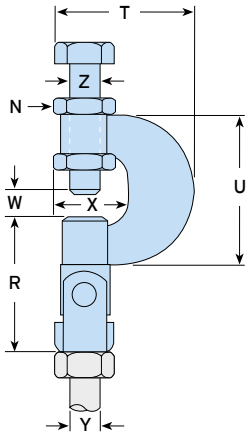
Type FLS

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.



FM APPROVED

VdS

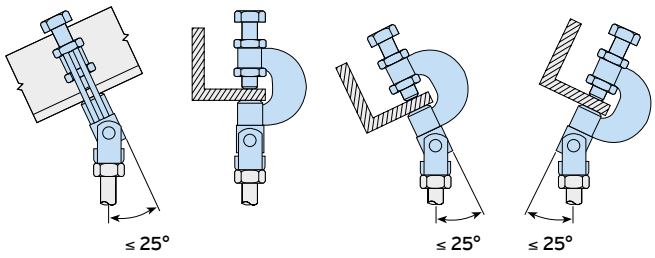


Material: High grade alloy steel, zinc plated.

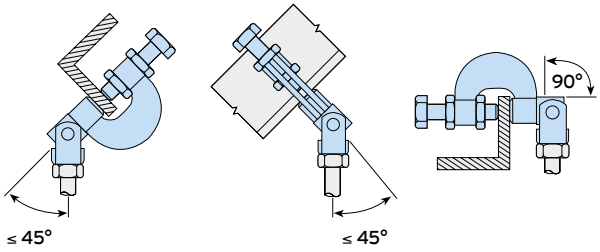
Product Code	Rod Y	Safe Working Load (FOS 4:1) Tensile ≤ 25° lbs	Safe Working Load (FOS 4:1) Tensile 25° to 45° lbs	Clamping Range W	Setscrew* Z	Tightening Torque Setscrew Z ft lb	Tightening Torque Locknut N ft lb	Dimensions R	T	U	X	Width
LFLS037	3/8" UNC	550	330	1/8" - 11/16"	M10 (3/8")	13	13	2 3/16"	2 1/8"	2 1/4"	1 1/16"	1 1/8"

* Metric setscrew supplied.

Independently Approved Applications

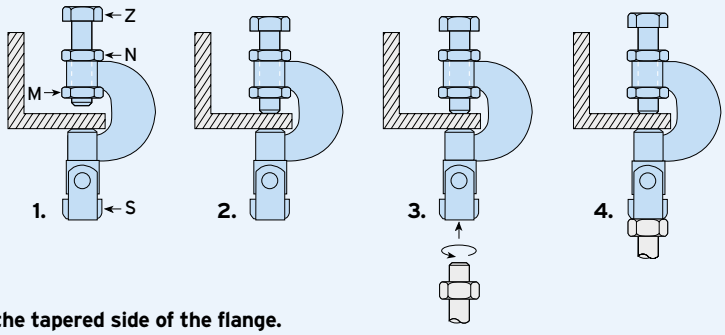


General Applications (Parallel Flanges only)



How to install...

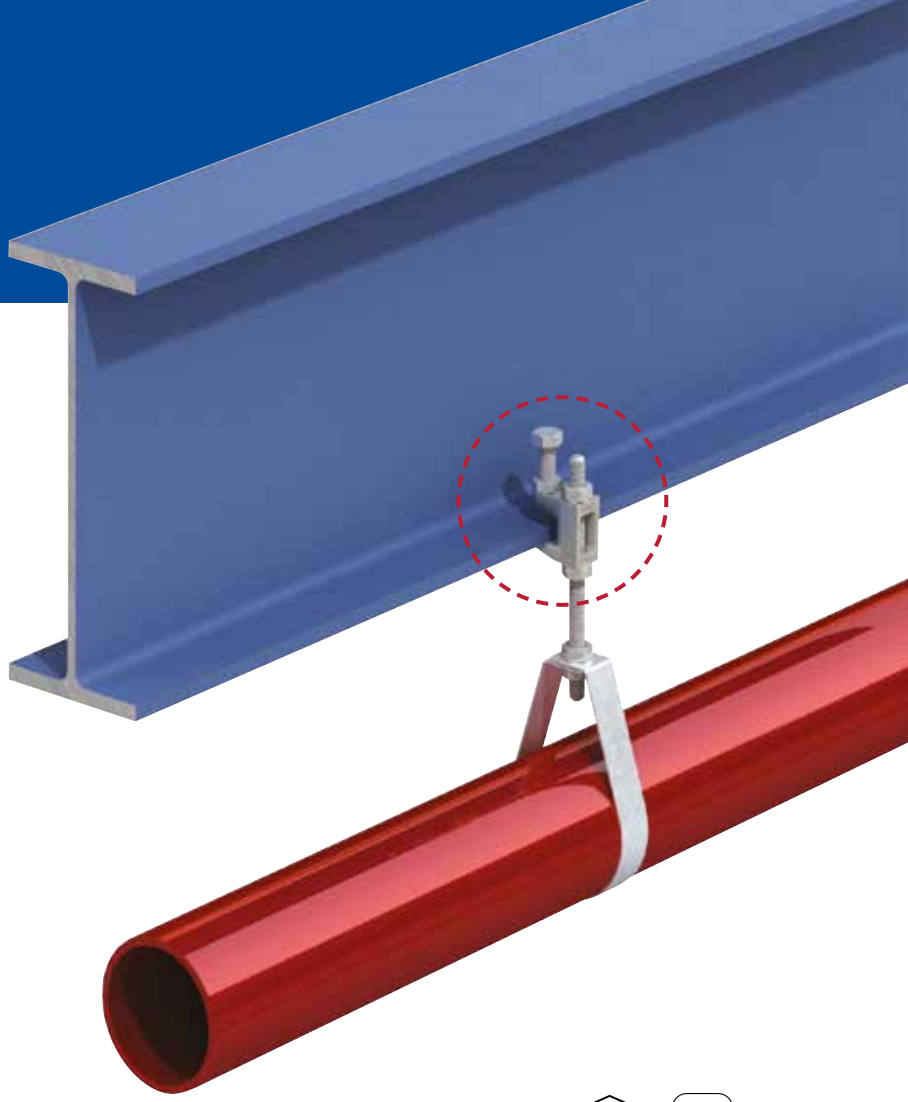
1) Locate the FLS onto the flange.
2) Ensuring the lug nut (M) locates into the main body, tighten down the setscrew (Z) and locknut (N).
3) Install the 3/8" UNC threaded rod by screwing into the nut located in the nut basket (S). Ensure full thread capture.
4) Secure assembly in nut basket (S) from beneath using a nut (not supplied).

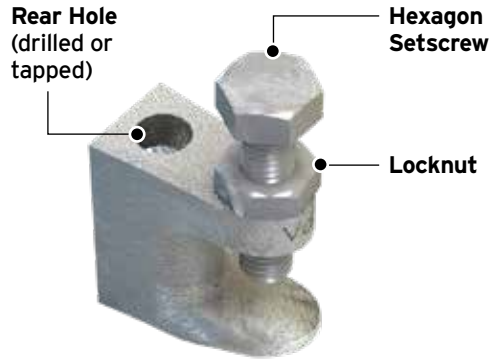


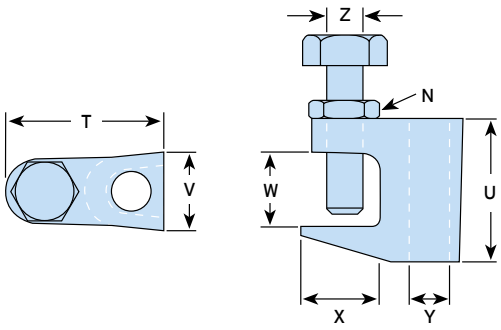
Ensure that the cup point setscrew always grips on the tapered side of the flange.

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		Ø Clear Hole Y	Tapped Thread Y	Safe Working Load (FOS 4:1)	Clamping Range W	Setscrew* Z	Tightening Torque		Dimensions			
Clear	Tapped			Tensile lbs			Setscrew Z ft lb	Locknut N ft lb	T	U	X	Width V
LFL037C	LFL037T	7/16"	3/8" UNC	540	1/8" - 3/4"	M10 (3/8")	6	16	1 3/4"	1 9/16"	7/8"	7/8"
LFL050C	LFL050T	1/2"	1/2" UNC	700	1/8" - 7/8"	M10 (3/8")	6	16	2"	1 13/16"	1 1/8"	1"

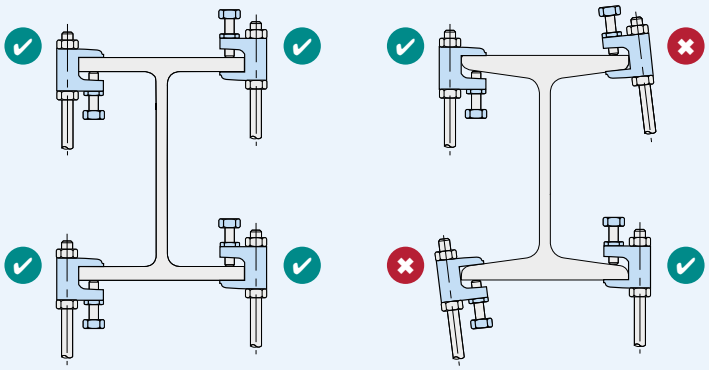
* Metric setscrew supplied.

The Type FL can be used with Type SW (page 53) when connecting to inclined sections.

How to install...

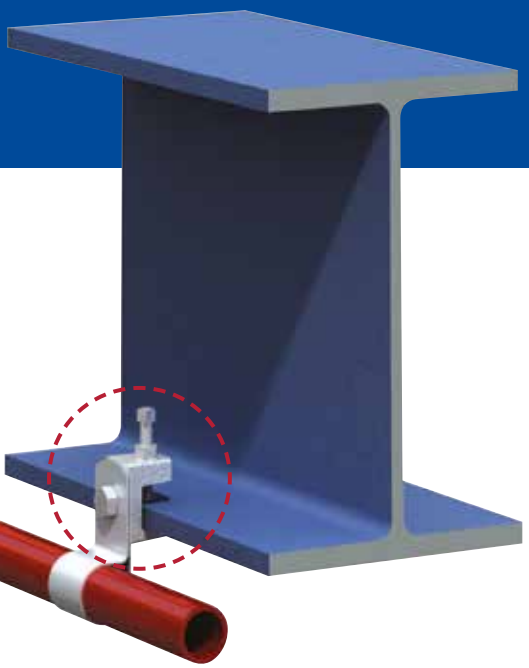
1) Slide the Type FL onto the beam flange and tighten setscrew to the recommended torque. As a guide, tighten the setscrew finger tight and then apply an additional quarter turn (90°) with a 11/16" wrench.
2) Tighten the locknut (N) to the recommended torque.

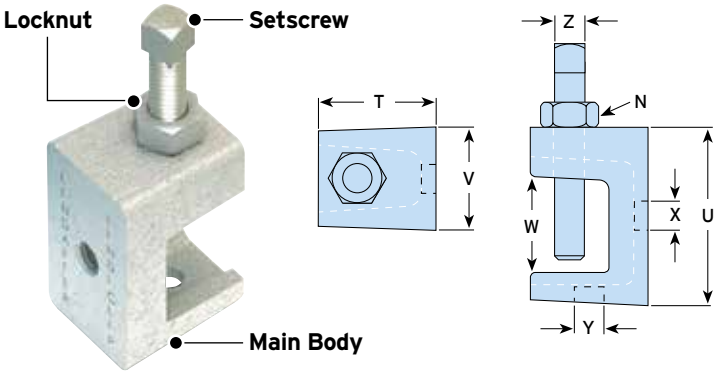
On tapered flanges, the cup point setscrew has to grip on the inside of the flange.



Type LC

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





Material: Malleable iron, zinc plated.

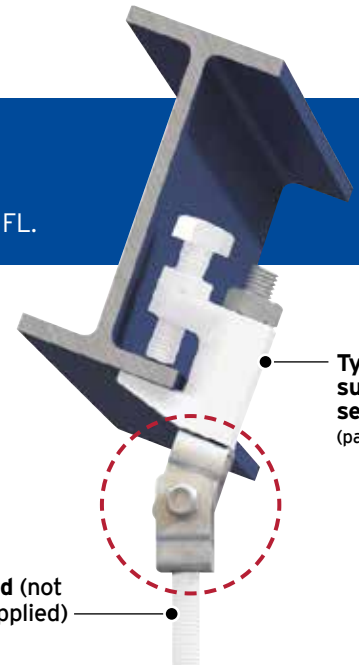
Product Code	Thread		Safe Working Load (FOS 4:1)		Clamping Range W	Setscrew* Z	Tightening Torque		Dimensions		
	X	Y	Tensile in Position X lbs	Tensile in Position Y lbs			Setscrew Z ft lb	Locknut N ft lb	T	U	Width V
LLC025	1/4" UNC	1/4" UNC	40	135	1/8" - 13/16"	M6 (1/4")	3	3	1"	17/16"	7/8"

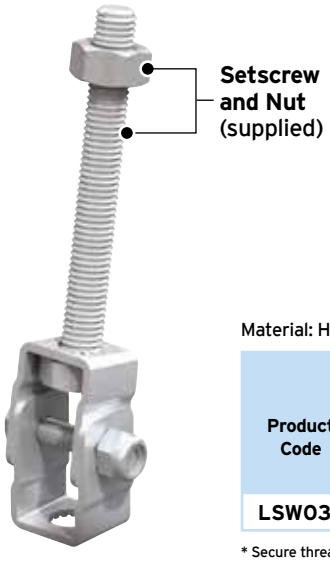
* Metric setscrew supplied.

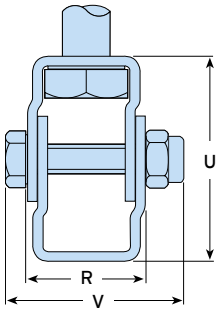
Installation is the same as Type FL (page 52).

Type SW

A swivel unit for applications on inclined beams complete with a M10 (3/8" x 3 9/16") Grd. 5 setscrew and nut. Can be supplied with Type FL.







FM APPROVED (when used with Type FL)

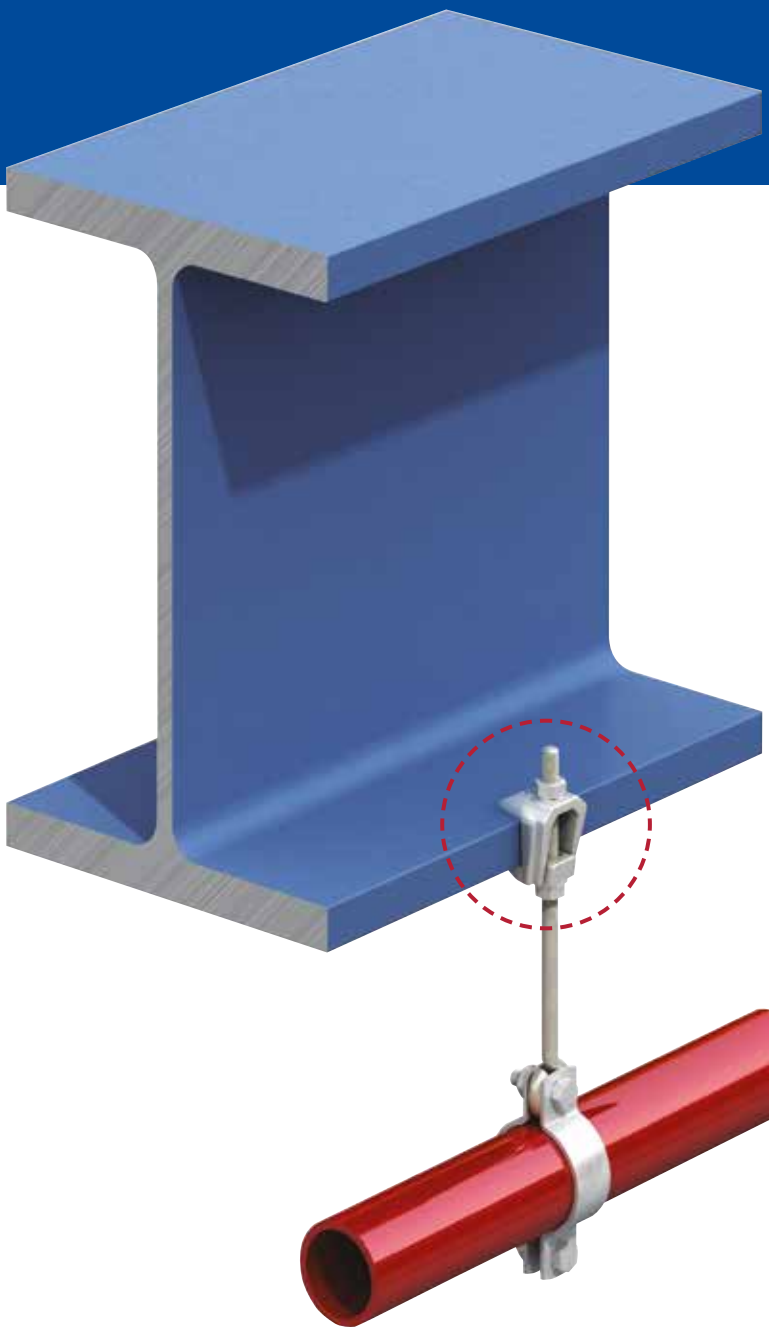
Material: High grade alloy steel, zinc plated.

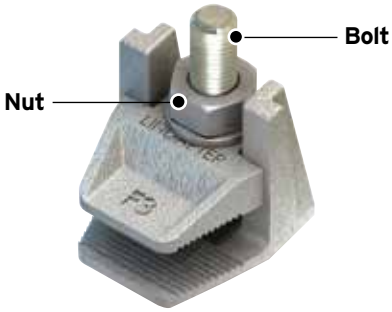
Product Code	Rod*	Safe Working Load (FOS 4:1) Tensile lbs	Maximum Inclination	Rotation	Tightening Torque ft lb	Dimensions U	R	Width with Bolt V
LSW037	M10 or 3/8"	540	18°	360°	8	1 3/4"	1"	1 3/8"

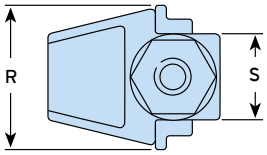
* Secure threaded rod (either M10 or 3/8") to the Type SW using a standard nut.

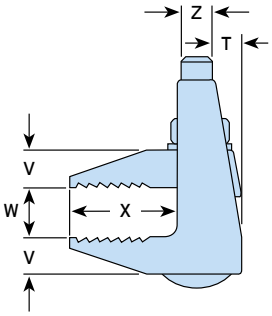
Type F3

An FM approved, high strength flange clamp with a large clamping range.









For heavier loads or wider clamping range, please see the Type F9 on **page 23.**

Material: Malleable iron, hot dip galvanized.

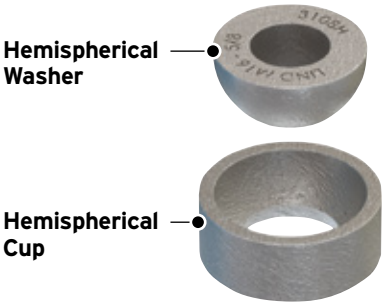
FM APPROVED *(M10 and above)*

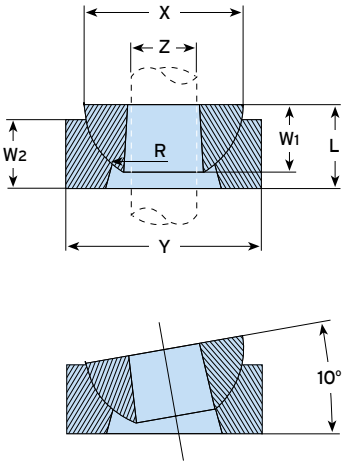
Without Bolt	With Bolt		Safe Working Load (FOS 4:1)			Dimensions				
Product Code	Product Code	Bolt Supplied Z	Tensile lbs	Clamping Range W	Tightening Torque ft lb	S	T	V	X	Width R
LF3037NB	LF3037WB	M10 (3/8")	270	1/16" - 1 3/16"	15	7/8"	5/16"	3/8"	1"	1 1/2"
LF3050NB	LF3050WB	M12 (1/2")	450	1/16" - 1 9/16"	29	1 1/8"	3/8"	1/2"	1 3/8"	1 15/16"
LF3062NB	LF3062WB	M16 (5/8")	900	1/8" - 2 3/16"	69	1 7/16"	1/2"	5/8"	1 13/16"	2 3/8"
LF3075NB	LF3075WB	M20 (3/4")	1350	3/16" - 2 3/4"	130	1 3/4"	9/16"	3/4"	2 3/16"	3"

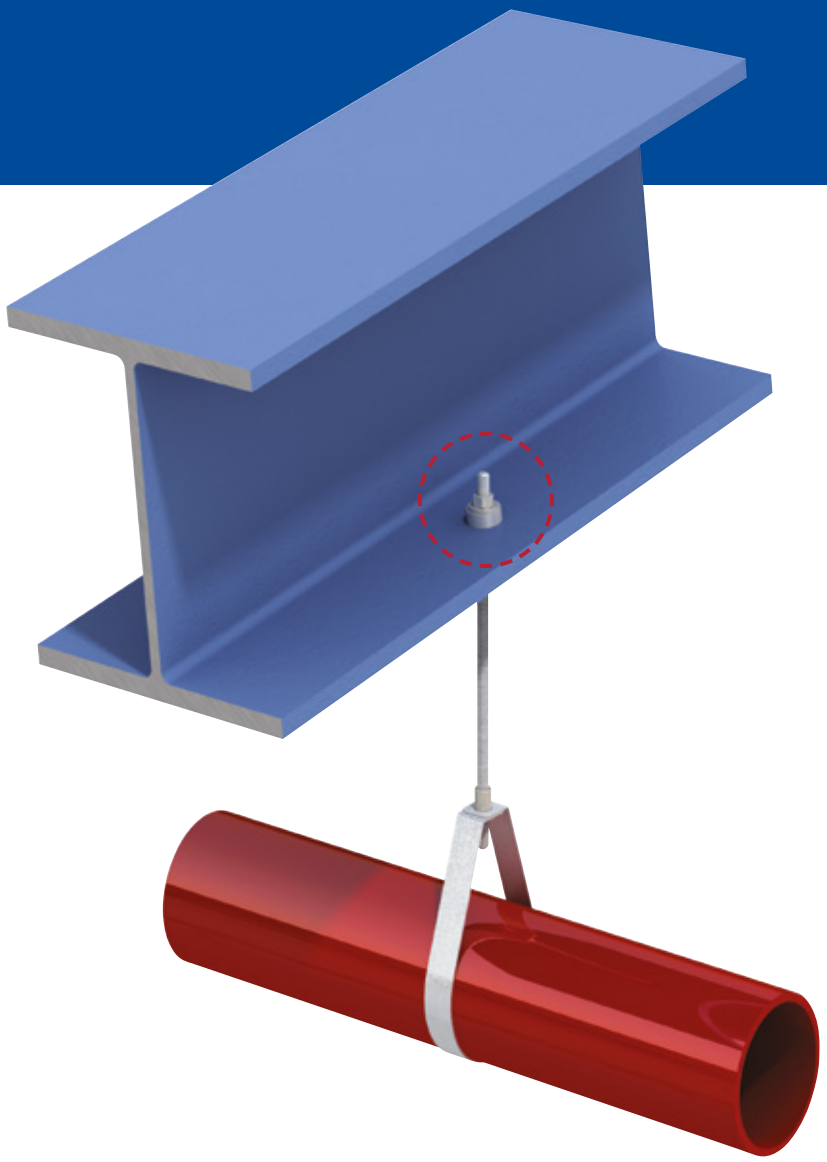
- **For parallel flanges only.**
- **Supplied without bolt or with bolt (contact your local distributor for details / options).**

Type HW / HC

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







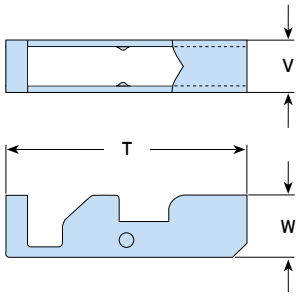
Material: Malleable iron, zinc plated / hot dip galvanized.

Product Code		Rod	Dimensions					
Hemispherical Washer*	Hemispherical Cup		Hemispherical Washer		Hemispherical Cup		Hemispherical Washer + Hemispherical Cup	
		Z	X	W1	Y	W2	R	L
LHW037	LHC037	3/8"	1"	1/2"	1 1/4"	1/2"	1/2"	5/8"
LHW050	LHC050	1/2"	1 1/8"	1/2"	1 3/8"	1/2"	9/16"	11/16"
LHW062	LHC062	5/8"	1 3/8"	5/8"	1 5/8"	5/8"	11/16"	7/8"
LHW075	LHC075	3/4"	1 3/4"	3/4"	2 1/8"	3/4"	7/8"	15/16"

* Can be used without hemispherical cup.

Type TC - Toggle Clamp

Designed for service suspension from pre-cast hollow core slabs (minimum core depth 3") as well as HSS, steel sheeting or purlins.



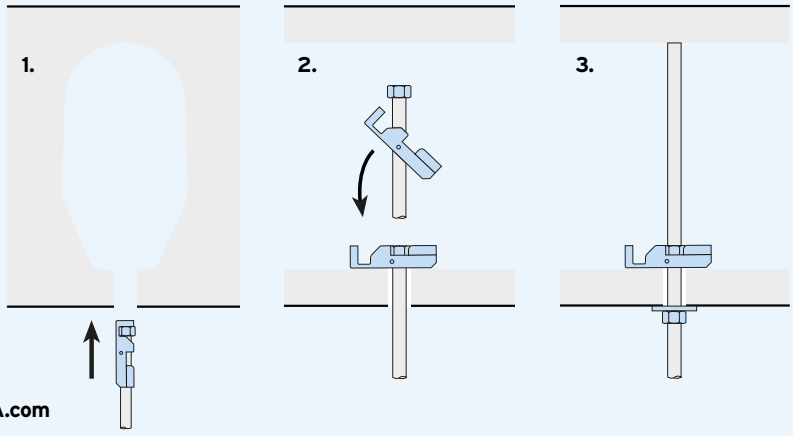
Material: Steel strip, zinc plated.

Product Code	Drop Rod	Hole Ø	Safe Working Load (FOS 4:1) Tensile / 1 Rod lbs	Tightening Torque ft lb	Dimensions T	W	Width V
LTC037	3/8" UNC	1"	550	7	2 11/16"	11/16"	9/16"

Subject to the strength of the concrete section. Safe working loads are based on tests performed on a pre-cast hollow core concrete panel with designed compressive strength of 7200psi.

How to install...

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 at www.LindapterUSA.com

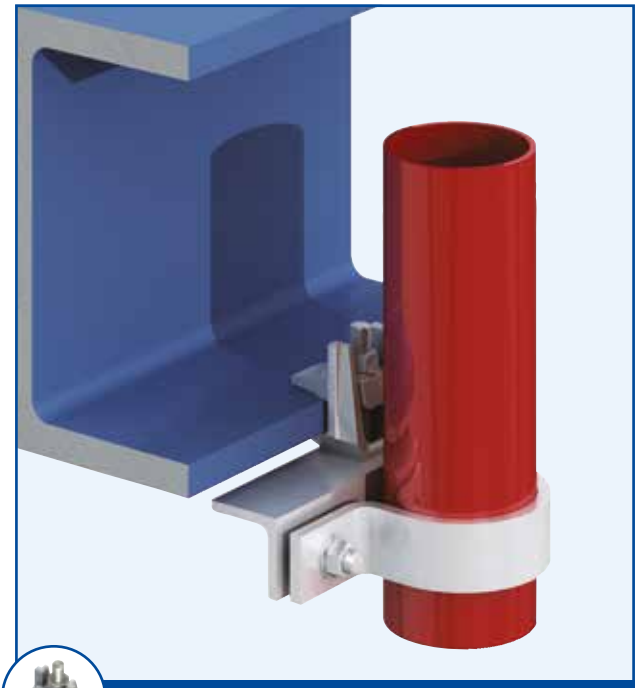
Typical Applications for Pipe Supports

Examples of popular connection arrangements are shown below. Visit www.LindapterUSA.com to view more examples or contact Lindapter to discuss your connection requirement.

Type FLS **(page 51)**

Type FL **(page 52)**

Type LC **(page 53)**



Type F3 **(page 54)**

Tightening Torque and DTI Washers

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

All torque figures given in this catalog 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 **Grd. A325** or **Grd. A490** 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 please refer to ASTM F959 – Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners.

Suitability of component with DTI Washers

	Lindapter Product		
	TYPE AAF (page 8) 	**TYPE AF** (page 10) 	**TYPE CF** (page 11) 
Grade A325 Bolts	✔	✔	✔
Grade A490 Bolts	✔	✔	✘

Lindapter Type LR (page 14), Type A (page 16), Type B (page 17) and Type LS (page 20) 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 catalog and on the website.

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 catalog 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 effect 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 could be in evidence 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 90º 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 (continued)

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 Galvanizing. Longevity would depend on the background corrosion rate evident in the location it is intended they be used; guidance should be sought from the galvanizers 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 recognized method of determining slip and is defined according to the Eurocode as the load corresponding to 0.004" (0.1mm) of movement. As the safe working load is based on movement of 0.004" it is acceptable to use a reduced factor of safety of 2:1.

Can I use Lindapters 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 either a product with a full width tail such as a Type LR or a Lindapter Type A or B with one of the standard range of packings (CW, P1 or P2S).

Can I use slotted holes in Hollo-Bolt connections?

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

What is the recommended Lindapter safe working temperature range?

As a general rule -22ºF to +662ºF; however this can increase or decrease in certain situations. For example, the Type AAF clamp is tested to -76ºF.

FAQs about Lindapter Hollo-Bolts

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

Can the Hollo-Bolt be used in concrete?

No. It is designed as an expansion bolt for HSS of all shapes and sizes or where access is available from one side only.

Why is there a minimum outer ply requirement when using 5/8" and 3/4" Hollo-Bolts?

To ensure the unique collapse mechanism (rubber washer) does not compromise the shear capacity of the Hollo-Bolt by being within the shear plane.

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

This is not always necessary especially on the larger size 5/8" and 3/4" Hollo-Bolt HCFs where the collapse mechanism (rubber washer) expands to fill the void. Sealing washers are available however it is important the interface between the RHS face and plate or bracket is not ignored.

Is it possible, however slightly, to exceed the maximum Hollo-Bolt clamping thicknesses published in the catalog?

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

Which Hollo-Bolt load table should I use?

For simple connections with un-factored loads please use the capacity figures shown on page 41 (5:1 Factor of Safety).

The Hollo-Bolt LRFD and ASD Design Strengths figures on page 40 (taken from ESR-3330) are to be used only when designing a bolted connection to **AISC 360**, **AISC 341** and **AISI S-100** as referenced in Section 2205 of the IBC.

Can the Hollo-Bolt be used in all shapes and sizes of HSS?

Yes. It can be used in square, rectangular, circular, and other profiles where access is restricted to the outer face. In all cases however 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.

Is it possible to reuse the Hollo-Bolt?

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

How do I remove a Hollo-Bolt?

Sizes 5/16", 3/8" and 1/2" using a pneumatic tool to remove the Hollo-Bolt:

1) Set the pneumatic hand tool to reverse mode (anti-clockwise rotation).
2) Place a suitable size wrench (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 HSS at the other end of the bolt is released to drop inside the HSS.
5) The bolt can now be removed as can the sleeve by prying the collar with a pinch or crow bar.

Sizes 5/8" and 3/4" (Hollo-Bolt HCF) using a pneumatic tool to remove the Hollo-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 HSS, at the other end of the bolt are released to drop inside the HSS.
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 Hollo-Bolt Countersunk Head. The Hollo-Bolt Flush Fit however cannot be removed once it is installed.

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 connections. To view more project examples please visit www.LindapterUSA.com

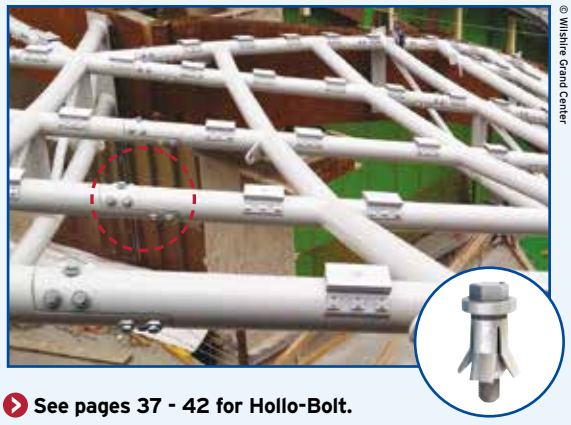
Wilshire Grand Center, CA

© AC Martin

Product: **Hollo-Bolt®**
Application: **Securing primary steel tubes (HSS) which form the canopy of this skyscraper in Los Angeles.**

3,000 Hollo-Bolts were used to connect steel tubes which form the curved canopy structure. They were installed from just one side, rapidly achieving discreet splice connections without drilling or welding in the field. The cost-effective installation did not require specialist equipment or labor and reduced the amount of work at height in comparison to welding or through-bolting.

The design eradicated the possibility of tube deformation that can be associated with through-bolting if the bolts are over-tightened. The result was aesthetically pleasing, clean and discreet connections which complement the architecturally exposed structural steel design.



© Wilshire Grand Center

See pages 37 - 42 for Hollo-Bolt.

American Copper Buildings, NY

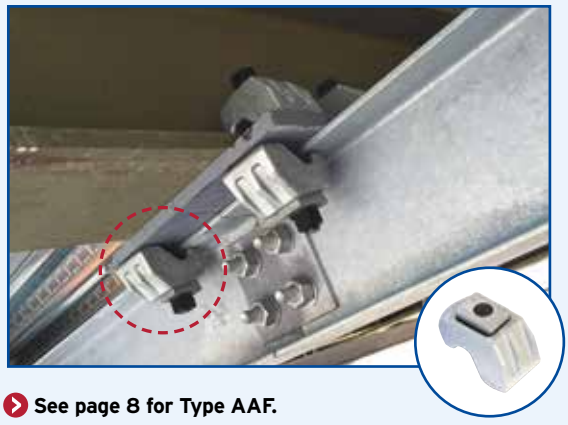
© Tectonic Photo

Product: **Type AAF**
Application: **Connecting a steel grid to the structural beams on the sky-bridge structure.**

The sky-pool is on the bottom floor of the three-story fitness and leisure complex, which bridges the gap between the two towers, high above New York City.

Engineers specified Lindapter's Type AAF clamps for connecting a steel grid to the trusses to create a frame for the façade panels to be installed onto the sky-bridge. Type AAF was chosen due to its high strength capacity and longevity.

The adjustability of the product allowed the contractors to quickly slide, align and secure the frame into position without drilling or welding, saving the contractors time and money on this prestigious project.



See page 8 for Type AAF.

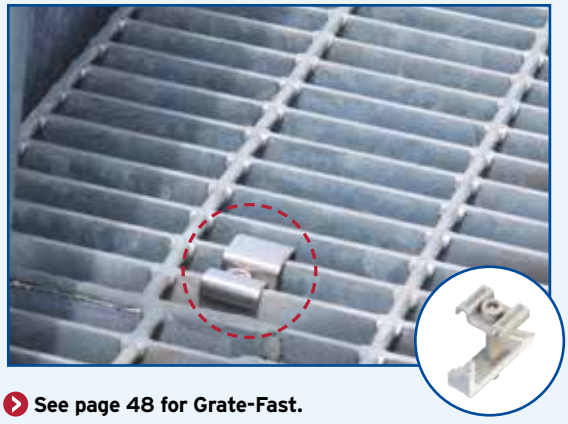
Benjamin Franklin Bridge, PA

Product: **Grate-Fast® Stainless Steel**
Application: **Securing open grate flooring for maintenance access.**

This suspension bridge connects Philadelphia, PA and Camden, NJ across the Delaware River.

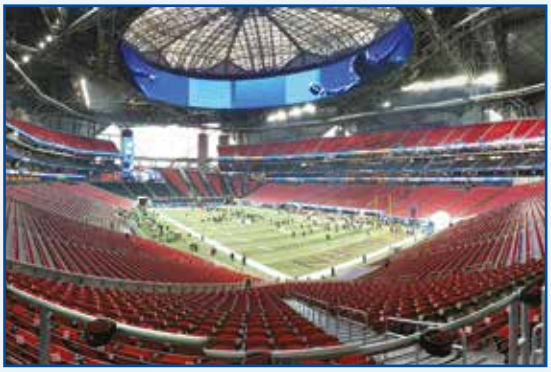
Lindapter's Grate-Fast was used to secure open bar grating platforms along the length of the bridge, so that Engineers can change the accent lighting. Using just standard hand tools to secure the grating allowed a rapid installation process, helping the contractors to complete the project on time and on budget.

Grate-Fast was chosen for its superior clamping force and durability as well as Lindapter's range of approvals such as the Lloyd's Register Type Approval that covers clamping force and vibration.



See page 48 for Grate-Fast.

Atlanta Falcons Stadium, GA

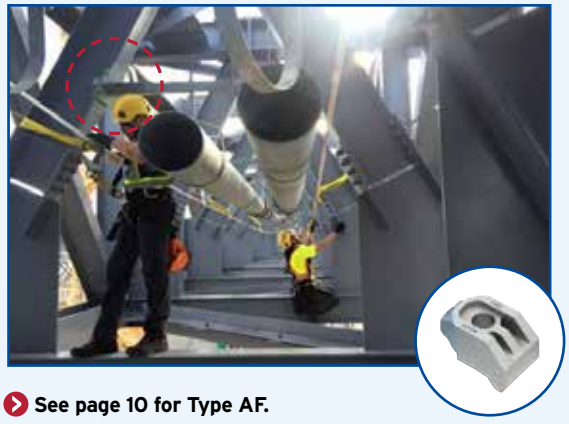


Product: **Type AF**
Application: **Securing the steel support frame for the storm water drainage system.**

The Type AF Girder Clamps were specified to connect the steel framework that supports the heavy duty storm water drains system, 270ft above ground level.

Type AF was chosen due to its high strength capacity in friction, slip and combined load applications. It is made from high strength SG iron and has a hot dip galvanized coating for anti-corrosion protection even in harsh environments.

The clamping systems provided a faster and safer alternative to drilling or welding and allowed the height of the frame to be adjusted since the tube support was telescoping.



See page 10 for Type AF.

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 connections. To view more project examples please visit www.LindapterUSA.com

American Helicopter Museum, PA

Product: **Lifting Point LP4**
Application: **Suspending helicopters from the museum ceiling in West Chester.**

Lindapter steel connections were supplied to The American Helicopter Museum for the suspension of an Enstrom F28A Helicopter. Weighing in at over 1500lbs, it is well within the capability of the lifting point, which was fitted with an eye bolt without drilling or welding. Connections have also been specified for arenas and theaters in lighting and sound rigging equipment, as well as in sports facilities to suspend heavy equipment.

Lindapter can design and manufacture customized lifting points for your specific load requirements free of charge. The Type ALP is an off-the-shelf adjustable lifting point that adjusts to suit the beam width, flange thickness and the orientation of the lift.

See page 32 for Lifting Points.

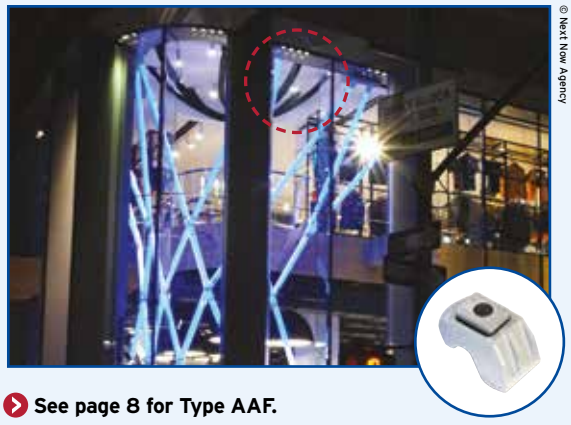
National Basketball Store, NY

Product: **Type AAF**
Application: **Securing a basketball sculpture to the top of the store in New York City.**

Lindapter connections were used throughout the store for securing structural elements and decorative pieces.

Contractors particularly benefited from using the Type AAF Girder Clamp to safely connect sections of 'H' channel to form a basketball shaped sculpture at the top of the store. Type AAF clamps self-adjust to suit a wide range of beam flange thicknesses, allowing a fast and convenient installation using standard hand tools.

Avoiding drilling and welding meant that there was no need for area closures, lead abatement or specialist labor and equipment, saving the contractor time and money.



See page 8 for Type AAF.

Manhattan Bridge, NY

Product: **Type F3**
Application: **Securing 450m pipework carrying an internet cable along the bridge.**

Lindapter Pipe and Conduit Supports 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 large pipe, carrying fibre optic cable for high-speed internet across this iconic structure.

Using simple hand tools avoided drilling and welding in the field 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 54 for Type F3.

'Flows Two Ways' Sculpture, NY

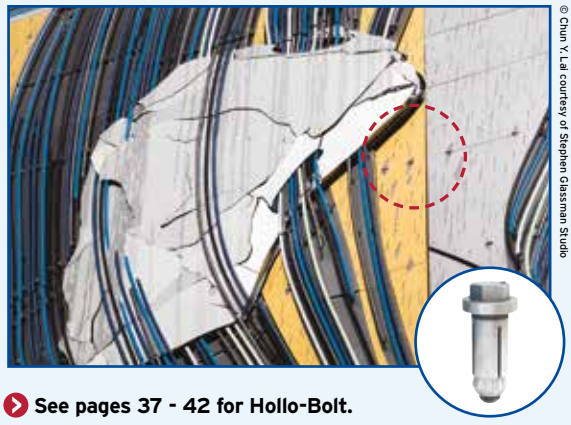
© Chun Y. Lai courtesy of Stephen Glassman Studio

Product: **Hollo-Bolt®**
Application: **Connect an eight-story artistic façade to the western wall of Helena 57 West.**

Stephen Glassman's 'Flows Two Ways' sculpture spans 60ft x 60ft and complements neighboring skyscraper VIA 57 West, which is dubbed 'The Great Pyramid of Manhattan'.

The monumental cladding is a stainless steel grid which is made up of 35 panels and 400 60ft aluminum tubes. These were attached with 250 Hollo-Bolts, which are approved for use in all ICC-ES seismic design categories (A-F).

The use of Hollo-Bolts resulted in a discreet architectural finish, which complemented the design of the sculpture and provided a durable, high strength connection.



© Chun Y. Lai courtesy of Stephen Glassman Studio

See pages 37 - 42 for Hollo-Bolt.

Passionate about safety

For over 80 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 catalog.

ICC-ES
Lindapter's Hollo-Bolt has been approved for use in Seismic Design Categories (SDC) A through F by North America's leading evaluation service.

Factory Mutual
This American insurance organization offers an approval that is recognized by the fire protection industry worldwide.

Los Angeles Research Report
The LARR provides independent evidence that the Hollo-Bolt product complies with the 2014 City of Los Angeles (COLA) Building Code.

CE Mark
For Lindapter products in compliance with provisions of the EC Construction Product Regulation 305/2011/EU, please refer to www.Lindapter.com/About/CE

Deutsches Institut für Bautechnik
DIBt approves construction products for use in structural and civil engineering industries in Germany.

Lloyd's Register Type Approval
Products with this approval 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.

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

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.

bsi. ISO 9001 Quality Management — Q 05143

bsi. ISO 14001 Environmental Management — EMS 546660

Associations

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

Factory Production Control and Traceability

The company operates a fully documented Factory Production Control system ensuring full compliance and traceability throughout the manufacturing process, in conjunction with the Construction Products Regulation.

Here to help you

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

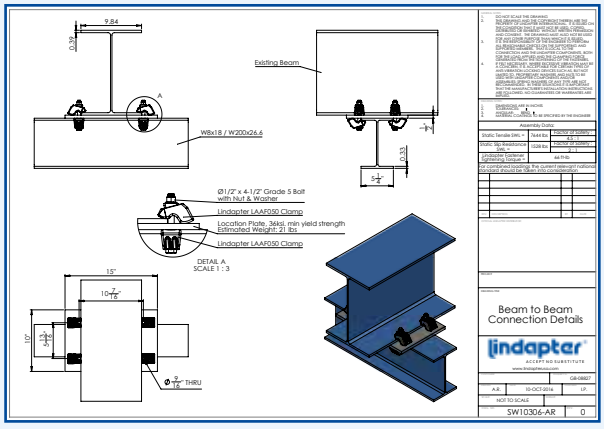
The Lindapter Service includes:

- Free design proposal
- 2D / 3D drawings
- Quotation
- Global distribution
- Installation guidance

Free Connection Design

Contact Lindapter's team of experienced Engineers and they will advise a connection solution for your specific requirement. The team will recommend the optimum product for your application and detail the Lindapter connection, providing drawings and 2D or 3D CAD files that can be imported into all major software. All you need to do is advise the details below and Lindapter will do the rest!

- **Steel sizes to be used or flange width / thickness**
- **Loads to resist (e.g. 2000lbs tension and 3000lbs slip)**
- **General arrangement sketch or verbal description**
- **Project Name / Title / Location (optional)**

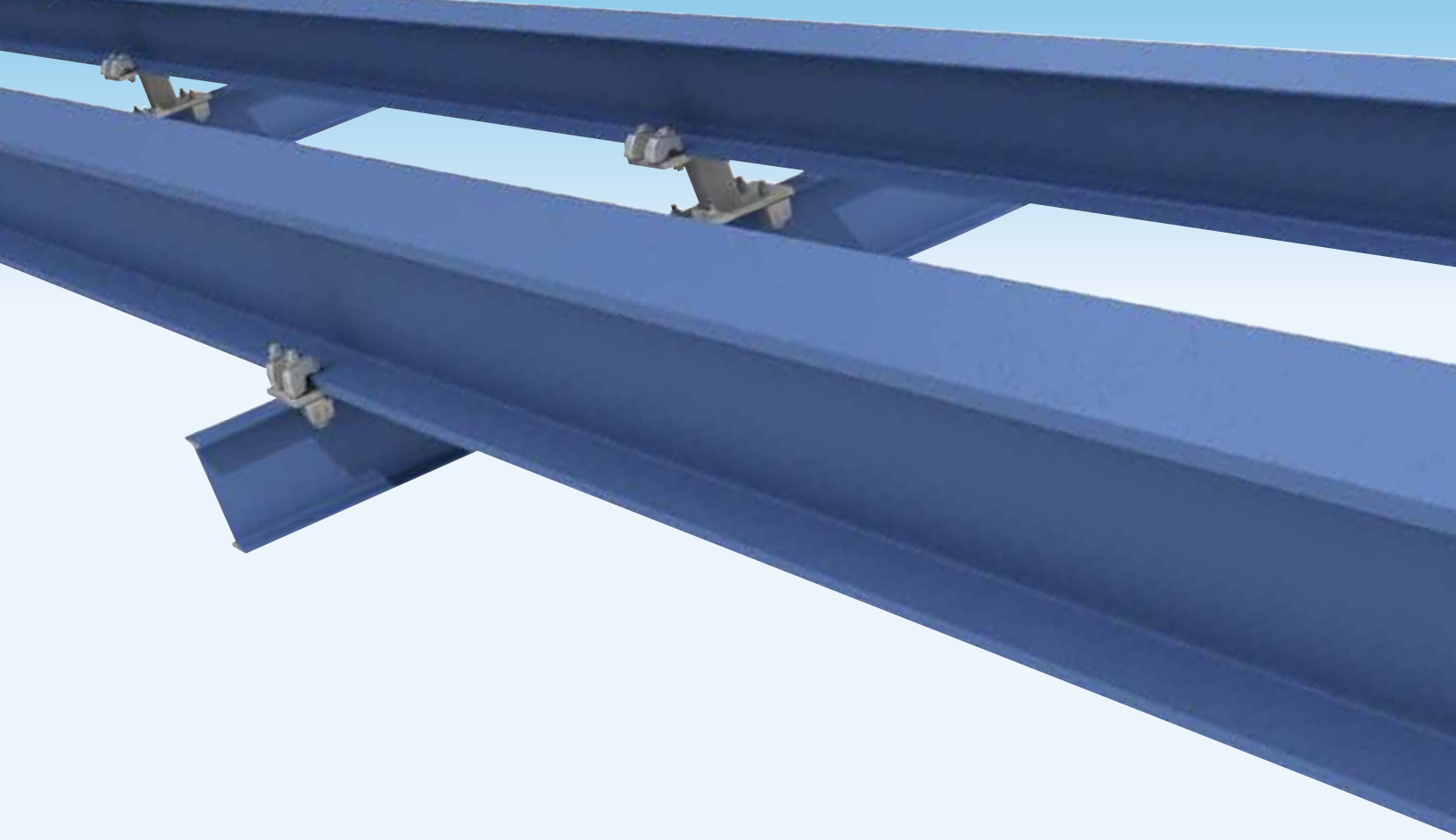


Engineered Solutions

Lindapter's Research & Development facility and unique expertise facilitates a custom 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 224,800lbs hydraulic test machines and finite element analysis, Lindapter's Engineers can develop solutions that satisfy your connection demands.

Contact Lindapter to design a solution to your connection requirements.
Email support@LindapterUSA.com or visit www.LindapterUSA.com for more details.



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