

STEELWORK CONNECTIONS

Steelwork Fixings

Lindapter Steelwork Fixings require no on-site drilling or welding, saving both time and money, and are compatible with virtually any size or shape of steel section in a wide variety of applications.

The Girder Clamp symbolises Lindapter's concept perfectly, boldly challenging the need to drill or weld, when a safe, high strength connection can be quickly accomplished by clamping two steel sections together. Although the concept is simple, Lindapter products undergo complex design and testing as the experienced Research & Development team constantly refine, improve and invent to achieve greater product performance and safety approvals.

Advantages

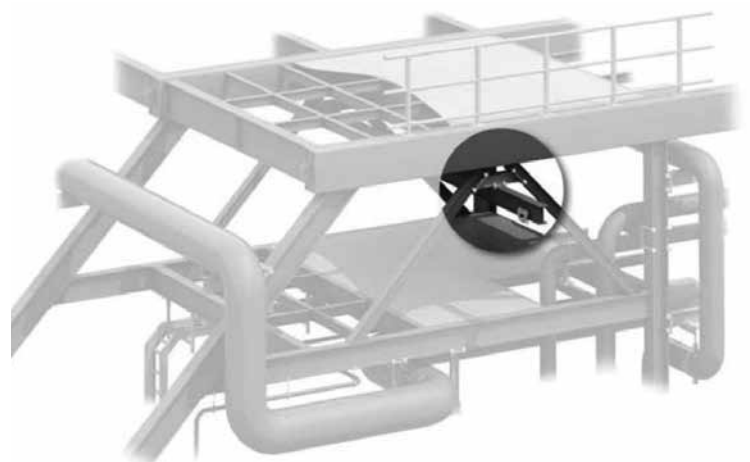
- Less design time (Lindapter will design the connection)
- Independently approved loads and quality standards
- No on-site drilling or welding
- Fast and safe construction
- 'Hot Working' not required
- Adjustable on-site
- Less work at height
- Only hand tools required to install
- Ability to deconstruct and multi-cycle

Markets

- Plant Engineering
- Chemical and Petrochemical
- Material Handling
- Structural Engineering
- Civil Engineering
- Facades
- Theatre Equipment
- Transportation
- Offshore

Applications

- Steel Construction
- Cranes
- Lifting Beams
- Pipe Supports
- Towers and Masts
- Almost any steel-to-steel connection

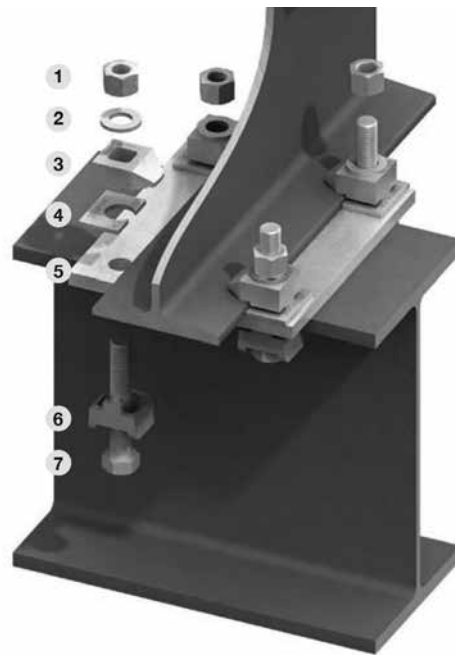


For a detailed Lindapter Product Catalogue, please visit the "Downloads" section on our website



Girder Clamp Components

- 1 **Standard Grade 8 or 10 Hex Nut**
- 2 **Standard Hardened Washer**
- 3 **Lindapter Clamp**
Dependent on the application different clamps could be used i.e. types A, B, BR, AF, LR, LS, D2 or D3.
- 4 **Packing Piece**
In combination with the clamps mentioned above, these parts increase the tail length to enable the product to sit correctly on the beam.
- 5 **Location Plate** (can be supplied if required)
This is an essential part of the girder clamp assembly that enables all the components to be located in the correct position. The hole centres and plate thickness are calculated to suit the individual application.
- 6 **Lindapter Clamp**
This can be of a similar type as 3 (above), although certain products are designed to specially work together e.g. A & B
- 7 **Standard Grade 8.8 or 10.9 hex Bolt or Setscrew.**



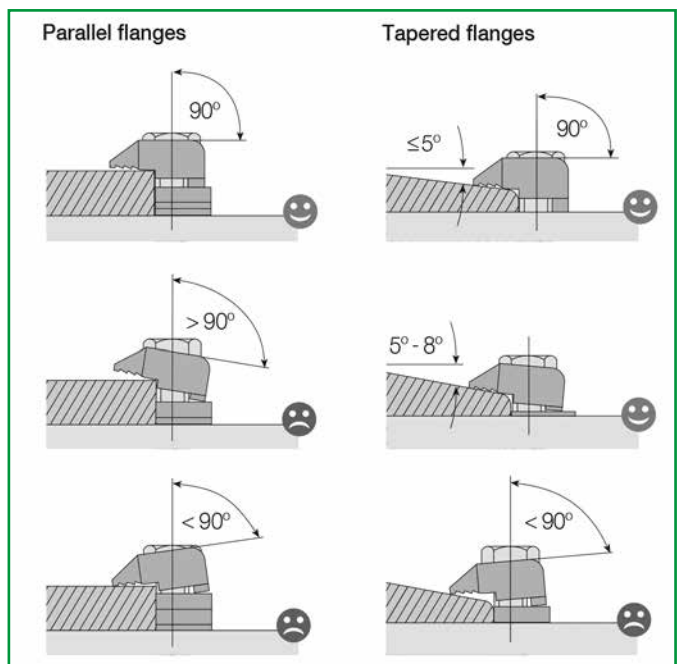
Bolt Length Calculation for a Standard Lindapter Girder Clamp

Showing Type A and B M20 as an example.
To calculate the bolt length all parts the bolt will go through have to be added up. The next longer standard bolt length should be used.

	mm
0.5 · bolt Ø as bolt protrusion	10
Height of nut	16
+ Washer	3
+ T of top clamp	20
+ Top section	12.5
+ Plate thickness	12
+ Lower section	10
+ T of lower clamp	10
=	93.5
Next standard bolt length	100.0

Correct Installation of Types A and B

Showing Type A as an example



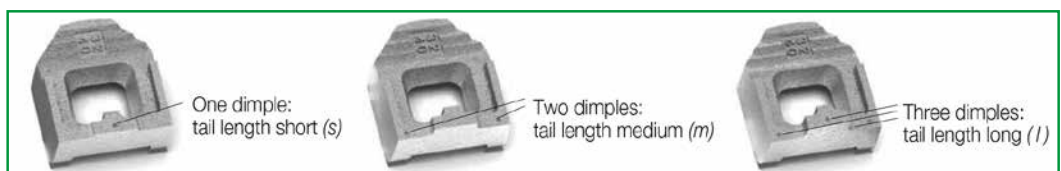
Before applying torque, the maximum acceptable tail length tolerance is -1mm (up to M16) and -1,5mm (M20, M24)

On 6° and 8° slopes, Types A and B require a special tail length/packing combination which will allow the clamp to tilt back slightly.

For applications above 8° please see Types AF, LF and LS.

Tail Length

The different tail length can be identified by a code of dimples underneath the clamps.



Loads and Specifications

Lindapter steel connections are designed to suit the loading condition of each application, as defined below. Safe working loads published in this catalogue are for bolt grade 8.8 unless otherwise stated. Should you require assistance in selecting the correct product for your needs, please contact Strutfast.



Tensile Loading

In tensile applications the load transmits a force parallel to the centre line of the bolt shank, hence applying a load to the contact point of the Lindapter clamp. See product data tables for allowable tensile loads at varying bolt sizes.



Frictional Loading

The force is applied at 90° to the bolt shank. The point at which slip occurs depends upon the condition and finish of the steelwork, the coating of the Lindapter clamp and the grade of bolt used. Slip is defined as the constant load at which relative movement between clamped components exceeds 0.1mm.



Shear Loading

The Safe Working Load of the assembly is determined by the bolt grade and diameter as the force is resisted by the cross sectional area of the bolt shanks. It is recommended that reference be made to the bolt manufacturers' technical literature or the relevant structural steel design code to ascertain a Safe Working Load per bolt.



Combined Loads

When the fixings are subject to more than one load condition, the resulting forces must be calculated to determine the product and bolt sizes required. Please contact Strutfast with your application.



Compression Loading

Force is applied direct to the supporting section rather than the Lindapter products. If, however, there is a gap between the surfaces being connected, the buckling strength of the supporting fabrication must be considered.



Torque

The recommended torque values stated in the product sections must be applied in order to achieve the stated Safe Working Load. Any reduction in torques applied will lower the product Safe Working Load and is not recommended.

Safe Working Loads

The table beneath shows tensile and frictional load capabilities for a standard four bolt Girder Clamp using 4 bolts and 8 clamps at a 90° crossover angle. Lindapter is only too pleased to carry out all design work for individual connections free of charge based on the following details:

- Load per connection
- Size and type of both beams
- Angle of crossover
- Distance between beams
- Inclination of beams.

CLAMPS BOLT SIZE BOLT GRADE	Types A, B, BR, LR				TYPE AF		
	M12 8.8	M16 8.8	M20 8.8	M24 8.8	M24 8.8	M24 10.9	
Safe Working Load Tensile / for 4 bolts	kN	23.2	29.2	59.0	78.8	160.0	250.0 ¹⁾
Safe Working Load Friction / for 4 bolts	kN	1.4	3.0	6.0	9.0	60.0 ²⁾	70.0 ²⁾
Tightening Torque	Nm	69	147	285	491	800	1000

¹⁾ Factor of safety 3.2:1 ²⁾ Factor of safety 2:1

Loads are based on a factor of safety (typically 5:1) The reduction of published safety factors is not recommended.





Cavity Fixings

The Hollo-Bolt® and Lindibolt® eliminate the need for conventional through-bolting or welding of structural hollow section (SHS) or any steel structure where access is only available from one side.

Both the Lindibolt and Hollo-Bolt enable fast and safe construction and can be swiftly installed by simply inserting the product into pre-drilled holes, then tightening to the recommended torque using hand tools.

In the late 1940s, Lindapter revolutionised 'blind connections' with the development of the original Lindibolt, for situations where access to both sides of the steel was restricted. Following the introduction and wide acceptance of SHS, the Hollo-Bolt was invented to suit virtually any type of hollow section, including square, rectangular, circular and oval profiles. As with all Lindapter products, the R&D department has continued to develop the range with the rapid expansion in diameters, lengths, finishes, and head types.

Following comprehensive testing, The Steel Construction Institute (SCI) and British Constructional Steelwork Association (BCSA) recognise the Hollo-Bolt as a primary structural connection, in the design guide 'Joints in Steel Construction & Simple Connections' / The Hollo-Bolt has CE Mark Certification, and is also approved by the Deutsches Institut für Bautechnik and TÜV NORD.

CE Marking

The Hollo-Bolt and Lindibolt achieved CE marking 2011, demonstrating Lindapter's commitment to quality manufacturing and transparency of product performance.

The CE mark confirms that Lindapter initiates independent and thorough assessments of their Factory Production Control System to ensure only premium quality products leave the production line. CE marked products are subjected to a comprehensive testing programme to verify product performance to the Eurocode 3 standard, resulting in independently published European Technical Approvals (ETA).

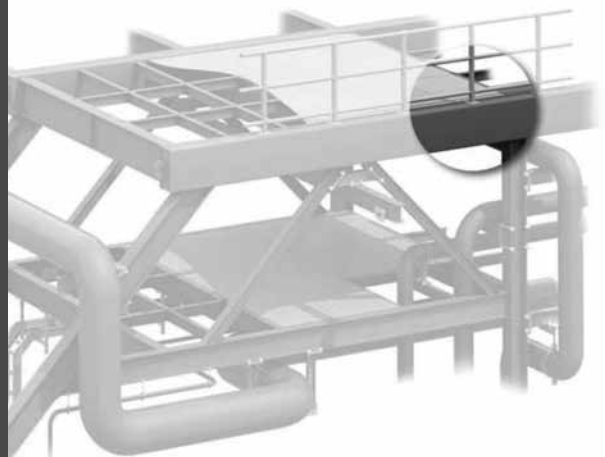


Eurocodes

In addition to the standard Safe Working Loads, you will find the Eurocode 3 Characteristic Values for the Hollo-Bolt and Lindibolt products. The Characteristic Values are used to determine the Design Resistance of the product.

Typical Hollo-Bolt Applications

- Primary Connections
- Secondary Connections
- Bridges
- Cladding
- Balconies
- Towers and masts
- Staircases and handrails
- Glazing and roofs



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Framo: Modular Steelwork Solutions



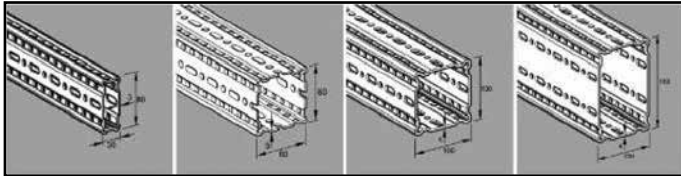
Framo is an innovative modular support system, which is a patented, fully certified and non-welded steelwork support system for the modular construction of frames and structures according to EN1090. Framo allows multi-directional connection possibilities without the need for through-bolts and back-plates.



Framo: Modular Steelwork Solutions

We understand the problems you face. Budgets are exceeded, schedules often over run and we have identified the challenges facing secondary steel solutions.

- Excessive waste by modification
- Weight is high, performance is poor
- Logistics are outdated and inefficient
- A hot works facility is required

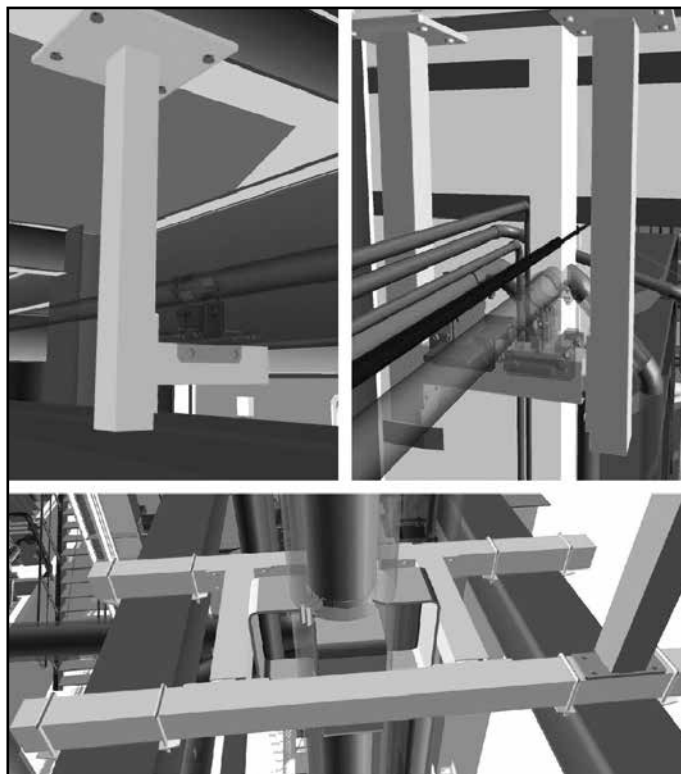


With the experience of over 40 years in developing innovative products for above-ground industrial pipe work installation, we believe it is possible to work in a way that is more efficient and more productive for everyone involved.

With Strutfast you can plan smarter through proven design and innovation, here is how:

Framo

A versatile, multifunctional support system that offers maximum flexibility using a compact range of off-the-shelf components used in partnership with our SIMOTEC modular pipe supports. All of our systems can be fully implemented in to the CAD process at planning stage.

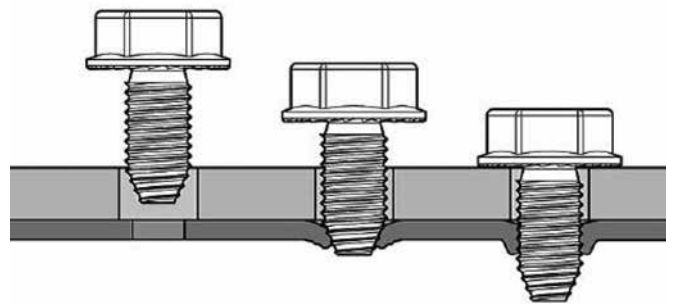


Key Benefits

- All parts are reusable without wastage
- Strong but lightweight, cutting down the total tonnage of steel required for the project
- Our products are readily available from stock with a distribution network that offers quick lead times
- There is no need for hot works!

These Benefits form the Foundation of Framo:

Lightweight from only 4.3kg per M, offering easily adjustable connections secured with minimal assembly using a thread forming, shake proof fastening.



All Framo 80 and 100 products are fully compatible with all other Sikla system parts including our SIMOTEC pipe support range. High load bearing and height adjustable as standard with approximately 50mm of adjustability per pipe shoe.

Why Use Us?

We can support you at every stage of the project and all of our products benefit from optimal design, performance and quality. Guaranteed to save you time and reduce costs.



EN 1090-1
Factory
Production
Control



For a detailed Framo Product Catalogue, please visit the "Downloads" section on our website

