

# What is BoxBolt® ?



## BoxBolt® Guide - Eurocode 3 / DIN 18800

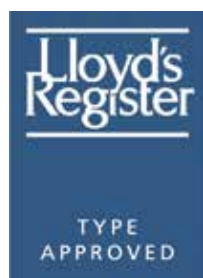
**BOXBOLT** is a fully tested and approved blind fixing solution for connecting to hollow section steelwork or where access is restricted to one side only. The **BOXBOLT** fixing is suitable for use with rectangular, square and even circular hollow sections. **BOXBOLT** features a hexagon head design to aid installation with a standard spanner but also allows it to be installed with our unique **BOXSOK** installation tool for when installation time needs to be kept to an absolute minimum.

**BOXBOLT** is available in three finishes, these are: Zinc Plated for the less aggressive environments, Hot Dip Galvanised for the more aggressive environments and Stainless Steel for the most arduous of applications. These finishes combined with three lengths of **BOXBOLT** make it extremely flexible to suit its environment and application.

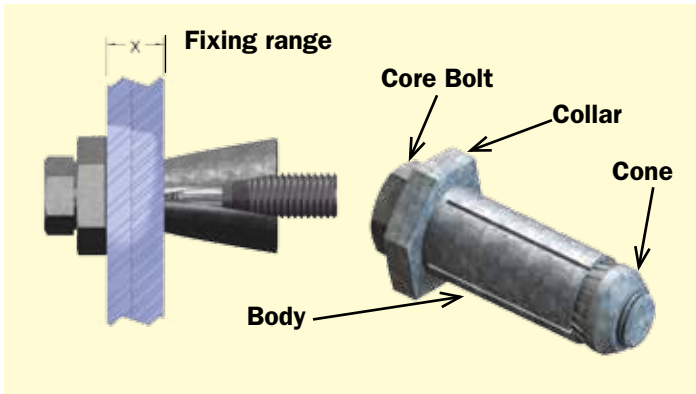
**BOXBOLT** is approved for use by Lloyds Register (LR) type approval and the Deutsches Institut für Bautechnik (DIBt).

Our DIBt approval complies with Eurocode 3 / DIN 18800 providing the designer and user with total confidence and peace of mind.

To make the specification of **BOXBOLT** quick and safe we have an easy to use Design Guide that explains how to design a connection using **BOXBOLT** with a calculation sheet to support this that can be referenced for your project.



Features	Advantages	Benefits
No Access to both sides of the connection required.	Connection can be made blind for connections into hollow section or where access is restricted.	No through bolting or strapping required reducing fabrication work.
No need for close tolerance holes or tapping.	New holes can be drilled quickly on-site if required.	Flexibility and reduced on-site installation time.
No special tools required - two spanners only.	No hire/purchase of specialist equipment or the need to move around heavy equipment.	Reduction in installation cost and administration.
Installation by semi-skilled labour.	Connections can be made much quicker without special skills or equipment.	Reduction in labour and hire costs.
Only BOXBOLT head visible when installed.	Aesthetic connection.	Flexibility in Architectural design.
Approved for use by Lloyds Register Type and DIBt.	Third party accreditation for use in tensile and shear applications.	Confidence that the connection will perform as stated without site proof testing required.
Exceptional Shear loading performance.	Less BOXBOLT fixings can be used to make shear connections.	Flexibility in design and possible cost reductions.
AISC and Eurocode 3 Method for designing connections.	Provides a simple to follow design procedure that is the same as standard bolted connections.	Designers easily recognise the method and can save costs on competitive methods.
BOXSOK rapid installation tool.	Unique installation tool for speeding up installation.	Reduction in on-site labour costs.



### MATERIALS

Mild steel to **BS EN 10083** Grade **1.1151**

Stainless steel to **BS EN 10088** Grade **1.4401**

### FINISHES

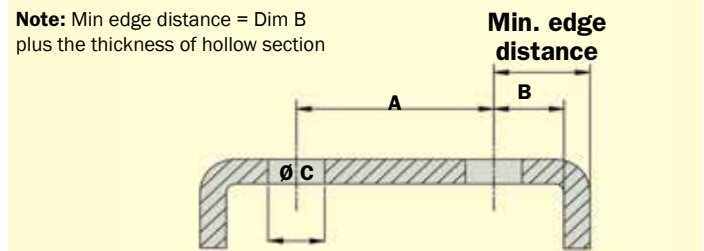
Zinc plated to **BS EN 12329** : Class **Fe//Zn8//A**

Hot Dip Spun Galvanised to **BS EN ISO 1461**

## Diameter and positioning of holes

Dia.	Dim A	Dim B	Dim C	Tolerance
<b>M06</b>	30	11	11	+1,00, -0,25
<b>M08</b>	35	13	14	+1,00, -0,25
<b>M10</b>	40	15	18	+1,00, -0,25
<b>M12</b>	50	18	20	+1,00, -0,25
<b>M16</b>	55	20	26	+2,00, -0,25
<b>M20</b>	70	25	33	+2,00, -0,25

**Note:** Min edge distance = Dim B plus the thickness of hollow section



Select the type of finish you require on the **BoxBolt** by replacing the \_ in the code with a **Z** for zinc plated, a **G** for Hot Dip Galvanised or an **S** for Stainless Steel. Example: **BQ2G12** is a **M12 BoxBolt** size **2** in **Hot Dip Galvanised** Finish.

\* BQ1Z06 is tested at an external test house but is not approved by LR type or DIBt.

## BoxBolt<sup>®</sup> Technical Data

Part Number & description			Dimensional information							Technical		Load information			
BoxBolt	Product code	Size	Setscrew length (mm)	Fixing range (dim x)		Across Flats of collar (mm)	Collar thickness (mm)	Dim A (mm)	Dim B (mm)	Hole size (mm)	Torque (Nm)	Galvanised/Zinc Plated Tensile (kN) Shear (kN)		Stainless Steel Tensile (kN) Shear (kN)	
<b>M06</b>	BQ1Z06*	1	45	4	26	17	5	30	11	11 +1,0,-0,25	19	5.71	16.21	/	/
<b>M08</b>	BQ1_08	1	50	5	26	22	6	35	13	14 +1,0,-0,25	25	12.86	21.07	13.29	26.14
	BQ2_08	2	70	18	46	22	6	35	13	14 +1,0,-0,25	25	12.86	21.07	13.29	26.14
	BQ3_08	3	90	30	66	22	6	35	13	14 +1,0,-0,25	25	12.86	21.07	13.29	26.14
<b>M10</b>	BQ1_10	1	50	5	23	24	7	40	15	18 +1,0,-0,25	45	24.07	37	21.07	47.07
	BQ2_10	2	70	18	43	24	7	40	15	18 +1,0,-0,25	45	24.07	37	21.07	47.07
	BQ3_10	3	90	35	63	24	7	40	15	18 +1,0,-0,25	45	24.07	37	21.07	47.07
<b>M12</b>	BQ1_12	1	55	5	25	26	8	50	18	20 +1,0,-0,25	80	29.43	48.29	30.64	59.86
	BQ2_12	2	80	20	50	26	8	50	18	20 +1,0,-0,25	80	29.43	48.29	30.64	59.86
	BQ3_12	3	100	40	70	26	8	50	18	20 +1,0,-0,25	80	29.43	48.29	30.64	59.86
<b>M16</b>	BQ1_16	1	75	5	35	36	9	55	20	26 +2,0,-0,25	190	52.29	88.21	57.07	108.57
	BQ2_16	2	100	30	60	36	9	55	20	26 +2,0,-0,25	190	52.29	88.21	57.07	108.57
	BQ3_16	3	120	55	80	36	9	55	20	26 +2,0,-0,25	190	52.29	88.21	57.07	108.57
<b>M20</b>	BQ1_20	1	100	8	42	46	11	70	25	33 +2,0,-0,25	300	92	145.36	89.07	181.79
	BQ2_20	2	120	35	72	46	11	70	25	33 +2,0,-0,25	300	92	145.36	89.07	181.79
	BQ3_20	3	150	65	102	46	11	70	25	33 +2,0,-0,25	300	92	145.36	89.07	181.79

The above loads are working loads that have the following **Factor of Safety (FOS) Applied: Tensile = 1.925 to 1 Shear = 1.54 to 1**

The loads stated above are based on our DIBt (Deutsches Institut für Bautechnik) approval document Z-14.4-482. The loads shown above are working loads based on the rated loads factored by 1.4 which is an average value between 1.35 used for static loading and 1.5 used for live loads. The rated loads stated in our approval already have a 1.375 factor for tensile and 1.1 factor for shear applied to them. This therefore means that the above loads have a  $1.375 \times 1.4 = 1.925$  to 1 FOS in tensile and  $1.1 \times 1.4 = 1.54$  FOS in shear.

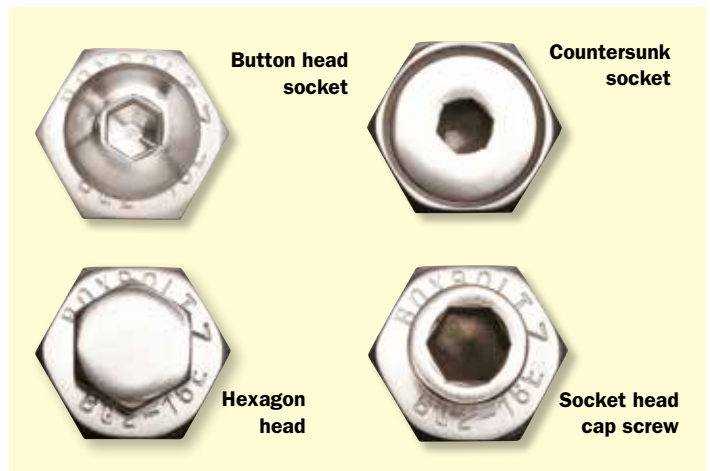
The **BoxBolt** is tested and approved by DIBt (Deutsches Institut für Bautechnik) which complies with the DIN 18800 and Eurocode 3 design methods for bolted steel connections. A design guide and calculator is available when using these methods, please ask our technical team for more information.

The **BoxBolt** is also Lloyds Register type approved for use, should you require a copy of the approval certificate our technical team will be able to assist.

The strength of the material our **BoxBolt** is connecting into should be checked for structural capacity by a structural engineer.

# BoxBolt® Technical Information

The **BOXBOLT** is often used on high profile projects where the aesthetics of the building are essential. It is for this reason the **BOXBOLT** can be adapted to suit the requirements of the Client and the Architect to make the connection pleasing to the eye. The most common versions we can offer are shown here. Should you require a different style then please contact our technical department.



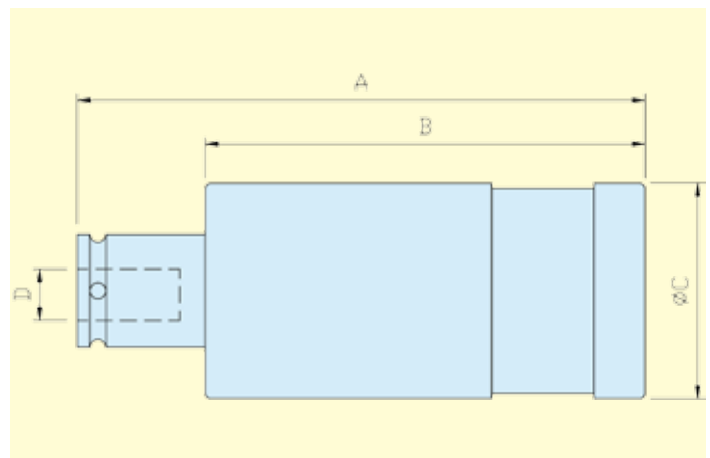
## BOXSOK Rapid Assembly Tool



The **BOXSOK Installation Tool** is a unique rapid assembly tool for the **BOXBOLT** fixing. This specially designed socket holds the hexagon shoulder on the body to stop it rotating whilst allowing the inner socket to tighten up the core bolt. The core bolt draws the cone up inside the slotted body of the sleeve and expands the individual fins inside the connection. The **BOXSOK** eliminates the need for two tools to install the **BOXBOLT**; this considerably speeds up the installation process and also reduces the risk of trapping hands between two tools. The **BOXSOK** device is available to suit all **BOXBOLT** diameters.

## BOXSOK Dimensions

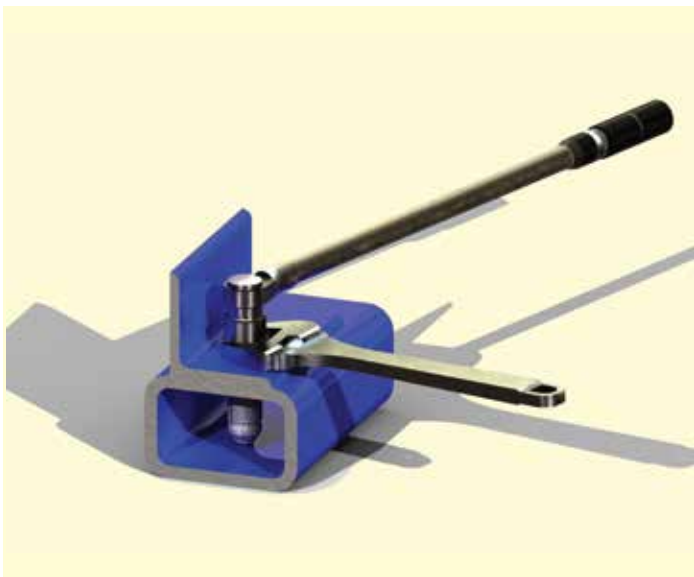
Dia. BOXSOK	Dim A	Dim B	Dim C	Drive D
	(mm)	(mm)	(mm)	(in)
<b>M06</b>	111,5	85,0	30,0	1/4"
<b>M08</b>	112,0	85,5	34,0	3/8"
<b>M10</b>	113,0	86,5	38,0	3/8"
<b>M12</b>	114,0	87,5	42,0	3/8"
<b>M16</b>	114,5	88,0	50,0	1/2"
<b>M20</b>	115,5	89,0	59,0	1/2"



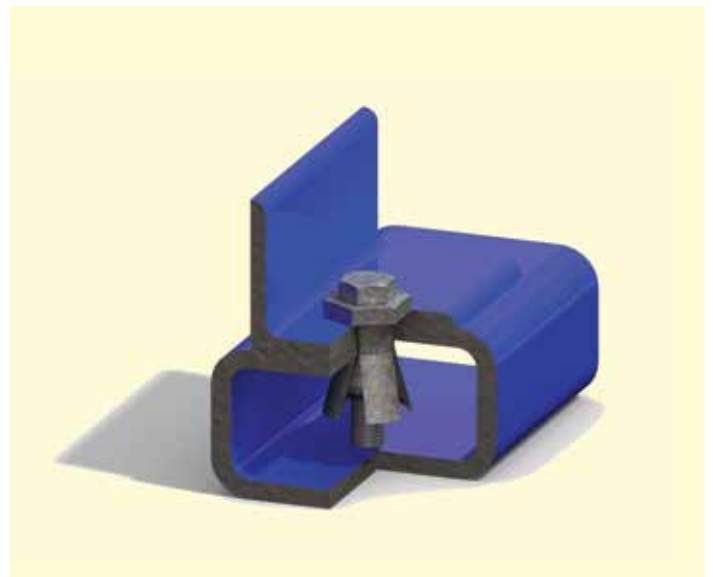
# BoxBolt® Installation Instructions



**STEP 1:** Align the holes in the bracket to be secured with the pre-drilled hole in the structural tube. Insert the **BOXBOLT** through both pieces of steel until the underside of the shoulder is flush with the outside of the steel.



**STEP 2:** Hold the hexagon shoulder of the **BoxBolt** with an open ended wrench. Use an impact wrench or ratchet to tighten the core bolt.



**STEP 3:** Remove the open ended wrench and check to ensure that the core bolt is tightened to the recommended torque.

# BoxBolt® Application Examples

1



Two hollow sections at 90 degrees using an end plate

2



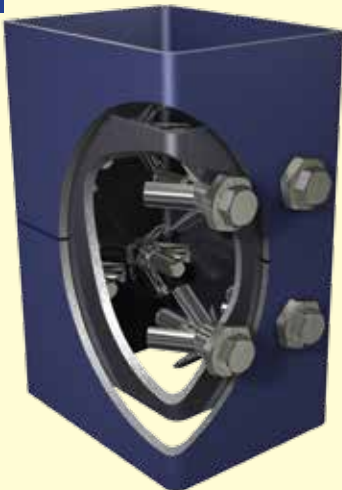
Hollow section below an I-Beam at 90 degrees using a combination of BOXBOLT and BEAMCLAMP fixings

3



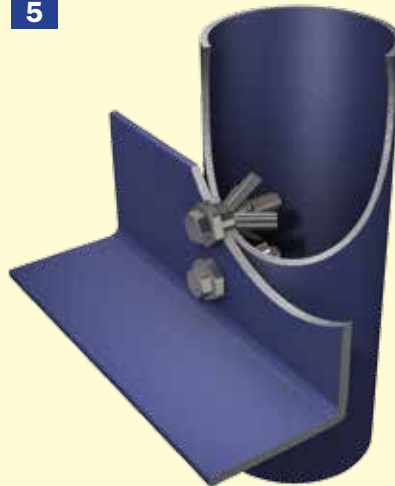
Two hollow sections at 90 degrees using angle brackets

4



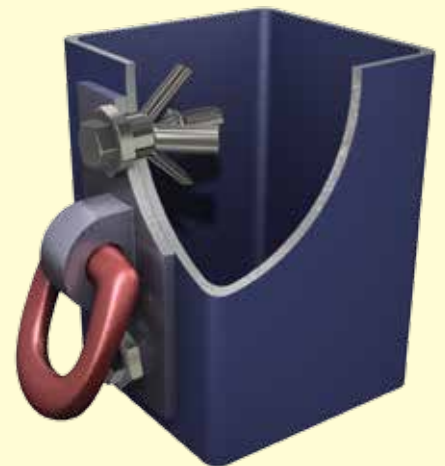
Hollow section sleeve connection creating an aesthetic joint from the outside

5



Angle to vertical hollow section post

6



Rigging point to outside of hollow section

7



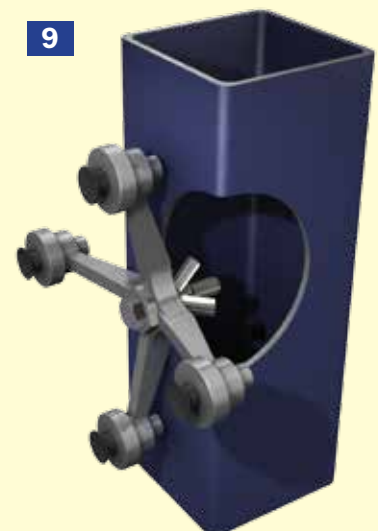
Side fixing of handrail base to hollow section

8



Top fixing of handrail base to hollow section

9



Glazing bracket to hollow section