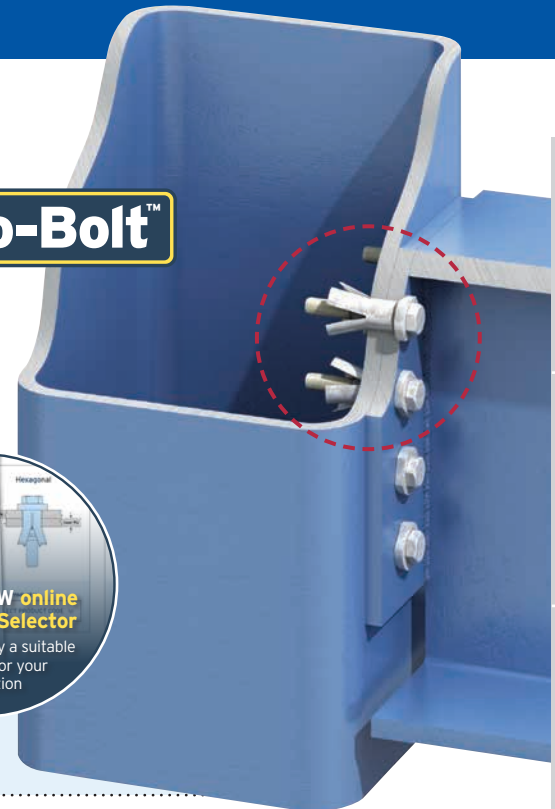


# Hollo-Bolt™ by Lindapter

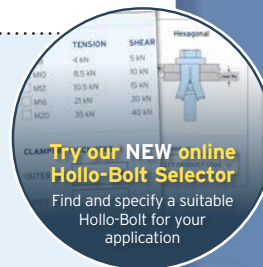
Installation is quickly carried out by inserting into pre-drilled steelwork and tightening with a torque wrench. Independent approvals include UKCA, CE Mark, TÜV, ICC-ES seismic accreditation and Fire Rated up to 120 minutes.



**Hollo-Bolt HCF**  
(High Clamping Force)  
See page 43



- Fast, cost saving installation from one side.
- For square, rectangular and circular hollow sections.
- High resistance to shear and tension.
- Independently tested for dynamic loading.
- **NEW** Independently fire tested.
- Unique High Clamping Force design.
- UKCA, CE Mark, TÜV and ICC-ES Seismic approvals.
- Low temperature tested to -45°C (carbon steel variants).
- **NEW** Hollo-Bolt plug-in tool available in Tekla Warehouse.



\* Carbon steel, hexagonal head Hollo-Bolts in all sizes have been independently fire tested in both tension and shear in accordance with ISO 834 and are fire rated up to 120 minutes. For further details and load data please contact Lindapter.

## 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 Minimal visible protrusion	FLUSH FIT Zero visible protrusion
Core Bolt Ø				
Sizes Available				
Core Bolt Ø	M8	✓	✓	✓
	M10	✓	✓	✓
	M12	✓	✓	✓
	M16 High Clamping Force	✓	✓	-
	M20 High Clamping Force	✓	-	-
Carbon Steel with finish				
Corrosion Protection				
Carbon Steel with finish	Zinc Plated plus JS500	✓	✓	✓
	Hot Dip Galvanised	✓	-	-
	Sheraplex	✓	✓	✓
Stainless Steel		✓	✓	✓

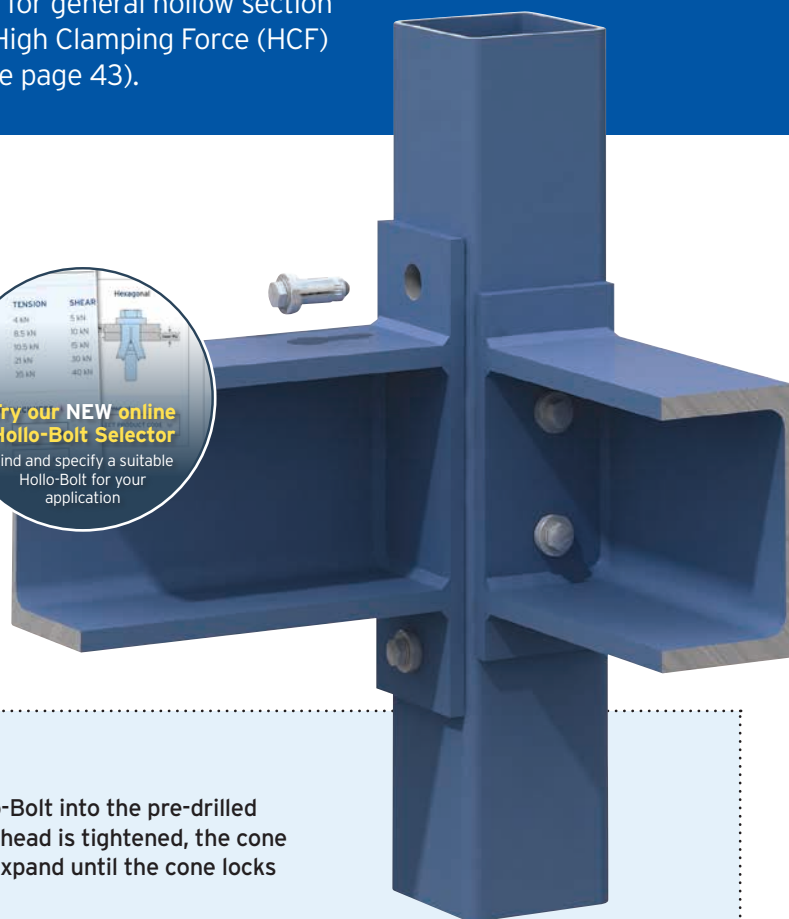
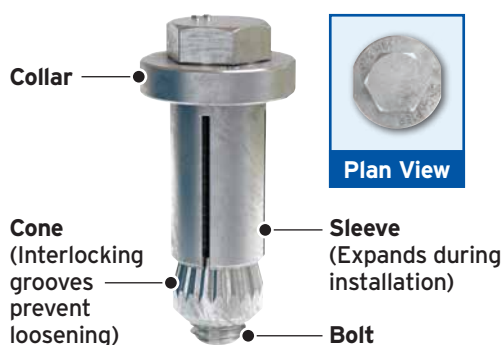
Sizes M16 and M20, known as the Hollo-Bolt HCF, feature a High Clamping Force mechanism to produce three times more clamping force than the same sized product without the mechanism. See page 43 for more information.



## Holo-Bolt Options

Two versions are available; the original design for general hollow section connections (see below) and the larger sized High Clamping Force (HCF) for higher strength structural connections (see page 43).

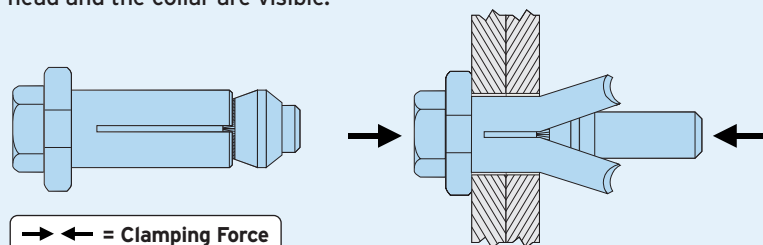
### Holo-Bolt (sizes M8, 10 and M12)



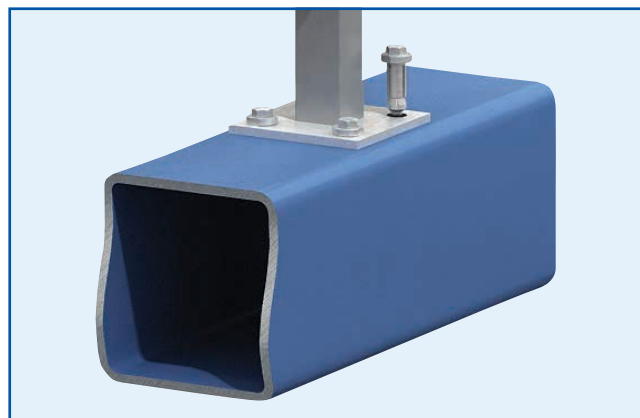
### The Connection Concept

A typical connection is made by inserting the Holo-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.



### Typical Applications



## Hollo-Bolt HCF

The larger M16 and M20 Hollo-Bolts are optimised for high strength structural connections and feature a High Clamping Force mechanism for superior performance.

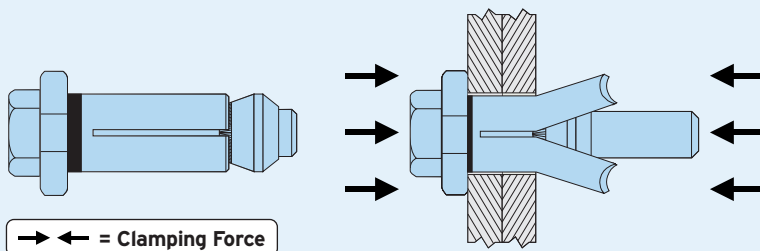
### Hollo-Bolt HCF (sizes M16 and M20)



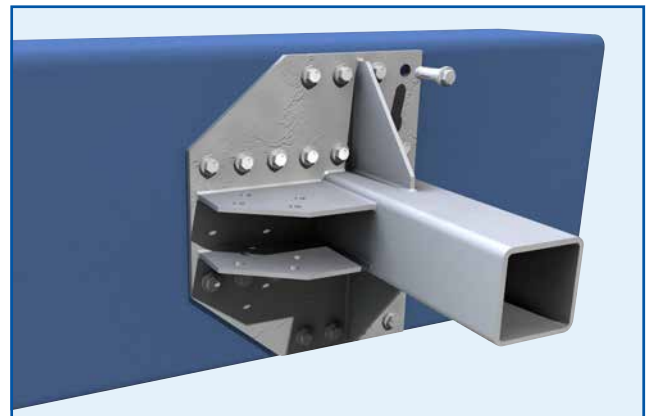
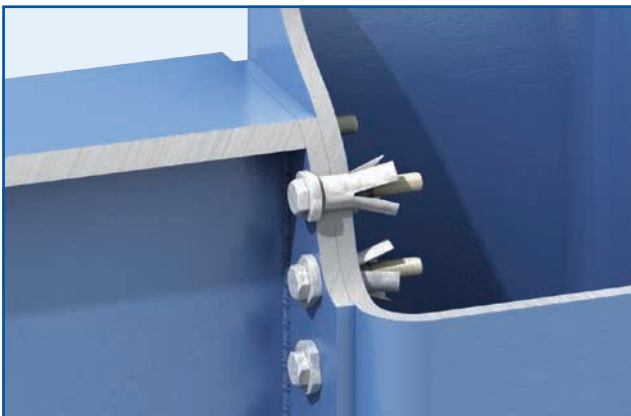
### The Connection Concept

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.

The typical clamping force of Hollo-Bolt HCF is over **three times higher** than the same sized product without the mechanism.

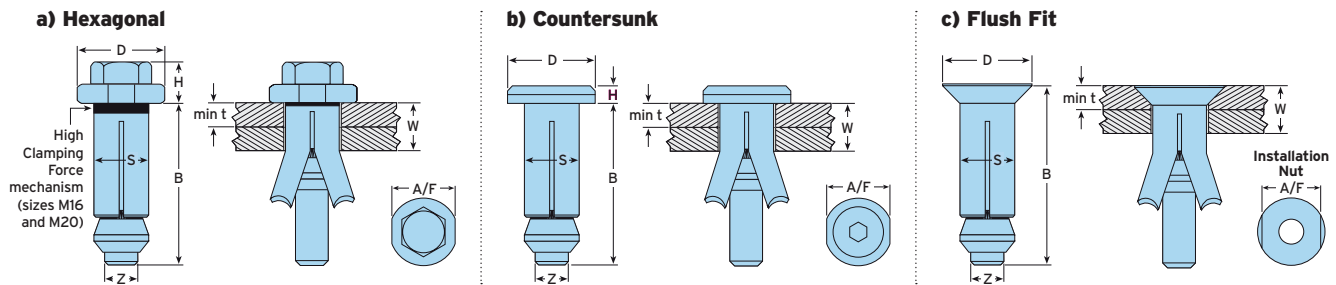


### Typical Applications



# Hollo-Bolt Safe Working Loads

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



Material: Carbon steel or stainless steel (see page 41 for corrosion protection options)

a) Hexagonal				b) Countersunk							Collar		Tightening Torque	Safe Working Loads (5:1 Factor of Safety)		
Product Code	Bolt Ø	Height	Length	Product Code	Bolt Ø	Height	Length	Clamping Thickness	Outer Ply	Sleeve Outer Ø	Ø			Tensile	Single Shear	
	Z	H mm	B (max) mm		Z	H mm	B (max) mm	W mm	min t mm	S mm	D mm	A/F mm		Nm	kN	kN
HB08-1	M8	10.5	45	HBCSK08-1	M8	5	45	3 - 22	-	13.75	22	19	23	4.0	5.0	
HB08-2	M8	10.5	65	HBCSK08-2	M8	5	65	22 - 41	-	13.75	22	19	23	4.0	5.0	
HB08-3	M8	10.5	85	HBCSK08-3	M8	5	85	41 - 60	-	13.75	22	19	23	4.0	5.0	
HB10-1	M10	12.5	49	HBCSK10-1	M10	6	44	3 - 22	-	17.75	29	24	45	8.5	10.0	
HB10-2	M10	12.5	64	HBCSK10-2	M10	6	64	22 - 41	-	17.75	29	24	45	8.5	10.0	
HB10-3	M10	12.5	84	HBCSK10-3	M10	6	84	41 - 60	-	17.75	29	24	45	8.5	10.0	
HB12-1	M12	14.5	53	HBCSK12-1	M12	7	48	3 - 25	-	19.75	32	30	80	10.5	15.0	
HB12-2	M12	14.5	73	HBCSK12-2	M12	7	73	25 - 47	-	19.75	32	30	80	10.5	15.0	
HB12-3	M12	14.5	93	HBCSK12-3	M12	7	93	47 - 69	-	19.75	32	30	80	10.5	15.0	
High Clamping Force (HCF)	HB16-1	M16	18	67	HBCSK16-1	M16	8	62	12 - 29	8	25.75	38	36	190	21.0	30.0
	HB16-2	M16	18	92	HBCSK16-2	M16	8	92	29 - 50	8	25.75	38	36	190	21.0	30.0
	HB16-3	M16	18	112	HBCSK16-3	M16	8	112	50 - 71	8	25.75	38	36	190	21.0	30.0
	HB20-1	M20	22.5	80	-	-	-	-	12 - 34	8	32.75	51	46	300	35.0	40.0
	HB20-2	M20	22.5	110	-	-	-	-	34 - 60	8	32.75	51	46	300	35.0	40.0
	HB20-3	M20	22.5	140	-	-	-	-	60 - 86	8	32.75	51	46	300	35.0	40.0

Material: Carbon steel or stainless steel (see page 41 for corrosion protection options)

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

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

➤ NEW Dynamic load testing has been performed for Hollo-Bolt Hexagonal in accordance with EN 1993-1-9. Please contact our Technical Support team for more information and design data.

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



# Hollo-Bolt Characteristic Resistances

The values listed in the tables below are to be used when designing bolted connection to Eurocode 3 only, they are **not** standard safe working loads. The Declaration of Performance (CE DoP No.001 or UKCA DoP No.101) can be viewed on Lindapter's website or alternatively, request the DoP Brochure.

## Hollo-Bolt Hexagonal

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

## Hollo-Bolt Hexagonal Stainless Steel

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

## Hollo-Bolt Countersunk

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

## Hollo-Bolt Countersunk Stainless Steel

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

Sizes M16 and M20, known as the Hollo-Bolt HCF, feature a High Clamping Force mechanism to produce three times more clamping force than the same sized product without the mechanism. See page 43 for more information.



## Hollo-Bolt Flush Fit

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

## Hollo-Bolt Flush Fit Stainless Steel

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

- Hollo-Bolt lengths 1, 2 and 3 are covered by ETA 10/0416. The characteristic values are used to determine the design resistance of the Hollo-Bolt. The design resistance is calculated by dividing the characteristic value by a partial factor  $\gamma_{M2}$ . The partial factor is a nationally determined parameter (eg:  $\gamma_{M2} = 1.25$  in UK).
- For Hollo-Bolt safe working loads with a Factor of Safety of 5:1 please refer to the tables on page 44 of this catalogue. The characteristic values are valid for the assembly itself, in any connection detail the design resistance of the connection may be limited to a lesser value. For example, when the thickness of the connected component is small, pull out failure may occur before failure of the Hollo-Bolt. Design checks should be carried out to determine the static design resistance.

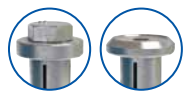
The SCI Greenbook publication 'Joints in Steel Construction: Simple Joints to Eurocode 3' contains a number of checks on the section. The characteristic values are only valid when the Hollo-Bolts are installed as per Lindapter's installation instructions. For more information please contact The Steel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



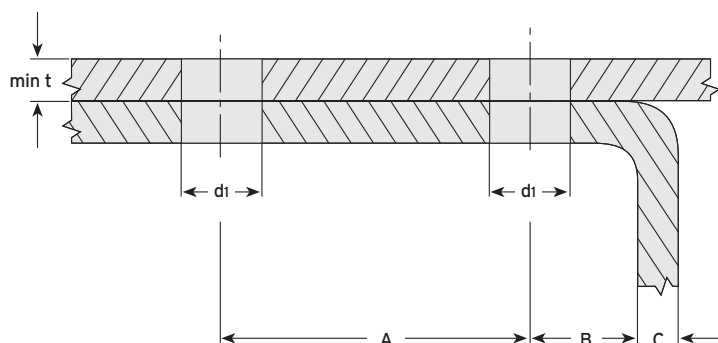


# Holo-Bolt Hexagonal and Countersunk - Drilling and Installation

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



## Preparation for installing Holo-Bolt Hexagonal and Countersunk



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

\* For Holo-Bolts with Hot Dip Galvanised Finish, drilling the clearance hole to the top tolerance is recommended.  
\*\* Ensure holes do not cut through the outer radius.

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



## Tool sizes for installing Holo-Bolt Hexagonal

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



## Tool sizes for installing Holo-Bolt Countersunk

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



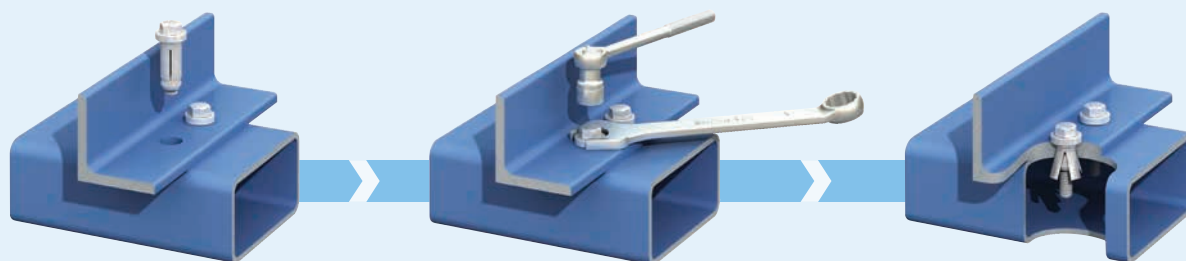
### How to install...

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

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

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

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



#### Notes:

a) Before tightening, ensure that the materials that are to be connected together are touching.

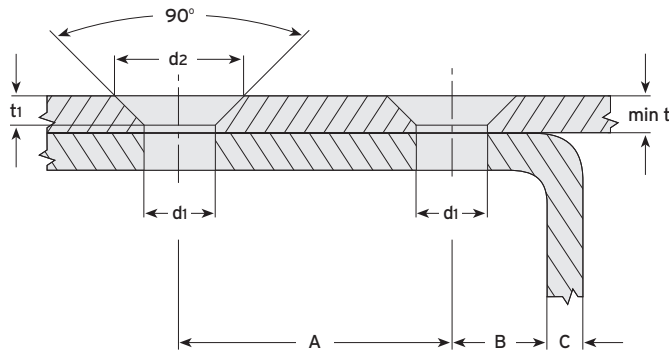
b) Rotate the torque wrench only. See table above for tightening torque.

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

# Hollo-Bolt Flush Fit - Drilling and Installation

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

## Preparation for installing Hollo-Bolt Flush Fit

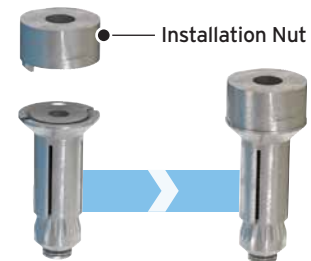


Type	Outer Ply min t mm	Clearance Hole Ø d1 mm	Countersunk d2 mm	t1 mm	Hole Distances* min A mm	min B mm	Edge Distances* B + C mm
HBFF08	8	14 (+1.0/-0.2)	27	6.5	35	13	≥ 17.5
HBFF10	10	18 (+1.0/-0.2)	31	6.5	40	15	≥ 22.5
HBFF12	10	20 (+1.0/-0.2)	35	7.5	50	18	≥ 25.0

\* Ensure holes do not cut through the outer radius.

## Tool sizes for installing Hollo-Bolt Flush Fit

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



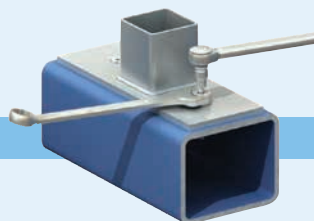
## How to install...

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

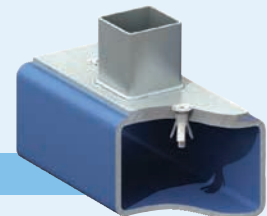
1) Align pre-drilled fixture and section then insert Hollo-Bolt<sup>a)</sup>.



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



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



### Notes:

- a) Before tightening, ensure that the materials that are to be connected together are touching.
- b) Rotate the torque wrench only (the installation nut is for restraining only). See table above for tightening torque.
- c) 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.

## Fillers for Hollo-Bolt applications

Fillers or shims are steel strips or plates used in bolted connections to fill gaps in the connecting steelwork. For guidance regarding the use of fillers/shims in Bolted-Bearing Type connections please refer to EN 1090-2 - Execution of Steel Structures and Aluminium Structures Section 8.

