



The following pages are an excerpt from the North American Product Technical Guide, Volume 1: Direct Fastening Technical Guide, Edition 22.

Please refer to the publication in its entirety for complete details on this product including data development, base materials, general suitability, installation, corrosion, and product specifications.

[Direct Fastening Technical Guide, Edition 22](#)

To consult directly with a team member regarding our direct fastening products, contact Hilti's team of technical support specialists between the hours of 7:00am - 5:00pm CST.

US: 877-749-6337 or HNATechnicalServices@hilti.com

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3.2.14 X-BT FASTENING SYSTEMS

3.2.14.1 PRODUCT DESCRIPTION

The Hilti X-BT Fastening System is an innovative method of fastening to pre-painted steel with little to no damage to the surface coating. The system consists of a Hilti powder-actuated or battery-actuated tool equipped with specially adapted fastener guides for use with X-BT threaded studs. The X-BT fasteners are stainless steel threaded studs available with thread diameters 8 mm, 1/4" (W6) and 3/8" (W10). The stud, with or without sealing washer, is set in a small pre-drilled hole in the base steel. The X-BT system is designed to work on carbon steels as thin as 5/16" (8 mm) without through-penetration and little to no damage to the back surface coatings, helping to eliminate time consuming surface preparation and rework (such as with welding).

The X-BT-GR M8 threaded stud, in conjunction with the X-FCM grating disks, can be used to fasten grating to a variety of different steel shapes (Refer to Section 3.4.2.). X-BT-MR W6 and W10 threaded fasteners can be used to support cable/conduit connectors and trays, piping, channels, instrumentation, lighting fixtures, signage, junction boxes, and other fastenings to steel.

Product features and benefits

- More efficient: No through penetration of base material — helping eliminate rework of the base steel coating.
- Fast: Up to 100 studs per hour can be set by one user.
- Durable: Highly corrosion resistant stainless steel. Fusion to base steel resulting in high load capacities compared to similar methods of fastening.
- Flexible: Works on most steel shapes and thicknesses down to 5/16" (8mm), ideal for both mild and high strength carbon steel base materials.
- Simple: Easy to use portable system requiring no electrical cords or heavy equipment.



X-BT-MR W6, X-BT-MR W10,
X-BT-GR M8

Listings/Approvals

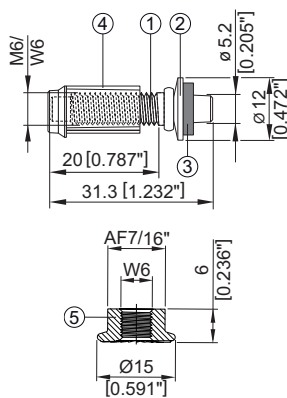
ICC-ES (International Code Council)
ESR-2347 with LABC/LARC Supplement

ABS (American Bureau of Shipping)

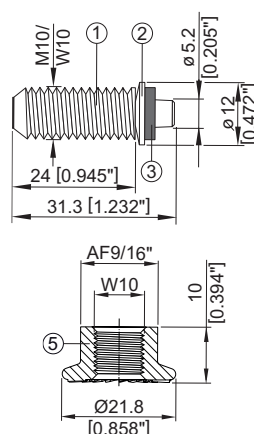
Lloyds Register

DNVGL

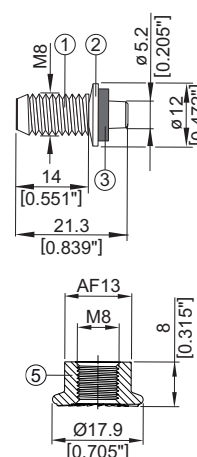
BV (Bureau Veritas)



X-BT-MR W6/10 SN 8
X-BT-MR W6/14 SN 8



X-BT-MR W10/15 SN 8



X-BT-GR M8/7 SN 8

3.2.14.2 MATERIAL SPECIFICATIONS

Part	Material designation
(1) Shank and Thread	S31803 (1.4462) equivalent to A4 / AISI Grade 316
(2) SN washer	S31635 (X2CrNiMo 17-12-2, 1.4404)
(3) Sealing washer	Elastomer, black resistant to: UV, salt water, water, ozone, oils, etc.
(4) Removable guide sleeve	Plastic
(5) Flange Nuts	A4 / AISI Grade 316

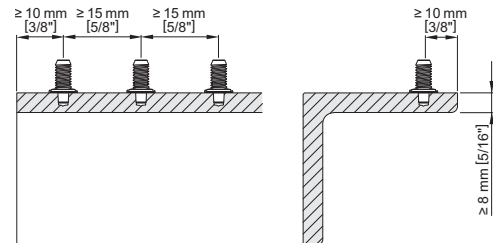
3.2.14.3 TECHNICAL DATA

3.2.14.3.1 North American load tables

Allowable loads in steel base materials 5/16" or greater^{1,2,3,4}

Load type		Minimum ASTM A36 steel	Minimum grade 50 steels
Static	Tension, lb (kN)	775 (3.4)	840 (3.7)
	Shear, lb (kN) ⁶	820 (3.6)	885 (3.9)
	Moment, ft-lb (Nm)	14.8 (20.0)	14.8 (20.0)
Seismic ⁵	Tension, lb (kN)	775 (3.4)	840 (3.7)
	Shear, lb (kN) ⁶	545 (2.4)	590 (2.6)

- The tabulated allowable load values are for the X-BT-MR and X-BT-GR fasteners only, using a safety factor of 5.0. Wood or steel members connected to the base material must be investigated in accordance with accepted design criteria.
- Minimum edge distance and minimum spacing are 3/8" and 5/8", respectively.
- Maximum installation torque for the X-BT-MR is 14.8 ft-lb. Maximum installation torque for the X-BT-GR is 14.8 ft-lb when in connection with the X-FCM-R HL and 5.9 ft-lb when in connection with the standard X-FCM-R.
- Multiple fasteners are recommended for any attachment.
- Allowable Loads commonly used in North America. Static and seismic allowable loads based on testing and evaluation in accordance with ICC-ES AC708-16, including Annex A.
- Allowable shear load requires that the shear is transferred directly to the fastener steel washer at surface. Shear loads shown are not valid for friction as a shear transfer mechanism.



3.2.14.3.2 European load tables

Recommended static loads in steel base materials 5/16" or greater^{1,2}

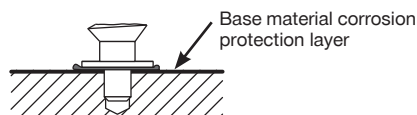
Load type	Minimum ASTM A36 steel	Minimum grade 50 steels
Tension, lb (kN)	810 (3.6)	1035 (4.6)
Shear, lb (kN)	970 (4.3)	1190 (5.3)
Moment, ft-lb (Nm)	14.8 (20.0)	14.8 (20.0)
Torque, ft-lb (Nm)	14.8 (20.0)	14.8 (20.0)

- Recommended loads are based on a global safety factor of 2.8 applied to the characteristic resistance for static tension or shear, which are derived from the 5% fractile of the ultimate load. Recommended moment values are based on a global safety factor of 1.75. This safety concept is commonly used in regions outside of North America, where design is carried out in accordance with the Eurocode.
- Multiple fasteners are recommended for any attachment.

Design resistance in steel base materials 5/16" or greater^{1,2}

Load type	Minimum ASTM A36 steel	Minimum grade 50 steels
Tension, lb (kN)	1120 (5.0)	1460 (6.5)
Shear, lb (kN)	1350 (6.0)	1680 (7.5)
Moment, ft-lb (Nm)	20.5 (28.0)	20.5 (28.0)

- Design resistance is based on a safety factor of $\gamma_M = 2.0$ applied to the characteristic resistance for static tension or shear, which is derived from the 5% fractile of the ultimate load. Moment design resistance values are based on a safety factor of $\gamma_M = 1.25$. Design resistance should be greater than calculated demand that has been reduced by a partial safety factor. This safety concept is commonly used in regions outside of North America, where design is carried out in accordance with the Eurocode.
- Multiple fasteners are recommended for any attachment.

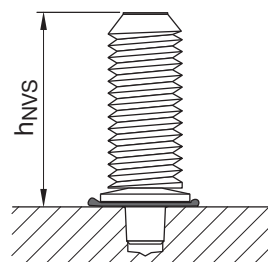


Thickness of base material corrosion protection layer ≤ 0.02 inch (0.5 mm).
For thicker coatings, please contact Hilti.

3.2.14.3.3 X-BT Fastener selection¹

Designation	Diameter	h_{NVS}^2 in. (mm)
For use in coated steel or HDG		
X-BT-MR W6/10 SN 8	1/4	1.055 (26.8)
X-BT-MR W6/14 SN 8 ³	1/4	1.055 (26.8)
X-BT-MR W10/15 SN 8	3/8	1.055 (26.8)
X-BT-GR M8/7 SN 8	M8	0.661 (16.8)

- Unless indicated otherwise, dimension in inches
- Maximum value allowable. May vary by -0.043 " (-1.1 mm).
- For use with DX 351 BT only

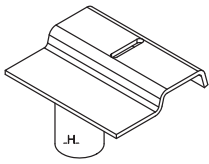


3.2.14.4 INSTALLATION INSTRUCTIONS

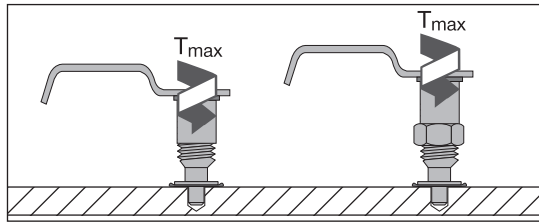
Installation Instructions For Use (IFU) are included with each product package. They can also be viewed or downloaded online at www.hilti.com. Because of the possibility of changes, always verify that downloaded IFU are current when used.

Proper installation is critical to achieve full performance. Training is available on request. Contact Hilti Technical Services for applications and conditions not addressed in the IFU.

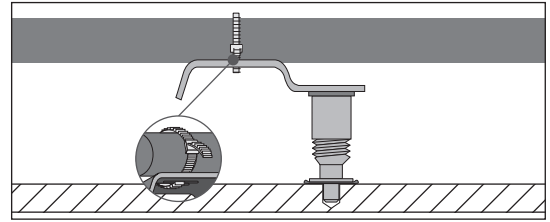
Stainless steel T-bar for fastening cables to steel structures^{1,2,3}



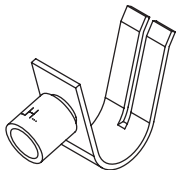
Slotted T-bar



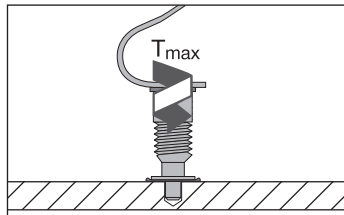
1. Attach Slotted T-bar on installed X-BT fastener. Do not exceed Maximum Tightening Torque, $T_{\max} = 6 \text{ ft-lb (8 Nm)}$.



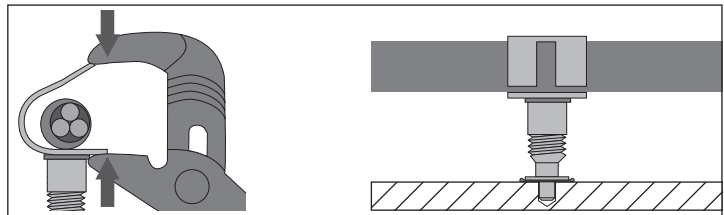
2. Place and attach cable to Slotted T-bar.



Crimp T-bar



1. Attach Crimp T-bar on installed X-BT fastener. Do not exceed Maximum Tightening Torque, $T_{\max} = 6 \text{ ft-lb (8 Nm)}$.



2. Insert cable into Crimp T-bar and wrap Crimp T-bar around cable.

¹ These are abbreviated instructions which may vary by application. **ALWAYS** review/follow the instructions accompanying the product.
² Reference Section 3.2.14.5 for information on number and size of cables.
³ Space T-bars at approximately 24" to 32" (60-80 cm). Adjust as necessary to control cable sagging.

3.2.14.5 ORDERING INFORMATION

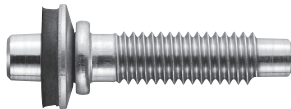
X-BT Stainless Steel Threaded Studs¹

Tapered shank, sealing washer diameter 1/2" (12 mm)

Thread diameter	Thread length in. (mm)	Package contents	Ordering designation
M8	9/16 (14)	100	X-BT-GR M8/7 SN 8
W6	13/16 (20)	100	X-BT-MR W6/10 SN 8
W6	13/16 (20)	100	X-BT-MR W6/14 SN 8
W10	15/16 (24)	100	X-BT-MR W10/15 SN 8

Box includes: 100 studs, 1 power regulation guide, 1 coating protector, 1 TX-BT step drill bit

¹ X-BT stainless steel threaded studs also available without sealing washer on request by special order



TX-BT Step Drill Bits¹

4.7 mm drill bit diameter, 7 mm drilling depth

Overall length in. (mm)	Package contents	Ordering designation
3-1/8 (80)	10	TX-BT 4.7/7-80 drill bit
4-5/16 (110)	10	TX-BT 4.7/7-110 drill bit

¹ 150 mm length bits available upon request by special order



Cartridges

(in magazine strips of 10)

Color code	Package contents	Ordering designation
Brown	100	6.8/11M brown cartridge



Tool sets

For use with	Package contents	Ordering designation
X-BT-MR W6/14 SN 8 and X-BT-MR W10/15 SN 8	1	X-BT Set
X-BT-GR M8/7 SN 8	1	X-BTG Set

DX 351 Set includes: 1 DX 351 BT or BTG powder-actuated tool, 1 BT cleaning kit, 1 SF BT 22-A cordless drill, 1 charger, 2 batteries, 1 information sheet, 1 spray lube, 3 operating instructions, packed complete in a Hilti toolbox.



Individual tools

For use with	Package contents	Ordering designation
X-BT-MR W6/10 SN 8	1	BX 3-BT Battery-actuated Tool X-FG B3-BT W Fastener Guide
Supplied in an impact-resistant plastic toolbox with cleaning kit and operating instructions, info sheet.		
X-BT-GR M8/7 SN 8	1	BX 3-BTG Battery-actuated Tool X-FG B3-BTG Fastener Guide
Supplied in an impact-resistant plastic toolbox with cleaning kit and operating instructions, info sheet.		
X-BT-MR W6/14 SN 8	1	DX 351 BT powder-actuated tool
Supplied in an impact-resistant plastic toolbox with cleaning kit, spray lubricant and operating instructions, info sheet.		
X-BT-GR M8/7 SN 8	1	DX 351 BTG powder-actuated tool
Supplied in an impact-resistant plastic toolbox with cleaning kit, spray lubricant and operating instructions, info sheet.		
X-BT	1	SF BT 22-A
Supplied in a cardboard box with operating instructions. Battery and charger sold separately.		
Supplied in a cardboard box with operating instructions. Battery and charger sold separately.		

**T-bar Cable Hangers**

Hanger description	Recommended max. no. of cables	Cable ø
Slotted T-bars		
T-bar X-P15002-ESL-2	2	Up to 1.25"
T-bar X-P15002-ESL-3	3	Up to 1.25"
T-bar X-P15002-ESL-4	4	Up to 1.25"
T-bar X-P15002-ESL-6	6	Up to 1.25"
T-bar X-P15002-ESL-8	8	Up to 1.25"
Crimp T-bars		
T-bar X-1026-1	1	0.437" to 0.750"
T-bar X-1027-1	1	0.680" to 0.900"
T-bar X-1030-1	1	0.750" to 1.000"
T-bar X-1040-1	1	0.375" to 0.531"
T-bar X-2002-2	2	0.437" to 0.750"
T-bar X-2003-2	2	0.680" to 0.900"

