



The following pages are an excerpt from the North American Product Technical Guide, Volume 1: Direct Fastening Technical Guide, Edition 24.

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 24](#)

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.

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## 3.2.12 STUD FASTENERS FOR ATTACHMENT TO STEEL

### 3.2.12.1 PRODUCT DESCRIPTION

The Hilti threaded stud program is for use with Hilti powder-actuated tools to provide a fast and reliable solution for making attachments to steel base material in lieu of through bolting, screw fastening, or stud welding. Threaded studs are available in SAE 316 stainless steel equivalent corrosion resistance or carbon steel to meet a wide range of application requirements when

making fastenings to steel 3/16" and thicker. The X-EW6H and X-EW10H threaded studs are hardened fasteners with a unique knurled shank design for improved penetration and high tension and shear values in ASTM A36 and higher grades of steel. Thread diameters are 1/4", 3/8", and 8 mm with thread lengths ranging from 3/8" to 1-1/2".

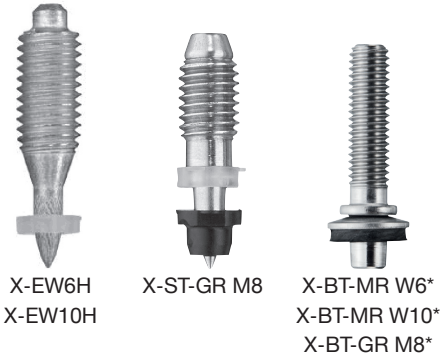
### 3.2.12.2 MATERIAL SPECIFICATIONS

Fastener designation	Fastener material	Fastener plating
X-EW6H	Carbon steel	5 µm Zinc <sup>1</sup>
X-EW10H	Carbon steel	5 µm Zinc <sup>1</sup>
X-ST-GR M8	SAE 316 stainless steel <sup>2</sup>	N/A
X-BT-MR W6*	SAE 316 stainless steel <sup>2</sup>	N/A
X-BT-MR W10*	SAE 316 stainless steel <sup>2</sup>	N/A
X-BT-GR M8*	SAE 316 stainless steel <sup>2</sup>	N/A

<sup>1</sup> ASTM B633, SC 1, Type III. Refer to Section 2.3.3.1 for more information.

<sup>2</sup> Equivalent corrosion resistance to SAE 316 stainless steel. Refer to Section 2.3.3.1 for more information.

3.2.12.1	Product description
3.2.12.2	Material specifications
3.2.12.3	Technical data
3.2.12.4	Installation instructions
3.2.12.5	Ordering information



### Listings/Approvals

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

**FM (Factory Mutual)**  
X-EW10H and X-EW6H

**UL (Underwriters Laboratories)**  
X-EW10H and X-EW6H

**ABS (American Bureau of Shipping)**

**Lloyds Register**

**GL (Germanischer Lloyd)**

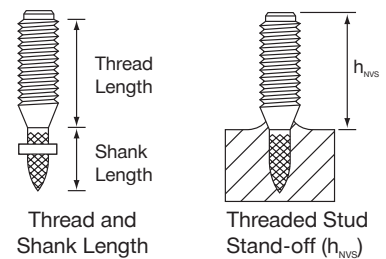
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### 3.2.12.3 TECHNICAL DATA

Threaded steel stud specification table

Designation	Thread designation	Thread length in. (mm)	Shank length in. (mm)	Threaded stud stand-off, h <sub>NVS</sub> in. (mm)
X-EW6H-11-9	UNC 1/4-inch	<b>7/16</b> (11)	<b>3/8</b> (9)	<b>3/8 - 1/2</b> (9.5 - 12.5)
X-EW6H-20-9	UNC 1/4-inch	<b>3/4</b> (20)	<b>3/8</b> (9)	<b>23/32 - 27/32</b> (18.5 - 21.5)
X-EW6H-28-9	UNC 1/4-inch	<b>1-1/8</b> (28)	<b>3/8</b> (9)	<b>1-1/16 - 1-5/32</b> (26.5 - 29.5)
X-EW6H-38-9	UNC 1/4-inch	<b>1-1/2</b> (38)	<b>3/8</b> (9)	<b>1-7/16 - 1-9/16</b> (36.5 - 39.5)
X-EW10H-30-14	UNC 3/8-inch	<b>1-3/16</b> (30)	<b>9/16</b> (14)	<b>1-3/32 - 1-7/32</b> (28.0 - 31.0)
X-ST-GR M8/5	Metric 8 mm	<b>3/8</b> (9)	<b>1/2</b> (12)	<b>15/32 - 19/32</b> (12.0 - 15.0)
X-ST-GR M8/10	Metric 8 mm	<b>5/8</b> (15)	<b>1/2</b> (12)	<b>21/32 - 25/32</b> (17.0 - 20.0)
X-BT-MR W6/14 SN 8*	UNC 1/4-inch	<b>13/16</b> (20)	<b>1/4</b> (6)	<b>1 - 1-1/16</b> (25.7 - 26.8)
X-BT-GR M8/7 SN 8*	Metric 8 mm	<b>9/16</b> (14)	<b>1/4</b> (6)	<b>5/8 - 11/16</b> (15.7 - 16.8)
X-BT-MR W10/15 SN 8*	UNC 3/8-inch	<b>15/16</b> (24)	<b>1/4</b> (6)	<b>1 - 1-1/16</b> (25.7 - 26.8)

\* Innovative blunt-tip X-BT fasteners are discussed in more detail in Section 3.2.14



Allowable loads in minimum ASTM A36 ( $F_y \geq 36$  ksi;  $F_u \geq 58$  ksi) steel<sup>1,2</sup>

Stud type	Shank diameter in. (mm)	Steel thickness in. (mm)									
		3/16 (4.8)		1/4 (6.4)		3/8 (9.5)		1/2 (12.7)		≥ 3/4 (19.1)	
		Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
X-EW6H	0.145 (3.7)	360 (1.60)	500 (2.22)	500 (2.22)	600 (2.67)	500 (2.22)	600 (2.67)	500 (2.22)	600 (2.67)	500 (2.22)	600 (2.67)
X-EW10H	0.205 (5.2)	-	-	970 (4.31)	1000 (4.45)	1100 (4.89)	1100 (4.89)	1100 (4.89)	1100 (4.89)	800 (3.56)	800 (3.56)
X-ST-GR M8	0.157 (4.0)	-	-	405 (1.80)	405 (1.80)	405 (1.80)	405 (1.80)	-	-	-	-
X-BT-MR W6/W10, X-BT-GR M8 <sup>3</sup>	Tapered <sup>4</sup>	-	-	-	-	775 (3.45)	820 (3.65)	775 (3.45)	820 (3.65)	775 (3.45)	820 (3.65)

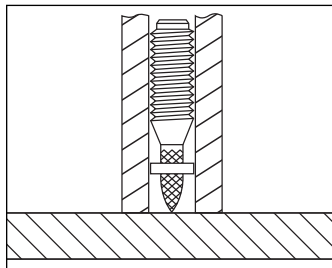
- The tabulated allowable load values are for the low-velocity threaded studs only, using a factor of safety that is greater than or equal to 5.0, calculated in accordance with AC70. Wood or steel members connected to the substrate must be investigated in accordance with accepted design criteria.
- Tabulated allowable load values based upon embedment in steel such that threaded stud stand-off,  $h_{NVS}$ , complies with the Threaded Steel Stud Specification Table.
- To prevent through penetration or damage to coatings on the base steel, a minimum base steel thickness of 5/16" is required for X-BT threaded studs. Load values provided for 3/8" base steel thickness are also valid for 5/16" base steel thickness. For further information, reference Section 3.2.14.
- Shank diameter: 0.213" - 0.193" (5.4mm - 4.9mm)

Allowable bending moments for threaded stud fasteners installed in minimum ASTM A36 steel<sup>1,2</sup>

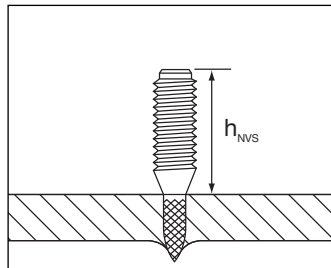
Fastener nomenclature	$M_{rec}$ ft-lb (Nm)
X-EW6H	2.2 (3.0)
X-EW10H	6.5 (8.8)
X-ST-GR M8	4.0 (5.5)
X-BT-MR W6/W10, X-BT-GR M8*	14.8 (20.0)

- Based on a safety factor greater than or equal to 2.0.
- For more information on bending moments, reference Section 3.2.2.7.

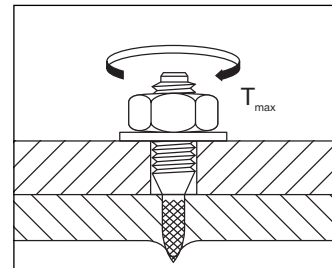
3.2.12.4 INSTALLATION INSTRUCTIONS<sup>1,2</sup>



- Press tip of fastener to steel material. Drive fastener with Hilti powder-actuated tool.



- Ensure proper threaded stud stand-off.



- Make attachment. Do not exceed maximum tightening torque,  $T_{max}$ .

- These are abbreviated instructions which may vary by application. **ALWAYS** review/follow the instructions accompanying the product.
- Installation instructions for innovative blunt-tip X-BT fasteners are provided in Section 3.2.14.4

Maximum tightening torque,  $T_{max}$ , for threaded studs driven into steel, ft-lb (Nm)

Stud type				
X-EW6H	X-EW10H	X-ST-GR M8	X-BT-MR W6/W10*	X-BT-GR M8*
3.0 (4.1)	11.0 (14.9)	6.0 (8.1)	14.8 (20.0)	12.0 (16.0)

\*Innovative blunt-tip X-BT fasteners are installed with a Hilti DX 351 BT powder-actuated tool and discussed in more detail in Section 3.2.14.

### 3.2.12.5 ORDERING INFORMATION

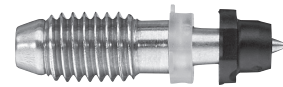
Fastener description	Shank length in. (mm)	Shank Ø in. (mm)	Thread length in. (mm)	Thread Ø	Guidance washer Ø	Packaging quantity
X-EW6H-38-9FP8	3/8 (9)	0.145 (3.7)	1-1/2 (38)	UNC 1/4-inch	8 mm plastic	100 pcs
X-EW6H-28-9FP8	3/8 (9)	0.145 (3.7)	1-1/8 (28)	UNC 1/4-inch	8 mm plastic	100 pcs
X-EW6H-20-9FP8	3/8 (9)	0.145 (3.7)	3/4 (20)	UNC 1/4-inch	8 mm plastic	100 pcs
X-EW6H-11-9FP8	3/8 (9)	0.145 (3.7)	7/16 (11)	UNC 1/4-inch	8 mm plastic	100 pcs
X-EW10H-30-14P10	9/16 (14)	0.205 (5.2)	1-3/16 (30)	UNC 3/8-inch	10 mm plastic	100 pcs
X-BT-MR W6/14 SN 8	1/4 (6)	Tapered	13/16 (20)	UNC 1/4-inch	12 mm steel	100 pcs
X-BT-MR W10/15 SN 8	1/4 (6)	Tapered	15/16 (24)	UNC 3/8-inch	12 mm steel	100 pcs
X-BT-GR M8/7 SN 8	1/4 (6)	Tapered	9/16 (14)	Metric 8 mm	12 mm steel	100 pcs
X-ST-GR M8/10	1/2 (12)	0.157 (4.0)	5/8 (15)	Metric 8 mm	8 mm plastic	100 pcs
X-ST-GR M8/5	1/2 (12)	0.157 (4.0)	3/8 (9)	Metric 8 mm	8 mm plastic	100 pcs



DX 5 Tool



X-EW6H and X-EW10H



X-ST-GR M8



X-BT 4000-A Drill and TX-BT Step Drill Bit



DX 351 BT Tool and Brown Cartridge Strip

X-BT\*

\* Innovative blunt-tip X-BT fasteners are discussed in more detail in Section 3.2.14