



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

CA: 1-800-363-4458 ext. 6 or CATechnicalServices@hilti.com

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Listings/Approvals

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



3.2.14.6 X-BT-MF FASTENING SYSTEMS

3.2.14.6.1 Product description

The Hilti X-BT-MF Fastening System is a faster, simpler, and more reliable fastening solution to painted or coated steel without damaging the surface coating for mildly corrosive environments. The system consists of a Hilti powder-actuated tool equipped with specially adapted fastener guides for use with X-BT-MF. The X-BT-MF fasteners are stainless steel shanks with composite fiber-reinforced polymer (FRP) threads with thread diameters M10 and W10. The stud with sealing washer is cleanly set in a small pre-drilled hole in the base steel. The X-BT-MF fastener is assembled with a pre-mounted 12 mm stainless steel washer with bonded elastomer sealing washer and is supplied with a fiber-reinforced polymer (FRP) nut with integrated flange. The X-BT-MF system is designed to work on carbon steel base material as thin as 5/16 inch (8 mm) without through-penetration or little to no damage to surface coatings, virtually eliminating time consuming surface preparation and rework (such as with welding).

Product features:

- Threaded blunt-tip fastener for light duty electrical & instrumentation applications
- No through penetration of steel base material and little to no rework on coated steel
- 304 stainless steel shank and high performance FRP polymer thread and flange nut – no need for additional washer, convenient fastenings in all directions
- Optimum choice for use in mildly corrosive environments, not for use in marine atmospheres (upstream) or in heavily polluted environments.

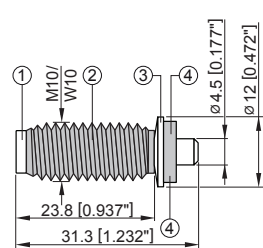
Specification text:

05090 Metal Fastenings

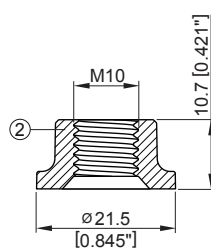
Blunt-tip (X-BT-MF), powder-actuated, M10 or W10 threaded stud with FRP flange nut manufactured by Hilti, for attaching items to coated/uncoated carbon steels with base materials thickness greater than or equal to 5/16 inch. Contact a manufacturer's representative from Hilti to provide installation training to the operators at the project site.

3.2.14.6.2 Material specifications

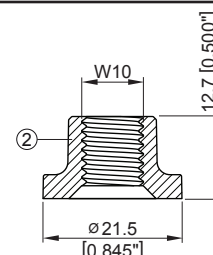
Part	Material designation	Tensile strength, F_u ksi (N/mm ²)
Shank	Corrosion resistant stainless steel	≥ 205 (1400)
Threaded sleeve	Glass-fiber reinforced polyamide material	≥ 27.5 (190)
SN washer	X2CrNiMo 17-12-2	≥ 110 (750)
Sealing washer	Elastomer, black resistant to: UV, water, ozone, oils, etc.	N/A
M10 flange nut	Glass-fiber reinforced polyamide material	≥ 27.5 (190)
W10 flange nut	Glass-fiber reinforced polyamide material	≥ 27.5 (190)



X-BT-MF M10/10 SN4
and X-BT-MF W10/10 SN4



M10 FRP Nut with
Integrated Washer



W10 FRP Nut with
Integrated Washer

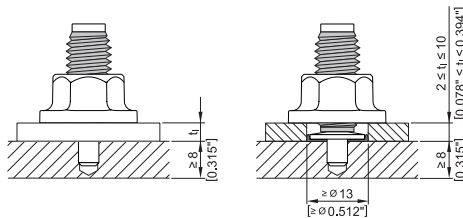
3.2.14.6.3 Technical data

Allowable loads in steel base material 5/16" or greater^{1,2,3,4,5,6}

Load Type	Minimum ASTM A36 steel
Tension, lb (kN)	340 (1.5)
Shear, lb (kN)	500 (2.2)
Moment, ft-lb (Nm)	6 (8.1)
Torque, ft-lb (Nm)	6 (8.1)

- The tabulated allowable load values are for the X-BT-MF fastener only, using a safety factor of 5.0 to the average ultimate values obtained in testing. Wood or steel members connected to the substrate must be investigated in accordance with accepted design criterion.
- Minimum edge distance and minimum spacing are 1/4" and 5/8", respectively.
- Multiple fasteners are recommended for any attachment.
- Based on service temperature from -40° F to +140° F (-40° C to +60° C) and installation temperature from 14° F to 140° F (-10° C to +60° C).
- Use with Hilti glass-fiber reinforced polyamide (FRP) flange nuts, M10 and W10.
- Not to be used with any additional washer which provide an axial force when deformed, e.g. spring or lock washer, etc. Lock washer will affect the integrity and functionality of Hilti glass-fiber reinforced polyamide (FRP) flange nuts.

Thickness of fastened materials



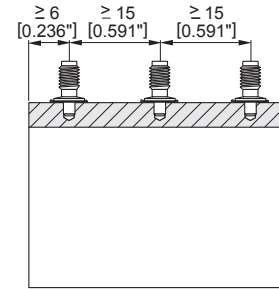
$2.0 \leq t_1 \leq 10.0 \text{ mm}$
 $0.07'' \leq t_1 \leq 0.39''$

Fastened material hole \varnothing
 13 mm (0.51")

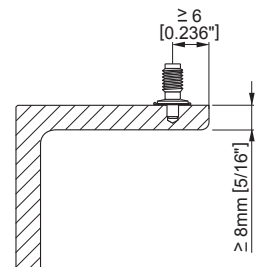
Remark: for group fastenings subjected to shear loading the fastened material hole diameter should not exceed 14 mm (0.55").

Spacing and edge distances

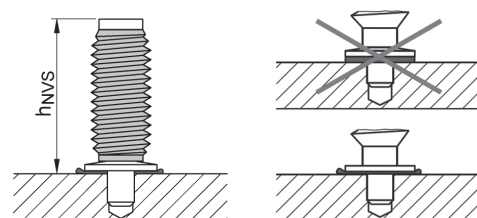
Spacing: $\geq 15 \text{ mm}$



Edge distance: $\geq 6 \text{ mm}$

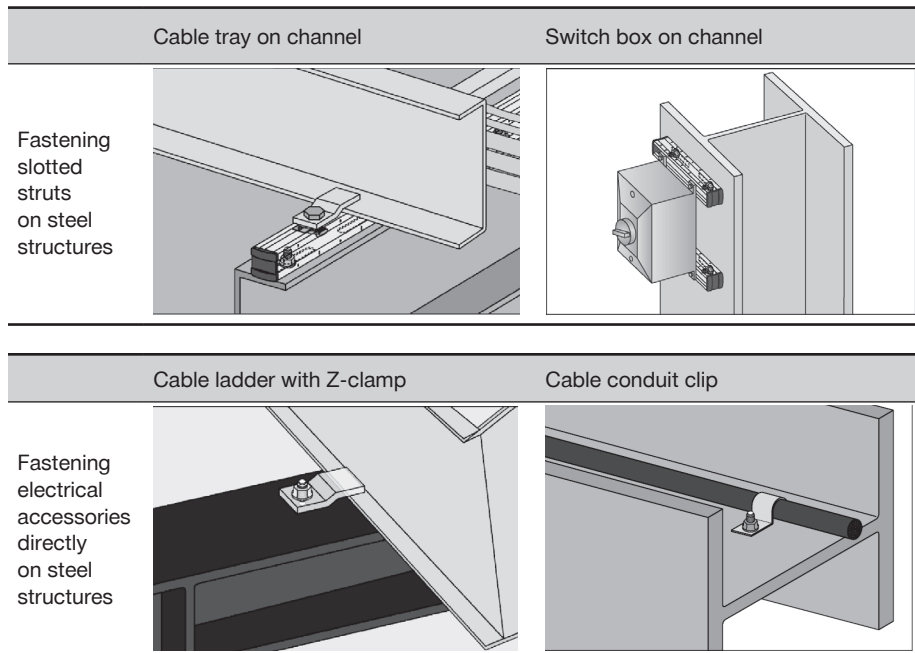


Checking stand-off from the base material



$h_{NVS} = 25.7 - 26.8 \text{ mm}$
 $= 1.012'' - 1.055''$

Applications



3.2.14.6.4 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.

3.2.14.6.5 Ordering information

X-BT-MF Composite Threaded Studs

Shank diameter **0.177"** (4.5 mm), sealing washer diameter **1/2"** (12 mm)

Thread diameter	Thread length in. (mm)	Package contents	Ordering designation
W10 (3/8")	15/16 (24)	100	X-BT-MF W10/10 SN4 (incl. FRP flange nut)

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



TX-BT Step Drill Bits

4 mm drill bit diameter, 7 mm drilling depth

Bit length in. (mm)	Package contents	Ordering designation
3-1/8 (80)	10	TX-BT 4/7 - 80 drill bit



Cartridges

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

"High Precision" is a narrow energy band at a specific energy level



Tool sets

For use with	Package contents	Ordering designation
X-BT-MF	1	X-BT Set

Set includes: 1 DX 351-BT 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-MF	1	DX 351 BT powder-actuated tool

Supplied in an impact-resistant plastic toolbox with cleaning kit, Hilti spray lubricant and operating instructions, info sheet.

For use with	Package contents	Ordering designation
X-BT-MF	1	SF BT 22-A

Supplied in a cardboard box with operating instructions. Battery and charger sold separately.



Replacement parts

For use with	Package contents	Ordering designation
X-BT-MF W10	1	X-351-BT FG W1024 Fastener Guide
X-BT-MF W10	1	X-351 BT P 1024 Piston



Accessories

Shank diameter 0.177" (4.5 mm), sealing washer diameter 1/2" (12 mm)

For use with	Package contents	Ordering designation
W10 nut with flange	1	Socket X-NSD 1/4" - 9/16" socket
X-NSD sockets	1	T-handle X-NSD 1/4"
X-NSD sockets	1	Torque tool X-BT 1/4"

Socket for 16mm and 9/16" WAF (width across flats) with holding mechanism for nuts

