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.

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3.2.16 STANDOFF ADAPTERS FOR THREADED STUDS

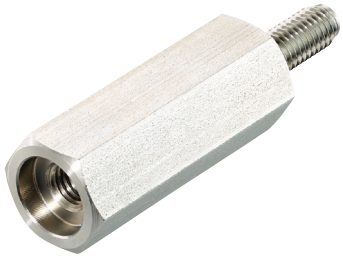
3.2.16.1	Product description
3.2.16.2	Material specifications
3.2.16.3	Application
3.2.16.4	Technical data
3.2.16.5	Installation instructions
3.2.16.6	Ordering information

3.2.16.1 PRODUCT DESCRIPTION

The MR and MF standoff adaptors are used in conjunction with Hilti X-BT and S-BT threaded stud fastening systems, to provide an extension to those fasteners. The threaded studs are installed into steel, according to their installation instructions, to provide a threaded protrusion for a variety of applications, including fastening of electrical cables and conduit, support of slotted framing channel (strut) and hanging of pipes from steel. Both the X-BT and S-BT systems provide a high level of corrosion protection for the steel that is being fastened to. Please see Sections 3.2.14 and 3.2.15 for detailed information regarding these products.

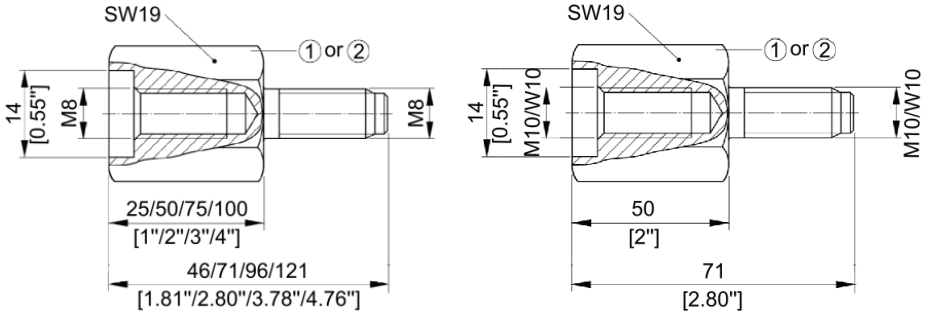
The Standoff Adapters are supplied in four lengths, in order to accommodate situations where a cantilever is needed to complete the application. Specifically, the adapters are used when fastening directly to steel with thick coatings, such as intumescent fire protection coatings. A small cylindrical section of the coating is removed using a special tool, allowing for installation of the X-BT or S-BT stud, followed by screwing the adaptor on the installed threaded stud. The adapter allows for various elements to be attached without damage to the coating as may occur with traditional methods like welding or clamping.

X-BT MR Threaded Stud



MR-M8 Standoff Adaptor

3.2.16.2 MATERIAL SPECIFICATIONS



Designation	Internal Thread Diameter	Standoff height in. (mm)	Overall height in. (mm)	Material designation [1,2]
Adapter M8-MR 25	8 mm	0.98 (25)	1.81 (46)	Stainless steel
Adapter M8-MR 50	8 mm	1.97 (50)	2.80 (71)	Stainless steel
Adapter M8-MR 75	8 mm	2.96 (75)	3.78 (96)	Stainless steel
Adapter M8-MR 100	8 mm	3.94 (100)	4.76 (121)	Stainless steel
Adapter M8-MF 25	8 mm	0.98 (25)	1.81 (46)	Carbon steel HDG
Adapter M8-MF 50	8 mm	1.97 (50)	2.80 (71)	Carbon steel HDG
Adapter M8-MF 75	8 mm	2.96 (75)	3.78 (96)	Carbon steel HDG
Adapter M8-MF 100	8 mm	3.94 (100)	4.76 (121)	Carbon steel HDG
Adapter W10-MR 50	3/8”	1.97 (50)	2.80 (71)	Stainless steel
Adapter W10-MF 50	3/8”	1.97 (50)	2.80 (71)	Carbon steel HDG

1 Stainless steel - AISI 316 (X5CrNiMo)
2 Carbon steel - duplex coated

3.2.16.3 APPLICATION

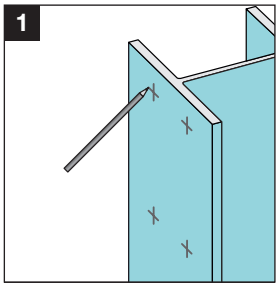
3.2.16.3.1 STANDOFF ADAPTOR WITH S-BT THREADED STUDS

S-BT threaded studs with Hilti standoff adapter for attaching instrumentation. junction boxes, lighting, installation channel systems etc. to steel with a Passive Fire Protection (PFP) coating or insulated steel members e.g. instulated bulkheads.

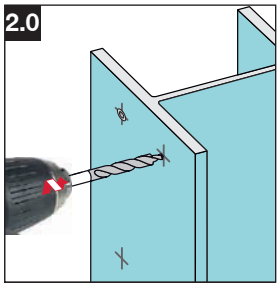
Installation Instructions

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.

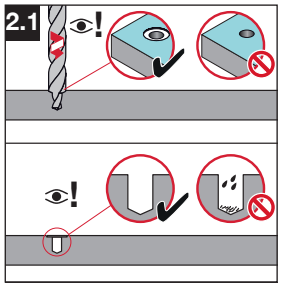
Proper installation is critical to achieve full performance. Training is available on request. Contact Hilti Technical Services for applications and conditions not addressed in the IFU.



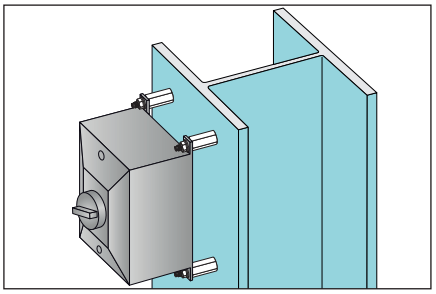
Mark location of each fastening.

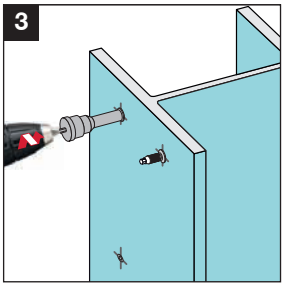


Pre-drill with TS-BT stepped drill bit.

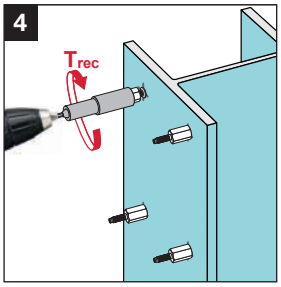


Pre-drill until shoulder grinds a shiny ring. The drilled hole and the area around drilled hole must be clean and free from liquids and debris.

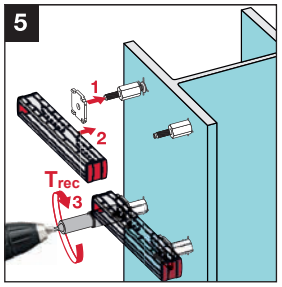




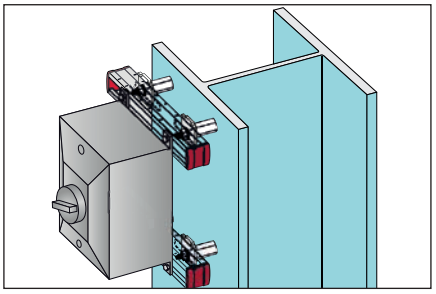
Screw-in S-BT studs into drilled hole.

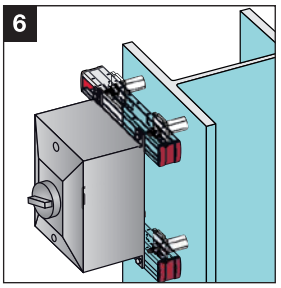


Screw-on the Hilti standoff adapter on the S-BT stud and tighten it with the suited installation torque.



Position channel on standoff adapter and hold in place. Tighten the nuts with a tightening torque T_{rec} of 20 Nm.





Fasten the accessory on the channel with the suited installation torque.

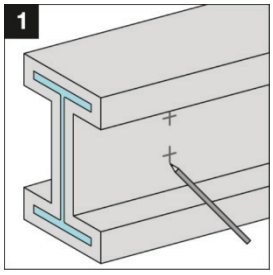
Tightening torque (standoff adapter on S-BT)
T_{rec} = 8 Nm
T_{rec} = 5 Nm [1)]

[1)] for steel base material thickness
3 mm ≤ tIl < 5 mm

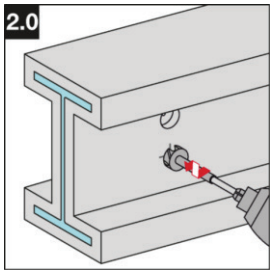
Tightening torque (nut on standoff adapter)
T_{rec} = 20 Nm

Notes:
1. See section 3.2.16.5 and 3.2.15 for more detailed instructions on the setting procedure for S-BT threaded studs.
2. The Standoff Adaptor can be used with X-BT threaded studs for applications similar to those shown above. It can also be used with both the X-BT and S-BT where Passive Fire Protection (PFP) coating is present. The installation process is similar but includes removal of a plug of the PFP. See application instructions 3.2.16.3.2 below for more information.

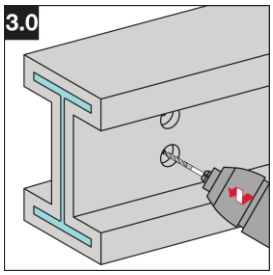
3.2.16.3.2 STANDOFF ADAPTOR WITH X-BT THREADED STUDS AND PFP COATED STEEL



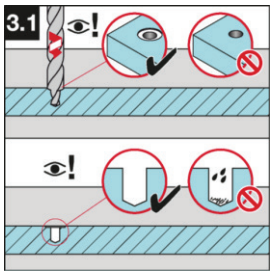
Mark location of each fastening.



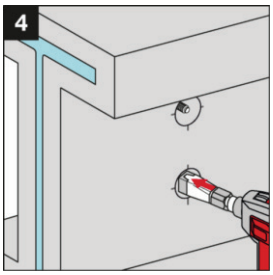
Pre-drill with TS-BT 31-74 PFP stepped drill bit...



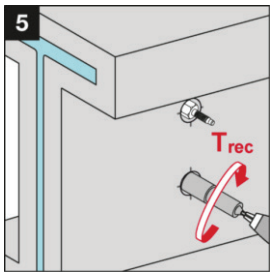
Pre-drill with TX-BT stepped drill bit...



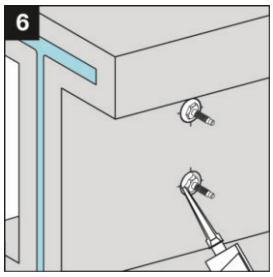
... until shoulder grinds a shiny ring. The area must be clean and free from liquids and debris.



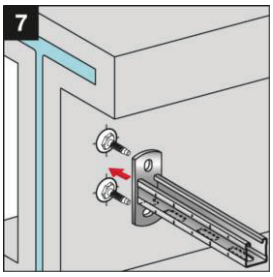
Set X-BT studs into drilled hole.



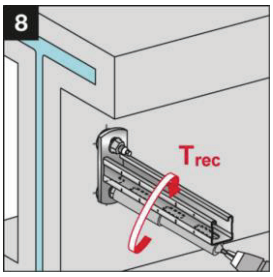
Tighten the standoff adapter with the recommended installation torque of 8 Nm.



Close the opening less than 4 hours after the opening is made in accordance to the patching instructions by the PFP-manufacturer.



Position accessory on standoff adapter and hold in place.

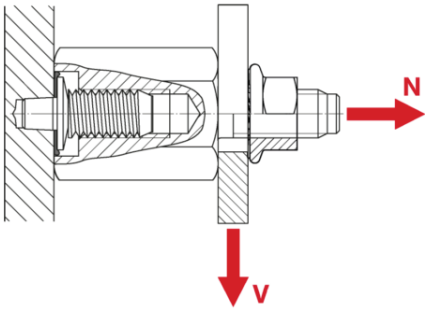


Fasten the accessory on the standoff adapter with the recommended installation torque of 20 Nm.

Notes:
1. See section 3.2.16.5 and 3.2.15 for more detailed instructions on the setting procedure for S-BT threaded studs.
2. The Standoff Adaptor can be used with S-BT threaded studs for applications similar to those shown above. Both the X-BT and S-BT can also be used in applications where Passive Fire Protection (PFP) coating is not present. The installation process is similar but does not include removal of the PFP. See application instructions 3.2.16.3.1 above for more information.

3.2.16.4 TECHNICAL DATA

3.2.16.4.1 LOAD APPLICATION



3.2.16.4.2 NORTH AMERICAN LOAD TABLES

Allowable static loads — Standoff Adaptor with X-BT MR threaded studs [1,2,3,4,5]

Load type/fastener		Minimum ASTM A36 steel	Miniumum grade 50 steel
Tension, lb (kN) 25, 50, 75, 100 mm		775 (3.45)	840 (3.74)
Shear, lb (kN) 25 mm Adaptor		175 (0.78)	205 (0.91)
Shear, lb (kN) 50 mm Adaptor		95 (0.42)	115 (0.51)
Shear, lb (kN) 75 mm Adaptor		75 (0.33)	85 (0.38)
Shear, lb (kN) 100 mm Adaptor		50 (0.22)	60 (0.27)
Tightening Torque, ft-lb (Nm)[6]	Standoff Adaptor on X-BT	5.9 (8.0)	5.9 (8.0)
	Nut on Standoff Adaptor	14.8 (20.0)	14.8 (20.0)

Notes:
1. Allowable loads are for MR and MF Standoff Adaptors in conjunction with X-BT MR M8 threaded studs. Moments on the stud beyond those induced by the shear load must be evaluated.
2. All installation parameters for X-BT MR M8 fasteners must be followed.
3. Allowable loads based on a minimum safety factor of 5.0 applied to the average ultimate load.
4. Multiple fasteners are recommended for any attachment.
5. Fastened material must be considered separately.
6. When installing nut on standoff adaptor, care should taken to ensure standoff adaptor connection to S-BT does not experience excess torque.

Allowable static loads — Standoff Adaptor with S-BT threaded studs [1,2,3,4,5]

Load type/fastener		Minimum ASTM A36 steel		Miniumum grade 50 steel	
		1/8" - 3/16" Thick	≥ 7/32" Thick	1/8" - 3/16" Thick	≥ 7/32" Thick
Tension, lb (kN) 25, 50, 75, 100 mm		225 (1.00)	405 (1.80)	295 (1.31)	520 (2.31)
Shear, lb (kN) 25 mm Adaptor		85 (0.38)	120 (0.53)	100 (0.44)	145 (0.64)
Shear, lb (kN) 50 mm Adaptor		45 (0.20)	65 (0.29)	55 (0.24)	80 (0.36)
Shear, lb (kN) 75 mm Adaptor		35 (0.16)	50 (0.22)	40 (0.18)	60 (0.27)
Shear, lb (kN) 100 mm Adaptor		25 (0.11)	35 (0.16	30 (0.13)	40 (0.18)
Tightening Torque, ft-lb (Nm)[6]	Standoff Adaptor on S-BT	3.6 (5.0)	5.9 (8.0)	3.6 (5.0)	5.9 (8.0)
	Nut on Standoff Adaptor	14.8 (20.0)	14.8 (20.0)	14.8 (20.0)	14.8 (20.0)

Notes:
1. Allowable loads are for MR and MF Standoff Adaptors in conjunction with S-BT threaded studs. Moments on the stud beyond those induced by the shear load must be evaluated.
2. All installation parameters for S-BT fasteners must be followed.
3. Allowable loads based on a minimum safety factor of 5.0 applied to the average ultimate load.
4. Multiple fasteners are recommended for any attachment.
5. Fastened material must be considered separately.
6. When installing nut on standoff adaptor, care should taken to ensure standoff adaptor connection to S-BT does not experience excess torque.

3.2.16.4.3 EUROPEAN LOAD TABLES

Recommended static loads — Standoff Adaptor with X-BT MR threaded studs [1,2,3,4,5]

Load type/fastener		Minimum ASTM A36 Steel	Minimum grade 50 steel
Tension, lb (kN) 25, 50, 75, 100 mm		810 (3.60)	1035 (4.60)
Shear, lb (kN) 25 mm Adaptor		255 (1.14)	320 (1.43)
Shear, lb (kN) 50 mm Adaptor		140 (0.62)	175 (0.78)
Shear, lb (kN) 75 mm Adaptor		115 (0.52)	145 (0.65)
Shear, lb (kN) 100 mm Adaptor		80 (0.35)	100 (0.44)
Tightening Torque, ft-lb (Nm)[6]	Standoff Adaptor on X-BT	5.9 (8.0)	5.9 (8.0)
	Nut on Standoff Adaptor	14.8 (20.0)	14.8 (20.0)

Notes:
1. Recommended laods are for MR and MF Standoff Adaptors in conjunction with X-BT MR M8 threaded studs. Moments on the stud beyond those induced by the shear load must be evaluated.
2. All installation parameters for X-BT MR M8 fasteners must be followed.
3 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.
4. Multiple fasteners are recommended for any attachment.
5. Fastened material must be considered separately.
6. When installing nut on standoff adaptor, care should taken to ensure standoff adaptor connection to S-BT is does not experience excess torque.

Design resistance — Standoff Adaptor with X-BT MR threaded studs [1,2,3,4,5]

Load type/fastener	Minimum ASTM A36 Steel	Minimum grade 50 steel
Tension, lb (kN) 25, 50, 75, 100 mm	1120 (5.00)	1460 (6.50)
Shear, lb (kN) 25 mm Adaptor	360 (1.60)	450 (2.00)
Shear, lb (kN) 50 mm Adaptor	195 (0.87)	245 (1.09)
Shear, lb (kN) 75 mm Adaptor	165 (0.73)	205 (0.91)
Shear, lb (kN) 100 mm Adaptor	110 (0.49)	135 (0.61)

Notes:
1. Design resistances are for MR and MF Standoff Adaptors in conjunction with X-BT MR M8 threaded studs. Moments on the stud beyond those induced by the shear load must be evaluated.
2. All installation parameters for X-BT MR M8 fasteners must be followed.
3. Design resistance is based on a safety factor of γM = 2.0 applied to the characteristic resistance for static tension or shear, which is derived from the 5% fractile of the ultimate load. 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.
4. Multiple fasteners are recommended for any attachment.
5. Fastened material must be considered separately.

Recommended static loads — Standoff Adaptor with S-BT threaded studs [1,2,3,4,5]

Load type/fastener		Minimum ASTM A36 steel		Miniumum grade 50 steel	
		1/8" - 3/16" Thick	≥ 7/32" Thick	1/8" - 3/16" Thick	≥ 7/32" Thick
Tension, lb (kN) 25, 50, 75, 100 mm		405 (1.8)	425 (1.9)	470 (2.1)	515 (2.3)
Shear, lb (kN) 25 mm Adaptor		125 (0.55)	190 (0.84)	125 (0.55)	225 (1.00)
Shear, lb (kN) 50 mm Adaptor		70 (0.31)	100 (0.45)	70 (0.31)	120 (0.54)
Shear, lb (kN) 75 mm Adaptor"		55 (0.24)	75 (0.33)	55 (0.24)	90 (0.40)
Shear, lb (kN) 100 mm Adaptor		40 (0.18)	50 (0.23)	40 (0.18)	60 (0.28)
Tightening Torque, ft-lb (Nm)[6]	Standoff Adaptor on S-BT	3.6 (5.0)	5.9 (8.0)	3.6 (5.0)	5.9 (8.0)
	Nut on Standoff Adaptor	14.8 (20.0)	14.8 (20.0)	14.8 (20.0)	14.8 (20.0)

Notes:
1. Recommended loads are for MR and MF Standoff Adaptors in conjunction with S-BT threaded studs. Moments on the stud beyond those inudced by the shear load must be evaluated.
2. All installation parameters for S-BT fasteners must be followed.
3. 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.
4. Multiple fasteners are recommended for any attachment.
5. Fastened material must be considered separately.
6. When installing nut on standoff adaptor, care should taken to ensure standoff adaptor connection to S-BT is does not experience excess torque.

Design resistance — Standoff Adaptor with S-BT threaded studs [1,2,3,4,5]

Load type/fastener	Minimum ASTM A36 steel		Minimum grade 50 steel	
	1/8" - 3/16" Thick	≥ 7/32" Thick	1/8" - 3/16" Thick	≥ 7/32" Thick
Tension, lb (kN) 25, 50, 75, 100 mm	560 (2.5)	605 (2.7)	670 (3.0)	715 (3.2)
Shear, lb (kN) 25 mm Adaptor	170 (0.77)	260 (1.17)	170 (0.77)	315 (1.41)
Shear, lb (kN) 50 mm Adaptor	95 (0.43)	140 (0.64)	95 (0.43)	170 (0.76)
Shear, lb (kN) 75 mm Adaptor	75 (0.34)	105 (0.47)	75 (0.34)	125 (0.55)
Shear, lb (kN) 100 mm Adaptor	55 (0.25)	70 (0.32)	55 (0.25)	90 (0.39)

Notes:
1. Design resistances are for MR and MF Standoff Adaptors in conjunction with S-BT threaded studs. Moments on the stud beyond those induced by the shear load must be evaluated.
2. All installation parameters for S-BT fasteners must be followed.
3. Design resistance is based on a safety factor of γM = 2.0 applied to the characteristic resistance for static tension or shear, which is derived from the 5% fractile of the ultimate load. 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.
4. Multiple fasteners are recommended for any attachment.
5. Fastened material must be considered separately.

3.2.16.5 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.

3.2.16.6 ORDERING INFORMATION

Description	Ordering designation (package quantity)	Item number
Standoff Adaptors (includes one M8 flange nut per adaptor)	Adapter M8-MR 25 (50)	2268522
	Adapter M8-MR 50 (50)	2268523
	Adapter M8-MR 75(50)	2268524
	Adapter M8-MR 100(50)	2268525
	Adapter M8-MF 25 (50)	2268526
	Adapter M8-MF 50 (25)	2268527
	Adapter M8-MF 75 (25)	2268528
	Adapter M8-MF 100 (25)	2268529
	Adapter W10-MR 50 (25)	2281191
	Adapter W10-MF 50 (25)	2281192
Drill bit (S-BT installation only)	Drill Bit TS-BT 5.5-74 S	2143137
Drill bit (X-BT installation only)	Drill Bit TX-BT 4.7/7 - 150	2197629
Drill bit for PFP coating removal (X-BT and S-BT)	Drill Bit TS-BT 31-74 PFP	2270470

Note: For additional installation accessories for X-BT threaded studs and S-BT threaded studs, see sections 3.2.14 and 3.2.15 respectively.