



**Hilti Product
Technical Guide
Supplement
S-BT Screw-in
Threaded Studs**

**Supplement to
Hilti North American
Product Technical Guide
Volume 1:
Direct Fastening
Technical Guide**

3.2.11 S-BT Fastening Systems

3.2.11.1 Product description

3.2.11.2 Material specifications

3.2.11.3 Technical data

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Listings/Approvals

COLA (City of Los Angeles) Pending
ABS (American Bureau of Shipping)
LR (Lloyd's Register)
DNV-GL
RS (Russian Maritime Register of shipping)
BV (Bureau Veritas)



3.2.11.1 Product Description

The Hilti S-BT Fastening System is an innovative method of fastening to steel base material. The system consists of a Hilti installation tool equipped with depth gauge for use with setting the S-BT studs.

The S-BT fasteners are threaded studs manufactured from carbon steel or stainless steel with thread diameters 8 mm (M8) and 3/8" (W10). Carbon steel studs are supplied with an aluminum sealing washer Ø10 mm, stainless steel studs are supplied with a stainless steel sealing washer Ø12, both with an EPDM sealing ring, are cleanly set in a pre-drilled hole in the base steel. The S-BT system is designed to

work on carbon steels from 1/8" to 3/16" with a pre-drilled through hole and carbon steels ≥ 1/4" with a pre-drilled pilot hole.

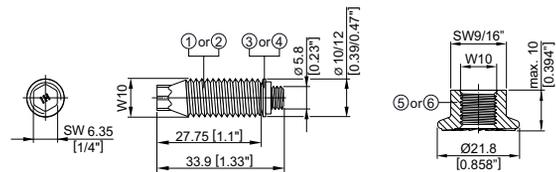
Product Features

- No propellants required.
- No through penetration of steel base material 1/4" and thicker.
- No rework of coated steel required.
- Offer fastening options for both stainless and carbon steel materials.
- Easy removal - S-BT fastener is removable.

3.2.11.2 Material Specifications

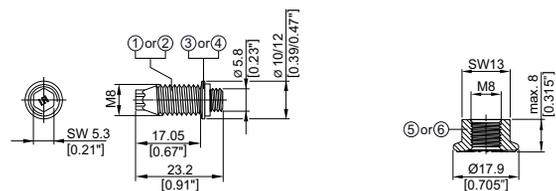
Product	Part	Material Designation	Tensile Strength, F _u ksi (N/mm ²)
Stainless Steel (S-BT-_R)	① Shank	Corrosion Resistant Stainless Steel S 31803 (1.4462)	≥ 190 (320)
	③ SN washer	Corrosion Resistant Stainless Steel S 31603 (1.4404)	N/A
	⑤ Serrated Flange Nut	Corrosion Resistant Stainless Steel grade A4 - 70/80	≥ 100 (700)
Carbon Steel (S-BT-_F)	② Shank	Carbon Steel 1038 duplex coated	≥ 130 (900)
	④ AN washer	Aluminum	N/A
	⑥ Serrated Flange Nut	Carbon Steel HDG	≥ 125 (870)
Both Stainless Steel (S-BT-_R) and Carbon Steel (S-BT-_F)	Sealing Washer	Elastomer, black resistant to: UV, water, ozone, oils, etc.	N/A

S-BT-MF W10/15 AN6



S-BT-GR M8/7 SN 6*)
 S-BT-GF M8/7 AN 6*)

*) : package does not include serrated flange nuts



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3.2.11.3 Technical Data

Allowable Loads in Minimum ASTM A36 ($F_y \geq 36$ ksi; $F_u \geq 58$ ksi) Steel^{1,2}

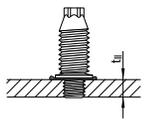
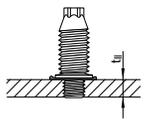
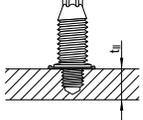
Fastener	Steel Thickness in.					
	1/8		3/16		$\geq 1/4$	
	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
S-BT-GR M8/7 SN 6	225 (1.00)	340 (1.50)	225 (1.00)	340 (1.50)	405 (1.80)	540 (2.40)
S-BT-GF M8/7 AN 6 S-BT MF W10/15 AN 6	225 (1.00)	340 (1.50)	225 (1.00)	340 (1.50)	405 (1.80)	540 (2.40)

Allowable Loads in Minimum ASTM 50 ($F_y \geq 50$ ksi; $F_u \geq 65$ ksi) Steel^{1,2}

Fastener	Steel Thickness in.					
	1/8		3/16		$\geq 1/4$	
	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
S-BT-GR M8/7 SN 6	295 (1.30)	430 (1.90)	295 (1.30)	430 (1.90)	520 (2.30)	610 (2.70)
S-BT-GF M8/7 AN 6 S-BT MF W10/15 AN 6	295 (1.30)	430 (1.90)	295 (1.30)	430 (1.90)	520 (2.30)	510 (2.25)

- The tabulated allowable values are for the S-BT fasteners only, using a safety factor that is greater than or equal to 5.0, calculated in accordance with ICC-ES AC70.
- Multiple fasteners are recommended for any attachment.

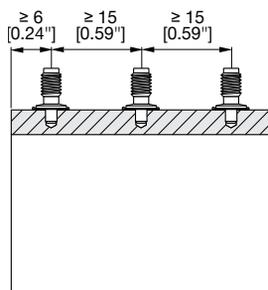
Recommended Tightening Torque on Serrated Flange Nut, ft-lb (Nm) and Type of Bore Hole

Fastener	Steel Thickness t_{II} in.		
	$1/8 \leq t_{II} < 3/16$	$3/16 \leq t_{II} < 1/4$	$t_{II} \geq 1/4$
S-BT-GR M8/7 SN 6 S-BT-GF M8/7 AN 6 S-BT MF W10/15 AN 6	Torque 3.6 (5)  Drill through hole*	Torque 5.9 (8)  Drill through hole*	Torque 5.9 (8)  Pilot hole*

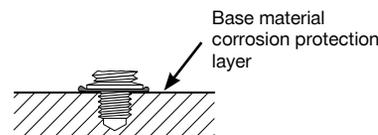
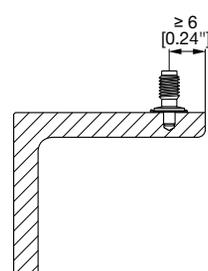
* In case of a drill through hole, or a pilot hole with steel thickness of 1/4 inch, rework of the coating on the back side of the plate / profile may be needed.

Spacing and Edge Distances

Spacing: ≥ 15 mm



Edge distance: ≥ 6 mm



Remark: thickness of base material corrosion protection layer ≤ 0.8 mm [0.032"]. For thicker coatings, please contact Hilti.

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Application Requirements

Thickness of Fastened Materials	Checking Stand-off from the Base Material
<p>S-BT-MF W10/15 AN6 $1.6 \text{ mm [0.063"]} \leq t_i \leq 15.0 \text{ mm [0.59"]}$</p>	<p>S-BT-MF W10/15 AN6 $h_{NVS} = 29.3 \text{ mm to } 29.8 \text{ mm [1.15" to } 1.17"]$</p>

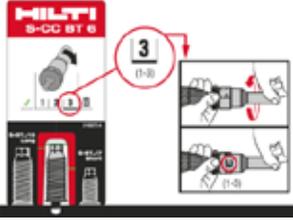
Applications

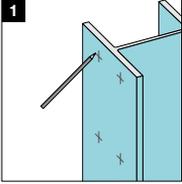
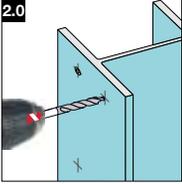
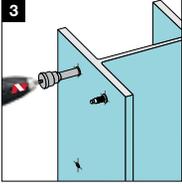
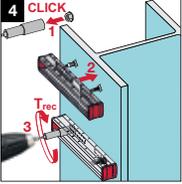
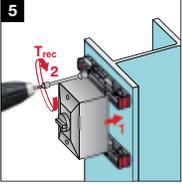
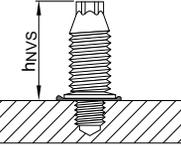
Multipurpose Fastening	Grating with X-FCM*)
<p>S-BT-MF W10/15 AN6</p>	<p>S-BT-GR M8/7 SN6</p>
	<p>S-BT-GF M8/7 AN6</p>
<p>Junction box, etc. Channel installation Signage</p>	<p>Grating fastening</p>

* Load data, application requirements, corrosion information, fastener selection, system recommendation, material specification and coating refer to section X-FCM Grating Fastening

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3.2.11.4 Installation Instructions

 <p>S-DG BT mechanical depth gauge</p>	<p>In order to help ensure the exact screw-in depth and a proper compressed sealing washer, the S-BT studs have to be installed with the appropriate depth gauge for M8 or M10/W10 S-BT fasteners. With this tool the screw-in depth can be adjusted in a range of 0 - 1.5 mm (3 steps, 0.5mm per step).</p>
 <p>Design and functionality of the mechanical calibration card S-CC BT</p>	<p>The S-CC BT calibration card is needed to check the initial stand-off of the S-BT stud and to adjust/calibrate the S-DG depth gauge. After finding the right adjustment level for the S-DG depth gauge, the gauge can be adjusted to the level number shown in the calibration card accordingly and the studs can be installed without additional check of the S-DG depth gauge.</p> <p>The depth gauge has to be re-adjusted (calibrated) at following times:</p> <ul style="list-style-type: none"> • Start of the installation process • Change of the working position (upwards, downwards, horizontal) • Installer change <p>The lifetime of the S-DG BT depth gauge is ≥ 1000 settings.</p>

<p>① Mark location for each fastening</p>	<p>② Pre-drill with TS-BT stepped drill bit</p>	<p>③ Screw-in S-BT studs into drilled hole</p>	<p>④ Fasten channel on base material</p>	<p>⑤ Fasten accessory on channel</p>											
															
	<p>Usage of SF BT 18-A or SF BT 22-A. Pre-drill until the shoulder grinds a shiny ring to assure proper drilling depth.</p>  <p>Before fastener installation: The drilled hole and the area around the drilled hole must be clear of liquids and debris.</p>	<p>Usage of SFC 18-A or SFC 22-A in combination with the calibrated depth gauge S-DG BT.</p> <p>Verify stud stand-off h_{NVS} with check gauge S-CG BT</p>  <p>Sealing washer must be properly compressed!</p>	<p>Position channel on S-BT studs and hold in place. Tighten the nuts with the suited tightening torque T_{rec}.</p> <p>T_{rec} ref. to table below. Tighten the nuts using</p> <ul style="list-style-type: none"> • SFC 18-A / 22-A with socket S-NS • torque tool X-BT 1/4", 5.9 ft-lbf (8Nm) or S-BT 1/4", 3.6 ft-lbf (5 Nm) • torque wrench <table border="1" data-bbox="959 1507 1225 1709"> <tr> <td rowspan="2">Hilti screwdriver:</td> <td colspan="2">T_{rec} (ft-lbs)</td> </tr> <tr> <td>3.6</td> <td>5.9</td> </tr> <tr> <td colspan="3">Torque setting:</td> </tr> <tr> <td>SFC 18-A SFC 22-A</td> <td>4</td> <td>5</td> </tr> </table>	Hilti screwdriver:	T_{rec} (ft-lbs)		3.6	5.9	Torque setting:			SFC 18-A SFC 22-A	4	5	<p>Tighten the bolts with the suited tightening torque T_{rec} (see IFU of the Hilti wing nuts).</p>
Hilti screwdriver:	T_{rec} (ft-lbs)														
	3.6	5.9													
Torque setting:															
SFC 18-A SFC 22-A	4	5													

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3.2.11.5 Ordering information

S-BT threaded studs

Ordering designation	Thread diameter	Thread length in. (mm)	Maximum thickness of fastened material (mm)	Package contents
S-BT-GF M8/7 AN 6 (use with X-FCM grating disc, serrated flange nut not included)	M8	11/16 (17.05)	7	100
S-BT-GR M8/7 SN 6 (use with X-FCM grating disc, serrated flange nut not included)	M8	11/16 (17.05)	7	100
S-BT-MF W10/15 AN 6 (incl. serrated flange nut)	W10	1-1/16 (27.75)	15	100

Box includes: 100 studs, 100 flange nuts (except S-BT-GF), M8 or W10 check gauge and 1 TS-BT step drill bit



TS-BT drill bits for S-BT threaded studs

5.5 mm drill bit diameter

Ordering designation	Bit length in. (mm)	Drilling depth in. (mm)	Package contents	For use with
TS-BT 5.5-74 S	2-7/8 (74)	0.185 (4.7)	10	Steel Base Material
TS-BT 5.5-74 AL	2-7/8 (74)	0.185 (4.7)	10	Aluminum Base Material



Tool sets

Ordering designation	Package contents	For use with
S-BT Set	1	S-BT fastener

Set includes: 1 SFC 18/22-A cordless setting tool, 1 SF BT 18/22-A cordless drill, 1 charger, 2 batteries, 1 information sheet, packed complete in a Hilti toolbox



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Tool sets

Ordering designation	Package contents	For use with
SFC 22-A cordless setting tool	1	S-BT Depth Gauge

Supplied in an impact-resistant plastic toolbox



Ordering designation	Package contents	For use with
SF BT 22-A cordless drill	1	TS-BT drill bits

Supplied in an impact-resistant plastic toolbox



Accessories

Ordering designation	Part	Package contents	For use with
S-DG BT M8/7 Short 6 Depth Gauge	①	1	SFC 22-A
S-DG BT M10-W10/15 Long 6 Depth Gauge	①	1	SFC 22-A
S-CC BT 6 Calibration Card	②	1	S-DG BT
S-CG BT / 7 Short 6 Check Gauge	③	1	S-BT
S-CG BT / 15 Long 6 Check Gauge	③	1	S-BT
X-BT 1/4" Manual Torque Tool - 8 Nm	④	1	X-NSD sockets
S-BT 1/4" Manual Torque Tool - 5 Nm	④	1	X-NSD sockets
S-NS 9/16" C 95/3 3/4" X-NSD socket	⑤	1	W10 nut with flange



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The data contained in this literature was current as of the date of publication. Updates and changes may be made based on later testing. If verification is needed that the data is still current, please contact the Hilti Technical Support Specialists at 1-800-879-8000. All published load values contained in this literature represent the results of testing by Hilti or test organizations. Local base materials were used. Because of variations in materials, on-site testing is necessary to determine performance at any specific site. Printed in the United States



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