



S-BT HL DATA SHEET

**Screw-in stainless steel and carbon
steel threaded stud**

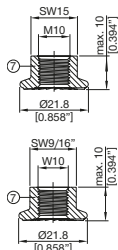
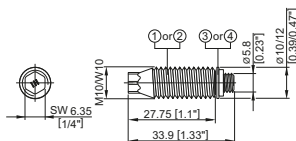
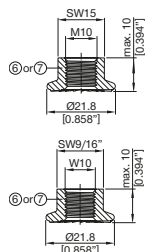


S-BT HL screw-in stainless steel and carbon steel threaded studs

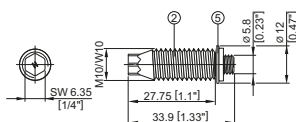
Product data

Dimensions

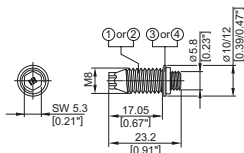
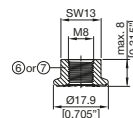
S-BT-MR M 10/15 SN 6 HL S-BT-MFM 10/15 AN 6 HL
 S-BT-MR W 10/15 SN 6 HL S-BT-MFW 10/15 AN 6 HL
 S-BT-MR M 10/15 SN 6 HL AL**)
 S-BT-MR W 10/15 SN 6 HL AL**)



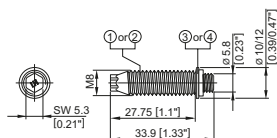
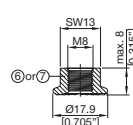
S-BT-MF MT M 10/15 AN 6 HL
 S-BT-MF MT W 10/15 AN 6 HL



S-BT-MRM 8/7 SN 6 HL S-BT-MFM 8/7 AN 6 HL
 S-BT-MRM 8/7 SN 6 HL AL**)
 S-BT-MRM 8/7 SN 6 HL AL**)
 S-BT-MRM 8/7 SN 6 HL AL**)



S-BT-MRM 8/15 SN 6 HL S-BT-MFM 8/15 AN 6 HL
 S-BT-MRM 8/15 SN 6 HL AL**)



Material specifications

- ① Threaded shank: Stainless steel (S-BT-_R) "S 31803 (1.4462)" zinc-coated
- ② Threaded shank: Carbon steel (S-BT-_F) "1038/duplex-coated"
- ③ SN 12-R washers: Ø 12 mm [0.47"]
Stainless steel (S-BT-_R) "S 31635 (1.4404)"
- ④ AN10-F washers: Ø 10 mm [0.39"]
Aluminum (S-BT-_F)
- ⑤ AN12-F washers: Ø 12 mm [0.47"]
Aluminum (S-BT-_F MT)
- ⑥ Serrated flange nut: Stainless steel (S-BT-MR) grade A4 – 70/80
- ⑦ Serrated flange nut: Carbon steel (S-BT-MF) HDG, grade 8

Sealing ring of sealing washers: Chloroprene rubber CR 3.1107, black resistant to UV, salt water, water, ozone, oils, etc.

Assessments, Reports and Type Approvals

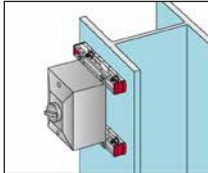
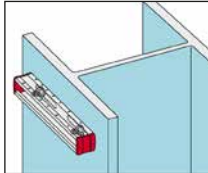

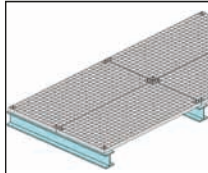
ETA-23/0001
 DNV: TAS00003NW
 ABS: in progress
 BV: 74271/A0 BV
 RINA: in progress



*) package does not include serrated flange nuts
 **) for use in aluminum base material

Applications

Examples

Multipurpose Fastening	Grating with Grating Fastening System X-FCM and X-FCS-R *)
S-BT-MR HL S-BT-MF HL, S-BT MF MT HL	S-BT-GR HL S-BT-GF HL
 Junction box, etc.	 Channel installation
 Signage	 Grating fastening

*) Load data, application requirements, corrosion information, fastener selection, system recommendation, material specification and coating refer to the Hilti Product Data Sheets (PDS) of X-FCM Grating Fastening System, or X-FCS-R Grating Fastening System.

Load data

Recommended loads

Base material thickness ¹⁾	S-BT-MR HL and S-BT-GR HL made of stainless steel				
	$t_{II} \geq 5 \text{ mm [0.20"]}$			$3 \text{ mm [0.12"]} \leq t_{II} < 5 \text{ mm [0.20"]}$	
Base material type	Steel S235 S280GD A36	Steel S355 to S500 S390GD to S550GD Grade 50	Aluminum $f_u \geq 270 \text{ MPa}$	Steel S235 S280GD A36	Steel S355 to S500 S390GD to S550GD Grade 50
Tension, N_{rec} [kN/lb]	3.6/810	4.3/970	2.1/470	2.3/520	2.8/625
Shear, V_{rec} [kN/lb] For edge distance $c \geq 6 \text{ mm [0.24"]}$	4.1/920		3.0/675	4.0/895	
Moment, M_{rec} [Nm/lbft]	11.1/8.0				

¹⁾ For base material thickness $3 \text{ mm [0.12"]} \leq t_{II} < 6 \text{ mm [0.24"]}$ rework of the coating on the back side of the plate/profile may be needed.

S-BT-MF HL and S-BT-GF HL made of duplex coated carbon steel					
Base material thickness ¹⁾	$t_{II} \geq 5 \text{ mm [0.20"]}$			3 mm [0.12"] $\leq t_{II} < 5 \text{ mm [0.20"]}$	
Base material type	Steel S235 S280GD A36	Steel S355 to S500 S390GD to S550GD Grade 50	Aluminum $f_u \geq 270 \text{ MPa}$	Steel S235 S280GD A36	Steel S355 to S500 S390GD to S550GD Grade 50
Tension, N_{rec} [kN/lb]	4.0/900	4.8/1080	n.a.	2.3/520	2.8/625
Shear, V_{rec} [kN/lb] For edge distance $c \geq 6 \text{ mm [0.24"]}$	2.8/625		n.a.	2.8/625	
Moment, M_{rec} [Nm/lbft]	6.7/5.0		n.a.	6.7/5.0	

S-BT-MF MT M10/15 (W10/15) AN 6 HL made of duplex coated carbon steel					
Base material thickness ¹⁾	$t_{II} \geq 5 \text{ mm [0.20"]}$			3 mm [0.12"] $\leq t_{II} < 5 \text{ mm [0.20"]}$	
Base material type	Steel S235 S280GD A36	Steel S355 to S500 S390GD to S550GD Grade 50	Aluminum $f_u \geq 270 \text{ MPa}$	Steel S235 S280GD A36	Steel S355 to S500 S390GD to S550GD Grade 50
Tension, N_{rec} [kN/lb]	4.0/900	4.8/1080	n.a.	2.3/520	2.8/625
Shear, V_{rec} [kN/lb] For edge distance $c \geq 6 \text{ mm [0.24"]}$	4.0/900		n.a.	4.0/900	
Moment, M_{rec} [Nm/lbft]	6.7/5.0		n.a.	6.7/5.0	

Design loads

S-BT-MR HL and S-BT-GR HL made of stainless steel					
Base material thickness ¹⁾	$t_{II} \geq 5 \text{ mm [0.20"]}$			3 mm [0.12"] $\leq t_{II} < 5 \text{ mm [0.20"]}$	
Base material type	Steel S235 S280GD A36	Steel S355 to S500 S390GD to S550GD Grade 50	Aluminum $f_u \geq 270 \text{ MPa}$	Steel S235 S280GD A36	Steel S355 to S500 S390GD to S550GD Grade 50
Tension, N_{Rd} [kN/lb]	5.1/1145	6.1/1370	3.0/670	3.3/740	3.9/875
Shear, V_{Rd} [kN/lb] For edge distance $c \geq 6 \text{ mm [0.24"]}$	5.7/1280		4.2/940	5.6/1255	
Moment, M_{Rd} [Nm/lbft]	15.6/12.0				

¹⁾ For base material thickness 3 mm [0.12"] $\leq t_{II} < 6 \text{ mm [0.24"]}$ rework of the coating on the back side of the plate/profile may be needed.

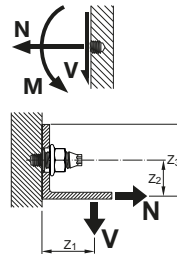
S-BT-MF HL and S-BT-GF HL made of duplex coated carbon steel					
Base material thickness ¹⁾	$t_{II} \geq 5 \text{ mm [0.20"]}$			$3 \text{ mm [0.12"]} \leq t_{II} < 5 \text{ mm [0.20"]}$	
Base material type	Steel S235 S280GD A36	Steel S355 to S500 S390GD to S550GD Grade 50	Aluminum $f_u \geq 270 \text{ MPa}$	Steel S235 S280GD A36	Steel S355 to S500 S390GD to S550GD Grade 50
Tension, N_{Rd} [kN/lb]	5.7/1280	6.8/1525	n.a.	3.3/740	3.9/875
Shear, V_{Rd} [kN/lb] For edge distance $c \geq 6 \text{ mm [0.24"]}$	3.9/875		n.a.	3.9/875	
Moment, M_{Rd} [Nm/lbft]	9.4/7.0		n.a.	9.4/7.0	

S-BT-MF MT M10/15 (W10/15) AN 6 HL made of duplex coated carbon steel					
Base material thickness ¹⁾	$t_{II} \geq 5 \text{ mm [0.20"]}$			$3 \text{ mm [0.12"]} \leq t_{II} < 5 \text{ mm [0.20"]}$	
Base material type	Steel S235 S280GD A36	Steel S355 to S500 S390GD to S550GD Grade 50	Aluminum $f_u \geq 270 \text{ MPa}$	Steel S235 S280GD A36	Steel S355 to S500 S390GD to S550GD Grade 50
Tension, N_{Rd} [kN/lb]	5.7/1280	6.8/1525	n.a.	3.3/740	3.9/875
Shear, V_{Rd} [kN/lb] For edge distance $c \geq 6 \text{ mm [0.24"]}$	5.6/1255		n.a.	5.6/1255	
Moment, M_{Rd} [Nm/lbft]	9.4/7.0		n.a.	9.4/7.0	

¹⁾ For base material thickness $3 \text{ mm [0.12"]} \leq t_{II} < 6 \text{ mm [0.24"]}$ rework of the coating on the back side of the plate/profile may be needed.

Conditions for recommended loads and design loads:

- Use S-BT-MR HL and S-BT-MF (MT) HL (multipurpose fastening) only with the supplied Hilti serrated flange nuts M8, M10, W10 (Ⓔ or Ⓕ) as per according to General Information – Material specifications)
- Global factor of safety Ω resp. partial factor of safety γ_m (based on 5 % fractile ultimate test value)



	Recommended loads	Design loads
static pull-out	2.80	2.00
static shear	2.80	2.00
Bending	1.75	1.25

- Minimum edge distance = 6 mm [0.24"] , minimum spacing $\geq 18 \text{ mm [0.709"]}$
- Effect of base metal vibration and stress (e.g. areas with tensile stress) considered.
- Redundancy (multiple fastening) must be provided.
- If eccentric loading exists (e.g. use of an angle clip), moments caused by off-center loading must be considered.

Cyclic loading

S-BT HL threaded studs are only to be used for fastenings subject to static or quasi-static loading. Inquire at Hilti for test data if cyclic loading has to be considered in the design.

Recommended interaction formula for combined loading

V-N (shear and tension)
$$\frac{V}{V_{rec}} + \frac{N}{N_{rec}} \leq 1.0 \text{ with } \frac{V}{V_{rec}} \leq 1.0 \text{ and } \frac{N}{N_{rec}} \leq 1.0$$

V-M (shear and bending)
$$\frac{V}{V_{rec}} + \frac{M}{M_{rec}} \leq 1.0 \text{ with } \frac{V}{V_{rec}} \leq 1.0 \text{ and } \frac{M}{M_{rec}} \leq 1.0$$

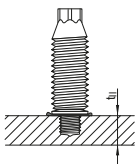
N-M (tension and bending)
$$\frac{N}{N_{rec}} + \frac{M}{M_{rec}} \leq 1.0$$

V-N-M (shear, tension and bending)
$$\frac{V}{V_{rec}} + \frac{N}{N_{rec}} + \frac{M}{M_{rec}} \leq 1.0$$

Application Requirements

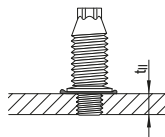
Base material thickness t_{II} and type of bore hole

Pilot hole



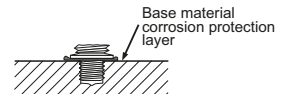
Base material thickness
steel and aluminum: $t_{II} \geq 6 \text{ mm [0.24"]}$

Drill through pilot hole



Base material thickness
steel: $3 \text{ mm [0.12"]} \leq t_{II} < 6 \text{ mm [0.24"]}$
aluminum: $5 \text{ mm [0.20"]} \leq t_{II} < 6 \text{ mm [0.24"]}$

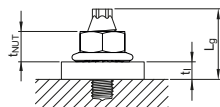
Thickness of base material corrosion protection layer $\leq 0.8 \text{ mm [0.031"]}$. When installing S-BT HL studs with Hilti SBT 6-22 cordless drill driver, the thickness of the base material corrosion protection layer is $\leq 1.0 \text{ mm [0.039"]}$



Thickness of fastened material t_I

S-BT-_____/7_____ $1.6 \text{ mm [0.063"]} \leq t_I \leq 7.0 \text{ mm [0.28"]}$

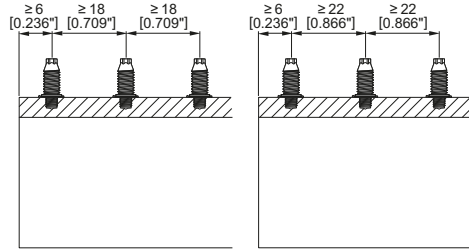
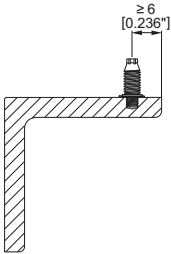
S-BT-_____/15_____ $1.6 \text{ mm [0.063"]} \leq t_I \leq 15.0 \text{ mm [0.59"]}$



Spacing & edge distances

Edge distance: ≥ 6 mm [0.24"]

Spacing: ≥ 18 mm [0.709"] for all S-BT M8 HL
 ≥ 22 mm [0.866"] for all S-BT M10 HL
 and S-BT W10 HL



Corrosion information

The S-BT HL stainless steel fasteners are made from the duplex stainless steel type 1.4462, which is equivalent to AISI 316L (A4) and 318LN steel grade. This grade of stainless steel is classified in the corrosion resistance class IV according to DIN EN 1993-1-4:2015, which makes the material suitable for aggressive environments like in coastal and offshore applications.

The microstructures of duplex stainless steels consist of a mixture of austenite and ferrite phases. Compared to the austenitic stainless steel grades, duplex stainless steels are magnetic. The surface of the S-BT HL stainless steel fasteners is zinc-coated (anti-friction coating) in order to reduce the thread forming torque when the stud is screwed in into the base material.

The coating of the carbon steel S-BT HL fasteners consists of an electroplated Zn-alloy for cathodic protection and a top coat for chemical resistance (Duplex-coating). The use of this coating is limited to the corrosion category C1, C2 and C3 according the standard EN ISO 9223. For higher corrosion categories stainless steel fasteners should be used.

In case of a drill through hole or a pilot hole in thin base material, rework of the coating on the back side of the plate/profile may be needed.

Note: ETA-23/0001 allows the use of carbon steel threaded studs with duplex coating only in dry indoor environment (C1 acc. to EN ISO 9223).

	S-BT-MF HL, S-BT-MF MT HL, S-BT-GF HL		S-BT-MR HL, S-BT-GR HL	
Corrosivity category C	C3 medium corrosive		C5 very high corrosive	
Drill hole type and base material thickness $t_{II}^{1)}$	Topside protection	Backside protection	Topside protection	Backside protection
Drill through pilot hole $3 \text{ mm [0.12"]} \leq t_{II} < 6 \text{ mm [0.24"]}$	✓	x ²⁾	✓	x ²⁾
Blind pilot hole $t_{II} \geq 6 \text{ mm [0.24"]}$	✓	✓	✓	✓

¹⁾ Real base material thickness, not nominal material thickness or material thickness with coating.

²⁾ Damage of the coating on the back side of the plate/profile require a rework of the coating.

Application limit

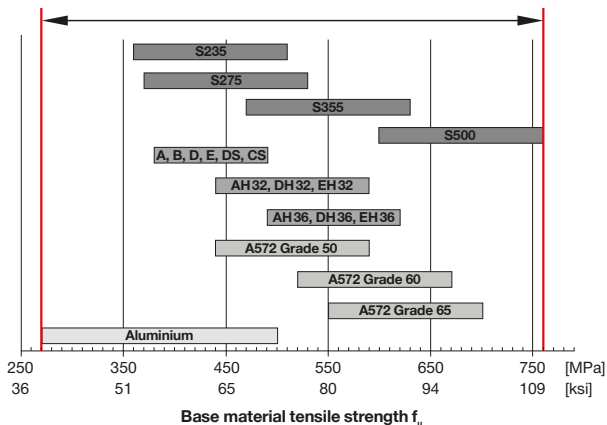
The base material is limited to steel grade with a maximum tensile strength $f_u = 760 \text{ MPa [110 ksi]}$.

The minimum tensile strength of steel is $f_u \geq 360 \text{ MPa [52 ksi]}$.

The minimum tensile strength of aluminum is $f_u \geq 270 \text{ MPa [39 ksi]}$.

Minimum thickness of base material t_{II} : refer to section “Application Requirements”

Maximum thickness of base material t_{II} : no limits



Fastener selection and system recommendation

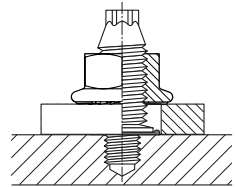
	Fastener	Drilling tool	Drill bit	Setting tool
Stainless steel	S-BT-GR M8/7 SN 6 HL	SBT 4-A22 or SBT 6-22 w/drill assist or SF 6-(A)22	TS-BT 5.3-95 S	SBT 4-A22 or SF 6-(A)22 + S-DG BT M8/7 Short 6 or
	S-BT-GR M8/7 SN 6 HL AL		TS-BT 5.5-74 AL	SBT 6-22 + S-SH BT M8
	S-BT-MR M8/7 SN 6 HL		TS-BT 5.3-65 S	SBT 4-A22 or SF 6-(A)22 + S-DG BT M8/15 Long 6 or
	S-BT-MR M8/15 SN 6 HL			SBT 6-22 + S-SH BT M8
	S-BT-MR M10/15 SN 6 HL			SBT 4-A22 or SF 6-(A)22 + S-DG BT M10-W10/15 Long 6 or
	S-BT-MR W10/15 SN 6 HL			SBT 6-22 + S-SH BT M10/W10
	S-BT-MR M8/7 SN 6 HL AL		TS-BT 5.5-74 AL	SBT 4-A22 or SF 6-(A)22 + S-DG BT M8/7 Short 6 or
	S-BT-MR M8/15 SN 6 HL AL			SBT 6-22 + S-SH BT M8
	S-BT-MR M10/15 SN 6 HL AL			SBT 4-A22 or SF 6-(A)22 + S-DG BT M8/15 Long 6 or
	S-BT-MR W10/15 SN 6 HL AL			SBT 6-22 + S-SH BT M10/W10
Carbon steel	S-BT-GF M8/7 AN 6 HL		TS-BT 5.3-95 S	SBT 4-A22 or SF 6-(A)22 + S-DG BT M8/7 Short 6 or
	S-BT-MF M8/7 AN 6 HL		TS-BT 5.3-65 S	SBT 6-22 + S-SH BT M8
	S-BT-MF M8/15 AN 6 HL			SBT 4-A22 or SF 6-(A)22 + S-DG BT M8/15 Long 6 or
	S-BT-MF M10/15 AN 6 HL			SBT 6-22 + S-SH BT M8
	S-BT-MF W10/15 AN 6 HL			SBT 4-A22 or SF 6-(A)22 + S-DG BT M10-W10/15 Long 6 or
	S-BT-MF MT M10/15 AN 6 HL			SBT 6-22 + S-SH BT M10/W10
	S-BT-MF MT W10/15 AN 6 HL			

Installation

S-BT fasteners made of stainless steel with washer- \varnothing 12 mm (S-BT-_R HL) and S-BT fasteners made of carbon steel with washer- \varnothing 12 mm (S-BT-MF MT HL)

Fastened material hole \varnothing : 13 mm [0.51"] $\leq \varnothing \leq$ 18 mm [0.71"]
for stud M10/W10

Fastened material hole \varnothing : 13 mm [0.51"] $\leq \varnothing \leq$ 14 mm [0.55"]
for stud M8



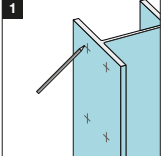
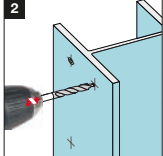
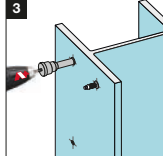
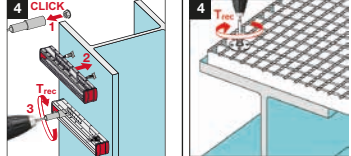

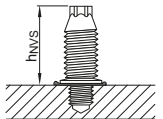
S-BT fasteners made of carbon steel with washer- \varnothing 10 mm (S-BT-_F HL)

Fastened material hole \varnothing : 11 mm [0.43"] $\leq \varnothing \leq$ 18 mm [0.71"] for stud M10 / W10

Fastened material hole \varnothing : 11 mm [0.43"] $\leq \varnothing \leq$ 14 mm [0.55"] for stud M8

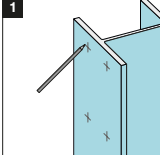
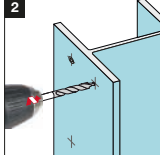
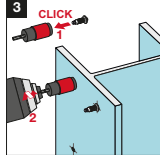
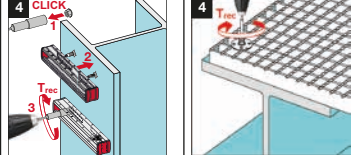

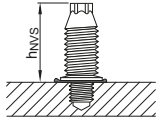
Important: for group fastenings subjected to shear loading the fastened material hole diameter should not exceed 14 mm [0.55"] (S-BT-_R HL and S-BT-MF MT HL) and 12 mm [0.47"] (S-BT-_F HL) respectively.

Installation with calibrated depth gauge S-DG BT

Mark location for each fastening	Pre-drill with TS-BT stepped drill bit	Screw-in S-BT studs into drilled hole	Fasten component or grating on base material																									
																												
	<p>Usage of drill driver SBT 4-A22 or SF 6-(A)22. 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 drill driver SBT 4-A22 or SF 6-(A)22 in combination with the calibrated depth gauge S-DG BT.</p> <p>Verify stud standoff h_{NVS} with S-CG BT or S-CC BT 6.</p>  <p>Sealing washer must be properly compressed.</p>	<p>Position component or grating on S-BT studs and hold in place. Tighten the nuts or grating fastener with the suited tightening torque T.</p> <p>Tighten using:</p> <ul style="list-style-type: none"> • Torque wrench and wrench socket, or • Torque tool S-BT 1/4" – 8 Nm or S-BT 1/4" – 16 Nm, or • Drill driver SBT 4-A22 or SF 6-(A)22 and suitable wrench socket S-NS <table border="1" data-bbox="617 722 968 850"> <thead> <tr> <th colspan="3"></th> <th colspan="2">T*)</th> </tr> <tr> <th>Hilti drill driver:</th> <th>8 Nm</th> <th>16 Nm</th> <th colspan="2"></th> </tr> <tr> <th colspan="3"></th> <th colspan="2">Torque setting:</th> </tr> </thead> <tbody> <tr> <td>SBT 4-A22</td> <td>7</td> <td>n.a.</td> <td colspan="2"></td> </tr> <tr> <td>SF 6-(A)22</td> <td>3</td> <td>4</td> <td colspan="2"></td> </tr> </tbody> </table> <p>*) T for grating application: refer to Product Data Sheet for X-FCM grating faster.</p>				T*)		Hilti drill driver:	8 Nm	16 Nm						Torque setting:		SBT 4-A22	7	n.a.			SF 6-(A)22	3	4		
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Important: These are abbreviated instructions which may vary by application. ALWAYS review/follow the instructions for use (IFU) accompanying the product. In case of a drill through hole, rework of the coating on the back side of the plate/profile may be needed.

Installation with Hilti SBT 6-22 cordless drill driver

Mark location for each fastening	Pre-drill with TS-BT stepped drill bit	Screw-in S-BT studs into drilled hole	Fasten component or grating on base material													
																
	<p>Usage of drill driver Hilti SBT 6-22.</p> <p>Using "Drill assist" mode.</p> <p>Set the gear selector switch to 2 and BT clutch setting.</p> <p>Speed of the tool reduces automatically when the hole is drilled to the correct depth.</p> <p>A shiny ring should be visible around the borehole after the drilling process.</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 drill driver Hilti SBT 6-22 in combination with the stud holder S-SH BT.</p> <p>Using "Fasten S-BT stud" mode.</p> <p>Set the gear selector switch to 1 and BT clutch setting. Insert the S-BT stud into the stud holder. The torque limiter trips when the stud reaches the correct depth.</p> <p>Verify stud standoff h_{NVS} with S-IC BT.</p>  <p>Sealing washer must be properly compressed.</p>	<p>Position component or grating on S-BT studs and hold in place.</p> <p>Tighten the nuts or grating fastener with the suited tightening torque T.</p> <p>Tighten using:</p> <ul style="list-style-type: none"> • Torque wrench and wrench socket, or • Torque tool S-BT 1/4" – 8 Nm or S-BT 1/4" – 16 Nm, or • Drill driver SBT 6-22 and suitable wrench socket S-NS <table border="1" data-bbox="680 735 1038 839"> <tr> <td></td> <td colspan="2" style="text-align: center;">T*)</td> </tr> <tr> <td>Hilti drill driver:</td> <td style="text-align: center;">8 Nm</td> <td style="text-align: center;">16 Nm</td> </tr> <tr> <td></td> <td colspan="2" style="text-align: center;">Clutch setting:</td> </tr> <tr> <td>SBT 6-22</td> <td style="text-align: center;">3</td> <td style="text-align: center;">4</td> </tr> </table> <p>*) T for grating application: refer to Product Data Sheet for X-FCM grating faster.</p>			T*)		Hilti drill driver:	8 Nm	16 Nm		Clutch setting:		SBT 6-22	3	4
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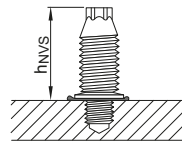
Important: These are abbreviated instructions which may vary by application. ALWAYS review/follow the instructions for use (IFU) accompanying the product. In case of a drill through hole, rework of the coating on the back side of the plate/profile may be needed.

Fastening inspection in case of installation with calibrated depth gauge S-DG BT

The installer is responsible for the correct setting of the S-BT studs. For the periodical verification of the correct stud stand-off the S-CG BT check gauge or S-CC BT 6 calibration card can be used.



Design and functionality of the check gauge S-CG BT



Verify stud stand-off h_{NVS} with S-CG BT or S-CC BT 6.

S-BT-___/7___6 $h_{NVS} = 18.6 \text{ mm to } 19.1 \text{ mm}$
 [0.732" to 0.752"]

S-BT-___/15___6 $h_{NVS} = 29.3 \text{ mm to } 29.8 \text{ mm}$
 [1.153" to 1.173"]

Designation	Product name	Comment
S-DG BT M8/7 Short 6	Depth gauge	for exact setting of S-BT M8/7 HL
S-DG BT M8/15 Long 6	Depth gauge	for exact setting of S-BT M8/15 HL
S-DG BT M 10-W 10/15 Long 6	Depth gauge	for exact setting of S-BT M 10/W 10 HL
S-CC BT 6	Calibration card	for calibration of the depth gauge (short/long studs) for verification of the stand-off (short/long studs)
S-CG BT/7 Short 6	Check gauge	for verification of the stand-off for short studs (7 mm)
S-CG BT/15 Long 6	Check gauge	for verification of the stand-off for long studs (15 mm)

Fastener quality assurance in case of installation with calibrated depth gauge S-DG BT

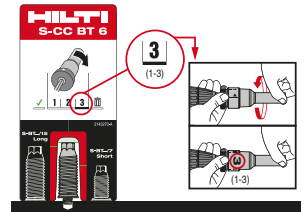
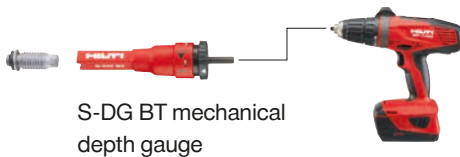
In order to ensure the exact screw-in depth and a proper compressed sealing washer, the S-BT HL studs have to be installed with the appropriate depth gauge. With this tool the screw-in depth can be adjusted in a range of ~0 – 1.5 mm (3 steps, ~0.5 mm per step).

The S-CC BT calibration card is needed to check the initial stand-off of the S-BT HL stud and to adjust/calibrate the S-DG BT depth gauge. After finding the right adjustment level for the S-DG BT depth gauge, the gauge can be adjusted and the studs can be installed without additional check of the S-DG BT depth gauge.

The correct stud stand-off has to be checked and, if necessary, the depth gauge has to be re-adjusted (calibrated) at following times:

- Start of the installation process
- Change of the working position (upwards, downwards, horizontal) and base material (thickness, strength, type)
- Installer change
- After each packaging respectively after the installation of 100 S-BT studs

The lifetime of the S-DG BT depth gauge is ≥ 1000 settings.



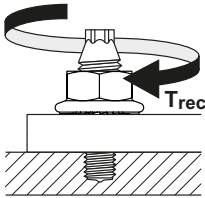
Design and functionality of the mechanical calibration card S-CC BT

Fastener quality assurance in case of installation with SBT 6-22 and S-SH BT

In order to ensure the exact screw-in depth and a proper compressed sealing washer, the S-BT HL studs have to be installed with the SBT 6-22 tool. With this tool the screw-in depth of the S-BT HL studs is controlled.

The S-IC BT inspection card can be used to check the stand-off in cases where the washer compression of the S-BT HL is assessed as incorrect (over or under compressed). Based on the coating thickness specified, the user can see if the inspection card shows green in this region. Green indicates the stud is set within the correct embedment depth range. Orange indicates that the stud is underset. To achieve the correct embedment depth, the user can place the tool over the stud and retrigger in BT mode. This will incrementally add $\frac{1}{4}$ rotations. After each trigger the user shall check with the inspection card and stop when the inspection card shows green. If the card shows red, this indicates that the stud is overset and should not be used.

Tightening torque serrated flange nut



Tightening torque for fastening to steel base material $t_{II} \geq 5 \text{ mm}$ [0.20"]

	Fastener: S-BT-MF (MT) HL, S-BT-MR HL
Element: nut	16 Nm

Tightening tool recommendation for tightening with cordless drill driver

Cordless drill driver	Clutch type (stop detection)	Gear	Clutch
Hilti SF 6-(A)22	ESC (HJ)	1	4
Hilti SBT 6-22	ESC (HJ)	1	4

Tightening tool recommendation for fastening with torque tool

Hilti torque tool
Torque tool S-BT 1/4" – 16 Nm

Tightening torque for fastening to aluminium base material $t_{II} \geq 5 \text{ mm}$ [0.20"] and to steel base material 3 mm [0.12"] $\leq t_{II} < 5 \text{ mm}$ [0.20"] (drill through hole)

	Fastener: S-BT-MF (MT) HL, S-BT MR HL, S-BT MR HL AL
Element: nut	8 Nm

Tightening tool recommendation for tightening with cordless drill driver

Cordless drill driver	Clutch type (stop detection)	Gear	Clutch
Hilti SBT 4-A22	TRC	1	7
Hilti SF 6-(A)22	ESC (HJ)	1	3
Hilti SBT 6-22	ESC (HJ)	1	3

Tightening tool recommendation for fastening with torque tool

Hilti torque tool

Torque tool S-BT 1/4" – 8 Nm



- Tool power level adjustment: Gear:



- Clutch:



- Hilti recommends using a calibrated torque wrench or the Hilti Torque tool to apply the recommended tightening torque.
- Tool power level adjustment is a guiding value which applies to new Hilti screwdriver.
- Tightening torque may vary depending on the user and the application.
- Torque release coupling (TRC): Achievable torque can change over time due to clutch wear.
- Electronic slip clutch (ESC): ESC has 2 stop detections, Soft Joint (SJ) and Hard Joint (HJ). Hard joint detection is activated due to drop in speed (fast stop) and can lead to a torque spike.

Designation	Item no.	Product name	Comment	Application
X-BT 1/4" - 8 Nm	2119272	Torque tool	manual torque tool (8 Nm)	
S-BT 1/4" - 16 Nm/11.8 lbf - ft	2346085	Torque tool	manual torque tool (16 Nm)	
SBT 4-A22	refer to Hilti Online	Drill driver	For drilling the pilot hole, setting in the stud and fastening an element	
SBT 6-22	refer to Hilti Online	Drill driver with drill assist and installation assist	For drilling the pilot hole, setting in the stud and fastening an element	
SF 6-A22	refer to Hilti Online	Drill driver	For drilling the pilot hole, setting in the stud and fastening an element	
SF 6-22	refer to Hilti Online	Drill driver	For drilling the pilot hole, setting in the stud and fastening an element	