



EN

## DECLARATION OF PERFORMANCE

according to Annex III of the Regulation (EU) Nr. 305/2011 (Construction Products Regulation)

Hilti threaded studs S-BT-MF, S-BT-GF  
No. Hilti-SF-DoP-030

- 1. Unique identification code of the product-type:** Hilti threaded studs S-BT-MF, S-BT-GF
- 2. Type, batch or serial number or any other element allowing identification of the construction product as required pursuant to Article 11(4):** Type and Lot-Number displayed on the packaging
- 3. Intended use or uses of the construction product, in accordance with the applicable harmonized technical specification, as foreseen by the manufacturer:**

Generic type and use	Threaded studs for connection of materials to structural steel members
Product size covered	M8, M10
Base material	Non-alloy steel, acc. to EN 1993-1-1, EN 10025, EN 10346
Fastened material	Non-alloy steel, acc. to EN 1993-1-1, EN 10346 Corrosion resistant steel acc. to EN 10088-2 Aluminium, e.g. acc. to EN 755-2 or EN 485-2
Fastener material	Carbon steel grade acc. to EN ISO 1620-4, galvanized and coated
Loading	Static & quasi static

**4. Name, registered trade name or registered trade mark and contact address of the manufacturer as required pursuant to Article 11(5):** Hilti AG, Business Unit Direct Fastening, 9494 Schaan, Fürstentum Liechtenstein

**5. Where applicable, name and contact address of the authorised representative whose mandate covers the tasks specified in Article 12(2):** n.a.

**6. System or systems of assessment and verification of constancy of performance of the construction product as set out in Annex V:** System 2+

**7. In case of the declaration of performance concerning a construction product covered by a harmonized standard:** n.a.

**8. In case of the declaration of performance concerning a construction product for which a European Technical Assessment has been issued:**

On the basis of EAD 333037-00-0602 issued ETA-20/0530. The notified body MPA-Stuttgart 0672 performed third party tasks under system 2+.

**9. Declared performance:**

Essential characteristic	Performance	Harmonized technical specification
Characteristic tension resistance $N_{Rk,II}$	see Table 1	EAD 333037-00-0602
Characteristic shear resistance of individual threaded studs $V_{Rk,II}$	see Table 2 und 3	
Characteristic shear resistance of groups of threaded stud connections $V_{Rk,II,g}$	see Table 2 und 3	
Characteristic bending moment resistance $M_{Rk}$	see Table 4	
Resistance in case of combined loading (interaction)	see Table 7	
Application limits	see Table 6	
Fatigue classification of base material	see Table 5	
Reaction to fire	Class A1 - EN 13501-1	
Resistance to fire	no performances assessed	

**10. The performance of the product identified in points 1 and 2 is in conformity with the declared performance in point 9. This declaration of performance is issued under the sole responsibility of the manufacturer identified in point 4.**

Signed for and on behalf of the manufacturer by:

**Lars Taenzer**  
Head of Business Unit Direct Fastening

**Pierre Hohmeier**  
Head of Quality Screw Fastening

Hilti AG, Schaan, 01.10.2020



**Table 1: Characteristic tension resistance for Hilti threaded studs S-BT-MF, S-BT-GF**

		<b>S-BT-MF, S-BT-GF</b>
<b>Steel failure threaded studs and pull-out</b>		
<b>Steel S235 to S355 - EN 10025, S280GD to S420GD - EN 10346</b>		
<b>Thickness <math>3,0 \text{ mm} \leq t_{II} &lt; 5,0 \text{ mm}</math></b>		
Characteristic tension resistance	$N_{Rk,II}^{1)}$ [kN]	5,30
<b>Steel S235 to S355 - EN 10025, S280GD to S420GD - EN 10346</b>		
<b>Thickness <math>t_{II} \geq 5,0 \text{ mm}</math></b>		
Characteristic tension resistance	$N_{Rk,II}^{1)}$ [kN]	5,50
Spacing	s [mm]	$\geq 18,0$ for M8 $\geq 22,0$ for M10
Edge distance	c [mm]	$\geq 6,0$
Coating thickness of steel base material	$t_c$ [mm]	$\leq 0,8$
Partial factor	$\gamma_M$ [-]	1,25
Partial factor	$\gamma_{MII}$ [-]	1,60

<sup>1)</sup> The characteristic tension resistance  $N_{Rk,II}$  may be increased by 20% when using steel base material S355 - EN 10025, S390GD and S420GD - EN 10346.

**Table 2: Characteristic shear resistance for Hilti threaded studs S-BT-MF at an edge distance  $6,0 \text{ mm} \leq c < 15,0 \text{ mm}$**

		S-BT-MF
<b>Steel failure threaded studs and pull-out</b>		
<b>Steel S235, S275 - EN 10025, S280GD to S350GD - EN 10346</b> <b>Thickness <math>3,0 \text{ mm} \leq t_{II} &lt; 5,0 \text{ mm}</math></b>		
Characteristic shear resistance	$V_{Rk,II}^{1)}$ [kN]	6,70
Reduction factor considering group effect	$\alpha^{2)}$ [-]	0,76
<b>Steel S235, S275 - EN 10025, S280GD to S350GD - EN 10346</b> <b>Thickness <math>t_{II} \geq 5,0 \text{ mm}</math></b>		
Characteristic shear resistance	$V_{Rk,II}^{1)}$ [kN]	7,00
Reduction factor considering group effect	$\alpha^{2)}$ [-]	0,71
<b>Steel S355 - EN 10025, S390GD, S420GD - EN 10346</b> <b>Thickness <math>3,0 \text{ mm} \leq t_{II} &lt; 5,0 \text{ mm}</math></b>		
Characteristic shear resistance	$V_{Rk,II}^{1)}$ [kN]	6,90
Reduction factor considering group effect	$\alpha^{2)}$ [-]	0,92
<b>Steel S355 - EN 10025, S390GD, S420GD - EN 10346</b> <b>Thickness <math>t_{II} \geq 5,0 \text{ mm}</math></b>		
Characteristic shear resistance	$V_{Rk,II}^{1)}$ [kN]	7,70
Reduction factor considering group effect	$\alpha^{2)}$ [-]	0,51
Spacing	s [mm]	$\geq 18,0$ for M8 $\geq 22,0$ for M10
Edge distance	c [mm]	$\geq 6,0$
Coating thickness of steel base material	$t_c$ [mm]	$\leq 0,8$
Partial factor	$\gamma_M$ [-]	1,25
Partial factor	$\gamma_{MII}$ [-]	1,60

<sup>1)</sup> The characteristic shear resistance  $V_{Rk,II}$  is related to a shear load introduction via the sealing washer according to Table B3 of ETA-20/0530. In case of a shear load introduction via the fastening thread, the additional bending moment due to the resulting eccentricity has to be considered in design.

<sup>2)</sup> The performance reduction factor  $\alpha$  covers group effects with a row-setup of maximum 4 studs or a rectangular plate setup of 2 rows with maximum 4 studs per row and symmetrical load introduction with uniform load distribution on all rows.

**Table 3: Characteristic shear resistance for Hilti threaded studs S-BT-MF at an edge distance  $c \geq 15,0$  mm**

		S-BT-MF
<b>Steel failure threaded studs and pull-out</b>		
<b>Steel S235, S275 - EN 10025, S280GD to S350GD - EN 10346</b>		
<b>Thickness <math>3,0 \text{ mm} \leq t_{II} &lt; 5,0 \text{ mm}</math></b>		
Characteristic shear resistance	$V_{Rk,II}^{1)}$ [kN]	7,50
Reduction factor considering group effect	$\alpha^{2)}$ [-]	0,76
<b>Steel S235, S275 - EN 10025, S280GD to S350GD - EN 10346</b>		
<b>Thickness <math>t_{II} \geq 5,0 \text{ mm}</math></b>		
Characteristic shear resistance	$V_{Rk,II}^{1)}$ [kN]	7,50
Reduction factor considering group effect	$\alpha^{2)}$ [-]	0,71
<b>Steel S355 - EN 10025, S390GD, S420GD - EN 10346</b>		
<b>Thickness <math>3,0 \text{ mm} \leq t_{II} &lt; 5,0 \text{ mm}</math></b>		
Characteristic shear resistance	$V_{Rk,II}^{1)}$ [kN]	8,00
Reduction factor considering group effect	$\alpha^{2)}$ [-]	0,92
<b>Steel S355 - EN 10025, S390GD, S420GD - EN 10346</b>		
<b>Thickness <math>t_{II} \geq 5,0 \text{ mm}</math></b>		
Characteristic shear resistance	$V_{Rk,II}^{1)}$ [kN]	8,00
Reduction factor considering group effect	$\alpha^{2)}$ [-]	0,51
Spacing	s [mm]	$\geq 18,0$ for M8 $\geq 22,0$ for M10
Edge distance	c [mm]	$\geq 15,0$
Coating thickness of steel base material	$t_c$ [mm]	$\leq 0,8$
Partial factor	$\gamma_M$ [-]	1,25
Partial factor	$\gamma_{MII}$ [-]	1,60

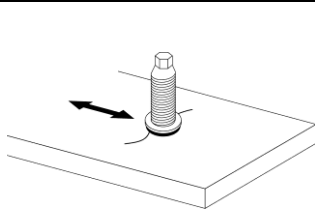
<sup>1)</sup> The characteristic shear resistance  $V_{Rk,II}$  is related to a shear load introduction via the sealing washer according to Table B3 of ETA-20/0530. In case of a shear load introduction via the fastening thread, the additional bending moment due to the resulting eccentricity has to be considered in design.

<sup>2)</sup> The performance reduction factor  $\alpha$  covers group effects with a row-setup of maximum 4 studs or a rectangular plate setup of 2 rows with maximum 4 studs per row and symmetrical load introduction with uniform load distribution on all rows.

**Table 4: Characteristic bending resistance for Hilti threaded studs S-BT-MF**

		S-BT-MF
<b>Steel failure with lever arm</b>		
<b>Steel S235 to S355 - EN 10025, S280GD to S420GD - EN 10346</b> <b>Thickness <math>\geq 3,0</math> mm</b>		
Characteristic bending resistance	$M_{Rk}$ [Nm]	11,80
Spacing	s [mm]	$\geq 18,0$ for M8 $\geq 22,0$ for M10
Edge distance	c [mm]	$\geq 6,0$
Coating thickness of steel base material	$t_c$ [mm]	$\leq 0,8$
Partial factor	$\gamma_M$ [-]	1,25
Partial factor	$\gamma_{MII}$ [-]	1,00

**Table 5: Construction detail „Steel base material with Hilti S-BT threaded studs“ in compliance with EN 1993-1-9:2005**

Detail category	Construction detail	Description	Requirements
100 m = 5		<p>Hilti threaded studs S-BT-MF, S-BT-GF with pre-drilled hole in structural steel base material.</p> <p>Imperfect fastener installations as e.g. overwound or pulled-out fasteners are covered.</p>	<p><math>\Delta\sigma</math> to be calculated on the gross cross section.</p> <p>Base material thickness <math>t_{II} \geq 3</math> mm.</p> <p>Steel base material S235 to S355 according to EN 10025.</p>

**Table 6: Application limits**

Threaded studs	$t_{I,min}$ [mm]	$t_{I,max}$ [mm]	$d_{c,max}$ [mm]	$t_{II,min}$ [mm]	$t_{c,max}$ [mm]	$T_{max}$ [Nm]
S-BT-MF M8/7	2,5	7	12	3,0	0,8	8 5 <sup>1)</sup>
S-BT-MF M8/15		15				
S-BT-MF M10/15						
S-BT-GF M8/7	-	-	-			

<sup>1)</sup> For base material made of steel with thickness  $3,0 \text{ mm} \leq t_{II} < 5,0 \text{ mm}$

- $t_I$  = thickness of fixed material (component I)  
 $t_{II}$  = thickness of base material (component II)  
 $t_c$  = coating thickness of base material (component II)  
 $d_c$  = diameter of the clearance hole in the fixed material (component I)  
 $T$  = installation torque of the flange nut, grating fastener or checker plate fastener

**Material of the base material (component II):**

- non-alloy structural steel, according to EN 1993-1-1 and the material codes given there, EN 10025, EN 10346 with tensile strength  $360 \leq R_m \leq 630 \text{ N/mm}^2$

**Table 7: Resistance in case of combined loading (interaction)**

Load combination	Interaction provision
Shear - Tension	$\frac{V_{Ed}}{V_{Rd}} + \frac{N_{Ed}}{N_{Rd}} \leq 1,0$
Shear – Bending moment	$\frac{V_{Ed}}{V_{Rd}} + \frac{M_{Ed}}{M_{Rd}} \leq 1,0$
Tension – Bending moment	$\frac{N_{Ed}}{N_{Rd}} + \frac{M_{Ed}}{M_{Rd}} \leq 1,0$
Shear – Tension – Bending moment	$\frac{V_{Ed}}{V_{Rd}} + \frac{N_{Ed}}{N_{Rd}} + \frac{M_{Ed}}{M_{Rd}} \leq 1,0$