



X-BT-MR-N DATA SHEET

**Stainless steel threaded stud
for narrow through hole**

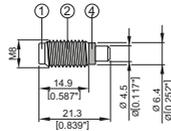
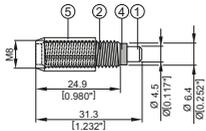
X-BT-MR-N Stainless steel threaded stud for narrow through hole

Product data

Dimensions

X-BT-MR-N M8/14 N 4

X-BT-MR-N M8/4 N 4



Note on drill-bit:

X-BT-MR-N requires the use of the specific drill bit TX-BT 4/5.5. The drill bit TX-BT 4/7, which is used for X-BT, X-BT-MF and X-BT-ER fasteners must not be used for X-BT-MR-N studs.

Material specifications

① Shank:

CR 500 (CrNiMo alloy) equivalent to A4 / S31803 (1.4462) AISI grade 316 material
N 08926 (1.4529) ¹⁾ Available on request

② Threaded sleeve:

S31609 (X5CrNiMo 17-12-2+2H, 1.4401)

④ Sealing washers:

Chloroprene rubber CR 3.1107, black*

⑤ Guide sleeve:

Plastic

* Resistant to UV, salt water, water, ozone, oils, etc.

¹⁾ For High Corrosion Resistance HCR material inquire at Hilti

Designation according to Unified Numbering System (UNS)

Recommended fastening tools

DX 351-BT / BTG



- For more details, please refer to **X-BT-MR-N fastener program** and to the chapter **Accessories and consumables compatibility** in the Direct Fastening Technology Manual (DFTM).

Approvals and certificates

ABS, LR, DNV-GL, BV



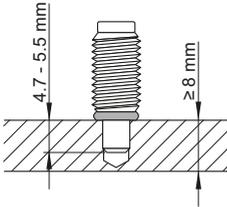
- Not all information presented in this product data sheet might be subject to approval/certificate content. Please refer to approval/certificate for further information.

Applications

Examples

Threaded stud applications especially for:

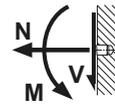
- High strength steel
- Coated steel structures
- Through penetration of base steel is not allowed



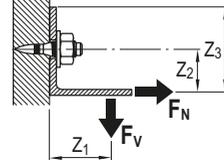
Performance data

Recommended loads – steel

Steel grade: Europe, USA	S235, A36	S355, Grade 50 and stronger steel
Tension, N_{rec} [kN/lb]	1.8 / 405	2.3 / 517
Shear, V_{rec} [kN/lb]	2.6 / 584	3.4 / 764
Moment, M_{rec} [Nm/lbft]	8.2 / 6	8.2 / 6
Torque, T_{rec} [Nm/lbft]	8 / 5.9	8 / 5.9



Example:



Recommended loads – cast iron*

Tension, N_{rec} [kN/lb]	0.5 / 115
Shear, V_{rec} [kN/lb]	0.75 / 170
Moment, M_{rec} [Nm/lbft]	8.2 / 6

Conditions for recommended loads

- Global factor of safety for static pull-out > 3 (based on 5% fractile value)
- Minimum edge distance = 6 mm [1/4"].
- Effect of base metal vibration and stress considered.
- Redundancy (multiple fastening) must be provided.
- The recommended loads in the table refer to the resistance of the individual fastening and may not be the same as the loads F_N and F_V acting on the fastened part.
Note: If relevant, prying forces need to be considered in design, see example.
Moment acting on fastener shank only in case of a gap between base and fastened material.

Design resistance – steel			
Steel grade:			
Europe		S235	S355
Tension	N_{Rd} [kN]	2.9	3.7
Shear	V_{Rd} [kN]	4.2	5.4
Moment	M_{Rd} [Nm]	18.4	18.4

Design resistance – cast iron*			
Tension	N_{Rd} [kN]	0.8	
Shear	V_{Rd} [kN]	1.2	
Moment	M_{Rd} [Nm]	13.1	

*Requirements of spheroidal graphite cast iron base material

Subject	Requirements
Cast iron	Spheroidal graphite cast iron according to EN 1563
Strength class	EN-GJS-400 to EN-GJS-600 according to EN 1563
Chemical analysis and amount of carbon	3.3–4.0 mass percentage
Microstructure	Form IV to VI (spherical) according to EN ISO 945-1:2010 Minimum size 7 according to Figure 4 of EN ISO 945-1:2010
Material thickness	$t_{II} \geq 20$ mm

Recommended interaction formula for combined loading - steel and cast iron base material

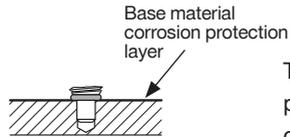
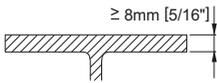
Combined loading situation	Interaction formula
V–N (shear and tension)	$\frac{V}{V_{rec}} + \frac{N}{N_{rec}} \leq 1.2$ with $\frac{V}{V_{rec}} \leq 1.0$ and $\frac{N}{N_{rec}} \leq 1.0$
V–M (shear and bending)	$\frac{V}{V_{rec}} + \frac{M}{M_{rec}} \leq 1.2$ with $\frac{V}{V_{rec}} \leq 1.0$ and $\frac{M}{M_{rec}} \leq 1.0$
N–M (tension and bending)	$\frac{N}{N_{rec}} + \frac{M}{M_{rec}} \leq 1.0$
V–N–M (shear, tension and bending)	$\frac{V}{V_{rec}} + \frac{N}{N_{rec}} + \frac{M}{M_{rec}} \leq 1.0$

Cyclic loading

- Anchorage of X-BT-MR-N threaded stud in steel base material is not affected by cyclic loading.
- Fatigue strength is governed by fracture of the shank. Inquire at Hilti for test data if high cycle loading has to be considered in the design.

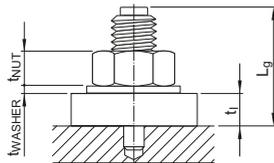
Application recommendation

Thickness of base material



Thickness of base material corrosion protection layer $\leq 0.4\text{mm}$. For thicker coatings, please contact Hilti.

Thickness of fastened material

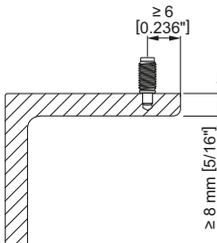


X-BT-MR-N M8/4 N 4: $t_1 \leq 4\text{ mm}$
 X-BT-MR-N M8/14 N 4: $4\text{ mm} \leq t_1 \leq 14\text{ mm}$

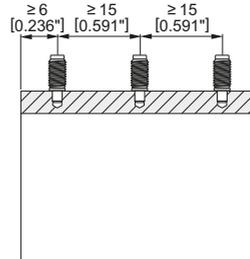
For thickness less than 4 mm, reduction of shear loading is required, please contact Hilti.

Spacing and edge distances

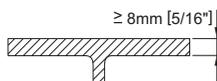
Edge distance: $\geq 6\text{ mm}$



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



Application limit



- $t_{II} \geq 8\text{ mm}$ [5/16"] \rightarrow No through penetration
- No limits with regards to steel strength

Corrosion information

The corrosion resistance of Hilti CR500 and S31803 stainless steel material is equivalent to AISI 316 (A4) steel grade.

Fastener program and system recommendation

Fastener program

Designation	Item no.	Tool Designation
X-BT-MR-N M8/14 N 4	2112004	DX 351 BT
X-BT-MR-N M8/4 N 4	2112003	DX 351 BTG

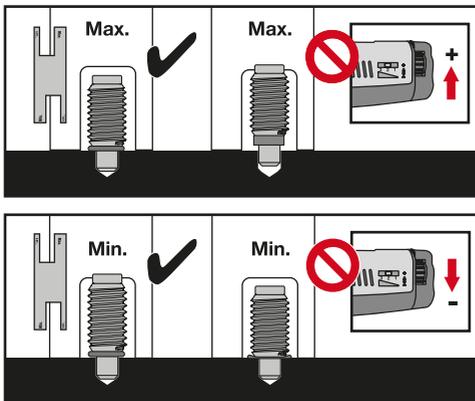
Cartridge selection and tool energy setting

6.8/11 M high precision brown cartridge

- Tool power level adjustment by setting tests on site.
- Start tool energy selection with lowest recommended tool power level.
- Correct according requirement from chapter quality assurance.

Quality assurance

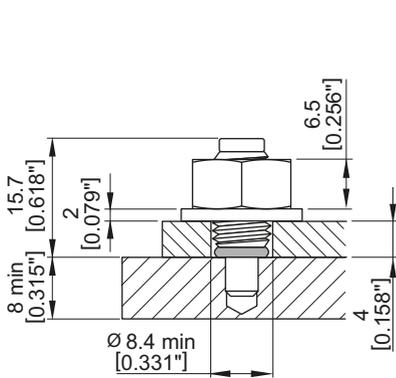
Fastening inspection



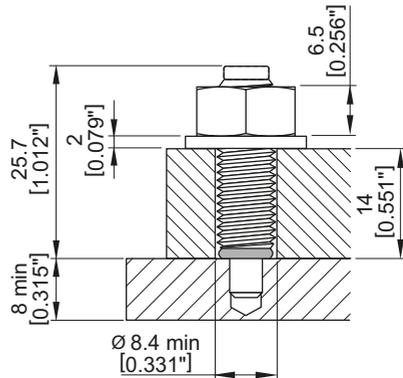
X-BT-MR-N M8/4 N 4
 $h_{NVS} = 15.7-16.8 \text{ mm}$

X-BT-MR-N M8/14 N 4
 $h_{NVS} = 25.7-26.8 \text{ mm}$

Installation recommendation

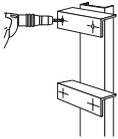


X-BT-MR-N M8/4 N4



X-BT-MR-N M8/14 N4

Pre-drill



- Pre-drill with TX-BT 4/5.5 step shank drill bit.
- Pre-drill until the shoulder grinds a shiny ring (to ensure proper drilling depth).
- Before fastener installation: the drilled hole must be clear of liquids and debris.
The area around the drilled hole must be free from liquids and debris.

These are abbreviated instructions which may vary by application.

ALWAYS review/follow the instructions accompanying the product.

Tightening torque

	Fastener: X-BT-MR N
Element: nut	8 Nm

Tightening tool recommendation for tightening with cordless screwdriver

Cordless screwdriver	Clutch type (stop detection)	Gear	Clutch
SF 4-A22	TRC	1	8
SF 6-A22	ESC (HJ)	1	3
SF 6H-A22	ESC (HJ)	1	3
SFC 14-A	TRC	1	6
SFC 18-A	TRC	1	3
SFC 22-A	TRC	1	5
SBT 4-A22	TRC	1	7



• Tool power level adjustment:

Gear:



Clutch:



- The setting of the torque via the Hilti screwdriver with torque release coupling (TRC) can change as the clutch wears over time. The specified torque setting is only a rough guide value and applies to a new Hilti screwdriver. To ensure recommended torque is applied, Hilti recommends the use of a calibrated torque wrench or the Hilti torque tool.
- The specified torque setting for the Hilti screw drivers with electronic slip clutch (ESC) is only a rough guide value as the ESC has 2 stop detections; Soft Joint (SJ) detection and Hard Joint (HJ) detection. The hard joint detection is activated due to drop in speed (fast stop) and can lead to a torque spike. The installation torque may vary depending on the user and the application. To ensure recommended torque is applied, Hilti recommends the use of a calibrated torque wrench or the Hilti torque tool.

Tightening tool recommendation for tightening with Hilti torque tool

Hilti torque tool

Torque tool X-BT 1/4" – 8 Nm