



X-FCI-M DATA SHEET

Grating fastening system

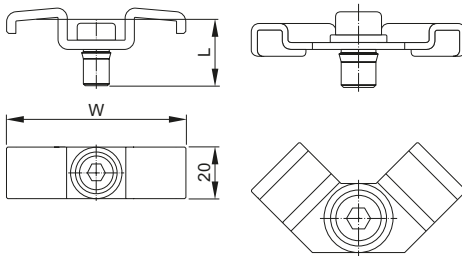


X-FCI-M Grating fastening system

Product data

Dimensions

X-FCI-M and X-FCI-M L X-FCI-M C



Dimension

See main section Fastener selection and system recommendation for dimension W and L.

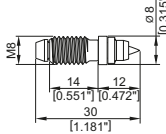
Material specifications

See section Material specifications and coatings in the next pages for more details.

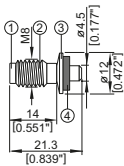
Recommended fastening tools

- For more details, please refer to Fastener selection.

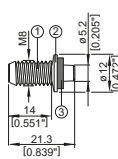
X-ST-GR M8/10 P8



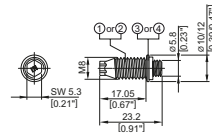
X-BT M8-15-6 SN12-R



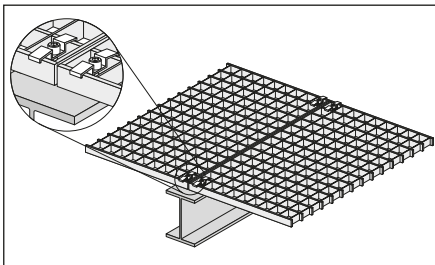
X-BT-GR M8/7 SN 8



S-BT-GF M8/7 AN 6 HL
S-BT-GR M8/7 SN 6 HL
S-BT-GR M8/7 SN 6 HL AL



Application



For fastenings exposed to weather and mildly corrosive conditions.

Not for use in marine atmospheres (upstream)!

Performance data

Recommended resistance under tension load

$$N_{rec} = 0.8 \text{ kN (180 lb)}$$

- Tensile loading is limited by plastic deformation of the saddle clip
- X-FCI-M resists shear by friction and is not suitable for explicit shear load design

Application recommendation

Base material thickness

<p>X-BT M8-15-6 SN12-R</p> <p>$t_{II} \geq 8 \text{ mm}$</p>	<p>X-BT-GR M8/7 SN 8</p> <p>$t_{II} \geq 8 \text{ mm}$</p>	<p>S-BT-GF M8/7 AN 6 HL S-BT-GR M8/7 SN 6 HL S-BT-GR M8/7 SN 6 HL AL*)</p> <p>$t_{II} \geq 6 \text{ mm}$ pilot hole</p>	<p>S-BT-GR M8/7 SN 6 HL S-BT-GR M8/7 SN 6 HL AL*)</p> <p>steel: $3 \text{ mm} \leq t_{II} < 6 \text{ mm}$, aluminum: $5 \text{ mm} \leq t_{II} < 6 \text{ mm}$ drill through hole</p>	<p>X-ST-GR</p> <p>$t_{II} \geq 6 \text{ mm}$</p>
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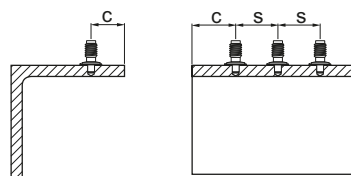
*) for use in aluminum base material

Fastened material thickness

Grating height: X-FCI-M:
 $HG = 28-52 \text{ mm (1.10"-2.05")}$, other dimensions for X-FCI-M are available on demand.
 See **Fastener selection** for detailed dimensions

Fastener positioning in base material

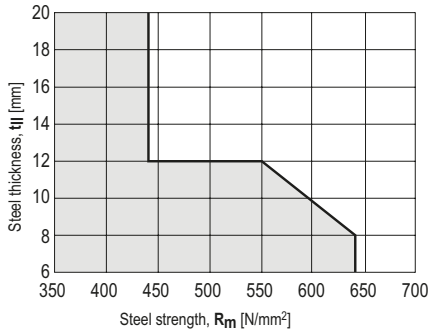
<p><u>X-ST-GR</u></p> <p>Edge distances: $c \geq 15 \text{ mm}$</p> <p>Spacing: $s \geq 15 \text{ mm}$</p>	<p><u>X-BT, X-BT-GR, S-BT HL</u></p> <p>Edge distance: $c \geq 6 \text{ mm}$</p> <p>Spacing: $s \geq 15 \text{ mm}$</p>
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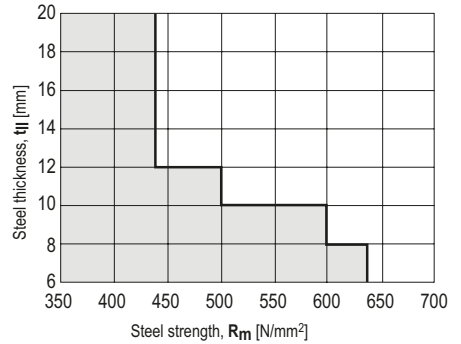
Application limits

Fastener: X-ST-GR

Tool type: DX 460, DX 5, DX 6



Tool type: DX 76 PTR



Fastener: X-BT and X-BT-GR

No application limits

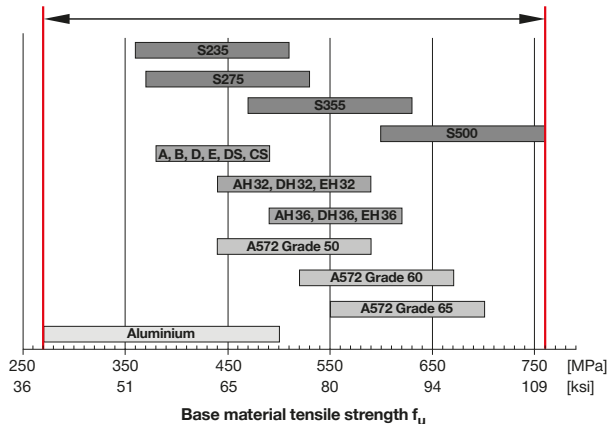
→ using in high strength steel (f_u up to 1000 MPa)

No through penetration

→ $t_{II} \geq 8$ mm [⁵/₁₆"

Fastener: S-BT HL

The base material is limited to steel grade with a maximum tensile strength $f_u = 760$ MPa (110 ksi). The minimum tensile strength of steel is $f_u \geq 360$ MPa (52 ksi). The minimum tensile strength of aluminum is $f_u \geq 270$ MPa (39 ksi). Minimum thickness of base material t_{II} : refer to section "Thickness of base material" Maximum thickness of base material t_{II} : no limits



Corrosion information



- For more details, please refer to following technical document: Hilti Corrosion Handbook.

X-FCI-M is used to weather and mildly corrosive conditions, not suitable for coastal and offshore applications.

X-BT, X-BT-GR and S-BT-GR HL stainless steel fasteners is suitable for coastal and offshore environment. However, they can only be used for weather and mildly corrosive conditions once combining with X-FCI-M.

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 to the standard EN ISO 9223. For higher corrosion categories stainless steel fasteners should be used. In case of a drill through hole, rework of the coating on the back side of the plate/profile may be needed.

The intended use of the X-ST-GR fasteners comprises fastenings exposed to outdoor environments in mildly corrosive conditions where HDG coated parts are commonly specified or used. Not for use in atmospheres with chlorides (marine atmospheres) or in heavily polluted environments (e.g. sulphur dioxide).

System recommendation

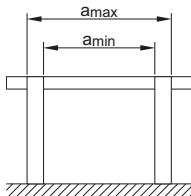


- For more details, please refer to the chapter **Accessories and consumables compatibility** in the Direct Fastening Technology Manual (DFTM).

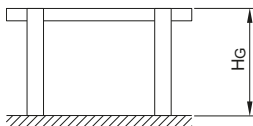
Fastener selection

Fastener	Item no.	W		L		Grating width		Grating height	
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	a	mm (inch)	H _G	mm (inch)
X-FCI-M 28/32	2223485	40 (1.58")	22.5 (0.89")	23-38 (0.91"-1.50")	28-32 (1.10"-1.26")				
X-FCI-M 33/37	2223486	40 (1.58")	27.5 (1.08")	23-38 (0.91"-1.50")	33-37 (1.30"-1.46")				
X-FCI-M 38/42	2223487	40 (1.58")	32.5 (1.30")	23-38 (0.91"-1.50")	38-42 (1.50"-1.65")				
X-FCI-M 43/47	2223488	40 (1.58")	37.5 (1.48")	23-38 (0.91"-1.50")	43-47 (1.69"-1.85")				
X-FCI-M 48/52	2223489	40 (1.58")	42.5 (1.67")	23-38 (0.91"-1.50")	48-52 (1.89"-2.05")				
X-FCI-M 28/32 L	2223661	67 (2.64")	21 (0.83")	35-65 (1.38"-2.56")	28-32 (1.10"-1.26")				
X-FCI-M 33/37 L	2223662	67 (2.64")	26 (1.02")	35-65 (1.38"-2.56")	33-37 (1.30"-1.46")				
X-FCI-M 38/42 L	2223663	67 (2.64")	31 (1.22")	35-65 (1.38"-2.56")	38-42 (1.50"-1.65")				
X-FCI-M 43/47 L	2223664	67 (2.64")	36 (1.42")	35-65 (1.38"-2.56")	43-47 (1.69"-1.85")				
X-FCI-M 48/52 L	2223665	67 (2.64")	41 (1.61")	35-65 (1.38"-2.56")	48-52 (1.89"-2.05")				
X-FCI-M 28/32 C	2223667	32 (1.26")	21 (0.83")	30 + (1.18" +)	28-32 (1.10"-1.26")				
X-FCI-M 33/37 C	2223668	32 (1.26")	26 (1.02")	30 + (1.18" +)	33-37 (1.30"-1.46")				
X-FCI-M 38/42 C	2223669	32 (1.26")	31 (1.22")	30 + (1.18" +)	38-42 (1.50"-1.65")				
X-FCI-M 43/47 C	2223670	32 (1.26")	36 (1.42")	30 + (1.18" +)	43-47 (1.69"-1.85")				
X-FCI-M 48/52 C	2223671	32 (1.26")	41 (1.61")	30 + (1.18" +)	48-52 (1.89"-2.05")				

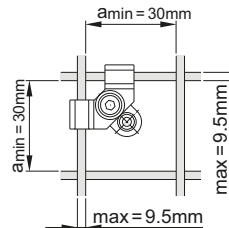
Grating width of X-FCI-M _/_ (L)



Grating height




Grating width of X-FCI-M _/_ C



Threaded studs


Designation	Item no.
X-ST-GR M8/10 P8	2122460
X-BT M8-15-6 SN12-R	377074
X-BT-GR M8/7 SN 8	2194344
S-BT-GF M8/7 AN 6 HL	2345766
S-BT-GR M8/7 SN 6 HL	2345767
S-BT-GR M8/7 SN 6 HL AL	2350548

Cartridge selection and tool energy setting

-  • Fastener setting information (e.g. cartridge recommendation, tool power level adjustment, base material properties and fastener material properties) and installation information (e.g. quality assurance) are part of the corresponding product data sheet for fastener.

Material specifications and coatings

Fastener X-FCI-M	Saddle	Threaded stem	Washer
Material designation	DC0136	11SMNPB30+C	Stainless Steel 316
Coating	Duplex	Duplex	-

-  • Metal washer only mounted on X-FCI-M L and X-FCI-M C items
- Duplex: comparable to 45 µm HDG steel (480 h Salt spray test per DIN 50021)

Threaded studs

	X-BT M8-15-6 SN12-R			X-ST-GR	
	Shank ①	Threaded sleeve ②	Sealing ring of sealing washer ④	Shank	Threaded sleeve
Material	Stainless steel	X2CrNiMo17132	Elastomer,	P558	(A4 / AISI316)
designation	1.4462, CR 500 (A4 / AISI316)	X5CrNiMo17122+2H (A4 / AISI316)	black	(CrMnMo alloy)	
Coating	none	none		none	none

①) resistant to: UV, saltwater ozone, oil, grease

②) Zinc applied by electroplating. Intended for corrosion protection during shipment, storage, construction and service in protected environment. It is not adequate for protection against corrosion in outside or otherwise corrosive applications

Threaded studs

	S-BT- <u> </u> _R HL, X-BT-GR			S-BT- <u> </u> _F HL		
	Threaded Shank ①	SN 12-R washer ③	Sealing ring of sealing washer ④	Threaded Shank ②	AN 10-F washer ④	Sealing ring of sealing washer ④
Material	Stainless steel	Stainless steel	Elastomer,	Carbon steel	Aluminum	Elastomer,
designation	1.4462 (A4 / AISI316)	1.4404 (A4 / AISI316)	black	1038		black
Coating	Zinc ③	none	none	Duplex-coating	none	HDG

①) resistant to: UV, salt water, ozone, oil, grease

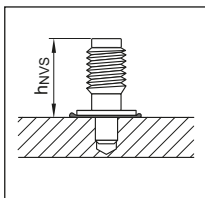
②) The surface of the S-BT HL stainless steel fasteners is zinc plated (anti-friction coating) in order to reduce the thread forming torque when the stud is screwed in into the base material.

③) only S-BT HL is coated, X-BT-GR is uncoated

Quality assurance

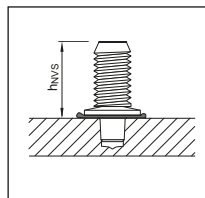
Fastening inspection

X-BT M8-15-6 SN12-R



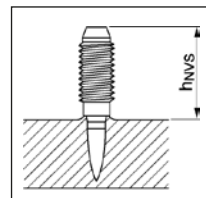
$h_{NVS} = 15.7 - 16.8 \text{ mm}$

X-BT-GR M8/7 SN 8



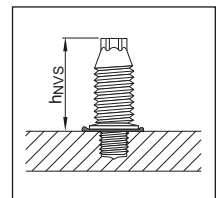
$h_{NVS} = 15.7 - 16.8 \text{ mm}$

X-ST-GR M8/10 P8



$h_{NVS} = 17.0 - 20.0 \text{ mm}$

S-BT- /7 6 HL



$h_{NVS} = 18.6 - 19.1 \text{ mm}$

Installation recommendation

Tightening torque for X-FCI-M, X-FCI-M-L

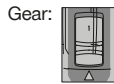
	Fastener: X-ST-GR, X-BT-GR, S-BT-GF HL, S-BT-GR HL
Element: X-FCI-M, X-FCI-M-L	4–5 Nm

Tightening tool recommendation for tightening with cordless screwdriver

Cordless screwdriver	Clutch type (stop detection)	Gear	Clutch
SF 2-A12	TRC	1	15
SF 2H-A12	TRC	1	15
SF 4-A22	TRC	1	4
SF 6-A22	ESC (SJ)	1	5
SF 6H-A22	ESC (SJ)	1	5
SF 8M-A22	TRC	3	5
SF 10W-A22	TRC	4	4-5
SBT 6-22	ESC (SJ)	1	5



• Tool power level adjustment:



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 S-BT 1/4" – 5 Nm

Tightening torque for X-FCI-M C

	Fastener: X-ST-GR, X-BT-GR, S-BT-GF HL, S-BT-GR HL
Element: X-FCI-M C	6–8 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 (SJ)	1	7
SF 6H-A22	ESC (SJ)	1	7
SF 8M-A22	TRC	3	7
SF 10W-A22	TRC	4	6
SBT 6-22	ESC (SJ)	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.
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Tightening tool recommendation for tightening with Hilti torque tool

Hilti torque tool

Torque tool X-BT 1/4" – 8 Nm