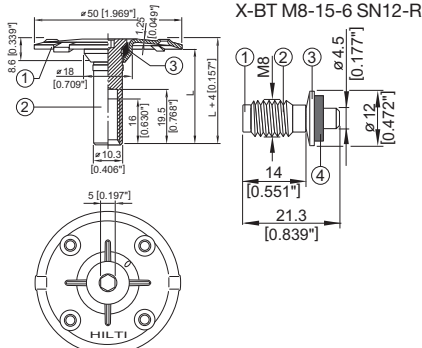


X-FCM Grating Fastening System

Product data

Dimensions



General information

Material specifications

See fastener selection for more details.

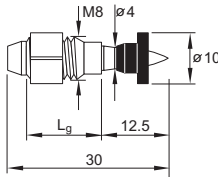
Fastening tool

See fastener selection for more details.

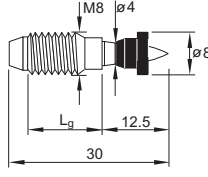
Approvals

ABS:	X-FCM-R
GL, DNV:	X-FCM-M, X-FCM-R
LR:	all types
DNV	

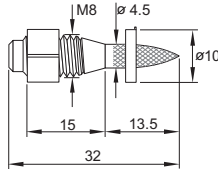
X-CRM8-15-12 FP10



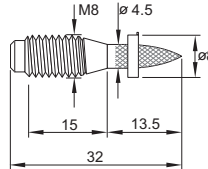
X-CRM8-15-12 P8



X-EM8H-15-12 FP10

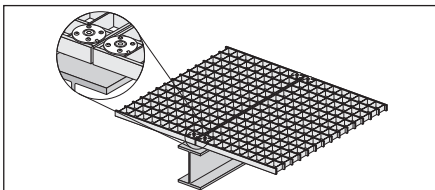


X-EM8H-15-12 P8



Applications

Example

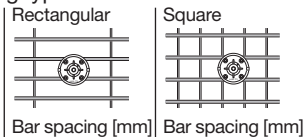


Grating (steel and fibreglass reinforced)

Load data

Recommended tensile loads N_{rec} [kN]

Grating opening type



	Rectangular		Square	
	18	30	18	30
X-FCM	0.8**	0.8**	2.4*	0.8**
X-FCM-M	0.8**	0.8**	1.8*	0.8**
X-FCM-R	1.4**	1.0**	1.8*	1.0**

* Loading is limited by recommended load for threaded stud.

** Loading is limited by elastic limit of the **X-FCM** disk. Exceeding recommended loads can result in plastic deformation of disk.

Notes:

X-FCM, **X-FCM-M**, **X-FCM-R** resist shear by friction and are not suitable for explicit shear load designs, e.g. diaphragms. Depending on surface characteristics, shear loads of up to about 0.3 kN will not result in permanent deformation. Therefore small unexpected shear loads can generally be accommodated without damage.

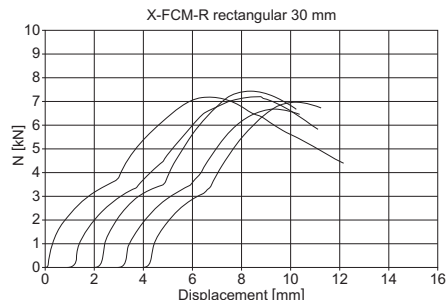
Characteristic tensile loads N_{Rk} :

Type	Grating – bar spacing	X-FCM-R with		
		X-BT S235 / A36 steel	> S355 / Grade 50 steel	X-CRM
	Rectangle 18 mm	4.2 kN / 945 lb*	4.2 kN / 945 lb*	4.2 kN / 945 lb*
	Rectangle 30 mm	3.0 kN / 675 lb*	3.0 kN / 675 lb*	3.0 kN / 675 lb*
	Square 18 mm	5.4 kN / 1215 lb	6.9 kN / 1550 lb	5.4 kN / 1215 lb
	Square 30 mm	3.0 kN / 675 lb*	3.0 kN / 675 lb*	3.0 kN / 675 lb*

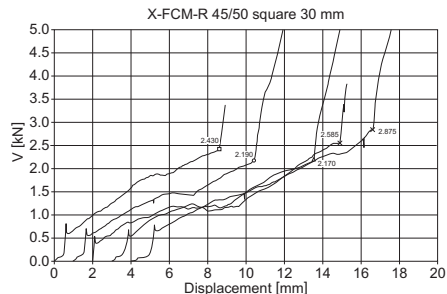
* Loading is limited by elastic limit of the **X-FCM** disc.

Load displacement behaviour – examples:

Tensile load



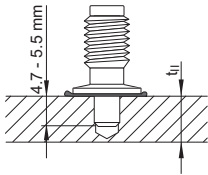
Shear load



Application requirements

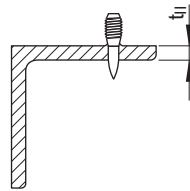
Thickness of base material

X-BT



$t_{II} \geq 8 \text{ mm}$

X-CRM and X-EM8H



$t_{II} \geq 6 \text{ mm}$

Thickness of fastened material

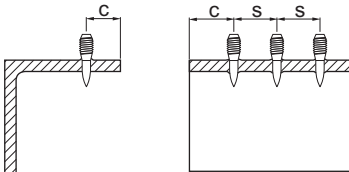
Grating height: 25–50 mm with standard X-FCM. For other dimensions special X-FCM are available on demand.

Spacing and edge distances

X-CRM, X-EM8H

Edge distances: $c \geq 15 \text{ mm}$

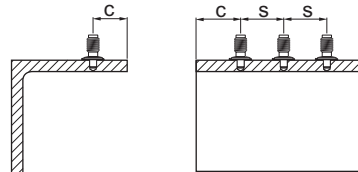
Spacing: $s \geq 15 \text{ mm}$



X-BT

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

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

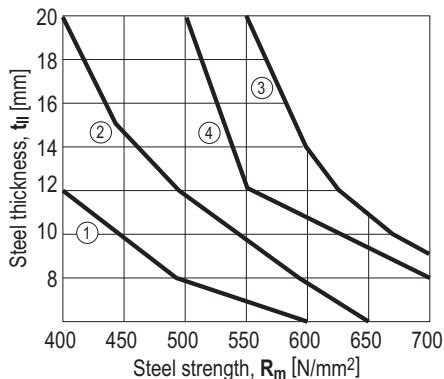


Corrosion information

The intended use of the **X-EM8H** carbon steel fasteners only comprises fastenings which are not directly exposed to external weather conditions or moist atmospheres. For outdoor applications **X-BT** or **X-CRM** stainless steel fasteners have to be used, see fastener selection.

Application limits

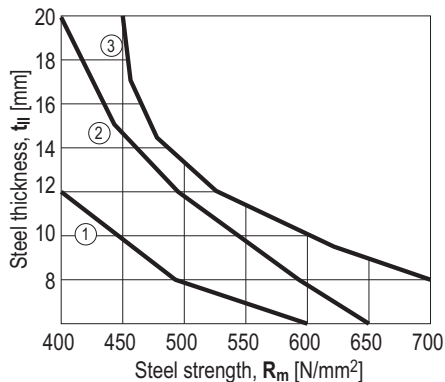
DX 76, DX 76 PTR



- ① **X-CRM8-15-12 FP10** /
DX 76, DX 76 PTR (impact)
- ② **X-CRM8-15-12 FP10** /
DX 76, DX 76 PTR (co-acting)
- ③ **X-EM8H-15-12 FP10** /
DX 76, DX 76 PTR (impact)
- ④ **X-EM8H-15-12 P8** /
DX 76, DX 76 PTR (impact)

X-BT: No application limits → using in high strength steel
No through penetration → $t_{II} \geq 8$ mm [9/16"]

DX 460



- ① **X-CRM8-15-12 P8** / DX 460 (impact)
- ② **X-CRM8-15-12 P8** / DX 460 (co-acting)
- ③ **X-EM8H-15-12 P8** / DX 460 (impact)

Fastener selection and system recommendation

Application areas

Indoors, dry and non corrosive environment

Indoors, mildly corrosive environment, or for limited lifetime use

Marine, offshore, petrochemical, caloric (coal, oil) power plants, etc.

X-FCM system

X-FCM		X-FCM-M		X-FCM-R		L [mm]	Grating height [mm]	Tools
Zinc plated	Item no.	Duplex coated	Item no.	Stainless steel	Item no.			
X-FCM 25/30	26582	X-FCM-M 25/30	378683	X-FCM-R 25/30	247181	23	25-30	¹⁾
X-FCM 1"-1 1/4"	247175	X-FCM-M 1"-1 1/4"	378686	X-FCM-R 1"-1 1/4"	247184	27	29-34	¹⁾
X-FCM 35/40	26583	X-FCM-M 35/40	378684	X-FCM-R 35/40	247182	33	35-40	¹⁾
X-FCM 45/50	26584	X-FCM-M 45/50	378685	X-FCM-R 45/50	247183	43	45-50	¹⁾
		Note: Not for use in marine atmosphere or in heavily polluted environment.		Note: Not for use in automobile tunnels, swimming pools or similar environments				

¹⁾ SF 100-A, SF 11-A, SF 150-A

Threaded studs

	Item no.	Tools
X-EM8H-15-12 P8	271981	²⁾
X-EM8H-15-12 FP10	271982	²⁾
	X-BT M8-15-6 SN12-R	377074 ³⁾
	X-CR M8-15-12 P8	372033 ²⁾
	X-CR M8-15-12 FP10	372034 ²⁾

²⁾ DX 76 PTR, DX 460

³⁾ DX 351-BTG

Cartridge selection and tool energy setting

X-BT

6.8/11M high precision cartridges

X-CRM and X-EM8H

6.8/11M yellow or red cartridges with DX 460

6.8/18M blue cartridges with DX 76 PTR

Tool energy adjustment by setting tests on site.

Material specifications and coatings

X-FCM system

	X-FCM-R		X-FCM-M		X-FCM		All systems
	① Disk	② Threaded stem	① Disk	② Threaded stem	① Disk	② Threaded stem	③ Absorber ¹)
Material designation	X2CrNiMo18143 X2CrNiMo17122	X2CrNiMo17132 X6CrNiMoTi17122 X5CrNiMo17122K700	DC 04	11SMNBPB30+C	DC 04	11SMNBPB30+C	Polyurethane Black
Coating	none	none	Duplex *	Duplex *	≥ 20µm Zn	10–20 µm Zn	–

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

*) 480 h Salt spray test per DIN 50021 and 10 cycles Kesternich test per DIN 50018/2.0 (comparable to 45 µm HDG steel)

Threaded studs

	X-BT			X-CRM8		X-EM8H
	Shank ①	Threaded sleeve ②	Sealing washer ¹) ③	Shank	Threaded sleeve	
Material designation	Stainless steel CR 500 (A4 / AISI316)	X2CrNiMo17132 X5CrNiMo17122+2H (A4 / AISI316)	Elastomer, black	Stainless steel CR 500 (A4 / AISI316)	X2CrNiMo17132 X5CrNiMo17122+2H (A4 / AISI316)	Carbon steel Ck 67 MOD
Coating	none	none		none	none	5–13 µm Zn ²)

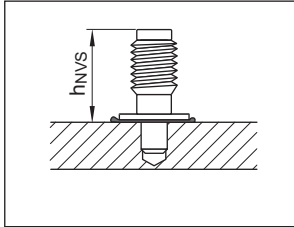
¹) resistant to: UV, saltwater ozone, oil, grease

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

Fastening quality assurance

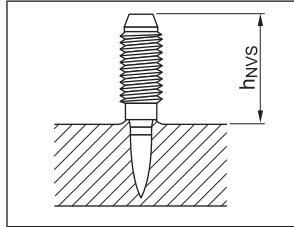
Fastening inspection

X-BT M8-15-6 SN12-R



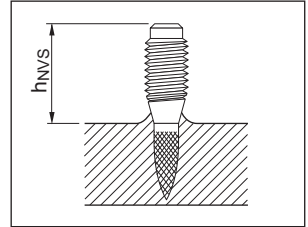
$h_{NVS} = 15.7-16.8 \text{ mm}$

X-CRM8-15-12



$h_{NVS} = 16-20 \text{ mm}$

X-EM8 H-15-12

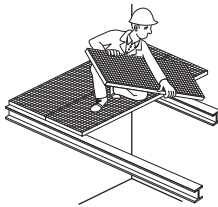


$h_{NVS} = 15.5-19.5 \text{ mm}$

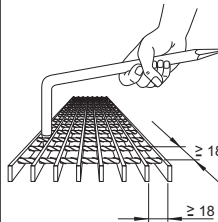
Installation

Installation procedure for bar grating

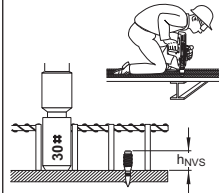
1. Place the grating sections



2. Widen opening at fastening location if necessary

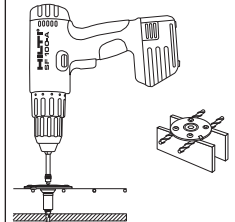


3. Place the threaded stud



For X-BT pre-drill with TX-BT4/7 stop shank drill bit

4. Tighten the disk



Tightening torque

$T_{rec} = 5-8 \text{ Nm}$

Tightening tool:

- Screwdriver with torque release coupling (TRC)
- 5 mm Allen-type bit

Hilti Screwdriver	Torque setting
SF 121-A	TRC 7-11
SF 150-A	TRC 5- 9

