



The following pages are an excerpt from the North American Product Technical Guide, Volume 1: Direct Fastening Technical Guide, Edition 24.

Please refer to the publication in its entirety for complete details on this product including data development, base materials, general suitability, installation, corrosion, and product specifications.

[Direct Fastening Technical Guide, Edition 24](#)

To consult directly with a team member regarding our direct fastening products, contact Hilti's team of technical support specialists between the hours of 7:00am - 5:00pm CST.

US: 877-749-6337 or HNATechnicalServices@hilti.com

CA: 1-800-363-4458 ext. 6 or CATechnicalServices@hilti.com

3.4.2 X-FCM AND X-FCP GRATING AND CHECKERPLATE

3.4.2.1 PRODUCT DESCRIPTION

The Hilti grating fastening system consists of the X-FCM grating disk, an 8 mm powder-actuated threaded stud, and a powder-actuated tool equipped with a special grating adapter that fits through the bar grating and contacts the base steel, or an 8 mm screw-in threaded stud with S-BT system. The X-FCM grating disk is available in three lengths to accommodate grating thickness of 1" to 2". Carbon steel disks are available with duplex coating (X-FCM-F). The stainless steel disks (X-FCM-R) offer the highest corrosion resistance. The 8 mm threaded studs are available in stainless steel.

The X-FCP fastening system is used to fasten flat steel floorplates with thicknesses of 1/4" to 1/2" to supporting steel structures. The Hilti X-FCP fastening system includes the X-FCP disk, an 8 mm powder-actuated threaded stud and a powder-actuated tool with specialized adapter. The adapter is designed to fit through a 3/4" diameter pre-drilled hole in the checkerplate or other similar solid flooring material, and contact the base steel. The X-FCP disk is available in duplex coated carbon steel (X-FCP-F) or stainless steel (X-FCP-R). The 8 mm threaded studs are available in stainless steel.

Product features:

- Grating or checkerplate are fastened in place
- Topside only access needed
- Removable* and reusable*
- Corrosion resistance of stainless steel disks and X-ST-GR threaded studs
- Non-trip profile
- Non-slip surfaces
- No electrical or pneumatic power required

* Only disk part of fastener can be removed and reused. Threaded stud remains in place unless removed by over-loading the fastener and not reusable.

Guide specification

05500 Metal fabrications

05530 Grating

Disk: X-FCM disk shall be duplex coated carbon steel or stainless steel, which consists of an assembly of a disk and an 8 mm internally threaded screw manufactured by Hilti.

Stud: Powder-actuated threaded stud shall be X-ST-GR M8/10 P8, X-BT-GR M8/7 SN 8 stainless steel studs, screw-in threaded stud shall be S-BT-GR M8/7 SN6 stainless steel studs or S-BT-GF M8/7 AN6 carbon steel studs for attaching the X-FCM disk.

Installation: Contact a manufacturer's representative from Hilti to provide training to the operators at the project site.

05540 Floor plates

Disk: X-FCP disk shall be duplex coated carbon steel or stainless steel, which consists of an assembly of a disk and an 8 mm internally threaded screw manufactured by Hilti.

Stud: Powder-actuated threaded stud for attaching the X-FCP disk shall be X-ST-GR M8/5 P8 or X-ST-GR M8/10 P8 stainless steel studs manufactured by Hilti.

Installation: Contact a manufacturer's representative from Hilti to provide training to the operators at the project site.

3.4.2.1 Product description

3.4.2.2 Material specifications

3.4.2.3 Technical data

3.4.2.4 Installation instructions

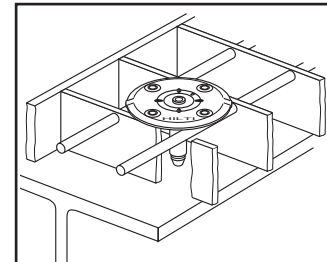
3.4.2.5 Ordering information



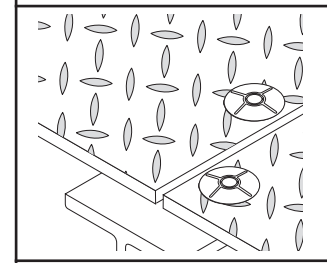
X-FCM



X-FCP



Bar grating (with X-FCM)



Checker plate (with X-FCP disk)

Listings/Approvals

ABS (American Bureau of Shipping)
for X-FCM-R and X-FCP-R

Lloyds Register
for all X-FCM types and X-FCP-R

DNV Certification
for X-FCM-F and X-FCM-R

GL (Germanischer Lloyd)
for X-FCM-F and X-FCM-R



3.4.2.2 MATERIAL SPECIFICATIONS

Component	X-FCM-F and X-FCP-F		X-FCM-R and X-FCP-R	
	Material	Coating	Material	Coating
Disk	Carbon steel	Duplex ¹	SAE 316	None
Threaded extension	Carbon steel	Duplex ¹	SAE 316	None
Threaded stud	SAE 316 Equivalent or carbon steel	None	SAE 316 Equivalent	None

¹ Duplex coating is comparable to 45 µm HDG coating. Reference Section 2.3.3.1 for more information.

3.4.2.3 TECHNICAL DATA

Allowable static tension loads for X-FCM-F or X-FCM-R with grating, lb (kN)^{1,2,4}

Fastener description	Rectangular grid barspacing in. (mm)				Square grid barspacing in. (mm)			
	3/4 (19)	1-3/16 (30)	3/4 (19)	1-3/16 (30)				
X-FCM-F	180 (0.8)	180 (0.8)	405 (1.8) ³	180 (0.8)				
X-FCM-R	315 (1.4)	225 (1.0)	405 (1.8) ³	225 (1.0)				

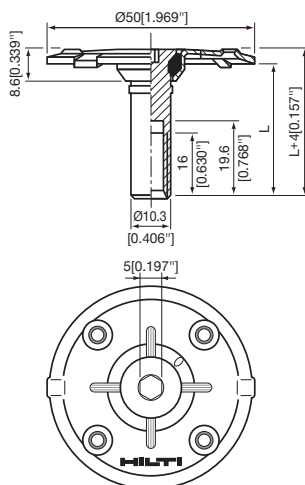
- 1 Allowable loads represent the capacity of the Hilti Grating System only. The capacity of the grating must be investigated in accordance with accepted design criteria.
- 2 Unless otherwise noted, load values are limited by plastic deformation of the X-FCM disk.
- 3 Allowable load value is limited by Allowable load for threaded stud. Reference Sections 3.2.13, 3.2.14, 3.2.15.
- 4 X-FCM-F and X-FCM-R Fastening Systems 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 65 lb (0.3 kN) will not result in permanent deformation. Therefore, small unexpected shear loads can generally be accommodated without damage.

Allowable Static Tension Load for X-FCP-F and X-FCP-R with Checkerplate^{1,3}

Fastener description	Allowable tension loads ²	
	lb	(kN)
X-FCP-F X-FCP-R	405	(1.8)

- 1 Allowable loads represent capacity of X-FCP disk or threaded stud. The capacity of checkerplate must be investigated in accordance with accepted design criteria.
- 2 Allowable load value is limited by the Allowable load for the threaded stud used with the grating disk.
- 3 X-FCP-F and X-FCP-R are not intended for shear loading.

3.4.2.4 INSTALLATION INSTRUCTIONS

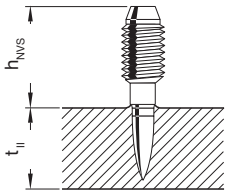
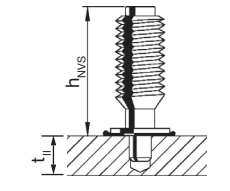
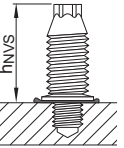
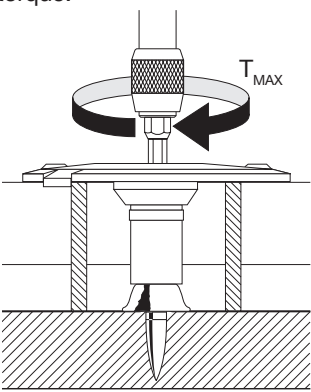
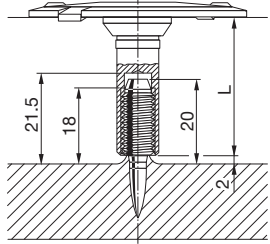
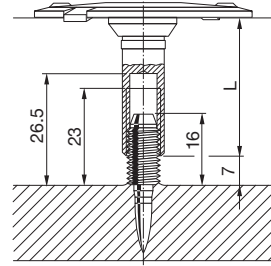


Product Selection Guide for Grating

	Duplex coated ¹	Stainless steel	L		Grating height	
			in.	(mm)	in.	(mm)
Grating disk	X-FCM-F 25/30	X-FCM-R 25/30	0.906	(23)	1 to 1-3/16	(25-30)
	X-FCM-F 1 -1/4	X-FCM-R 1 -1/4	1.063	(27)	1-1/4	(32)
	X-FCM-F 35/40	X-FCM-R 35/40	1.299	(33)	1-3/8 to 1-9/16	(35-40)
	X-FCM-F 45/50	X-FCM-R 45/50	1.693	(43)	1-3/4 to 2	(45-50)
Threaded stud	X-ST-GR M8/10 P8					
	X-BT-GR M8/7 SN 8					
	S-BT-GR M8/7 SN6					
	S-BT-GF M8/7 AN6					

¹ 480 hour salt spray test per DIN 50021 and 10 cycles Kesternich test per DIN 50018/2.0 (Comparable to 45 microns HDG coating).

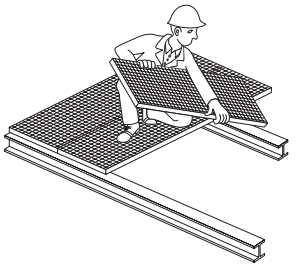
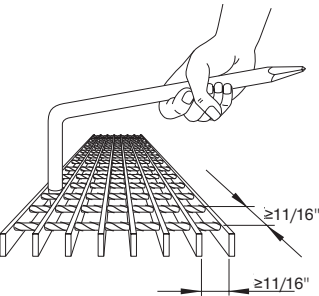
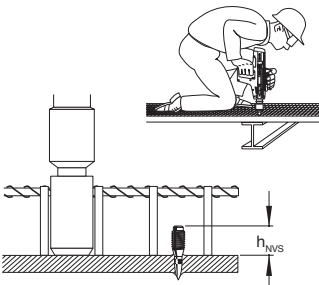

Installation details for X-FCM grating disks¹

Threaded stud placing	Tightening torque	Fitting tolerances/height of grating (dimensions in mm)	
<p>X-ST-GR M8/10 P8 $h_{NVS} = 5/8''$ to $25/32''$ (16.0 to 20.0 mm) $t_{II} = 1/4''$ to $1/2''$ (6 to 12 mm)</p>  <p>X-BT-GR M8/7 SN 8¹ $h_{NVS} = 5/8''$ to $11/16''$ (15.7 to 16.8 mm) $t_{II} \geq 5/16''$ (8 mm)</p>  <p>S-BT-GR M8/7 SN6 S-BT-GF M8/7 AN6 $h_{NVS} = 0.732'' - 0.752''$ (18.6 to 19.1 mm)</p>  <p>Refer Section 3.2.14 for base steel thickness</p>	<p>$T_{max} = 6.0$ ft-lb (8.0 N-m) for X-ST-GR. $T_{max} = 12.0$ ft-lb (16.0 N-m) for X-BT-GR M8 studs.¹ $T_{max} = 3.6$ ft-lb (5.0 N-m) for S-BT M8 studs.</p> <p>Tightening tool: Hilti screwdriver SF 18-A, SFH 18-A, SF 144-A or SFH 144 with 5 mm Torx Bit</p> <p>Set clutch to appropriate setting to obtain desired torque.</p> 	<p>Min. grating height = $L + 2$</p>  <p>Governing requirement:</p> <ul style="list-style-type: none"> Minimum 2 mm clearance between X-FCM and surface of base steel to allow for deflections <p>Example: X-FCM 25/30 Min. grating ht. = $23 + 2 = 25$ mm Max. grating ht. = $23 + 7 = 30$ mm</p> <p>Grating height of 32 can be accommodated if $h_{NVS} \geq 18$ mm</p>	<p>Max. grating height = $L + 7$</p>  <p>Governing requirement:</p> <ul style="list-style-type: none"> Minimum 5 mm thread engagement at the minimum allowable stand-off, h_{NVS}. <p>Note:</p> <ul style="list-style-type: none"> The maximum grating height for an X-FCM type can be extended if h_{NVS} is tightly controlled (e.g. at 18 mm instead of 16 mm).²

¹ Reference Section 3.2.14 for more details on proper installation of X-BT fasteners. Reference Section 3.2.15 for more details on proper installation of S-BT fasteners. Always consult "Instructions for Use" for more detailed installation instructions.

² Maximum grating height can be extended with the use of the X-SEA-R30 M8. Reference Section 3.4.2.4 for photo.

Installation procedure for bar grating¹

<p>1. Place the grating sections following recognized safety precautions.</p> 	<p>2. Widen opening at fastening</p> 	<p>3. Place the threaded stud</p> 	<p>4. Tighten the disk, without exceeding maximum tightening torque</p> 
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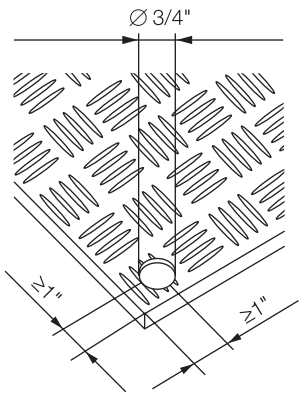
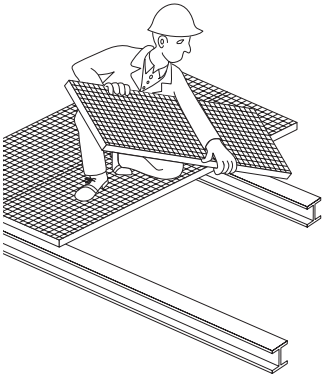
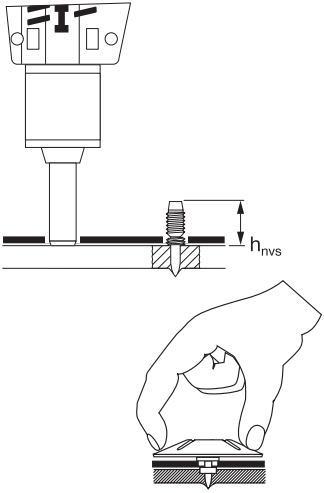

¹ Installation Instructions For Use (IFU) are included with each product package. They can also be viewed or downloaded online at www.hilti.com. Because of the possibility of changes, always verify that downloaded IFU are current when used. Proper installation is critical to achieve full performance. Training is available on request. Contact Hilti Technical Services for applications and conditions not addressed in the IFU.

Product selection guide for checkerplate

Fastening height in. (mm)	X-FCP Disk ¹	DX 460-GR Stud
1/4 to 21/64 (6.4 to 8.3)	X-FCP-F5/10 X-FCP-R5/10	X-ST-GR M8/5 P8 Stud Stand-off 31/64" – 37/64"
11/32 to 1/2 (8.7 to 12.7)	X-FCP-F5/10 X-FCP-R5/10	X-ST-GR M8/10 P8 Stud Stand-off 41/64" – 25/32"
1/4 to 1/2 (6.4 to 12.7)	X-FCP sealing ring	Optional

¹ X-FCP-F = Duplex Coated Carbon Steel, X-FCP-R = Stainless

Installation procedure for checkerplate¹

	 <p>1. Place and align the plate section following recognized safety precautions.</p>
 <p>2. Install the 8 mm stainless threaded stud through the pre-drilled hole.</p> <p>3. Start the X-FCP on the stud by hand.</p>	 <p>4. Tighten the disk, without exceeding maximum tightening torque.</p> <p>T_{rec} 3.7 – 6 ft-lb (5-8 Nm)</p> <p>h_{NVS} = Stud Stand-off Length</p>

¹ Installation Instructions For Use (IFU) are included with each product package. They can also be viewed or downloaded online at www.hilti.com. Because of the possibility of changes, always verify that downloaded IFU are current when used. Proper installation is critical to achieve full performance. Training is available on request. Contact Hilti Technical Services for applications and conditions not addressed in the IFU.

3.4.2.5 ORDERING INFORMATION

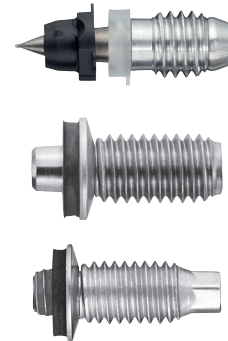
Grating disks

Description	Coating/material	Box qty
X-FCM-F 25/30	Duplex Coated	100
X-FCM-F 35/40	Duplex Coated	100
X-FCM-F 1-1/4	Duplex Coated	100
X-FCM-F 45/50	Duplex Coated	100
X-FCM-R 25/30	Stainless Steel	100
X-FCM-R 35/40	Stainless Steel	100
X-FCM-R 1-1/4	Stainless Steel	100
X-FCM-R 45/50	Stainless Steel	100



Threaded studs

Description	Coating/material	Box qty
X-ST-GR M8/10 P8	Stainless Steel	100
X-ST-GR M8/10 P8	Stainless Steel	100
X-BT-GR M8/7 SN 8	Stainless Steel	100
X-ST-GR M8/5 P8	Stainless Steel	100
X-ST-GF M8/7 AN6	Duplex Coated	100
S-BT-GR M8/7 SN6	Stainless Steel	100
S-BT-GF M8/7 AN6	Duplex Coated	100



Checkerplate disks

Description	Coating/material	Box qty
X-FCP-F5/10	Duplex Coated	200
X-FCP-R5/10	Stainless Steel	200
X-FCP Sealing Ring	Polyurethane	200



Grating extensions

Description	Coating/material	Box qty
X-SEA 30	Stainless Steel	100

