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European Technical Assessment Body
for construction products



European Technical Assessment

ETA-24/0018
of 14 June 2024

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

Hilti X-FCM, X-FCM-F, X-FCM-R,
X-FCM-F L, X-FCM-R L,
X-FCM-F HL, X-FCM-R HL,
X-FCM-F NG, X-FCM-R NG,
X-FCP-F, X-FCP-R

Product family
to which the construction product belongs

Grating fasteners and checker plate fasteners for
connection of gratings and checker plates to structural
steel and aluminium members

Manufacturer

Hilti AG
Feldkircherstraße 100
9494 Schaan
FÜRSTENTUM LIECHTENSTEIN

Manufacturing plant

Plants of Hilti AG

This European Technical Assessment
contains

20 pages including 16 annexes which form an integral
part of this assessment

This European Technical Assessment is
issued in accordance with Regulation (EU)
No 305/2011, on the basis of

EAD 333037-00-0602

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Specific part

1 Technical description of the product

The Hilti X-FCM grating fasteners are mechanical fasteners made of corrosion resistant stainless steel, galvanized carbon steel or galvanized and coated carbon steel. The X-FCM grating fasteners consist of a disc, a stem with internal metric thread M8 and an absorber ring made of polyurethane.

The grating fasteners are intended for use in combination with threaded studs with thread size M8 to secure the position of gratings with rectangular or square openings.

Optional, the Hilti X-FCM grating fastener system can be combined with the Hilti X-SEA-R 30 M8 or X-SEA-F 30 M8 extension adapter to increase the length of the grating fastener.

The Hilti X-FCP checker plate fasteners are mechanical fasteners made of corrosion resistant stainless steel or galvanized and coated carbon steel. The X-FCP checker plate fasteners consist of a disc and a screw with internal metric thread M8.

The checker plate fasteners are intended for use in combination with threaded studs with thread size M8 to secure the position of checker plates.

The product description, installation condition as well as the description of the components of the grating fasteners and checker plate fasteners are given in Annexes A2 to A4.

2 Specification of the intended use in accordance with the applicable European Assessment Document 333037-00-0602 (Threaded studs for connection of materials to structural steel and aluminium members)

The intended use of Hilti X-FCM grating fasteners and X-FCP checker plate fasteners is specified in Annex B1.

The performances given in section 3 and annexes C1 to C5 are only valid if the grating fasteners and checker plate fasteners are used in compliance with the specifications and conditions given in Annexes B1 to B5.

The verification and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the grating fasteners and checker plate fasteners of at least 25 years. The indications given on the working life can't be interpreted as a guarantee given by the manufacturer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Tension resistance	see Annexes C1 to C5

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1 - EN 13501-1
Resistance to fire	no performances determined

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with EAD 333037-00-0602, the applicable European legal act is: 1998/214/EC, amended by 2001/596/EC.

The system to be applied is: 2+

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 14 June 2024 by Deutsches Institut für Bautechnik

Dr.-Ing. Ronald Schwuchow
Head of Section

beglaubigt:
Hahn

Terms and symbols used in this ETA

Grating fastener, checker plate fastener, grating and checker plate

L	=	length of the grating fastener
T	=	installation torque of the grating fastener or checker plate fastener
a	=	clear bar spacing in a grating with square mesh
b	=	clear bar spacing of the bearing bars in a grating with rectangular mesh
d ₁	=	inner thread diameter
d ₂	=	nominal outer diameter of the stem of the grating fastener
d	=	nominal diameter of the disc of the grating fastener
h	=	nominal height of the disc of the grating fastener
h _G	=	height of the grating
t _i	=	total thickness of component I (checker plate)
w	=	width of the hex recess in the stem of the grating fastener

X-SEA M8 adapter

L _A	=	total length of the X-SEA M8 adapter
L ₁	=	extension length of the X-SEA M8 adapter
d ₁	=	inner thread diameter
d ₂	=	nominal outer diameter of the X-SEA M8 adapter
d ₃	=	outer thread diameter

Design

N _{Rk,g}	=	characteristic tension resistance of the grating fastener or checker plate fastener
N _{Rd,g}	=	design tension resistance of the grating fastener or checker plate fastener
γ _M	=	partial factor

Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

Terms and symbols

Annex A1

Product description: Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG

Figure A1: X-FCM, X-FCM-F/-R

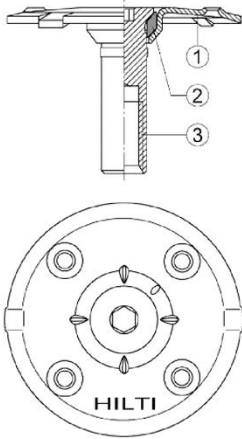


Figure A2: X-FCM-F/-R L

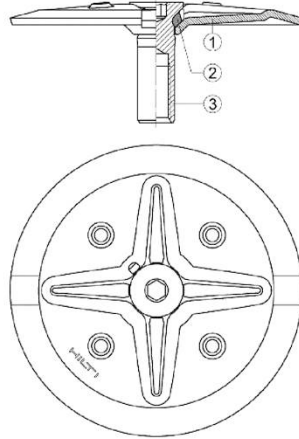


Figure A3: X-FCM-F/-R HL

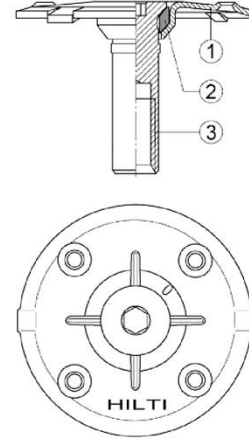


Figure A4: X-FCM-F/-R NG

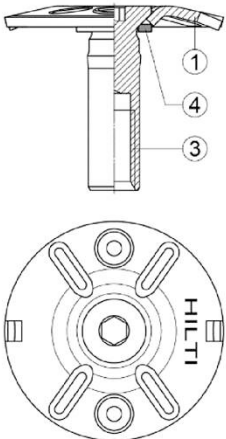


Figure A5: Adapter X-SEA-R 30 M8, X-SEA-F 30 M8



Table A1: Product description

Position	Description
①	Disc
②	Absorber O-ring
③	Stem with internal thread
④	O-ring

Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

Product description

Annex A2

Product description: Hilti X-FCP-R, X-FCP-F

Figure A6: X-FCP-R

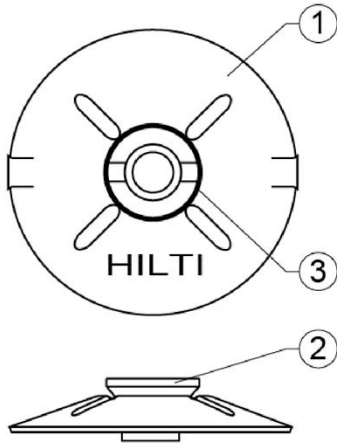


Figure A7: X-FCP-F

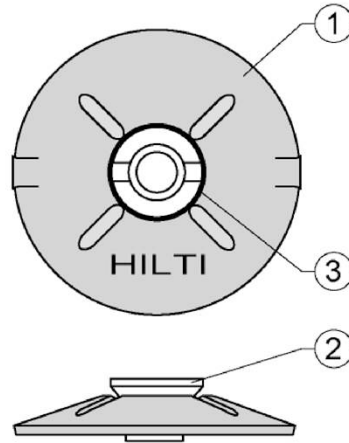


Table A2: Product description X-FCP-R, X-FCP-F

Position	Description
①	Disc
②	Screw
③	Absorber O-ring

Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

Product description

Annex A3

Installed condition

The Hilti X-FCM grating fastener system and the Hilti X-FCP checker plate fastener system are intended for use in combination with threaded studs with thread size M8. The threaded studs M8, the grating and checker plate are not part of this ETA.

Optional, the Hilti X-FCM grating fastener system can be combined with the Hilti X-SEA-R 30 M8 or X-SEA-F 30 M8 extension adapter to increase the length L of the grating fastener.

Figure A8: X-FCM with threaded stud

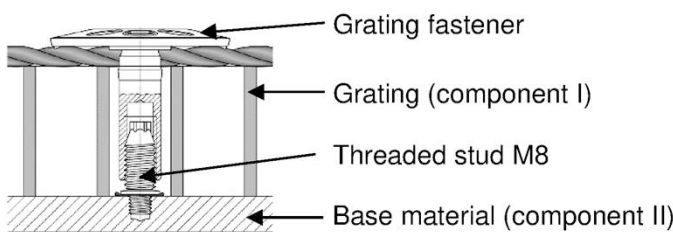


Figure A9: X-FCM with X-SEA M8 adapter

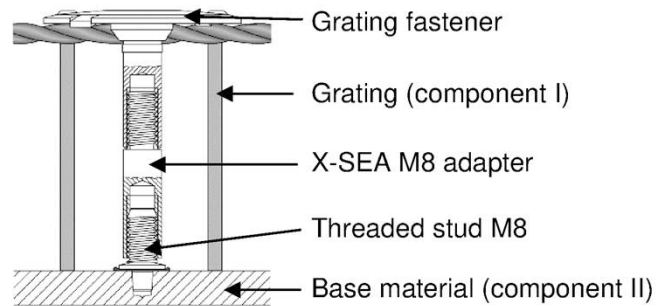


Figure A10:
Grating with clear square mesh width a

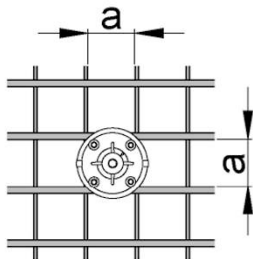


Figure A11:
Grating with clear rectangular mesh width b

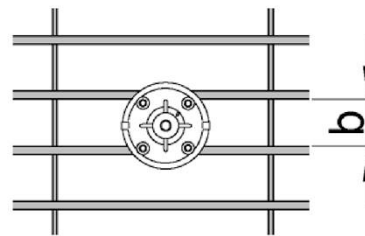
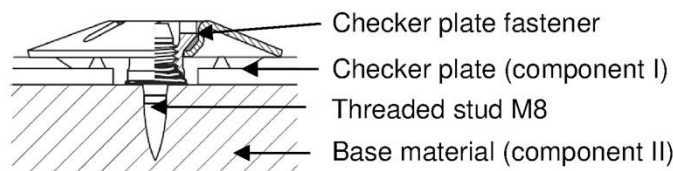


Figure A12:
X-FCP with threaded stud



Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

Installed condition

Annex A4

Dimensions

Figure A13: Hilti X-FCM grating fastener

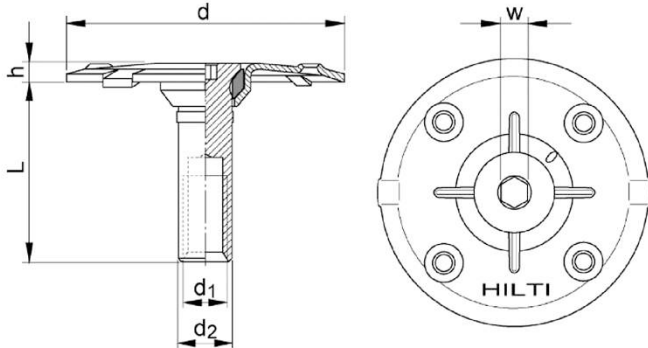


Figure A14: Hilti X-SEA M8 extension adapter

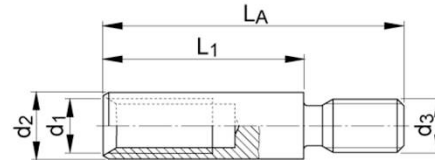


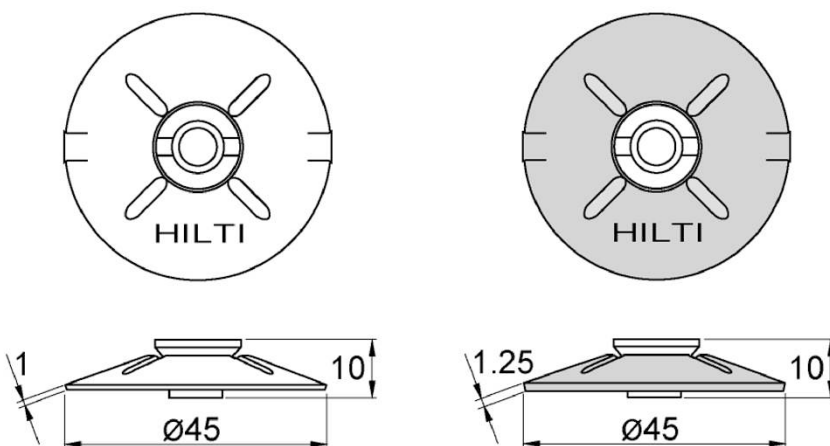
Table A3: Dimensions Hilti X-FCM grating fastener

Grating fastener	L [mm]	h [mm]	d ₁	d ₂ [mm]	d [mm]	w [mm]
X-FCM, X-FCM-F, X-FCM-R	18, 23, 27, 33, 43	4	acc. to M8	10.3	50	5
X-FCM-F L, X-FCM-R L	23, 27, 33, 43	8	acc. to M8	10.3	82	5
X-FCM-F HL, X-FCM-R HL	18, 23, 27, 33, 43	4	acc. to M8	10.3	50	5
X-FCM-F NG, X-FCM-R NG	18, 23, 27, 33, 43	4	acc. to M8	10.3	44	5

Table A4: Dimensions Hilti X-SEA-R 30 M8 and X-SEA-F 30 M8 extension adapter

X-SEA adapter	L _A [mm]	L ₁ [mm]	d ₁	d ₂ [mm]	d ₃
X-SEA-R 30 M8	45	30	acc. to M8	10	acc. to M8
X-SEA-F 30 M8	45	30	acc. to M8	10	acc. to M8

Figure A15: Dimensions Hilti X-FCP-R, X-FCP-F checker plate fastener



Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

Dimensions

Annex A5

Materials

Table A5: Materials Hilti X-FCM grating fastener

Designation	Material		
	X-FCM	X-FCM-F, X-FCM-F L, X-FCM-F HL, X-FCM-F NG	X-FCM-R, X-FCM-R L, X-FCM-R HL, X-FCM-R NG
Disc	Carbon steel DC04 (1.0338) - EN 10130, galvanized	Carbon steel DC04 (1.0338) - EN 10130, galvanized and coated	Stainless steel 1.4404 - EN 10088-2
Stem with internal thread	Carbon steel 11SMnPb30+C - EN 10277-3, galvanized	Carbon steel 11SMnPb30+C - EN 10277-3, galvanized and coated	Stainless steel 1.4404 - EN 10088-2
Absorber O-ring	Thermoplastic polyurethane (black)	Thermoplastic polyurethane (black) Thermoplastic polyurethane (red) ¹⁾	Thermoplastic polyurethane (black) Thermoplastic polyurethane (red) ²⁾

¹⁾ for X-FCM-F HL ²⁾ for X-FCM-R HL

Table A6: Materials Hilti X-SEA M8 extension adapter

Designation	Material	
	X-SEA-F 30 M8	X-SEA-R 30 M8
Adapter	Carbon steel with $R_m \geq 360$ N/mm ² , galvanized and coated	Stainless steel 1.4401 - EN 10088-2 or Stainless steel 1.4571 - EN 10088-2

Table A7: Materials Hilti X-FCP checker plate fastener

Designation	Material	
	X-FCP-F	X-FCP-R
Disc	Carbon steel DC01 (1.0330) - EN 10130, galvanized and coated	Stainless steel 1.4404 - EN 10088-2
Screw	Carbon steel 9SMnPb28 K - EN 10277-3, galvanized and coated	Stainless steel 1.4404 - EN 10088-2
Absorber O-ring	Thermoplastic elastomer (black)	Thermoplastic elastomer (black)

Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

Materials

Annex A6

Specifications of intended use

General

The Hilti X-FCM grating fastener system is intended for use in combination with threaded studs with thread size M8 to secure the position of gratings with rectangular or square openings.

The Hilti X-FCP checker plate fasteners are intended for use in combination with threaded studs with thread size M8 to secure the position of checker plates.

Use of the fastening

- Static and quasi static tensile loading

Use conditions (environmental conditions)

- X-FCM grating fastener made from galvanized carbon steel.
Surface protection: galvanized (min. 10 µm)
- X-FCM-F, X-FCM-F L, X-FCM-F HL, X-FCM-F NG grating fastener made from galvanized and coated carbon steel.
Surface protection: duplex coating: galvanized (min. 20 µm) with additional inorganic sealer
- X-FCM-R, X-FCM-R L, X-FCM-R HL, X-FCM-R NG grating fastener made of stainless steel.
The grating fasteners are allocated to the corrosion resistance class (CRC) III according to EN 1993-1-4.
- X-FCP-F checker plate fastener made from galvanized and coated carbon steel.
Surface protection: duplex coating: galvanized with additional inorganic sealer
- X-FCP-R checker plate fastener made of stainless steel.
The checker plate fasteners are allocated to the corrosion resistance class (CRC) III according to EN 1993-1-4.
- All types X-FCM grating fasteners and X-FCP checker plate fasteners can be used in atmospheres with an ambient temperature varying from -40 °C to +60 °C.

Design

- The fasteners are designed under the responsibility of an engineer experienced in fasteners work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the fasteners, their designation and the ETA number is indicated on the design drawings.
- The verification concept in EN 1990:2002 + A1:2005 + A1:2005/AC:2010 is used for the design of connections with X-FCM grating fasteners and X-FCP checker plate fasteners.
- The partial factors γ_M specified in the Annexes of this ETA are used to determine the design values of the tensile load carrying capacity provided no other values are given in national regulations of the member states.
- The design tension resistance value $N_{Rd,g}$ of the grating fastener and X-FCP checker plate fastener shall be determined as follows:

$$N_{Rd,g} = \frac{N_{Rk,g}}{\gamma_M} \quad N_{Rk,g} \text{ and } \gamma_M \text{ are listed in Annex C1 to C5.}$$

Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

Specifications of intended use

Annex B1

Installation

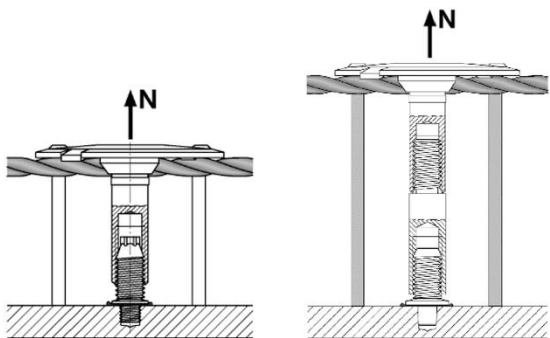
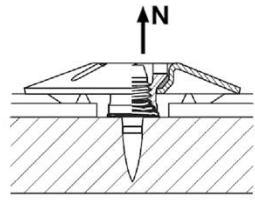
- The installation is carried out according to the manufacturer's specifications with the tools and devices defined therein.
- The installation is carried out by appropriately qualified personnel and under the supervision of the site manager.
- The application limits (maximum and minimum grating or checker plate height, clear bar spacing) must be observed.
- The tightening torque T for the grating fastener and checker plate fastener can be found in the installation instructions for the fastener or in Table B1 of this ETA. The tightening torque T must not be exceeded. Exceeding the tightening torque T leads to damage of the grating fastener, checker plate fastener or threaded stud's anchorage with negative impact on the load values.

Table B1: Installation parameters

Fastener	$h_{G,min}^{1)}$ [mm]	$h_{G,max}^{1)}$ [mm]	a_{min} [mm]	a_{max} [mm]	b_{min} [mm]	b_{max} [mm]	T_{max} [Nm]
X-FCM	23	53	18	40	18	40	8
X-FCM-F	23	53	18	40	18	40	8
X-FCM-R	23	53	18	40	18	40	8
X-FCM-F L	28	53	30	60	30	57	8
X-FCM-R L	28	53	30	60	30	57	8
X-FCM-F HL	23	53	20	38	24	35	16
X-FCM-R HL	23	53	20	40	24	40	20
X-FCM-F NG	23	53	13	22	13	22	5
X-FCM-R NG	23	53	13	22	13	22	8
X-FCP-F	-	-	-	-	-	-	8
X-FCP-R	-	-	-	-	-	-	8

¹⁾ In combination with the Hilti X-SEA-R 30 M8 or X-SEA-F 30 M8 extension adapter the grating height h_G can be increased by 30 mm.

Table B2: Type of connections and loading conditions

Fastening of gratings ¹⁾	Fastening of checker plates ¹⁾
Tensile loading	Tensile loading
	

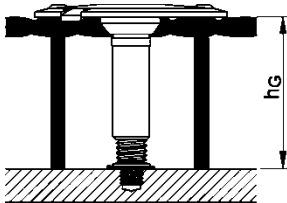
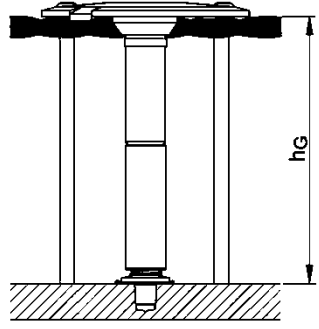
¹⁾ The threaded studs M8, the grating and the checker plate are not part of this ETA.

Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

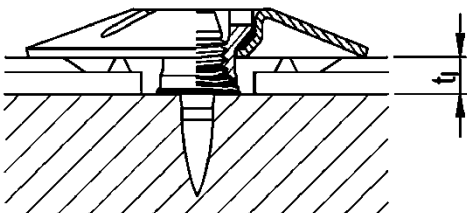
Installation, installation parameters, type of connections and loading conditions

Annex B2

Table B3: Grating element height recommendation

Grating fastener					
		Grating height h_g		Grating height h_g with X-SEA M8 extension adapter	
		[mm]		[mm]	
		min	max	min	max
X-FCM 23/28		23	28	53	58
X-FCM 28/33		28	33	58	63
X-FCM 32/37		32	37	62	67
X-FCM 38/43		38	43	68	73
X-FCM 48/53		48	53	78	83
X-FCM-F 23/28	X-FCM-R 23/28	23	28	53	58
X-FCM-F 28/33	X-FCM-R 28/33	28	33	58	63
X-FCM-F 32/37	X-FCM-R 32/37	32	37	62	67
X-FCM-F 38/43	X-FCM-R 38/43	38	43	68	73
X-FCM-F 48/53	X-FCM-R 48/53	48	53	78	83
X-FCM-F L 28/33	X-FCM-R L 28/33	28	33	58	63
X-FCM-F L 32/37	X-FCM-R L 32/37	32	37	62	67
X-FCM-F L 38/43	X-FCM-R L 38/43	38	43	68	73
X-FCM-F L 48/53	X-FCM-R L 48/53	48	53	78	83
X-FCM-F HL 23/28	X-FCM-R HL 23/28	23	28	53	58
X-FCM-F HL 28/33	X-FCM-R HL 28/33	28	33	58	63
X-FCM-F HL 32/37	X-FCM-R HL 32/37	32	37	62	67
X-FCM-F HL 38/43	X-FCM-R HL 38/43	38	43	68	73
X-FCM-F HL 48/53	X-FCM-R HL 48/53	48	53	78	83
X-FCM-F NG 23/28	X-FCM-R NG 23/28	23	28	53	58
X-FCM-F NG 28/33	X-FCM-R NG 28/33	28	33	58	63
X-FCM-F NG 32/37	X-FCM-R NG 32/37	32	37	62	67
X-FCM-F NG 38/43	X-FCM-R NG 38/43	38	43	68	73
X-FCM-F NG 48/53	X-FCM-R NG 48/53	48	53	78	83

The maximum total thickness t_t of the checker plate depends on the length of the threaded studs used.



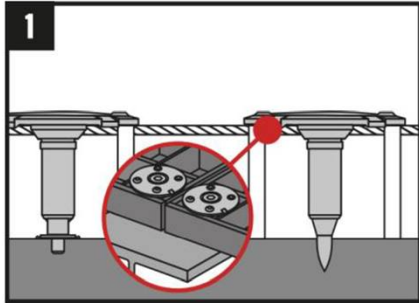
Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

Grating element height recommendation

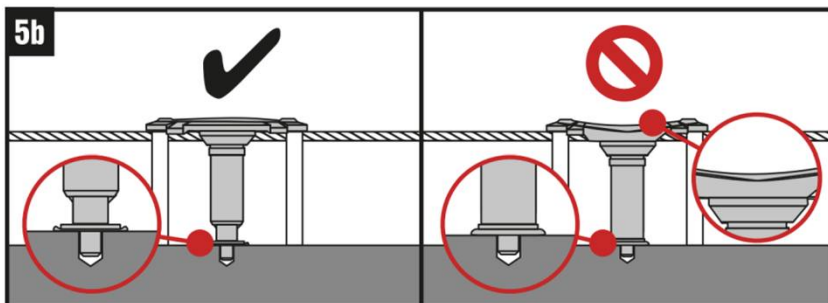
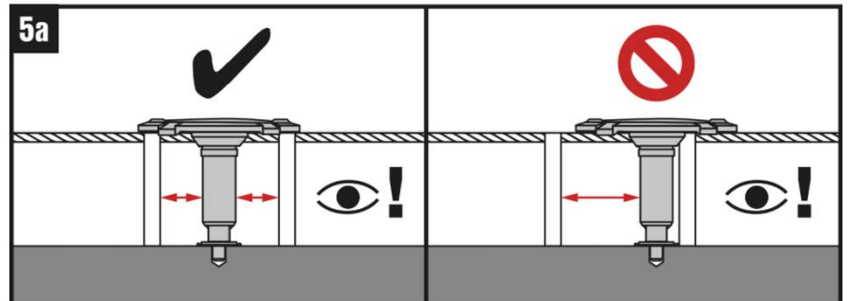
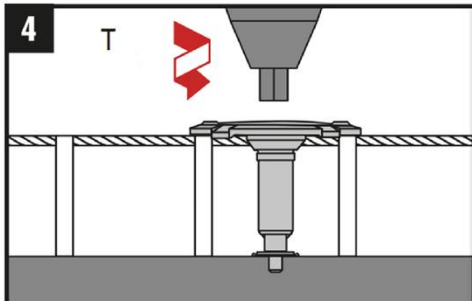
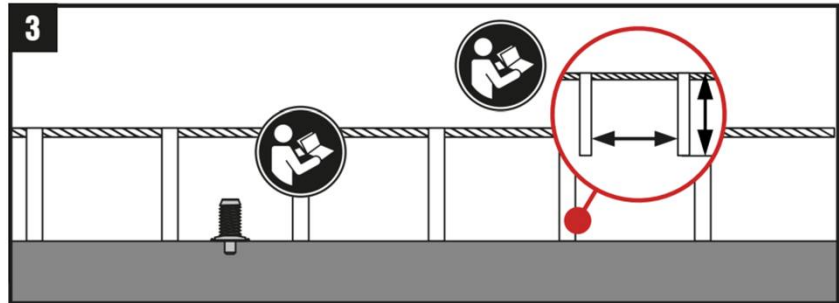
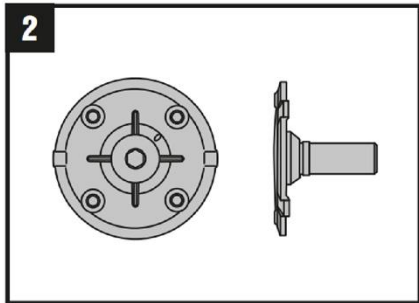
Annex B3

Figure B1: General installation instruction for X-FCM grating fastener

Installed state



Installation procedure



Note: Figure B1 shows only the general installation steps, which may vary depending on the grating fastener type. The grating fastener must be placed in the centre of the grating opening and rest on the bearing bars. Always follow the installation instructions accompanying the respective Hilti grating fastener.

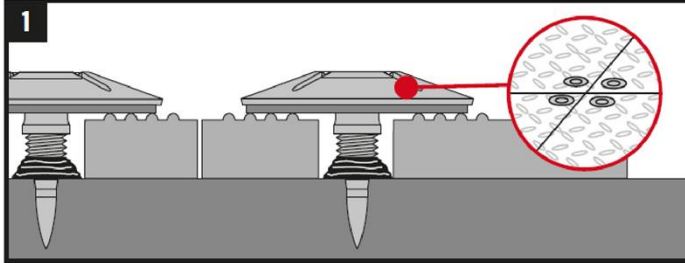
Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

General installation instruction

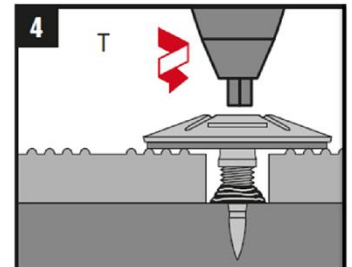
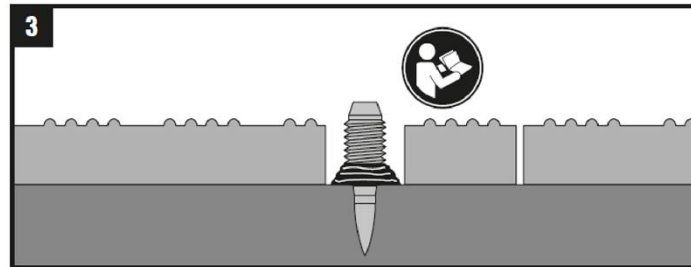
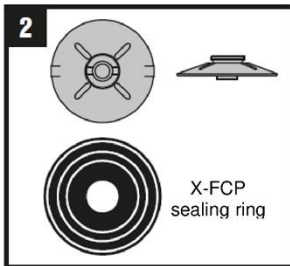
Annex B4

Figure B2: General installation instruction for X-FCP checker plate fastener

Installed state



Installation procedure



Note: Figure B2 shows only the general installation steps, which may vary depending on the checker plate fastener type. The checker plate fastener must be placed in the centre of the checker plate opening. Always follow the installation instructions accompanying the respective Hilti checker plate fastener. The Hilti checker plate fastener can be installed also with the X-FCP sealing ring.

Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

General installation instruction

Annex B5

Table C1: Characteristic tension resistance for Hilti X-FCM and X-FCM-F grating fastener ¹⁾

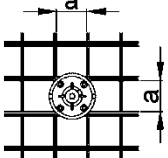
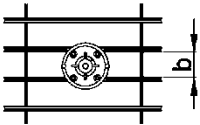
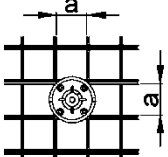
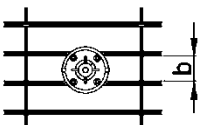
Square grating				
Clear bar spacing	a [mm]	18	18 < a ≤ 30	30 < a ≤ 40
Characteristic tension resistance	N _{Rk,g} [kN]	4.50	1.50	1.15
Rectangular grating				
Clear bar spacing	b [mm]	18	18 < b ≤ 30	30 < b ≤ 40
Characteristic tension resistance	N _{Rk,g} [kN]	1.50	1.50	0.95
Partial factor ²⁾	γ _M [-]	1.25		
¹⁾ The characteristic tension resistance N _{Rk,g} is also valid for the combination of the X-FCM or X-FCM-F grating fastener with the Hilti X-SEA-F 30 M8 extension adapter. ²⁾ Recommended value in the absence of national regulations.				

Table C2: Characteristic tension resistance for Hilti X-FCM-R grating fastener ¹⁾

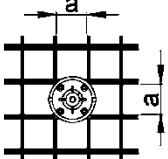
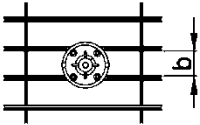
Square grating				
Clear bar spacing	a [mm]	18	18 < a ≤ 30	30 < a ≤ 40
Characteristic tension resistance	N _{Rk,g} [kN]	3.40	1.90	1.50
Rectangular grating				
Clear bar spacing	b [mm]	18	18 < b ≤ 30	30 < b ≤ 40
Characteristic tension resistance	N _{Rk,g} [kN]	2.65	1.90	1.15
Partial factor ²⁾	γ _M [-]	1.25		
¹⁾ The characteristic tension resistance N _{Rk,g} is also valid for the combination of the X-FCM-R grating fastener with the Hilti X-SEA-R 30 M8 extension adapter. ²⁾ Recommended value in the absence of national regulations.				

Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

Characteristic values of resistance under tension loading

Annex C1

Table C3: Characteristic tension resistance for Hilti X-FCM-F L, X-FCM-R L grating fastener ¹⁾

Square grating			
Clear bar spacing	a [mm]	30	30 < a ≤ 60
Characteristic tension resistance	N _{Rk,g} [kN]	3.40	1.50
Rectangular grating			
Clear bar spacing	b [mm]	30	30 < b ≤ 57
Characteristic tension resistance	N _{Rk,g} [kN]	1.50	1.50
Partial factor ²⁾	γ _M [-]	1.25	
¹⁾ The characteristic tension resistance N _{Rk,g} is also valid for the combination of the X-FCM-F L or X-FCM-R L grating fastener with the Hilti X-SEA-F 30 M8 or X-SEA-R 30 M8 extension adapter. ²⁾ Recommended value in the absence of national regulations.			

Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

Characteristic values of resistance under tension loading

Annex C2

Table C4: Characteristic tension resistance for Hilti X-FCM-F HL grating fastener ¹⁾

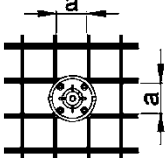
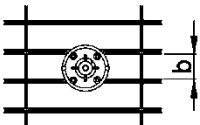
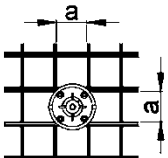
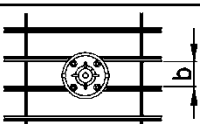
Square grating				
Clear bar spacing	a [mm]	20	20 < a ≤ 30	30 < a ≤ 38
Characteristic tension resistance	N _{Rk,g} [kN]	6.80	6.80	2.25
Rectangular grating				
Clear bar spacing	b [mm]	24	24 < b ≤ 30	30 < b ≤ 35
Characteristic tension resistance	N _{Rk,g} [kN]	5.30	4.00	2.65
Partial factor ²⁾	γ _M [-]	1.25		
¹⁾ The characteristic tension resistance N _{Rk,g} is also valid for the combination of the X-FCM-F HL grating fastener with the Hilti X-SEA-F 30 M8 extension adapter. ²⁾ Recommended value in the absence of national regulations.				

Table C5: Characteristic tension resistance for Hilti X-FCM-R HL grating fastener ¹⁾

Square grating				
Clear bar spacing	a [mm]	20	20 < a ≤ 38	38 < a ≤ 40
Characteristic tension resistance	N _{Rk,g} [kN]	6.80	6.80	2.30
Rectangular grating				
Clear bar spacing	b [mm]	24	24 < b ≤ 30	30 < b ≤ 35
Characteristic tension resistance	N _{Rk,g} [kN]	5.30	4.00	2.70
Partial factor ²⁾	γ _M [-]	1.25		
¹⁾ The characteristic tension resistance N _{Rk,g} is also valid for the combination of the X-FCM-R HL grating fastener with the Hilti X-SEA-R 30 M8 extension adapter. ²⁾ Recommended value in the absence of national regulations.				

Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

Characteristic values of resistance under tension loading

Annex C3

Table C6: Characteristic tension resistance for Hilti X-FCM-F NG grating fastener ¹⁾

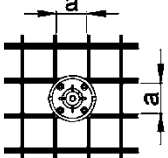
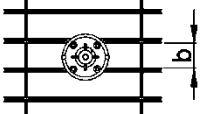
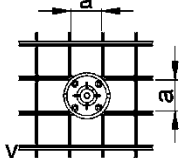
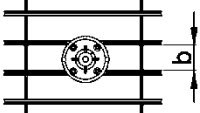
Square grating				
Clear bar spacing	a [mm]	13	13 < a ≤ 18	18 < a ≤ 22
Characteristic tension resistance	N _{Rk,g} [kN]	7.50	4.70	3.20
Rectangular grating				
Clear bar spacing	b [mm]	13	13 < b ≤ 18	18 < b ≤ 22
Characteristic tension resistance	N _{Rk,g} [kN]	7.50	4.00	2.25
Partial factor ²⁾	γ _M [-]	1.25		
¹⁾ The characteristic tension resistance N _{Rk,g} is also valid for the combination of the X-FCM-F NG grating fastener with the Hilti X-SEA-F 30 M8 extension adapter.				
²⁾ Recommended value in the absence of national regulations.				

Table C7: Characteristic tension resistance for Hilti X-FCM-R NG grating fastener ¹⁾

Square grating				
Clear bar spacing	a [mm]	13	13 < a ≤ 18	18 < a ≤ 22
Characteristic tension resistance	N _{Rk,g} [kN]	6.80	6.80	5.10
Rectangular grating				
Clear bar spacing	b [mm]	13	13 < b ≤ 18	18 < b ≤ 22
Characteristic tension resistance	N _{Rk,g} [kN]	6.80	6.80	4.00
Partial factor ²⁾	γ _M [-]	1.25		
¹⁾ The characteristic tension resistance N _{Rk,g} is also valid for the combination of the X-FCM-R NG grating fastener with the Hilti X-SEA-R 30 M8 extension adapter.				
²⁾ Recommended value in the absence of national regulations.				

Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

Characteristic values of resistance under tension loading

Annex C4

Table C8: Characteristic tension resistance for Hilti X-FCP-F, X-FCP-R checker plate fastener

Checker plate fastener		
Characteristic tension resistance	$N_{Rk,g}$ [kN]	3.40
Partial factor ¹⁾	γ_M [-]	1.25
¹⁾ Recommended value in the absence of national regulations.		

Hilti X-FCM, X-FCM-F/-R, X-FCM-F/-R L, X-FCM-F/-R HL, X-FCM-F/-R NG, X-FCP-F/-R

Characteristic values of resistance under tension loading

Annex C5