











X-FCM DATA SHEET

Grating fastening system



X-FCM Grating fastening system

| Product data | | | |
|---|--|--|--|
| Product description | | | |
| Grating element for securing grating | | | Special features |
| X-FCM | X-FCM-F | X-FCM-R | <ul style="list-style-type: none"> • standard disc • protrusion above the walkway ≤ 4 mm |
|  |  |  | |
| | X-FCM-F L | X-FCM-R L | <ul style="list-style-type: none"> • large disc • protrusion above the walkway ≤ 8 mm |
| |  |  | |
| | | X-FCM-R HL | <ul style="list-style-type: none"> • high load resistance • high tension resistance for use in wave zones • vibration resistance • protrusion above the walkway ≤ 4 mm |
| | |  | |
| | X-FCM-F NG | X-FCM-R NG | <ul style="list-style-type: none"> • narrow gratings • protrusion above the walkway ≤ 4 mm |
| |  |  | |
| <ul style="list-style-type: none"> • low corrosion resistance • zinc plated | <ul style="list-style-type: none"> • medium corrosion resistance • duplex coated | <ul style="list-style-type: none"> • high corrosion resistance • stainless steel | <ul style="list-style-type: none"> • Special material characteristics |

- Discs with locking tabs to ensure durable hold and to prevent loosening or spinning.
- Non-slip disc surface to reduce trip hazard.
- Cordless solution.
- Labour-saving due to fewer installation steps compared to grating clamps or welding.
- Grating elements will be assembled on pre-installed fasteners.
- Fastener installation is describe in the corresponding Product Data Sheet(s) for fasteners.

Designation for grating element

| Designation | | Technology | Product identifier | Corrosion resistance | Feature /characteristic | Minimum grating height | Maximum grating height |
|-----------------------|------------------------|------------|--------------------|----------------------|-------------------------|------------------------|------------------------|
| Product family | Grating element | | | | | | |
| Product type | X-FCM | X | FCM | | | | |
| Product subtype | X-FCM | X | FCM | | | | |
| Product | X-FCM 28/33 | X | FCM | | | 28 | 33 |
| Product family | Grating element | | | | | | |
| Product type | X-FCM | X | FCM | | | | |
| Product subtype | X-FCM-F | X | FCM | F | | | |
| Product | X-FCM-F 28/33 | X | FCM | F | | 28 | 33 |
| Product family | Grating element | | | | | | |
| Product type | X-FCM | X | FCM | | | | |
| Product subtype | X-FCM-F L | X | FCM | F | L | | |
| Product | X-FCM-F L 28/33 | X | FCM | F | L | 28 | 33 |
| Product family | Grating element | | | | | | |
| Product type | X-FCM | X | FCM | | | | |
| Product subtype | X-FCM-R HL | X | FCM | R | HL | | |
| Product | X-FCM-R HL 28/33 | X | FCM | R | HL | 28 | 33 |
| Product family | Grating element | | | | | | |
| Product type | X-FCM | X | FCM | | | | |
| Product subtype | X-FCM-R NG | X | FCM | R | NG | | |
| Product | X-FCM-R NG 28/33 | X | FCM | R | NG | 28 | 33 |

Designation for stud extension adapter

| Designation | | Technology | Product identifier | Corrosion resistance | Length | Thread holder size | |
|-----------------------|-------------------------------|------------|--------------------|----------------------|--------|--------------------|--|
| Product family | Stud Extension Adapter | | | | | | |
| Product type | X-SEA | X | SEA | | | | |
| Product subtype | X-SEA-R | X | SEA | R | | | |
| Product | X-SEA-R 30 M8 | X | SEA | R | 30 | M8 | |



- Information presented in this product data sheet at product family level are valid for all others levels, i.e. product type, product subtype and product. This statement applies also to lower levels.

Grating fastening system for fastening to steel and aluminum

| Fastener | X-BT-GR M8/7 SN 8 | S-BT-GR M8/7 SN 6 | S-BT-GR NG M8/7 SN 6 | S-BT-GF M8/7 AN 6 | S-BT-MF M8/15 AN 6 | S-BT-GF NG M8/7 AN 6 | X-ST-GR M8/10 P8 | X-EM8H-15-12 P8 | X-EM8H-15-12 FP10 | S-BT-GR M8/7 SN 6 AL | |
|--|-------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Optional: stud extension adapter | X-SEA-R 30 M8 | | | | | | | | | X-SEA-R 30 M8 | |
| Base material | Steel | | | | | | | | | Aluminum | |
| Grating element | X-FCM | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| | X-FCM-F | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | - | - | <input type="checkbox"/> |
| | X-FCM-F L | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | - | - | <input type="checkbox"/> |
| | X-FCM-F NG | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | - | - | <input type="checkbox"/> |
| | X-FCM-R | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | - | - | - | - | - | - | <input checked="" type="checkbox"/> |
| | X-FCM-R L | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | - | - | - | - | - | - | <input checked="" type="checkbox"/> |
| | X-FCM-R HL | <input checked="" type="checkbox"/> | - | - | - | - | - | - | - | - | - |
| | X-FCM-R NG | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | - | - | - | - | - | - | <input type="checkbox"/> |

= recommended for combination
 = suitable for combination

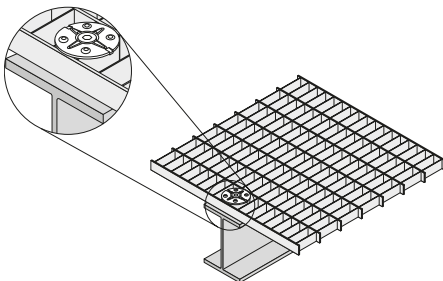
Approvals and certificates

| Authority | Approval/certificate no. | Date of issue | Designation | Application area |
|---------------------------------|--------------------------|---------------|--|------------------------------------|
| American Bureau of Shipping ABS | 22-2285526-PDA | 09/2022 | all X-FCM grating elements | Marine industry, offshore industry |
| Bureau Veritas BV | 71291/A0 BV | 04/2022 | all X-FCM grating elements | Marine industry, offshore industry |
| Det Norske Veritas DNV | TAS00001UJ Rev-3 | 08/2022 | all X-FCM grating elements | Marine industry, offshore industry |
| Lloyd's Register LR | LR21394055TA | 10/2021 | all X-FCM grating elements | Marine industry, offshore industry |
| | LR 19-00003-02 | 07/2020 | elements, except X-FCM-F L and X-FCM-R L | |
| RINA | FPE247421CS/001 | 07/2021 | X-FCM-R, X-FCM-R HL | Marine industry, offshore industry |

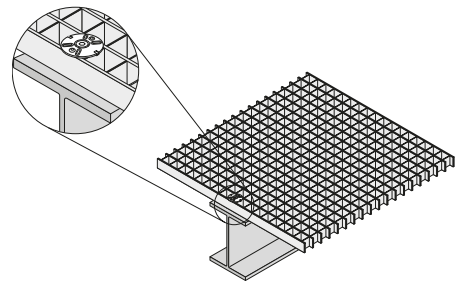


- Information presented in this product data sheet is based on Hilti Technical Data. For the specific application please refer to the corresponding approval/certificate.

Application

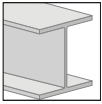


Securing rectangular grating

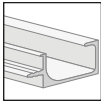


Securing square grating

Base materials



Steel



Aluminum

Base material properties and fastener positioning in base material

| | |
|--------------------------------------|--|
| Fastener | X-EM8H-15-12 P8, X-EM8H-15-12 FP10, X-ST-GR M8/10 P8 |
| Base material | Steel |
| Base material tensile strength R_m | ≥ 360 MPa |
| Base material thickness t_{II} | ≥ 6 mm |

| | |
|---------------------------------------|--------------------------|
| Fastener | X-BT-GR M8/7 SN 8 |
| Base material | Steel |
| Base material tensile strength R_m | ≥ 360 MPa |
| Base material thickness t_{II} | ≥ 8 mm |
| Base material coating thickness t_c | ≤ 500 μm |

| | |
|---------------------------------------|---|
| Fastener | S-BT-GF M8/7 AN 6, S-BT-MF M8/15 AN 6, S-BT-GF NG M8/7 AN 6 S-BT-GR M8/7 SN 6, S-BT-GR NG M8/7 SN 6 |
| Base material | Steel |
| Base material tensile strength R_m | 360 – 630 MPa |
| Base material thickness t_{II} | ≥ 3 mm |
| Base material coating thickness t_c | ≤ 800 μm |
| Base material steel grade | S235 Jxx – S355 Jxx acc. to EN 10025-2 S275N – S355N, S275NL – S355NL acc. to EN 10025-3 S280 GD – S420 GD acc. to EN 10346 |

| | |
|---------------------------------------|--|
| Fastener | S-BT-GR M8/7 SN 6 HL, S-BT-GF M8/7 AN 6 HL |
| Base material | Steel |
| Base material tensile strength R_m | 360 – 760 MPa |
| Base material thickness $t_{ }$ | ≥ 3 mm |
| Base material coating thickness t_c | ≤ 800 μ m |
| Base material steel grade | S235 Jxx – S500 Jxx acc. to EN 10025-2 |
| | S275N – S460 N S275NL – S460 NL acc. to EN 10025-3 |
| | S280 GD – S550 GD acc. to EN 10346 |

| | |
|---------------------------------------|--|
| Fastener | S-BT-GR M8/7 SN 6 HL, S-BT-GF M8/7 AN 6 HL |
| Base material | Steel |
| Base material tensile strength R_m | 360 – 760 MPa |
| Base material thickness $t_{ }$ | ≥ 3 mm |
| Base material coating thickness t_c | ≤ 800 μ m |
| Base material steel grade | S235 Jxx – S500 Jxx acc. to EN 10025-2 |
| | S275N – S460 N S275NL – S460 NL acc. to EN 10025-3 |
| | S280 GD – S550 GD acc. to EN 10346 |
| | S315MC – S550MC acc- tp EN 10149-2 |

| | |
|--------------------------------------|----------------------|
| Fastener | S-BT-GR M8/7 SN 6 AL |
| Base material | Aluminum |
| Base material tensile strength R_m | ≥ 270 MPa |
| Base material thickness $t_{ }$ | ≥ 5 mm |
| Base material steel grade | acc. to EN 1999-1-1 |



- Maximum base material tensile strength R_m depending on fastener application limitation, see corresponding Product Data Sheet(s).
- Fastener positioning in base material is describe in the corresponding Product Data Sheet(s) for fasteners.

Base material back side coating rework

| Base material | Base material thickness | Back side coating rework |
|---------------|--------------------------------|--|
| Steel | $3 \leq t_{II} < 6 \text{ mm}$ | Rework process based on end use requirements |
| | $t_{II} \geq 6 \text{ mm}$ | no rework |

Load conditions










Static/
quasi static

Environmental conditions



- In general, grating fastening system not to be used in wave zones due to high load impact. For applications in wave zones see X-FCM-R HL.
- For more details, please refer to following technical document(s): Hilti Corrosion Handbook.

| Environmental condition | Fastened part | X-FCM combined with S-BT-GF M8/7 AN 6, S-BT-MF M8/15 AN 6, S-BT-GF NG M8/7 AN 6, X-EM8H-15-12 P8, X-EM8H-15-12 FP10 | X-FCM-F, X-FCM-F L combined with S-BT-GF M8/7 AN 6, S-BT-MF M8/15 AN 6, S-BT-GF NG M8/7 AN 6, X-ST-GR M8 10P8 | X-FCM-R, X-FCM-R L, combined with X-BT-GR M8/7 SN 8, S-BT-GR M8/7 SN 6, S-BT-GR NG M8/7 SN 6, S-BT-GR M8/7 SN 6 AL X-FCM-R HL combined with X-BT-GR M8/7 SN 8 |
|--|---|--|--|--|
|  Dry indoor | Steel (zinc-coated, painted), aluminum, stainless steel | ■ | ■ | ■ |
| | Steel (zinc-coated, painted), aluminum | - | ■ | ■ |
|  Indoor with temporary condensation | Stainless steel | - | - | ■ |
| | Steel (zinc-coated, painted), aluminum | - | □ ¹⁾ | ■ |
|  Outdoor with low pollution | Stainless steel | - | - | ■ |
| | Steel (zinc-coated, painted), aluminum | - | □ ¹⁾ | ■ |
|  Outdoor with moderate concentration of pollutants | Stainless steel | - | - | ■ |
| | Steel (zinc-coated, painted), aluminum | - | □ ¹⁾ | ■ |
|  Coastal areas | Stainless steel | - | - | ■ |
| | Steel (zinc-coated, painted), aluminum, stainless steel | - | - | ■ |
|  Outdoor, areas with heavy industrial pollution | Stainless steel | - | - | ■ |
| | Steel (zinc-coated, painted), aluminum, stainless steel | - | - | ■ |
|  Close proximity to roads | Stainless steel | - | - | ■ |
| | Steel (zinc-coated, painted), aluminum, stainless steel | - | - | ■ |

Notes for next page:

- = expected lifetime of anchors made from this material is typically satisfactory in the specified environment based on the typically expected lifetime of a building. The assumed service life in European Technical Assessments is 50 years for concrete anchors, 25 years for power-driven fasteners, steel and sandwich panel screws, and 10 years for flat roof insulation screws.
- = a decrease in the expected lifetime of non-stainless fasteners in these atmospheres must be taken into account (≤ 25 years). Higher expected lifetime needs a specific assessment.
 - = fasteners made from this material are not suitable in the specified environment. Exceptions need a specific assessment.
- 1) From a technical point of view, HDG/duplex coatings and A2/304 material are suitable for outdoor environments with certain application restrictions. This is based on long-term experience with these materials as reflected e.g. in the corrosion rates for Zn given in the ISO 9224:2012 (corrosivity categories, C-classes), the selection guidelines for stainless steel grades provided in Eurocode 3 EN 1993 (final draft 2014) or in the national technical approval issued by the DIBt Z.30.3-6 (April 2014) and the ICC-ES evaluation reports for our products for North America (e.g. ESR-1917, May 2013). The use of those materials in outdoor environments however is currently not covered by the European Technical Assessments (ETA) of anchors, where it is stated that anchors made of galvanized carbon steel or stainless steel grade A2 may only be used in structures subject to dry indoor conditions, based on an assumed working life of the anchor of 50 years.

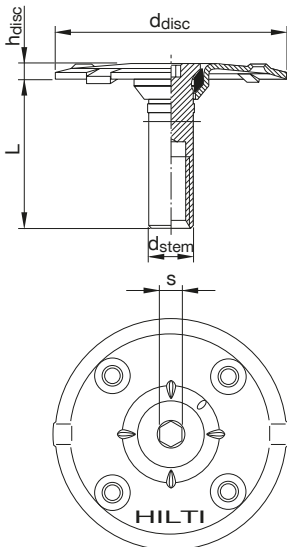
X-FCM, X-FCM-F, X-FCM-R

Securing grating with standard disc

Dimensions

Technical drawings for grating element with standard disc with medium and high corrosion resistance

Technical drawing



Designation

X-FCM,
X-FCM-F,
X-FCM-R



- Threaded stem, Disc, Absorber O-Ring.

Dimensions for grating elements with standard discs

| Designation | Grating element length L | Grating element stem diameter d_{stem} | Grating element disc diameter d_{disc} | Grating element disc height h_{disc} | Grating element hex width s |
|-------------|-----------------------------|--|--|--|--------------------------------|
| X-FCM 23/28 | 18 mm | 10.3 mm | 50 mm | 4 mm | 5 mm |
| X-FCM 28/33 | 23 mm | | | | |
| X-FCM 32/37 | 27 mm | | | | |
| X-FCM 38/43 | 33 mm | | | | |
| X-FCM 48/53 | 43 mm | | | | |

| Designation | | Grating element length L | Grating element stem diameter d_{stem} | Grating element disc diameter d_{disc} | Grating element disc height h_{disc} | Grating element hex width s |
|---------------|---------------|-----------------------------|--|--|--|--------------------------------|
| X-FCM-F 23/28 | X-FCM-R 23/28 | 18 mm | 10.3 mm | 50 mm | 4 mm | 5 mm |
| X-FCM-F 28/33 | X-FCM-R 28/33 | 23 mm | | | | |
| X-FCM-F 32/37 | X-FCM-R 32/37 | 27 mm | | | | |
| X-FCM-F 38/43 | X-FCM-R 38/43 | 33 mm | | | | |
| X-FCM-F 48/53 | X-FCM-R 48/53 | 43 mm | | | | |

Material specification and material properties
Material specification and material properties for carbon steel parts

| Designation | Element | Material | Coating | Coating thickness | Category of corrosivity of the atmosphere according to EN ISO 9223 |
|-------------|---------------------|--------------|---------------|-----------------------|--|
| X-FCM | Disc, threaded stem | Carbon steel | Zinc | $\geq 20 \mu\text{m}$ | C1 |
| X-FCM-F | Disc, threaded stem | Carbon steel | Duplex coated | $\geq 30 \mu\text{m}$ | C3 |



- Duplex coated steel is comparable to HDG steel.
- Duplex coated steel is tested according to EN ISO 9227: NSS, 480 h on salt spray exposure.

Material specification and material properties for stainless steel parts

| Designation | Element | Material | Coating | Steel grade according to EN 10088 | Corrosion resistance class according to EN 1993-1-4 |
|-------------|---------------------|-----------------|---------|-----------------------------------|---|
| X-FCM-R | Disc, threaded stem | Stainless steel | - | 1.4404 | CRC III |

Material specification and material properties for plastic parts

| Designation | Element | Material | Color | Other properties |
|-------------|--------------------|---------------------|-------|---|
| X-FCM | Absorber O-Ring | Poly-urethane (PUR) | Black | Resistant to UV, water, saltwater, ozone, oil, grease |
| X-FCM-F | | | | |
| X-FCM-R | | | | |

Application recommendation
Grating material and grating material properties for square grating

| | | |
|--|--|--|
| | Grating type | Square |
| | Grating material | Carbon steel, stainless steel, reinforced fiberglass |
| | Clear bar spacing $w_{\text{bearing bar}}$ | 18 – 30 mm |
| | Clear cross bar spacing $w_{\text{cross bar}}$ | 18 – 30 mm |
| | Grating height h_G | 23 – 53 mm |
| | Grating height h_G with X-SEA | 53 – 83 mm |

Grating material and grating material properties for rectangular grating

| | | |
|--|--|--|
| | Grating type | Rectangular |
| | Grating material | Carbon steel, stainless steel, reinforced fiberglass |
| | Clear bar spacing $w_{\text{bearing bar}}$ | 18 – 30 mm |
| | Clear cross bar spacing | ≥ 18 mm |
| | $w_{\text{cross bar}}$ | |
| | Grating height h_G | 23 – 53 mm |
| | Grating height h_G with X-SEA | 53 – 83 mm |

Grating element recommendation

| Technical drawing | Designation | Grating material | Grating type | Grating height h_G |
|-------------------|---------------|--|---------------------|----------------------|
| | X-FCM 23/28 | Carbon steel, reinforced fiberglass | Square, rectangular | 23 – 28 mm |
| | X-FCM 28/33 | | | 28 – 33 mm |
| | X-FCM 32/37 | | | 32 – 37 mm |
| | X-FCM 38/43 | | | 38 – 43 mm |
| | X-FCM 48/53 | | | 48 – 53 mm |
| | X-FCM-F 23/28 | Carbon steel, reinforced fiberglass | Square, rectangular | 23 – 28 mm |
| | X-FCM-F 28/33 | | | 28 – 33 mm |
| | X-FCM-F 32/37 | | | 32 – 37 mm |
| | X-FCM-F 38/43 | | | 38 – 43 mm |
| | X-FCM-F 48/53 | | | 48 – 53 mm |
| | X-FCM-R 23/28 | Stainless steel, reinforced fiberglass | Square, rectangular | 23 – 28 mm |
| | X-FCM-R 28/33 | | | 28 – 33 mm |
| | X-FCM-R 32/37 | | | 32 – 37 mm |
| | X-FCM-R 38/43 | | | 38 – 43 mm |
| | X-FCM-R 48/53 | | | 48 – 53 mm |

Grating element recommendation for use with stud extension adapter X-SEA

| Technical drawing | Designation | Grating material | Grating type | Grating height h_G |
|-------------------|-------------|-------------------------------------|---------------------|----------------------|
| | X-FCM 23/28 | Carbon steel, reinforced fiberglass | Square, rectangular | 53 – 58 mm |
| | X-FCM 28/33 | | | 58 – 53 mm |
| | X-FCM 32/37 | | | 62 – 67 mm |
| | X-FCM 38/43 | | | 68 – 73 mm |
| | X-FCM 48/53 | | | 78 – 83 mm |



- Please contact Hilti for grating element recommendation when the requirements deviate from the standard.

Performance data
Recommended tension load for grating elements

| Designation | Grating type | Clear bar spacing | Tension load |
|-------------|---------------------|--------------------------|------------------|
| | | $w_{\text{bearing bar}}$ | N_{rec} |
| X-FCM | Square grating | 18 mm | 2.4 kN |
| | | 30 mm | 0.8 kN |
| | Rectangular grating | 18 mm | 0.8 kN |
| | | 30 mm | 0.8 kN |
| X-FCM-F | Square grating | 18 mm | 1.8 kN |
| | | 30 mm | 0.8 kN |
| | Rectangular grating | 18 mm | 0.8 kN |
| | | 30 mm | 0.8 kN |
| X-FCM-R | Square grating | 18 mm | 1.8 kN |
| | | 30 mm | 1.0 kN |
| | Rectangular grating | 18 mm | 1.4 kN |
| | | 30 mm | 1.0 kN |

Recommended tension load for grating fastening system

| Designation | Grating type | Clear bar spacing | Base material tensile strength R_m | Base material thickness t_{II} | Tension load N_{rec} | |
|---|--------------|--------------------|---|-------------------------------------|---------------------------|--------|
| | | $w_{bearing\ bar}$ | | | | |
| X-FCM combined with S-BT-GF M8/7 AN 6 S-BT-MF M8/15 AN 6 S-BT-GF NG M8/7 AN 6 | Square | 18 mm | Steel: 360 – 630 MPa | $3 \leq t_{II} < 5\ mm$ | 1.9 kN | |
| | | 30 mm | | | 0.8 kN | |
| | | 18 mm | | | $t_{II} \geq 5\ mm$ | 2.0 kN |
| | | 30 mm | | | | 0.8 kN |
| | Rectangular | 18 mm | | $3 \leq t_{II} < 5\ mm$ | 0.8 kN | |
| | | 30 mm | | | 0.8 kN | |
| | | 18 mm | | | $t_{II} \geq 5\ mm$ | 0.8 kN |
| | | 30 mm | | | | 0.8 kN |
| X-FCM combined with X-EM8H-15-12 P8 X-EM8H-15-12 FP10 | Square | 18 mm | Steel: $\geq 360\ MPa$ | $t_{II} \geq 6\ mm$ | 1.8 kN | |
| | | 30 mm | | | 0.8 kN | |
| | Rectangular | 18 mm | | | 0.8 kN | |
| | | 30 mm | | | 0.8 kN | |
| X-FCM-F combined with S-BT-GF M8/7 AN 6 S-BT-MF M8/15 AN 6 S-BT-GF NGM8/7 AN 6 | Square | 18 mm | Steel: 360 – 630 MPa | $3 \leq t_{II} < 5\ mm$ | 1.8 kN | |
| | | 30 mm | | | 0.8 kN | |
| | | 18 mm | | | $t_{II} \geq 5\ mm$ | 1.8 kN |
| | | 30 mm | | | | 0.8 kN |
| | Rectangular | 18 mm | | $3 \leq t_{II} < 5\ mm$ | 0.8 kN | |
| | | 30 mm | | | 0.8 kN | |
| | | 18 mm | | | $t_{II} \geq 5\ mm$ | 0.8 kN |
| | | 30 mm | | | | 0.8 kN |
| X-FCM-F combined with X-ST-GR M8/10 P8 | Square | 18 mm | Steel: $\geq 360\ MPa$ | $t_{II} \geq 6\ mm$ | 1.8 kN | |
| | | 30 mm | | | 0.8 kN | |
| | Rectangular | 18 mm | | | 0.8 kN | |
| | | 30 mm | | | 0.8 kN | |



- Maximum base material tensile strength R_m depending on fastener application limitation, see corresponding Product Data Sheet(s).

| Designation | Grating type | Clear bar spacing | Base material tensile strength | Base material thickness | Tension load | |
|--|--------------|--------------------------|--|--------------------------------|----------------------------|--------|
| | | $w_{\text{bearing bar}}$ | R_m | t_{II} | N_{rec} | |
| X-FCM-R combined with S-BT-GR M8/7 SN 6 S-BT-GR NG M8/7 SN 6 | Square | 18 mm | Steel: 360 – 630 MPa | $3 \leq t_{II} < 5 \text{ mm}$ | 1.8 kN | |
| | | 30 mm | | | 1.0 kN | |
| | | 18 mm | | | $t_{II} \geq 5 \text{ mm}$ | 1.8 kN |
| | | 30 mm | | | | 1.0 kN |
| | Rectangular | 18 mm | | $3 \leq t_{II} < 5 \text{ mm}$ | 1.4 kN | |
| | | 30 mm | | | 1.0 kN | |
| | | 18 mm | | | $t_{II} \geq 5 \text{ mm}$ | 1.4 kN |
| | | 30 mm | | | | 1.0 kN |
| X-FCM-R combined with X-BT-GR M8/7 SN 8 | Square | 18 mm | Steel: $\geq 360 \text{ MPa}$, no upper limit | $t_{II} \geq 8 \text{ mm}$ | 1.8 kN | |
| | | 30 mm | | | 1.0 kN | |
| | Rectangular | 18 mm | | | 1.4 kN | |
| | | 30 mm | | | 1.0 kN | |
| X-FCM-R combined with S-BT-GR M8/7 SN 6 AL | Square | 18 mm | Aluminum: $\geq 270 \text{ MPa}$ | $t_{II} \geq 5 \text{ mm}$ | 1.8 kN | |
| | | 30 mm | | | 1.0 kN | |
| | Rectangular | 18 mm | | | 1.4 kN | |
| | | 30 mm | | | 1.0 kN | |



- Data valid for use with stud extension adapter X-SEA.

Recommended shear load for grating fastening system



- Not suitable for explicit shear load design, e.g. diaphragms.
- Shear resistance by friction is depending on surface characteristics.
- Shear loads up to 0.3 kN will not result in permanent deformation.
- Small unexpected shear loads can be accommodated without damage.

Design resistance under tension and shear load for grating fastening system

| Load type | Partial factor for actions | Characteristic resistance |
|--------------|----------------------------|--|
| | γ_f | |
| Tension load | 1.4 | $N_{Rd} = N_{\text{rec}} \cdot \gamma_f$ |
| Shear load | 1.4 | $V_{Rd} = V_{\text{rec}} \cdot \gamma_f$ |



- Design resistance can be calculated.

Characteristic resistance under tension and shear load for grating fastening system



- For characteristic resistance under shear and tension load contact Hilti.

Installation recommendation

Recommended tightening torque for tightening grating element

| Designation Grating element combined with fastener | | Base material | Base material thickness t_{II} | Tightening torque T_{rec} |
|---|----------------------|---------------------|--|-----------------------------------|
| X-FCM | S-BT-GF M8/7 AN 6 | Steel | $3 \leq t_{II} < 5 \text{ mm}$ | 5 Nm |
| | S-BT-MF M8/15 AN 6 | | $\geq 5 \text{ mm}$ | 8 Nm |
| | S-BT-GF NG M8/7 AN 6 | Steel | $t_{II} \geq 6 \text{ mm}$ | 8 Nm |
| X-FCM-F | X-EM8H-15-12 FP10 | Steel | $t_{II} \geq 6 \text{ mm}$ | 8 Nm |
| | S-BT-GF M8/7 AN 6 | Steel | $3 \leq t_{II} < 5 \text{ mm}$ | 5 Nm |
| | S-BT-MF M8/15 AN 6 | | $\geq 5 \text{ mm}$ | 8 Nm |
| | S-BT-GF NGM8/7 AN 6 | Steel | $\geq 6 \text{ mm}$ | 8 Nm |
| X-ST-GR M8/10 P8 | Steel | $\geq 6 \text{ mm}$ | 8 Nm | |

| Designation Grating element combined with fastener | | Base material | Base material thickness t_{II} | Tightening torque T_{rec} |
|---|----------------------|---------------|--|-----------------------------------|
| X-FCM-R | S-BT-GR M8/7 SN 6 | Steel | $3 \leq t_{II} < 5 \text{ mm}$ | 5 Nm |
| | S-BT-GR NG M8/7 SN 6 | | $\geq 5 \text{ mm}$ | 8 Nm |
| | X-BT-GR M8/7 SN 8 | Steel | $\geq 8 \text{ mm}$ | 8 Nm |
| | S-BT-GR M8/7 SN 6 AL | Aluminum | $\geq 5 \text{ mm}$ | 5 Nm |



- Data valid for use with stud extension adapter X-SEA.

Tightening tool recommendation for tightening with screwdriver

| Designation | Clutch type (stop detection) | Tightening torque | | | |
|-------------|---------------------------------|-----------------------------|--------|--------------------------|--------|
| | | $T_{rec} = 5 \text{ Nm}$ | | $T_{rec} = 8 \text{ Nm}$ | |
| | | Tool power level adjustment | | | |
| | | Gear | Clutch | Gear | Clutch |
| SF 2-A12 | TRC | 1 | 15 | 1 | 15 |
| SF 2H-A12 | TRC | 1 | 15 | 1 | 15 |
| SF 4-A22 | TRC | 1 | 4 | 1 | 8 |
| SF 6-A22 | ESC (SJ) | 1 | 5 | 1 | 7 |
| SF 6H-A22 | ESC (SJ) | 1 | 5 | 1 | 7 |
| SF 18-A | TRC | 1 | 4 | 1 | 5 |
| SFC 18-A | TRC | 1 | 4 | 1 | 5 |
| SF 22-A | TRC | 1 | 4 | 1 | 5 |
| SFC 22-A | TRC | 1 | 4 | 1 | 5 |
| SBT 4-A22 | TRC | 1 | 5 | 1 | 7 |

- Data valid for use with stud extension adapter X-SEA.
- Hilti recommends using a calibrated torque wrench or the Hilti Torque tool to apply the recommended tightening torque.
- Tool power level adjustment is a guiding value which applies to new Hilti screwdriver.
- Tightening torque may vary depending on the user and the application.
- Torque release coupling (TRC): Achievable torque can change over time due to clutch wear.
- Electronic slip clutch (ESC): ESC has 2 stop detections, Soft Joint (SJ) and Hard Joint (HJ). Hard joint detection is activated due to drop in speed (fast stop) and can lead to a torque spike.

Tightening tool recommendation for tightening with Hilti torque tool

| Designation | Tightening torque T_{rec} |
|------------------|--------------------------------|
| S-BT 1/4" - 5 Nm | 5 Nm |
| X-BT 1/4" - 8 Nm | 8 Nm |

- Data valid for use with stud extension adapter X-SEA.

Fastener program

Item no. and description for grating elements

| Designation | Item no. | Description |
|---------------|------------------|---|
| X-FCM 23/28 | 2349077, 2349147 | Zinc plated grating element for securing grating with standard disc |
| X-FCM 28/33 | 2349078, 2349148 | |
| X-FCM 32/37 | 2349149 | |
| X-FCM 38/43 | 2349120, 2349150 | |
| X-FCM 48/53 | 2349151 | |
| X-FCM-F 23/28 | 2349122, 2349152 | Duplex coated grating element for securing grating with standard disc |
| X-FCM-F 28/33 | 2349123, 2349153 | |
| X-FCM-F 32/37 | 2349154 | |
| X-FCM-F 38/43 | 2349125, 2349155 | |
| X-FCM-F 48/53 | 2349126, 2349156 | |
| X-FCM-R 23/28 | 2349157 | Stainless steel grating element for securing grating with standard disc |
| X-FCM-R 28/33 | 2349133, 2349158 | |
| X-FCM-R 32/37 | 2349134, 2349159 | |
| X-FCM-R 38/43 | 2349135, 2349160 | |
| X-FCM-R 48/53 | 2349136, 2349161 | |

Item no. and description for fastener

| Designation | Item no. | Description |
|----------------------|----------|--|
| S-BT-GF M8/7 AN 6 | 2140527 | Screw-in carbon steel threaded stud |
| S-BT-MF M8/15 AN 6 | 2148618 | Screw-in carbon steel threaded stud |
| S-BT-GF NG M8/7 AN 6 | 2302143 | Screw-in carbon steel threaded stud |
| X-EM8H-15-12 P8 | 271981 | Sharp-tip zinc plated carbon steel threaded stud |
| X-EM8H-15-12 FP10 | 271982 | Sharp-tip zinc plated carbon steel threaded stud |
| X-ST-GR M8/10 P8 | 2122460 | Sharp-tip stainless steel threaded stud |
| X-BT-GR M8/7 SN 8 | 2194344 | Blunt-tip stainless steel threaded stud |
| S-BT-GR M8/7 SN 6 | 2140529 | Screw-in stainless steel threaded stud |
| S-BT-GR NG M8/7 SN 6 | 2302142 | Screw-in stainless steel threaded stud |
| S-BT-GR M8/7 SN 6 AL | 2140742 | Screw-in stainless steel threaded stud |

Item no. and description for tools

| Designation | Item no. | Description |
|------------------|----------|---------------------------------|
| BX 3-BTG | | Battery-actuated fastening tool |
| DX 351-BTG | | Powder-actuated fastening tool |
| SF 2-A12 | | Screwdriver |
| SF 2H-A12 | | Screwdriver |
| SF 4-A22 | | Screwdriver |
| SF 6-A22 | | Screwdriver |
| SF 6H-A22 | | Screwdriver |
| SF 18-A | | Screwdriver |
| SFC 18-A | | Screwdriver |
| SF 22-A | | Screwdriver |
| SFC 22-A | | Screwdriver |
| SBT 4-A22 | | Screwdriver |
| S-BT 1/4" - 5 Nm | 2143271 | Hilti torque tool (5 Nm) |
| X-BT 1/4" - 8 Nm | 2119272 | Hilti torque tool (8 Nm) |

Item no. and description for accessories

| Designation | Item no. | Description |
|-----------------------|----------|--|
| X-SEA-R 30 M8 | 432274 | Stainless steel stud extension adapter |
| TX-BT 4.7/7-80 | 2197930 | Stepped drill bit |
| TX-BT 4.7/7-110 | 2197931 | Stepped drill bit |
| TS-BT 5.5-74 S | 2143137 | Stepped drill bit |
| TS-BT 5.5-74 AL | 2143138 | Stepped drill bit |
| Allen key - Size 5 mm | | Adapter |



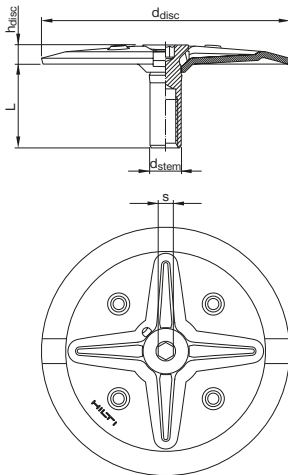
X-FCM-F L, X-FCM-R L

Securing grating with large disc with medium and high corrosion resistance

Dimensions

Technical drawings for grating element

Technical drawing



Designation

X-FCM-F L,
X-FCM-R L



- Threaded stem, Disc, Absorber O-Ring.

Dimensions for grating elements with large discs

| Designation | | Grating element length L | Grating element stem diameter d _{stud} | Grating element disc diameter d _{disc} | Grating element disc height h _{disc} | Grating element hex width s |
|-----------------|-----------------|-----------------------------|--|--|--|--------------------------------|
| X-FCM-F L 28/33 | X-FCM-R L 28/33 | 23 mm | 10.3 mm | 82 mm | 4 mm | 5.0 mm |
| X-FCM-F L 32/37 | X-FCM-R L 32/37 | 27 mm | | | | |
| X-FCM-F L 38/43 | X-FCM-R L 38/43 | 33 mm | | | | |
| X-FCM-F L 48/53 | X-FCM-R L 48/53 | 43 mm | | | | |

Material specification
Material specification and material properties for carbon steel parts

| Designation | Element | Material | Coating | Coating thickness | Category of corrosivity of the atmosphere according to EN ISO 9223 |
|-------------|---------------------|--------------|---------------|-------------------|--|
| X-FCM-F L | Disc, threaded stem | Carbon steel | Duplex coated | ≥ 30 µm | C3 |



- Duplex coated steel is comparable to HDG steel.
- Duplex coated steel is tested according to EN ISO 9227: NSS/AASS/CASS, 480 h on salt spray exposure.

Material specification and material properties for stainless steel parts

| Designation | Element | Material | Coating | Steel grade according to EN 10088 | Corrosion resistance class according to EN 1993-1-4 |
|-------------|---------------------|-----------------|---------|-----------------------------------|---|
| X-FCM-R L | Disc, threaded stem | Stainless steel | – | 1.4404 | CRC III |

Material specification and material properties for plastic parts

| Designation | Element | Material | Color | Other properties |
|-------------|----------|--------------------|-------|--|
| X-FCM-F L | Absorber | Polyurethane (PUR) | Black | Resistant to UV, saltwater, ozone, oil, grease |
| X-FCM-R L | O-Ring | | | |

Application recommendation for securing grating
Grating material and grating material properties for square grating

| | | |
|--|---|--|
| | Grating type | Square grating |
| | Grating material | Carbon steel bar grating Stainless steel bar grating Reinforced fiberglass grating |
| | Clear bar spacing $w_{\text{bearing bar}}$ | 30 – 60 mm |
| | Clear cross bar spacing $w_{\text{cross bar}}$ | ≥ 30 mm |
| | Grating height h_G | 23 – 53 mm |
| | Grating height h_G with X-SEA | 53 – 83 mm |

Grating material and grating material properties for rectangular grating

| | | |
|--|---|--|
| | Grating type | Rectangular grating |
| | Grating material | Carbon steel bar grating Stainless steel bar grating Reinforced fiberglass grating |
| | Clear bar spacing $w_{\text{bearing bar}}$ | 30 – 60 mm |
| | Clear cross bar spacing $w_{\text{cross bar}}$ | ≥ 30 mm |
| | Grating height h_G | 23 – 53 mm |
| | Grating height h_G with X-SEA | 53 – 83 mm |

Grating element recommendation

| Technical drawing | Designation | Grating material | Grating type | Grating height h_G |
|-------------------|-----------------|---|--------------------------------|----------------------|
| | X-FCM-F L 28/33 | Carbon steel and reinforced fiberglass | Square and rectangular grating | 28 – 33 mm |
| | X-FCM-F L 32/37 | | | 32 – 37 mm |
| | X-FCM-F L 38/43 | | | 38 – 43 mm |
| | X-FCM-F L 48/53 | | | 48 – 53 mm |
| | X-FCM-R L 28/33 | Stainless steel and reinforced fiberglass | Square and rectangular grating | 28 – 33 mm |
| | X-FCM-R L 32/37 | | | 32 – 37 mm |
| | X-FCM-R L 38/43 | | | 38 – 43 mm |
| | X-FCM-R L 48/53 | | | 48 – 53 mm |

Grating element recommendation for use with stud extension adapter X-SEA

| Technical drawing | Designation | Grating material | Grating type | Grating height h_G |
|-------------------|-----------------|---|--------------------------------|----------------------|
| | X-FCM-R L 28/33 | Stainless steel and reinforced fiberglass | Square and rectangular grating | 58 – 53 mm |
| | X-FCM-R L 32/37 | | | 62 – 67 mm |
| | X-FCM-R L 38/43 | | | 68 – 73 mm |
| | X-FCM-R L 48/53 | | | 78 – 83 mm |

Performance data

Recommended tension load for grating elements

| Designation | Grating type | Clear bar spacing | Tension load |
|-------------|---------------------|--------------------------|------------------|
| | | $w_{\text{bearing bar}}$ | N_{rec} |
| X-FCM-F L | Square grating | 30 mm | 1.8 kN |
| | | 60 mm | 0.8 kN |
| | Rectangular grating | 30 mm | 0.8 kN |
| | | 57 mm | 0.8 kN |
| X-FCM-R L | Square grating | 30 mm | 1.8 kN |
| | | 60 mm | 0.8 kN |
| | Rectangular grating | 30 mm | 0.8 kN |
| | | 57 mm | 0.8 kN |

Recommended tension load for grating fastening system

| Designation | Grating type | Clear bar spacing | Base material tensile strength | Base material thickness | Tension load |
|---|---------------------|--------------------------|----------------------------------|--------------------------------|------------------|
| | | $w_{\text{bearing bar}}$ | R_m | t_{II} | N_{rec} |
| X-FCM-F L combined with S-BT-GF M8/7 AN 6, S-BT-MF M8/15 AN 6, S-BT-GF NG M8/7 AN 6 | Square grating | 30 mm | Steel: 360 – 630 MPa | $3 \leq t_{II} < 5 \text{ mm}$ | 1.8 kN |
| | | 60 mm | | | 0.8 kN |
| | | 30 mm | | $t_{II} \geq 5 \text{ mm}$ | 1.8 kN |
| | | 60 mm | | | 0.8 kN |
| | Rectangular grating | 30 mm | | $3 \leq t_{II} < 5 \text{ mm}$ | 0.8 kN |
| | | 57 mm | | | 0.8 kN |
| | | 30 mm | | $t_{II} \geq 5 \text{ mm}$ | 0.8 kN |
| | | 57 mm | | | 0.8 kN |
| X-FCM-F L combined with X-ST-GR M8/10 P8 | Square grating | 30 mm | Steel: $\geq 360 \text{ MPa}$ | $t_{II} \geq 6 \text{ mm}$ | 1.8 kN |
| | | 60 mm | | | 0.8 kN |
| | Rectangular grating | 30 mm | | | 0.8 kN |
| | | 57 mm | | | 0.8 kN |



- Maximum base material tensile strength R_m depending on fastener application limitation, see corresponding Product Data Sheet(s).

| Designation | Grating type | Clear bar spacing | Base material tensile strength R_m | Base material thickness t_{II} | Tension load N_{rec} |
|--|---------------------|---------------------|---|-------------------------------------|---------------------------|
| | | $w_{bearing\ bar}$ | | | |
| X-FCM-R-L combined with S-BT-GR M8/7 SN 6, S-BT-GR NG M8/7 SN 6 | Square grating | 30 mm | Steel: 360 – 630 MPa | $3 \leq t_{II} < 5\ mm$ | 1.8 kN |
| | | 60 mm | | | 0.8 kN |
| | | 30 mm | | $t_{II} \geq 5\ mm$ | 1.8 kN |
| | | 60 mm | | | 0.8 kN |
| | Rectangular grating | 30 mm | | $3 \leq t_{II} < 5\ mm$ | 0.8 kN |
| | | 57 mm | | | 0.8 kN |
| 30 mm | | $t_{II} \geq 5\ mm$ | 0.8 kN | | |
| 57 mm | 0.8 kN | | | | |
| X-FCM-R-L combined with X-BT-GR M8/7 SN 8 | Square grating | 30 mm | Steel: $\geq 360\ MPa$, no upper limit | $t_{II} \geq 8\ mm$ | 1.8 kN |
| | | 60 mm | | | 0.8 kN |
| | Rectangular grating | 30 mm | | | 0.8 kN |
| | | 57 mm | | | 0.8 kN |
| X-FCM-R-L combined with S-BT-GR M8/7 SN 6 AL | Square grating | 30 mm | Aluminum: $\geq 270\ MPa$ | $t_{II} \geq 5\ mm$ | 1.8 kN |
| | | 60 mm | | | 0.8 kN |
| | Rectangular grating | 30 mm | | $t_{II} \geq 5\ mm$ | 0.8 kN |
| | | 57 mm | | | 0.8 kN |

• Data valid for use with stud extension adapter X-SEA.

Design resistance under tension and shear load for grating fastening system

| Load type | Partial factor for actions γ_f | Characteristic resistance |
|--------------|--|-----------------------------------|
| Tension load | 1.4 | $N_{Rd} = N_{rec} \cdot \gamma_f$ |
| Shear load | 1.4 | $V_{Rd} = V_{rec} \cdot \gamma_f$ |

• Design resistance can be calculated.

Characteristic resistance under tension and shear load for grating fastening system

• For characteristic resistance under shear and tension load contact Hilti.

Installation recommendation

Recommended tightening torque for tightening grating element

| Designation Grating element combined with fastener | | Base material | Base material thickness t_{II} | Tightening torque T_{rec} |
|---|---|---------------|--|-----------------------------------|
| X-FCM-F L | S-BT-GF M8/7 AN 6, S-BT-MF M8/15 AN 6, S-BT-GF NG M8/7 AN 6 | Steel | $3 \leq t_{II} < 5 \text{ mm}$ | 5 Nm |
| | | | $\geq 5 \text{ mm}$ | 8 Nm |
| | X-ST-GR M8/10 P8 | | $\geq 6 \text{ mm}$ | 8 Nm |

| Designation Grating element combined with fastener | | Base material | Base material thickness t_{II} | Tightening torque T_{rec} |
|---|--|---------------|--|-----------------------------------|
| X-FCM-R L | S-BT-GR M8/7 SN 6, S-BT-GR NG M8/7 SN 6 | Steel | $3 \leq t_{II} < 5 \text{ mm}$ | 5 Nm |
| | | | $\geq 5 \text{ mm}$ | 8 Nm |
| | X-BT-GR M8/7 SN 8 | Steel | $\geq 8 \text{ mm}$ | 8 Nm |
| | S-BT-GR M8/7 SN 6 AL | Aluminum | $t_{II} \geq 5 \text{ mm}$ | 5 Nm |



- Data valid for use with stud extension adapter X-SEA.

Tightening tool recommendation for tightening with screwdriver

| Designation | Clutch type (stop detection) | Tightening torque | | | |
|-------------|---------------------------------|-----------------------------|--------|--------------------------|--------|
| | | $T_{rec} = 5 \text{ Nm}$ | | $T_{rec} = 8 \text{ Nm}$ | |
| | | Tool power level adjustment | | | |
| | | Gear | Clutch | Gear | Clutch |
| SF 2-A12 | TRC | 1 | 15 | 1 | 15 |
| SF 2H-A12 | TRC | 1 | 15 | 1 | 15 |
| SF 4-A22 | TRC | 1 | 4 | 1 | 8 |
| SF 6-A22 | ESC (SJ) | 1 | 5 | 1 | 7 |
| SF 6H-A22 | ESC (SJ) | 1 | 5 | 1 | 7 |
| SF 18-A | TRC | 1 | 4 | 1 | 5 |
| SFC 18-A | TRC | 1 | 4 | 1 | 5 |
| SF 22-A | TRC | 1 | 4 | 1 | 5 |
| SFC 22-A | TRC | 1 | 4 | 1 | 5 |
| SBT 4-A22 | TRC | 1 | 5 | 1 | 7 |



- Hilti recommends using a calibrated torque wrench or the Hilti Torque tool to apply the recommended tightening torque.
- Tool power level adjustment is a guiding value which applies to new Hilti screwdriver.
- Tightening torque may vary depending on the user and the application.
- Torque release coupling (TRC): Achievable torque can change over time due to clutch wear.
- Electronic slip clutch (ESC): ESC has 2 stop detections, Soft Joint (SJ) and Hard Joint (HJ). Hard joint detection is activated due to drop in speed (fast stop) and can lead to a torque spike.

Tightening tool recommendation for tightening with Hilti torque tool

| Designation | Tightening torque T_{rec} |
|------------------|--------------------------------|
| S-BT 1/4" - 5 Nm | 5 Nm |
| X-BT 1/4" - 8 Nm | 8 Nm |



- Data valid for use with stud extension adapter X-SEA.

Fastener program

Item no. and description for grating elements

| Designation | Item no. | Description |
|-----------------|----------|---|
| X-FCM-F L 28/33 | 2354532 | Duplex coated grating element for securing grating with large disc |
| X-FCM-F L 32/37 | 2354533 | |
| X-FCM-F L 38/43 | 2354534 | |
| X-FCM-F L 48/53 | 2354535 | |
| X-FCM-R L 28/33 | 2354514 | Stainless steel grating element for securing grating with large disc |
| X-FCM-R L 32/37 | 2354515 | |
| X-FCM-R L 38/43 | 2354516 | |
| X-FCM-R L 48/53 | 2354517 | |

Item no. and description for fastener

| Designation | Item no. | Description |
|----------------------|----------|---|
| S-BT-GF M8/7 AN 6 | 2140527 | Screw-in carbon steel threaded stud |
| S-BT-MF M8/15 AN 6 | 2148618 | Screw-in carbon steel threaded stud |
| S-BT-GF NG M8/7 AN 6 | 2302143 | Screw-in carbon steel threaded stud |
| X-ST-GR M8/10 P8 | 2122460 | Sharp-tip stainless steel threaded stud |
| X-BT-GR M8/7 SN 8 | 2194344 | Blunt-tip stainless steel threaded stud |
| S-BT-GR M8/7 SN 6 | 2140529 | Screw-in stainless steel threaded stud |
| S-BT-GR NG M8/7 SN 6 | 2302142 | Screw-in stainless steel threaded stud |
| S-BT-GR M8/7 SN 6 AL | 2140742 | Screw-in stainless steel threaded stud |

Item no. and description for tools

| Designation | Item no. | Description |
|------------------|----------|---------------------------------|
| BX 3-BTG | | Battery-actuated fastening tool |
| DX 351-BTG | | Powder-actuated fastening tool |
| SF 2-A12 | | Screwdriver |
| SF 2H-A12 | | Screwdriver |
| SF 4-A22 | | Screwdriver |
| SF 6-A22 | | Screwdriver |
| SF 6H-A22 | | Screwdriver |
| SF 18-A | | Screwdriver |
| SFC 18-A | | Screwdriver |
| SF 22-A | | Screwdriver |
| SFC 22-A | | Screwdriver |
| SBT 4-A22 | | Screwdriver |
| S-BT 1/4" - 5 Nm | 2143271 | Hilti torque tool (5 Nm) |
| X-BT 1/4" - 8 Nm | 2119272 | Hilti torque tool (8 Nm) |

Item no. and description for accessories

| Designation | Item no. | Description |
|-----------------------|----------|--|
| X-SEA-R 30 M8 | 432274 | Stainless steel stud extension adapter |
| TX-BT 4.7/7-80 | 2197930 | Stepped drill bit |
| TX-BT 4.7/7-110 | 2197931 | Stepped drill bit |
| TS-BT 5.5-74 S | 2143137 | Stepped drill bit |
| TS-BT 5.5-110 S | 2201685 | Stepped drill bit |
| TS-BT 5.5-74 AL | 2143138 | Stepped drill bit |
| Allen key - Size 5 mm | | Adapter |



- Please check delivery times for special item(s) with Hilti Customer Service.

X-FCM-R HL

Securing grating under high load with medium and high corrosion resistance

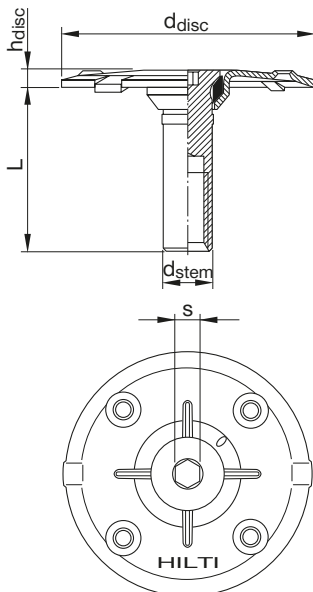
Dimensions

Technical drawings for grating element

Technical drawing

Designation

X-FCM-R HL



- Threaded stem, Disc, Absorber O-Ring.

Dimensions for grating elements for narrow gratings

| Designation | Grating element length L | Grating element stem diameter d _{stud} | Grating element disc diameter d _{disc} | Grating element disc height h _{disc} | Grating element hex width s |
|------------------|-----------------------------|--|--|--|--------------------------------|
| X-FCM-R HL 23/28 | 18 mm | 10.3 mm | 50 mm | 4 mm | 5 mm |
| X-FCM-R HL 28/33 | 23 mm | | | | |
| X-FCM-R HL 32/37 | 27 mm | | | | |
| X-FCM-R HL 38/43 | 33 mm | | | | |
| X-FCM-R HL 48/53 | 43 mm | | | | |

Material specification
Material specification and material properties for stainless steel parts

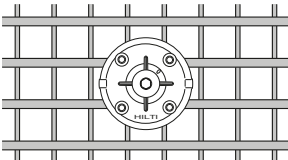
| Designation | Element | Material | Coating | Steel grade according to EN 10088 | Corrosion resistance class according to EN 1993-1-4 |
|-------------|---------------------|-----------------|---------|-----------------------------------|---|
| X-FCM-R HL | Disc, threaded stem | Stainless steel | - | 1.4404 | CRC III |

Material specification and material properties for plastic parts

| Designation | Element | Material | Color | Other properties |
|-------------|--------------------|-------------------------------------|-------|------------------|
| X-FCM-R HL | Absorber O-Ring | Thermoplastic Polyurethane (TPU) | Red | |

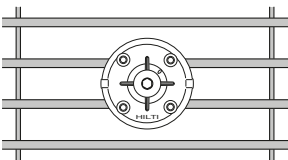
Application recommendation

Grating material and grating material properties for square grating



| | |
|---|--|
| Grating type | Square grating |
| Grating material | Carbon steel bar grating Stainless steel bar grating Reinforced fiberglass grating |
| Clear bar spacing $w_{\text{bearing bar}}$ | 18 – 44 mm |
| Clear cross bar spacing $w_{\text{cross bar}}$ | 18 – 44 mm |
| Grating height h_G | 23 – 53 mm |
| Grating height h_G with stud extension adapter X-SEA | 53 – 83 mm |

Grating material and grating material properties for rectangular grating



| | |
|---|--|
| Grating type | Rectangular grating |
| Grating material | Carbon steel bar grating Stainless steel bar grating Reinforced fiberglass grating |
| Clear bar spacing $w_{\text{bearing bar}}$ | 18 – 44 mm |
| Clear cross bar spacing $w_{\text{cross bar}}$ | ≥ 20 mm |
| Grating height h_G | 23 – 53 mm |
| Grating height h_G with stud extension adapter X-SEA | 53 – 83 mm |

Grating element recommendation

| Technical drawing | Designation | Grating material | Grating type | Grating height h_G |
|-------------------|------------------|---|--------------------------------|----------------------|
| | X-FCM-R HL 23/28 | Stainless steel and reinforced fiberglass | Square and rectangular grating | 23 – 28 mm |
| | X-FCM-R HL 28/33 | | | 28 – 33 mm |
| | X-FCM-R HL 32/37 | | | 32 – 37 mm |
| | X-FCM-R HL 38/43 | | | 38 – 43 mm |
| | X-FCM-R HL 48/53 | | | 48 – 53 mm |

Grating element recommendation for use with stud extension adapter X-SEA

| Technical drawing | Designation | Grating material | Grating type | Grating height h_G |
|-------------------|------------------|---|--------------------------------|----------------------|
| | X-FCM-R HL 23/28 | Stainless steel and reinforced fiberglass | Square and rectangular grating | 53 – 58 mm |
| | X-FCM-R HL 28/33 | | | 58 – 63 mm |
| | X-FCM-R HL 32/37 | | | 62 – 67 mm |
| | X-FCM-R HL 38/43 | | | 68 – 73 mm |
| | X-FCM-R HL 48/53 | | | 78 – 83 mm |

Application areas


- X-FCM-R HL together with X-BT-GR M8/7 SN 8 threaded fasteners forms a high resistance and robust fastening system to fix grating in marine C5 corrosive environment.
- High tension resistance for use in wave zones.

Performance data

Recommended tension and shear load for grating elements

| Designation | Grating type | Clear bar spacing | Tension load | Shear load |
|-------------|---------------------|---|------------------|------------------|
| | | $w_{\text{bearing bar}}$ | N_{rec} | V_{rec} |
| X-FCM-R HL | Square grating | $18 \leq w_{\text{bearing bar}} \leq 38 \text{ mm}$ | 3.6 kN | 0.6 kN |
| | | $38 < w_{\text{bearing bar}} \leq 44 \text{ mm}$ | 1.2 kN | |
| | Rectangular grating | $18 \leq w_{\text{bearing bar}} \leq 24 \text{ mm}$ | 2.8 kN | 0.4 kN |
| | | $24 < w_{\text{bearing bar}} \leq 30 \text{ mm}$ | 2.1 kN | |
| | | $30 < w_{\text{bearing bar}} \leq 35 \text{ mm}$ | 1.4 kN | |
| | | $35 < w_{\text{bearing bar}} \leq 44 \text{ mm}$ | 0.7 kN | |

Recommended tension load for grating fastening system

| Designation | Grating type | Clear bar spacing | Tension load |
|--|---------------------|---|------------------|
| | | $w_{\text{bearing bar}}$ | N_{rec} |
| X-FCM-R HL combined with X-BT-GR M8/7 SN 8 | Square grating | $18 \leq w_{\text{bearing bar}} \leq 38 \text{ mm}$ | 3.6 kN |
| | | $38 < w_{\text{bearing bar}} \leq 44 \text{ mm}$ | 1.2 kN |
| | Rectangular grating | $18 \leq w_{\text{bearing bar}} \leq 24 \text{ mm}$ | 2.8 kN |
| | | $24 < w_{\text{bearing bar}} \leq 30 \text{ mm}$ | 2.1 kN |
| | | $30 < w_{\text{bearing bar}} \leq 35 \text{ mm}$ | 1.4 kN |
| | | $35 < w_{\text{bearing bar}} \leq 44 \text{ mm}$ | 0.7 kN |



- Data valid for use with stud extension adapter X-SEA.

Recommended shear load for grating fastening system

| Designation | Grating type | Clear bar spacing | Grating system extension | Tension load |
|--|---------------------|---|--------------------------|------------------|
| | | $w_{\text{bearing bar}}$ | | N_{rec} |
| X-FCM-R HL combined with X-BT-GR M8/7 SN 8 | Square grating | $18 \leq w_{\text{bearing bar}} \leq 44 \text{ mm}$ | – | 0.6 kN |
| | | | X-SEA-R | 0.4 kN |
| | Rectangular grating | $18 \leq w_{\text{bearing bar}} \leq 44 \text{ mm}$ | – | 0.4 kN |
| | | | X-SEA-R | 0.4 kN |

Design resistance under tension and shear load for grating fastening system

| Load type | Partial factor for actions γ_f | Characteristic resistance |
|--------------|--|-----------------------------------|
| Tension load | 1.4 | $N_{Rd} = N_{rec} \cdot \gamma_f$ |
| Shear load | 1.4 | $V_{Rd} = V_{rec} \cdot \gamma_f$ |

- Design resistance can be calculated.

Characteristic resistance under tension and shear load for grating fastening system

- Characteristic tensile loads N_{Rk} can be conservatively calculated by multiplying the recommended load values N_{rec} with the factor 2.8, $N_{Rk} = 2.8 \cdot N_{rec}$.

Installation recommendation

Recommended tightening torque for tightening grating element

| Designation Grating element combined with fastener | | Base material | Base material thickness t_{II} | Tightening torque T_{rec} |
|---|-------------------|---------------|-------------------------------------|--------------------------------|
| X-FCM-R HL | X-BT-GR M8/7 SN 8 | Steel | ≥ 8 mm | 20 Nm |

- Data valid for use with stud extension adapter X-SEA.

Tightening tool recommendation for tightening with screwdriver

| Designation | Clutch type (stop detection) | Tightening torque | | | |
|-------------|---------------------------------|-----------------------------|--------|-------------------|--------|
| | | $T_{rec} = 16$ Nm | | $T_{rec} = 20$ Nm | |
| | | Tool power level adjustment | | | |
| | | Gear | Clutch | Gear | Clutch |
| SF 6-A22 | ESC (SJ) | 1 | 13 | 1 | 15 |
| SF 6H-A22 | ESC (SJ) | 1 | 13 | 1 | 15 |

- Data valid for use with stud extension adapter X-SEA.
- Hilti recommends using a calibrated torque wrench or the Hilti Torque tool to apply the recommended tightening torque.
- Tool power level adjustment is a guiding value which applies to new Hilti screwdriver.
- Tightening torque may vary depending on the user and the application.
- Electronic slip clutch (ESC): ESC has 2 stop detections, Soft Joint (SJ) and Hard Joint (HJ). Hard joint detection is activated due to drop in speed (fast stop) and can lead to a torque spike.

Tightening tool recommendation for tightening with Hilti torque tool

| Designation | Tightening torque |
|-------------------|--------------------|
| X-BT 1/4" - 20 Nm | T_{rec} 20 Nm |



- Data valid for use with stud extension adapter X-SEA.

Fastener program
Item no. and description

| Designation | Item no. | Description |
|------------------|----------|---|
| X-FCM-R HL 23/28 | 2349142 | Stainless steel grating element for securing grating under high load |
| X-FCM-R HL 28/33 | 2349143 | |
| X-FCM-R HL 32/37 | 2349144 | |
| X-FCM-R HL 38/43 | 2349145 | |
| X-FCM-R HL 48/53 | 2349146 | |

Item no. and description for fastener and stud extension adapter

| Designation | Item no. | Description |
|-------------------|----------|--|
| X-BT-GR M8/7 SN 8 | 2194344 | Threaded stud for highly corrosive environment |

Item no. and description for tools

| Designation | Item no. | Description |
|-------------------|----------|---------------------------------|
| BX 3-BTG | | Battery-actuated fastening tool |
| DX 351-BTG | | Powder-actuated fastening tool |
| SF 6-A22 | | Screwdriver |
| SF 6H-A22 | | Screwdriver |
| X-BT 1/4" - 20 Nm | | Hilti torque tool (20 Nm) |

Item no. and description for accessories

| Designation | Item no. | Description |
|----------------------|----------|--|
| X-SEA-R 30 M8 | 432274 | Stainless steel stud extension adapter |
| TX-BT 4.7/7-80 | 2197930 | Stepped drill bit |
| TX-BT 4.7/7-110 | 2197931 | Stepped drill bit |
| Allen key - Size 5mm | | Adapter |

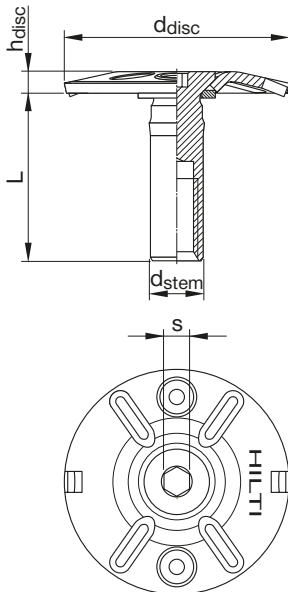
X-FCM-F NG, X-FCM-R NG

Securing narrow grating with medium and high corrosion resistance

Dimensions

Technical drawings for grating element

Technical drawing



Designation

X-FCM-F NG,
X-FCM-R NG

- Threaded stem, Disc, Absorber O-Ring.

Dimensions for grating elements for narrow gratings

| Designation | | Grating element length L | Grating element stem diameter d _{stud} | Grating element disc diameter d _{disc} | Grating element disc height h _{disc} | Grating element hex width s |
|------------------|------------------|-----------------------------|--|--|--|--------------------------------|
| X-FCM-F NG 23/28 | X-FCM-R NG 23/28 | 18 mm | 10.3 mm | 44 mm | 4 mm | 5 mm |
| X-FCM-F NG 28/33 | X-FCM-R NG 28/33 | 23 mm | | | | |
| X-FCM-F NG 32/37 | X-FCM-R NG 32/37 | 27 mm | | | | |
| X-FCM-F NG 38/43 | X-FCM-R NG 38/43 | 33 mm | | | | |
| X-FCM-F NG 48/53 | X-FCM-R NG 48/53 | 43 mm | | | | |

Material specification
Material specification and material properties for carbon steel parts

| Designation | Element | Material | Coating | Coating thickness | Category of corrosivity of the atmosphere according to EN ISO 9223 |
|-------------|---------------------|--------------|---------------|-------------------|--|
| X-FCM-F NG | Disc, threaded stem | Carbon steel | Duplex coated | ≥ 45 µm | C3 |



- Duplex coated steel is comparable to HDG steel.
- Duplex coated steel is tested according to EN ISO 9227: NSS/AASS/CASS, 480 h on salt spray exposure.

Material specification and material properties for stainless steel parts

| Designation | Element | Material | Coating | Steel grade according to EN 10088 | Corrosion resistance class according to EN 1993-1-4 |
|-------------|---------------------|-----------------|---------|-----------------------------------|---|
| X-FCM-R NG | Disc, threaded stem | Stainless steel | - | 1.4404 | CRC III |

Material specification and material properties for plastic parts

| Designation | Element | Material | Color | Other properties |
|-------------|----------|--------------------|-------|------------------|
| X-FCM-F NG | Absorber | Polyurethane (PUR) | Black | |
| X-FCM-R NG | O-Ring | | | |

Application recommendation

Grating material and grating material properties for square grating

| | | |
|--|---|--|
| | Grating type | Square grating |
| | Grating material | Carbon steel bar grating Stainless steel bar grating Reinforced fiberglass grating |
| | Bearing bar thickness $t_{\text{bearing bar}}$ | 5 mm |
| | Clear bar spacing $w_{\text{bearing bar}}$ | 18 – 22 mm |
| | Clear cross bar spacing $w_{\text{cross bar}}$ | 18 – 22 mm |
| | Grating height h_G | 23 – 53 mm |
| | Grating height h_G with stud extension adapter X-SEA | 53 – 83 mm |



- Deviating bearing bar thickness can be qualified by grating manufacturer.

Grating material and grating material properties for rectangular grating

| | | |
|--|---|--|
| | Grating type | Rectangular grating |
| | Grating material | Carbon steel bar grating Stainless steel bar grating Reinforced fiberglass grating |
| | Bearing bar thickness $t_{\text{bearing bar}}$ | 5 mm |
| | Clear bar spacing $w_{\text{bearing bar}}$ | 13 – 22 mm |
| | Clear cross bar spacing $w_{\text{cross bar}}$ | ≥ 18 mm |
| | Grating height h_G | 23 – 53 mm |
| | Grating height h_G with stud extension adapter X-SEA | 53 – 83 mm |



- Deviating bearing bar thickness can be qualified by grating manufacturer.

Grating element recommendation

| Technical drawing | Designation | Grating material | Grating type | Grating height h_G |
|-------------------|------------------|---|--------------------------------|----------------------|
| | X-FCM-F NG 23/28 | Carbon steel and reinforced fiberglass | Square and rectangular grating | 23 – 28 mm |
| | X-FCM-F NG 28/33 | | | 28 – 33 mm |
| | X-FCM-F NG 32/37 | | | 32 – 37 mm |
| | X-FCM-F NG 38/43 | | | 38 – 43 mm |
| | X-FCM-F NG 48/53 | | | 48 – 53 mm |
| | X-FCM-R NG 23/28 | Stainless steel and reinforced fiberglass | Square and rectangular grating | 23 – 28 mm |
| | X-FCM-R NG 28/33 | | | 28 – 33 mm |
| | X-FCM-R NG 32/37 | | | 32 – 37 mm |
| | X-FCM-R NG 38/43 | | | 38 – 43 mm |
| | X-FCM-R NG 48/53 | | | 48 – 53 mm |

Grating element recommendation for use with stud extension adapter X-SEA

| Technical drawing | Designation | Grating material | Grating type | Grating height h_G |
|-------------------|------------------|---|--------------------------------|----------------------|
| | X-FCM-R NG 23/28 | Stainless steel and reinforced fiberglass | Square and rectangular grating | 53 – 58 mm |
| | X-FCM-R NG 28/33 | | | 58 – 63 mm |
| | X-FCM-R NG 32/37 | | | 62 – 67 mm |
| | X-FCM-R NG 38/43 | | | 68 – 73 mm |
| | X-FCM-R NG 48/53 | | | 78 – 83 mm |



- Please contact Hilti for grating element recommendation when the requirements deviate from the standard.

Performance data

Recommended tension load for grating fastening system


| Designation | Grating type | Clear bar spacing | Base material steel grade | Base material thickness t_{II} | Tension load | |
|---|---|--------------------------|----------------------------|--|--------------------------------|--------|
| | | $w_{\text{bearing bar}}$ | | | N_{rec} | |
| X-FCM-F NG combined with S-BT-GF NG M8/7 AN 6 | Square grating | 18 mm | S235 Jxx – S275 Jxx | $3 \leq t_{II} < 5 \text{ mm}$ | 1.9 kN | |
| | | 22 mm | | | 1.7 kN | |
| | | 18 mm | S280 GD – S350 GD | | $t_{II} \geq 5 \text{ mm}$ | 2.0 kN |
| | | 22 mm | | | | 1.7 kN |
| | Square grating | 18 mm | S355 Jxx, S420 | $3 \leq t_{II} < 5 \text{ mm}$ | 2.3 kN | |
| | | 22 mm | | | 1.7 kN | |
| | | 18 mm | S390 GD – S420 GD | | $t_{II} \geq 5 \text{ mm}$ | 2.4 kN |
| | | 22 mm | | | | 1.7 kN |
| | X-FCM-F NG combined with S-BT-GF NG M8/7 AN 6 | Rectangular grating | 13 mm | S235 Jxx – S275 Jxx S280 GD – S350 GD | $3 \leq t_{II} < 5 \text{ mm}$ | 1.9 kN |
| | | | 18 mm | | | 1.9 kN |
| 22 mm | | | 1.2 kN | | | |
| 13 mm | | | $t_{II} \geq 5 \text{ mm}$ | | 2.0 kN | |
| 18 mm | | | | | 2.0 kN | |
| 22 mm | | | | | 1.2 kN | |
| Rectangular grating | | 13 mm | S355 Jxx, S420 | $3 \leq t_{II} < 5 \text{ mm}$ | 2.3 kN | |
| | | 18 mm | | | 2.1 kN | |
| | | 22 mm | | | 1.2 kN | |
| | | 13 mm | S390 GD – S420 GD | | $t_{II} \geq 5 \text{ mm}$ | 2.4 kN |
| | | 18 mm | | | | 2.1 kN |
| | | 22 mm | | | | 1.2 kN |

| Designation | Grating type | Clear bar spacing | Base material steel grade | Base material thickness t_{II} | Tension load |
|---|----------------------------|--------------------------|--|----------------------------------|------------------|
| | | $w_{\text{bearing bar}}$ | | | N_{rec} |
| X-FCM-R NG combined with S-BT-GR NG M8/7 SN 6 | Square grating | 18 mm | S235 Jxx – S275 Jxx | $3 \leq t_{II} < 5 \text{ mm}$ | 1.8 kN |
| | | 22 mm | | | |
| | | 18 mm | S280 GD – S350 GD | $t_{II} \geq 5 \text{ mm}$ | 1.9 kN |
| | | 22 mm | | | |
| | Square grating | 18 mm | S355 Jxx, S420 | $3 \leq t_{II} < 5 \text{ mm}$ | 2.1 kN |
| | | 22 mm | | | |
| | | 18 mm | S390 GD – S420 GD | $t_{II} \geq 5 \text{ mm}$ | 2.3 kN |
| | | 22 mm | | | |
| X-FCM-R NG combined with S-BT-GR NG M8/7 SN 6 | Rectangular grating | 13 mm | S235 Jxx – S275 Jxx S280 GD – S350 GD | $3 \leq t_{II} < 5 \text{ mm}$ | 1.9 kN |
| | | 18 mm | | | 1.9 kN |
| | | 22 mm | | | 1.2 kN |
| | | 13 mm | | $t_{II} \geq 5 \text{ mm}$ | 2.0 kN |
| | | 18 mm | | | 2.0 kN |
| | | 22 mm | | | 1.2 kN |
| | Rectangular grating | 13 mm | S355 Jxx, S420 S390 GD – S420 GD | $3 \leq t_{II} < 5 \text{ mm}$ | 2.1 kN |
| | | 18 mm | | | |
| | | 22 mm | | | |
| | | 13 mm | | | |
| 18 mm | 2.3 kN | | | | |
| 22 mm | $t_{II} \geq 3 \text{ mm}$ | 2.1 kN | | | |




• Data valid for use with stud extension adapter X-SEA.

Recommended shear load for grating fastening system


-  • Not suitable for explicit shear load design, e.g. diaphragms.
- Shear resistance by friction is depending on surface characteristics.
- Shear loads up to 0.3 kN will not result in permanent deformation.
- Small unexpected shear loads can be accommodated without damage.

Design resistance under tension and shear load for grating fastening system

| Load type | Partial factor for actions γ_f | Characteristic resistance |
|--------------|--|-----------------------------------|
| Tension load | 1.4 | $N_{Rd} = N_{rec} \cdot \gamma_f$ |
| Shear load | 1.4 | $V_{Rd} = V_{rec} \cdot \gamma_f$ |

-  • Design resistance can be calculated.

Characteristic resistance under tension and shear load for grating fastening system

-  • For characteristic resistance under shear and tension load contact Hilti.

Installation recommendation

Recommended tightening torque for tightening grating element

| Designation Grating element combined with fastener | | Base material | Base material thickness t_{II} | Tightening torque T_{rec} |
|---|----------------------|---------------|-------------------------------------|--------------------------------|
| X-FCM-F NG | S-BT-GF NG M8/7 AN 6 | Steel | $t_{II} \geq 3 \text{ mm}$ | 5 Nm |

| Designation Grating element combined with fastener | | Base material | Base material thickness t_{II} | Tightening torque T_{rec} |
|---|----------------------|---------------|-------------------------------------|--------------------------------|
| X-FCM-R NG | S-BT-GR NG M8/7 SN 6 | Steel | $t_{II} \geq 3 \text{ mm}$ | 8 Nm |



- Data valid for use with stud extension adapter X-SEA.

Tightening tool recommendation for tightening with screwdriver

| Designation | Clutch type (stop detection) | Tightening torque | | | |
|-------------|---------------------------------|-----------------------------|--------|--------------------------|--------|
| | | $T_{rec} = 5 \text{ Nm}$ | | $T_{rec} = 8 \text{ Nm}$ | |
| | | Tool power level adjustment | | | |
| | | Gear | Clutch | Gear | Clutch |
| SF 2-A12 | TRC | 1 | 15 | n.a. | n.a. |
| SF 2H-A12 | TRC | 1 | 15 | n.a. | n.a. |
| SF 4-A22 | TRC | 1 | 4 | 1 | 8 |
| SF 6-A22 | ESC (SJ) | 1 | 5 | 1 | 7 |
| SF 6H-A22 | ESC (SJ) | 1 | 5 | 1 | 7 |
| SFC 22-A | TRC | 1 | 4 | 1 | 5 |
| SBT 4-A22 | TRC | 1 | 5 | 1 | 7 |



- Hilti recommends using a calibrated torque wrench or the Hilti Torque tool to apply the recommended tightening torque.
- Tool power level adjustment is a guiding value which applies to new Hilti screwdriver.
- Tightening torque may vary depending on the user and the application.
- Torque release coupling (TRC): Achievable torque can change over time due to clutch wear.
- Electronic slip clutch (ESC): ESC has 2 stop detections, Soft Joint (SJ) and Hard Joint (HJ). Hard joint detection is activated due to drop in speed (fast stop) and can lead to a torque spike.

Tightening tool recommendation for tightening with Hilti torque tool

| Designation | Tightening torque T_{rec} |
|------------------|--------------------------------|
| S-BT 1/4" - 5 Nm | 5 Nm |
| X-BT 1/4" - 8 Nm | 8 Nm |



- Data valid for use with stud extension adapter X-SEA.

Fastener program
Item no. and description

| Designation | Item no. | Description |
|------------------|----------|---|
| X-FCM-F NG 23/28 | 2351686 | Duplex coated grating element for securing grating with standard disc |
| X-FCM-F NG 28/33 | 2279753 | |
| X-FCM-F NG 32/37 | 2279754 | |
| X-FCM-F NG 38/43 | 2279755 | |
| X-FCM-F NG 48/53 | 2279756 | |
| X-FCM-R NG 23/28 | 2351685 | Stainless steel grating element for securing grating with standard disc |
| X-FCM-R NG 28/33 | 2279757 | |
| X-FCM-R NG 32/37 | 2279758 | |
| X-FCM-R NG 38/43 | 2279759 | |
| X-FCM-R NG 48/53 | 2279752 | |

Item no. and description for fastener and stud extension adapter

| Designation | Item no. | Description |
|----------------------|----------|--|
| S-BT-GF NG M8/7 AN 6 | 2302143 | Screw-in carbon steel threaded stud |
| S-BT-GR NG M8/7 SN 6 | 2302142 | Screw-in stainless steel threaded stud |

Item no. and description for tools

| Designation | Item no. | Description |
|------------------|----------|--------------------------|
| SF 2-A12 | | Screwdriver |
| SF 2H-A12 | | Screwdriver |
| SF 4-A22 | | Screwdriver |
| SF 6-A22 | | Screwdriver |
| SF 6H-A22 | | Screwdriver |
| SFC 22-A | | Screwdriver |
| SBT 4-A22 | | Screwdriver |
| S-BT 1/4" - 5 Nm | 2143271 | Hilti torque tool (5 Nm) |
| X-BT 1/4" - 8 Nm | 2119272 | Hilti torque tool (8 Nm) |

Item no. and description for accessories

| Designation | Item no. | Description |
|-----------------------|----------|--|
| X-SEA-R 30 M8 | 432274 | Stainless steel stud extension adapter |
| TS-BT 5.5-110 S | 2201685 | Stepped drill bit for use with S-CS NG |
| S-CS NG | 2310191 | Centering space |
| S-DG BT M8/7 Short 6 | 2279735 | Depth gauge |
| Allen key – Size 5 mm | | Adapter |



- Please check delivery times for special item(s) with Hilti Customer Service.