



The following pages are an excerpt from the North American Product Technical Guide, Volume 1: Direct Fastening Technical Guide, Edition 22.

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

[Direct Fastening Technical Guide, Edition 22](#)

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

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

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

| | |
|---------|---------------------------|
| 3.4.3.1 | Product description |
| 3.4.3.2 | Material specifications |
| 3.4.3.3 | Technical Data |
| 3.4.3.4 | Installation instructions |
| 3.4.3.5 | Ordering information |

3.4.3 X-GR AND X-MGR GRATING FASTENING SYSTEMS

3.4.3.1 PRODUCT DESCRIPTION

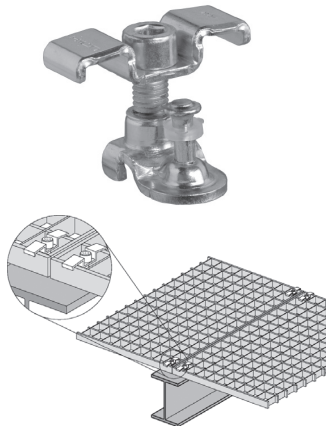
Hilti provides a wide range of solutions for the attachment of grating. These solutions allow attachment of different grating heights, have HDG* equivalent corrosion resistance and provide the ability to remove the grating.

Product features:

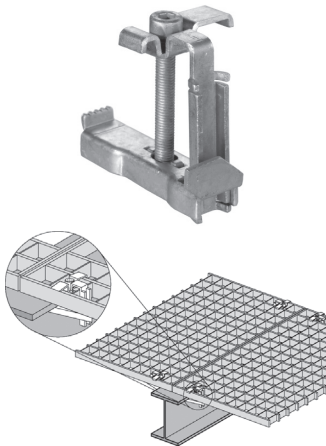
- Grating fastened in place
- Topside only access needed
- Removable and reusable**
- Corrosion resistance of HDG*
- Non-trip profile
- No electrical or pneumatic power required

* Refer to material specifications below for more details on coatings.

** Only saddle clip and screw parts of X-GR and X-MGR grating fastening systems fasteners can be removed and reused.



X-GR Grating Fastening System



X-MGR Grating Fastening System

3.4.3.2 MATERIAL SPECIFICATIONS

| System component | X-GR | | X-MGR | |
|--------------------------|---------------------------|------------------------|-----------------|----------------------|
| | Material | Coating ¹ | Material | Coating ¹ |
| Saddle clip | Carbon steel | Duplex ² | Carbon steel | 65 µm zinc |
| Powder-actuated fastener | CrMnMo alloy ⁴ | 8 µm zinc ³ | – | – |
| Screw | Carbon steel | Duplex ² | Carbon steel | 60 µm zinc |
| Nut | – | – | Carbon steel | 45 µm zinc |
| Nut holder | – | – | Stainless steel | – |

¹ Reference Section 2.3.3.1 for more information on coatings.

² Duplex coating is comparable to 45 µm HDG coating. Reference Section 2.3.3.1 for more information.

³ Zinc coating on X-GR stainless steel powder-actuated fasteners are for improved driving performance during installation.

⁴ Equivalent to grade 316 stainless steel

3.4.3.3 TECHNICAL DATA

Allowable static tension loads for Hilti grating fastening systems^{1,2,3}

| Fastener description | Bearing bar spacing ⁴ in. (mm) | Base steel thickness in. (mm) | Allowable tension load lb. (kN) |
|----------------------|--|----------------------------------|------------------------------------|
| X-GR | 1 to 1-1/4 (25 to 32) | ≥ 3/16* (4) | 180 (0.8) |
| X-MGR | ≥ 1-3/16 (≥ 30) | 1/8 to 1 (3 to 25) | 135 (0.6) |

¹ Allowable loads represent the static capacity of the Hilti Grating System only. The capacity of the grating must be investigated in accordance with accepted design criteria.

² Allowable load values are limited by plastic deformation of the X-GR or X-MGR saddle clip.

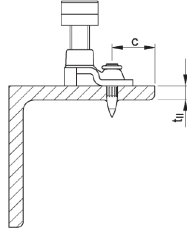
³ X-GR and X-MGR Grating Fastening Systems resist shear by friction and are not suitable for explicit shear load designs, (e.g. diaphragms). Depending on surface characteristics, shear loads of up to 65 lb (0.3 kN) will not result in permanent deformation. Therefore, small unexpected shear loads can generally be accommodated without damage.

⁴ Reference installation instructions for more details regarding bearing and cross bar dimensions.

*For application limits and cartridge selection of X-GR grating fastening system, please refer to Section 3.2.4

3.4.3.4 INSTALLATION INSTRUCTIONS (INCLUDING SELECTION GUIDES)

General spacing edge distance and base steel thickness guidelines



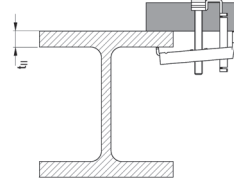
X-GR

Edge distance: $c \geq 1/2"$ (12 mm)

Spacing: $s \geq 5/8"$ (15 mm)

Base steel thickness: $t_{\text{fl}} = 1/4"$ to $1/2"$ (6 mm to 12 mm)*

* Fastening X-GR fasteners into base steel thicknesses greater than $1/2"$ (12 mm) is possible when pre-drilling is used. Reference X-GR installation instructions for more information.



X-MGR

Edge distance: No general restriction for end of beam condition (reference X-MGR Installation Procedures for more detail).

Spacing: No general restriction.

Base steel (flange) thickness: $1/8"$ to $1"$ (3 mm to 25 mm)

X-GR selection guide for grating

| Fastener description | Powder-actuated fastener ¹ | Nominal grating height in. (mm) | Min. cross bar spacing ² in. (mm) | Bearing bar spacing ² in. (mm) | Base steel thickness ³ in. (mm) | DX tool |
|----------------------|---------------------------------------|---------------------------------|--|---|--|---------------------------------------|
| X-GR 1" | X-R 20-4.0 Zn P8 | 1 (25) | 1-3/16 (30) | 1 to 1-1/4 (25 to 32) | 1/4 to 1/2 (6 to 12) | DX 5-GR with 6.8/11M black cartridges |
| X-GR 1-1/4" | | 1-1/4 (32) | | | | |
| X-GR 1-1/2" | | 1-1/2 (38) | | | | |

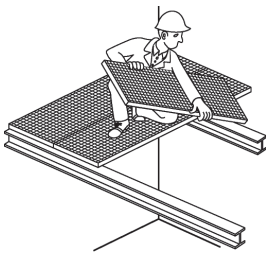
¹ Comes pre-assembled as part of X-GR fastener.

² Reference step 2 of the X-GR Installation Procedures below for more details on bar spacing requirements.

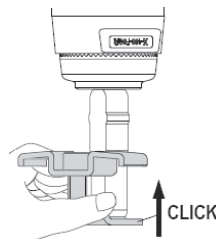
³ Fastening X-GR fasteners into base material thicknesses greater than $1/2"$ (12 mm) is possible when pre-drilling is used. Reference X-GR installation instructions for more information.

X-GR standard installation procedures for grating¹

1. Place the grating sections following recognized safety precautions.



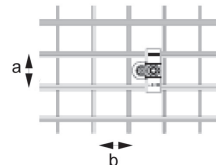
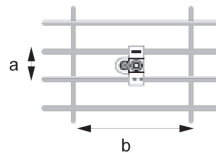
2. Install X-GR Fastener per the "Instructions for Use."



Note: position the flat side of the fastener guide to the saddle!

Bearing bar spacing (a): $a = 1"$ to $1-1/4"$ (25 to 32 mm)

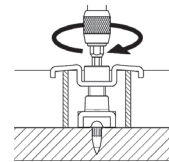
Cross bar spacing (b): $b \geq 1-3/16"$ () mm)



3. Tighten the screw²
 $T_{\text{rec}} = 2.2 - 3.7 \text{ ft-lb (3 - 5 Nm)}$

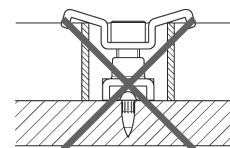
Tightening tool:

- Screw driver with torque release coupling (TRC)
- 6 mm Allen-type bit

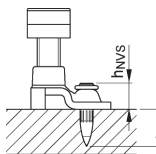


| Hilti Screw Driver | Torque setting ² |
|--------------------|-----------------------------|
| SFH 18-A | 3-5 |
| SF 18-A | 3-5 |
| SFH 144 | 3-5 |
| SF 144-A | 3-5 |

Do not over tighten: The saddle of the fastener should not be bent.



4. Check installed fastener



$h_{\text{NVS}} = 0.28" - 0.41"$
 (7.0 mm - 10.5 mm)

- 4a. Check nail stand-off (h_{NVS}).
 4b. Check that screw has not been over tightened as shown in step 3.

¹ These are abbreviated instructions which may vary by application. **ALWAYS** review/follow the instructions accompanying the product.

² Tool torque settings are for guideline purposes. Tool wear and temperature as well as battery charge will influence torque characteristics.

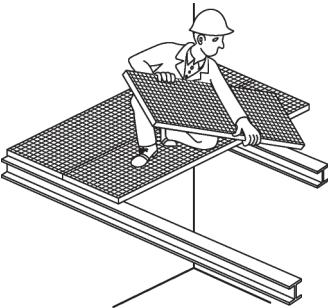
X-MGR selection guide for grating

| Fastener description | Powder-actuated fastener | Grating height in. (mm) | Minimum cross bar spacing ¹ in. (mm) | Bearing bar spacing ¹ in. (mm) | Maximum bearing bar thickness ¹ in. (mm) | Base Steel Thickness in. (mm) |
|----------------------|--------------------------|-------------------------|---|---|---|-------------------------------|
| X-MGR-W60 | None | 1 to 1-1/2 (25 to 38) | 1-3/16 (30) | 1 (25) | 3/16 (4.8) | 1/8 to 1 (3 to 25) |

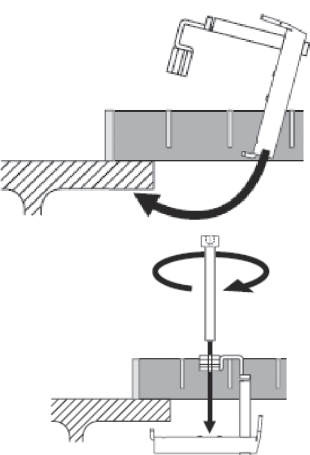
¹ Reference step 2 of the X-MGR Installation Procedures below for more details on bar spacing and thickness requirements.

X-MGR installation procedures for grating²

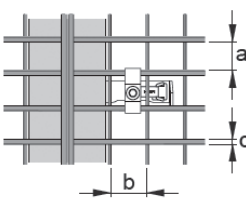
1. Place the grating sections following recognized safety precautions.



2. Install the X-MGR Fastener per the "Instructions for Use."



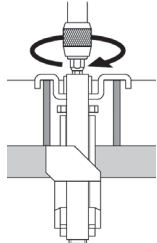
| | a | b | c |
|-------|---------|-----------|----------|
| X-MGR | 1" | ≥ 1-3/16" | ≤ 3/16" |
| W60 | (25 mm) | (30 mm) | (4.8 mm) |



3. Tighten the screw¹
 $T_{rec} = 3.7 - 6.0 \text{ ft-lb}$
 $(5 - 8 \text{ Nm})$

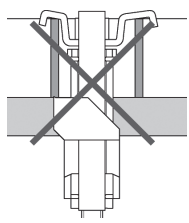
Tightening tool:

- Screw driver with torque release coupling (TRC)
- 1/4" Allen-type bit



| Hilti Screw Driver | Torque Setting ² |
|--------------------|-----------------------------|
| SFH 18-A | 5-9 |
| SF 18-A | 5-9 |
| SFH 144 | 5-9 |
| SF 144-A | 5-9 |

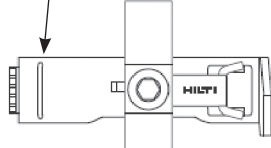
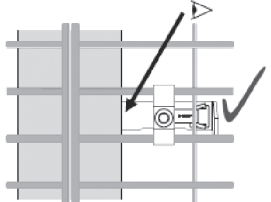
Do not over tighten: The saddle of the fastener should not be bent.



4. Check

4a. Check that the indentation line on the clip is positioned under the steel flange as shown below.

indentation line

4b. Check that screw has not been over tightened as shown in step 3.

¹ Tool torque settings are for guideline purposes. Tool wear and temperature as well as battery charge will influence torque characteristics.
² Installation Instructions For Use (IFU) are included with each product package. They can also be viewed or downloaded online at www.hilti.com. Because of the possibility of changes, always verify that downloaded IFU are current when used. Proper installation is critical to achieve full performance. Training is available on request. Contact Hilti Technical Services for applications and conditions not addressed in the IFU.

3.4.3.5 ORDERING INFORMATION

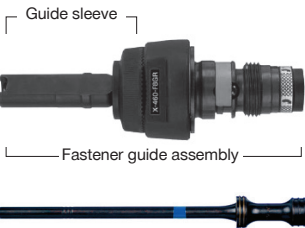
DX5-GR

| Description |
|---|
| DX5-GR Deluxe Grating Tool |
| Includes tool, ramrod, cleaning brushes, cleaning cloth, spray lubricant and operating instructions in an impact-resistant plastic tool box |



Replacement parts

| Description |
|---------------------------------|
| X-5-FGR Fastener guide assembly |
| X-5-PGR Piston |



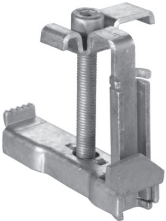
X-GR Fastener
Fastener only packs

| Non-combo description | Qty |
|------------------------|---------|
| X-GR 1" 25/30 CR 20 P8 | 100 pcs |
| X-GR 1-1/4" CR 20 P8 | 100 pcs |
| X-GR 1-1/2" CR 20 P8 | 100 pcs |



X-MGR Fastener
Fastener only packs

| Description | Qty |
|-------------|--------|
| X-MGR W 60 | 20 pcs |



.27 Caliber cartridge — short (strips of 10 each)
Fastener only packs

| Description | Qty |
|--|---------|
| 6.8/18 M black — extra heavy (power level 6) | 100 pcs |

