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 removable or permanent grating attachment.

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 RU fasteners can be removed and reused.

3.4.3.2 Material Specifications

<table>
<thead>
<tr>
<th>System Component</th>
<th>X-GR RU</th>
<th>X-MGR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saddle Clip</td>
<td>Carbon Steel</td>
<td>Duplex*</td>
</tr>
<tr>
<td>Powder-Actuated Fastener</td>
<td>Stainless Steel</td>
<td>8 μm Zinc^3</td>
</tr>
<tr>
<td>Screw</td>
<td>Carbon Steel</td>
<td>Duplex*</td>
</tr>
<tr>
<td>Nut</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nut Holder</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

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 RU stainless steel powder-actuated fasteners are for improved driving performance during installation.

3.4.3.3 Technical Data

Allowable Static Tension Loads for Hilti Grating Fastening Systems

<table>
<thead>
<tr>
<th>Fastener Description</th>
<th>Bearing Bar Spacing*</th>
<th>Base Steel Thickness</th>
<th>Allowable Tension Load</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>in. (mm)</td>
<td>in. (mm)</td>
<td>lb. (kN)</td>
</tr>
<tr>
<td>X-GR RU</td>
<td>1 to 1-1/4 (25 to 32)</td>
<td>1/4 to 1/2 (6 to 12)</td>
<td>180 (0.8)</td>
</tr>
<tr>
<td>X-MGR</td>
<td>2 1-3/16 (≥ 30)</td>
<td>1/8 to 1 (3 to 25)</td>
<td>135 (0.6)</td>
</tr>
</tbody>
</table>

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 RU or X-MGR saddle clip.
3 X-GR RU 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.
5 Fastening X-GR RU fasteners into base material thicknesses greater than 1/2” (12 mm) is possible when pre-drilling is used. Reference X-GR RU installation instructions for more information.
3.4.3 X-GR RU and X-MGR Grating Fastening Systems

3.4.3.4 Installation Instructions (including selection guides)

General Spacing Edge Distance and Base Steel Thickness Guidelines

X-GR RU

Edge Distance: \( c \geq 1/2" \) (12 mm)
Spacing: \( s \geq 5/8" \) (15mm)
Base Steel Thickness: \( t_{ll} = 1/4" \) to 1" (6 mm to 12 mm)

* Fastening X-GR RU fasteners into base steel thicknesses greater than 1/2" (12 mm) is possible when pre-drilling is used. Reference X-GR RU 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 RU Selection Guide for Grating

<table>
<thead>
<tr>
<th>Fastener Description</th>
<th>Powder-Actuated Fastener¹</th>
<th>Nominal Grating Height in. (mm)</th>
<th>Min. Cross Bar Spacing² in. (mm)</th>
<th>Bearing Bar Spacing³ in. (mm)</th>
<th>Base Steel Thickness² in. (mm)</th>
<th>DX Tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-GR RU 1&quot;</td>
<td>X-CR 20-4.5R Zn P8</td>
<td>1 (25)</td>
<td>1-3/16 (30)</td>
<td>1 to 1-1/4 (25 to 32)</td>
<td>1/4 to 1/2 (6 to 12)</td>
<td>DX 460-GR with 6.8/11M black cartridges</td>
</tr>
<tr>
<td>X-GR RU 1-1/4&quot;</td>
<td></td>
<td>1-1/4 (32)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X-GR RU 1-1/2&quot;</td>
<td></td>
<td>1-1/2 (38)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¹ Comes pre-assembled as part of X-GR RU fastener.
² Reference step 2 of the X-GR RU Installation Procedures below for more details on bar spacing requirements.
³ Fastening X-GR RU fasteners into base material thicknesses greater than 1/2" (12 mm) is possible when pre-drilling is used. Reference X-GR RU installation instructions for more information.

X-GR RU Standard Installation Procedures for Grating¹ (without pre-drilling)

1. Place the grating sections following recognized safety precautions.

2. Install X-GR RU Fastener

   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): \( b \geq 1-3/16" \) (30 mm)

3. Tighten the screw

   \( T_{rec} = 2.2 – 3.7 \) ft-lb (3 - 5 Nm)

   Tightening tool:
   • Screw driver with torque release coupling (TRC)
   • 6 mm Allen-type bit

   Hilli Screw Driver Torque Setting²
   | 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

   \( h_{na} = 0.28" - 0.41" \) (7.0 mm - 10.5 mm)

   4a. Check nail stand-off (\( h_{na} \)).
   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

<table>
<thead>
<tr>
<th>Fastener Description</th>
<th>Powder-Actuated Fastener</th>
<th>Grating Height in. (mm)</th>
<th>Minimum Cross Bar Spacing(^1) in. (mm)</th>
<th>Bearing Bar Spacing(^1) in. (mm)</th>
<th>Maximum Bearing Bar Thickness(^1) in. (mm)</th>
<th>Base Steel Thickness in. (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X-MGR-W60</td>
<td>None</td>
<td>1 to 1-1/2 (25 to 38)</td>
<td>1-3/16 (30)</td>
<td>1 (25)</td>
<td>3/16 (4.8)</td>
<td>1/8 to 1 (3 to 25)</td>
</tr>
</tbody>
</table>

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 Grating**

1. Place the grating sections following recognized safety precautions.

2. Place the X-MGR Fastener

   - Tighten the screw
   \[ T_{rec} = 3.7 - 6.0 \text{ ft-lb} \]
   \[ (5 - 8 \text{ Nm}) \]

   - **Tightening tool:**
     - Screw driver with torque release coupling (TRC)
     - 1/4” Allen-type bit

3. Check

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

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

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

\[ a \geq 1\text{"} (25 \text{ mm}) \quad b \leq 1-3/16\text{"} (30 \text{ mm}) \quad c \leq 3/16\text{"} (4.8 \text{ mm}) \]

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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.
3.4.3 X-GR RU and X-MGR Grating Fastening Systems

3.4.3.5 Ordering Information

DX 460-GR
Description
DX 460-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-460-F8GR Fastener Guide Assembly
X-460-TGR Fastener Guide Sleeve
X-460-PGR Piston

X-GR RU Fastener
Fastener Only Packs
Non-Combo Description   Qty
X-GR RU 1” 25/30 CR 20 P8  100 pcs
X-GR RU 1-1/4” CR 20 P8   100 pcs
X-GR RU 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

Pre-drilling Tools for X-GR RU Installation
Description   Qty
XBT 4000-A    1 pcs
TX-GR-RU 3.4/10.5-110 Stepped Drill Bit 1 pcs
TX-GR-RU 3.4/10.5-110 Stepped Drill Bit (10 pack) 10 pcs
S-B HEX 6 Bit  1 pcs