DESCRIPTION AND APPLICATION GUIDELINES

Roxtec selection guide – frames and gaskets
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1. **Bolted rectangular frames – GH series**

Roxtec GH series is a steel frame intended for bolting onto walls/floors and enclosures. The frame provides environmental protection against fire, water and gas as well as protection against rodents and pests. The rectangular frame allows for high cable and pipe packing density.

1.1 GH
The GH frame is suitable for apertures in steel, gypsum, wood or sandwich panels. The flange is 60mm wide to cover a rough aperture.

1.2 GH BG™
The GH BG frame is a GH frame equipped with two diagonally placed ground lugs for bonding and grounding applications. Single frames have only one. The separate earthing points provide a dedicated electrical path to ground when the mounting surface is not conductive. When needed, the frame can be grounded from both sides of the flange.

1.3 GH FL 100
The GH FL100 is a frame suitable for bolting in concrete and brick walls, thanks to the wide 100mm flange. The wide flange distances the fasteners from the aperture to prevent cracks in the concrete during assembly.

1.4 GH BG™ FL 100
The GH BG™ FL 100 frame is a GH FL 100 frame equipped with two diagonally placed ground lugs for bonding and grounding applications. Single frames have only one. The separate earthing points provide a dedicated electrical path to ground when the mounting surface is not conductive. When needed, the frame can be grounded from both sides of the flange.

1.5 GHM
The GHM frame has a more narrow hole pattern to fit in pressurized installations or in shielded environments such as computer rooms or enclosures using an EMC gasket. For the same reason, it can be useful also in decks/bulkheads or advanced buildings. The frame provides extended pressure withstand capabilities for water and gas as well as improved shielding capability compared to the standard hole pattern.
2. Bolted sleeves – SLF series

Roxtec SLF series is a sleeve intended for bolting made for walls/floors and enclosures. The sleeves are intended for the round R frames and RS seals and provide environmental protection against fire, water and gas as well as against rodents and pests.

2.1 SLFR/SLFRS
This pipe sleeve is to be used in steel, gypsum, wood or sandwich panels. The flange covers a rough aperture. Wider flanges are available upon request.

2.2 SLFO
The SLFO is an openable sleeve intended for retrofit solutions. It is used to cover existing openings in steel, gypsum, wood or sandwich panels. Ground lugs can be added upon request.

2.3 SLFO EXT
The SLFO EXT is an openable sleeve intended for retrofit solutions. It is used to cover existing openings in concrete. The wide flange distances the fasteners from the aperture to prevent cracks in the concrete during assembly. The dept is also increased.

3. Customized solutions

All standard frames and sleeves can be customized to fit existing apertures or hole patterns. Ground lugs are available upon request for all frames and sleeves.

Contact your Roxtec representative for more information.
4. Sealing methods per structure

4.1 Concrete walls
For installations in concrete a frame with wide flange such as the GH FL 100, GH BG™ FL 100 or SLF EXT is recommended. The roughness of the structure determines the gasket to be used between the flange and the structure.

4.1.1 Smooth concrete
For concrete with a smooth grinded surface we recommend using an RTV sealant or butyl sealing strip to achieve a good sealing against any small structural irregularities. Cracks or voids might need plastering before installation.

4.1.2 Uneven or rough concrete
For uneven concrete we recommend using an RTV sealant to fill up the irregularities in the structure. Cracks or voids need plastering before installation.
4.2 Brick walls
For installations in brick walls a frame with wide flange such as the GH FL 100, GH BG™ FL 100 or SLF EXT is recommended.

For brick walls, Roxtec recommends using an RTV sealant to achieve a good sealing against the structural irregularities. Cracks or voids need plastering before installation.

4.3 Gypsum/wood/sandwich panels
In flat walls or floors in sandwich material, wood or gypsum, Roxtec recommends installing the GH, GH BG™, SLF or SLFO frames and sleeves.

Roxtec frames and sleeves bolted in flat walls and floors are recommended to be installed using an RTV sealant or a sealing strip. Make sure the wall can carry the weight of the transit.
4.4 Steel structures
In flat steel structures such as cabinets, containers or decks/bulkheads, Roxtec recommends GH, GHM, GH BG™, SLF or SLFO frames and sleeves.

For metal structures sealing strips or pre-punched gaskets are recommended.

For shielded EMC applications the contact area between the EMC gasket and mounting surface must be conductive. Remove any paint or dirt to secure earth continuity.
Table: Sealing method per structure

<table>
<thead>
<tr>
<th></th>
<th>Concrete</th>
<th>Brick</th>
<th>Board (Gypsum Wood)</th>
<th>Steel (Sandwich Bulkheads)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Uneven</td>
<td>Smooth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GH</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GH FL 100</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>GH BG™</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>GH BG™ FL 100</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>GHM</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLFR/SLFRS</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>SLFO</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>SLFO EXT</td>
<td>X</td>
<td></td>
<td></td>
<td>Sealant (Butyl strip)</td>
</tr>
</tbody>
</table>

Sealant (TSL Strip) (Prepunched gaskets)

Note:
- Sandwich panels must be supported to carry the weight of the transit.
- Through-holes must be sealed using sealing washers or sealant.
- Consider curing time for sealant.
- Consult the installation instructions for application of gaskets.
- Shielded installations require EMC gaskets.

5. Bonding and grounding

Frames with integrated ground lugs are strongly recommended for bonding and grounding applications to simplify the connections to the earthed structure. This is good practice also for EMI applications. Frames and sleeves directly bolted to an earthed structure may not require external connections to earth if the electrical continuity is safely secured through bolts.
6. **Gaskets and sealants**

6.1 **TSL 15x6 sealing strip**  
The TSL 15x6 sealing strip is a solid cellular rubber sealing strip made of EPDM. It has a self-adhesive liner and is to be mounted on the flange of the frame.

- Color: Black  
- Material: EPDM/self-adhesive  
- State: Cellular rubber  
- Thickness: 6mm  
- Delivered in rolls

6.2 **Butyl sealing strip**  
The Butyl sealing strip is a solid rubber gasket made of butyl. It has a sticky surface and is to be mounted on the flange of the frame.

- Color: Black/grey  
- Material: Butyl rubber  
- State: Sticky solid  
- Thickness: 8mm  
- Delivered in rolls  
- Requires a compression stop creating a 2mm gap

6.3 **Pre-punched gaskets**  
Pre-punched gaskets are solid EPDM gaskets with a pre-defined hole pattern corresponding to the frame or sleeve.

- Color: Black  
- Material: EPDM  
- State: Cellular rubber or solid  
- Thickness: 3 or 4mm  
- Shore: 50° or 60°
6.4 Sealant
The sealant is primarily used to seal against structures with a rough surface but it is suitable for any surface. Below properties should be fulfilled.

- Fire retardant where required
- Environmental sealing capabilities
- UV-resistant
- Ability to take dynamic loads
- Adhesion to most construction materials
- Requires a compression creating a 2 mm gap

Examples of brands fulfilling these requirements are:
- Zapp Zimmermann Brandschutzsilicone NE
- Rectorseal Metacaulk 835+
- ESSVE Ultraflex T
- SIKA Sikaflex AT Connection

6.5 EMC gaskets
Roxtec recommends and supplies different gaskets for EMI applications depending on the application and the environmental ratings. The EMC gaskets can also be combined with other sealing materials in order to meet fire protection demands.

EMC gaskets – Required for shielded environments

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Material</th>
<th>Length</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fabric over foam</td>
<td>6.4 x 9.5mm</td>
<td>Nickel-plated copper and polyester</td>
<td>Made-to-order</td>
<td>Indoor/Dust tight</td>
</tr>
<tr>
<td>Oriented wire in silicone</td>
<td>4 x 10mm/2 x 10mm</td>
<td>Monel and silicone</td>
<td>Made-to-order</td>
<td>Indoor/outdoor IP: 65/66</td>
</tr>
<tr>
<td>Knitted mesh</td>
<td>6.4 x 9.5mm</td>
<td>Stainless steel</td>
<td>Made-to-order</td>
<td>Indoor/outdoor –</td>
</tr>
<tr>
<td>EMC frame gasket</td>
<td>5 x 60mm</td>
<td>Roxylon and tin-plated copper tape</td>
<td>Made-to-order</td>
<td>Indoor/outdoor Watertight/fire rated</td>
</tr>
</tbody>
</table>

The gaskets presented above are just some examples of the Roxtec range of gaskets. Note that the sealing needs may vary from one application to another. Please contact your local Roxtec representative or send an email to info@roxtec.com if you need assistance.
7. Fasteners

7.1 Concrete and brick walls
Anchor bolts are recommended for concrete and brick walls to provide a strong joint for heavy design elements. To avoid cracks in the structure, wide flanged frames such as GH FL100 should be used. In structures where there is a considerable risk of cracks due to the anchor bolt, a concrete screw should be used. The fasteners should be of the same type of material as the frame.

7.2 Lightweight concrete
In lightweight materials a concrete screw is recommended. The safe distance from the aperture to avoid cracks in the structure is smaller than for anchor bolts but wide flanged frames is still recommended. The fasteners should be of the same type of material as the frame.

7.3 Steel structures
In steel structures a standard socket/hexagonal head screw is recommended. The fasteners should be of the same type of material as the frame.
Note: When mounted in through holes, a sealing washer should be applied to prevent leakage through the joint.

7.4 Wood / Steel studs
When bolted in construction elements the frame must be firmly attached in the loadbearing structure. A standard wood screw should be used in wood and in steel studs a self-drilling, self-tapping screw is recommended. Fasteners should be of the same type of material as the frame.

7.5 Sandwich panels
When bolting a frame in a sandwich panel using steel screws the structural integrity must be secured before applying the weight of the frame. If necessary, the panel should be supported or attached with bolts going through the panel.
8. Technical data

8.1 Certificates and approvals
Contact your local Roxtec representative for valid certificates and approvals. Ratings may differ between structures and chosen sealing method.

8.2 Frames
The primed frames are treated with a transportation protection suitable as a primer for a complete painting system. The galvanized and stainless steel frames are ready for use at delivery. Frames can be ordered untreated or in other materials than standard.

<table>
<thead>
<tr>
<th></th>
<th>Acid proof stainless steel</th>
<th>Galvanized Min 80µ ISO 1461</th>
<th>Mild steel</th>
<th>Primed Min 20-30µm Transportation protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>G series</td>
<td>EN 1.4404*</td>
<td>S355J2*</td>
<td></td>
<td>S355J2*</td>
</tr>
<tr>
<td>Sleeves</td>
<td>EN 1.4404*</td>
<td>S355J2*</td>
<td></td>
<td>S355J2*</td>
</tr>
</tbody>
</table>

*Or equivalent material

8.3 Apertures
Aperture tables and dimensions are available on www.roxtec.com.

In thick walls or floors a GE extension frame can be used for channelization.
DISCLAIMER

“The Roxtec cable entry sealing system ("the Roxtec system") is a modular-based system of sealing products consisting of different components. Each and every one of the components is necessary for the best performance of the Roxtec system. The Roxtec system has been certified to resist a number of different hazards. Any such certification, and the ability of the Roxtec system to resist such hazards, is dependent on all components that are installed as a part of the Roxtec system. Thus, the certification is not valid and does not apply unless all components installed as part of the Roxtec system are manufactured by or under license from Roxtec ("authorized manufacturer"). Roxtec gives no performance guarantee with respect to the Roxtec system, unless (I) all components installed as part of the Roxtec system are manufactured by an authorized manufacturer and (II) the purchaser is in compliance with (a), and (b), below.

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