Roxtec

# Cable and pipe transits for marine and offshore applications


Cable and pipe seals with multidiameter technology.

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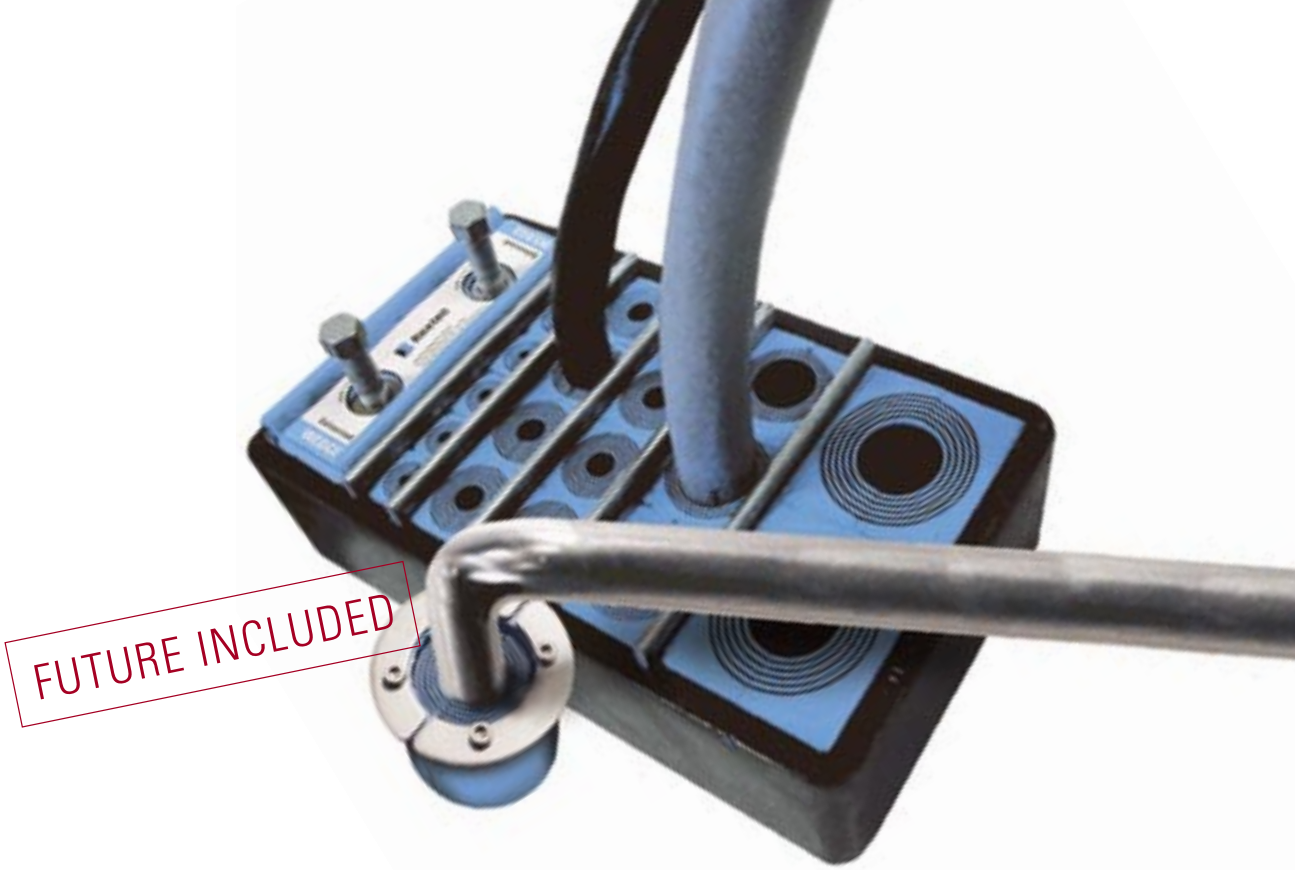



# Safety and reliability are in the details

It is the sum of all the individual parts that determines the ultimate quality and safety of a vessel. Cable and pipe transits may seem like small details in the context of a large marine or offshore project, but it is crucial to the final result that each and every component is selected with care.

This is why many of the world's leading shipbuilders and operators have chosen to install the Roxtec sealing system on board their passenger vessels, tankers, ferries and oil platforms. Roxtec helps to prevent the spead of fire, water and gas through cable and pipe passages, and to maintain the integrity of decks and bulkheads.

Roxtec system is a complete sealing solution. It has a wide product range and is a cost-effective choice. Investing in safety and reliability from the beginning ensures considerable savings later.

Learn more about us and find your nearest Roxtec representative at www.roxtec.com ■

Roxtec

# The Roxtec sealing system

Cable and pipe penetrations in decks and bulkheads need to be properly sealed. The need of a sealing system is obvious, but there are choices. Roxtec's sealing system provides optimum functionality.


Wherever cables or pipes penetrate decks or bulkheads the integrity of the structure is exposed to the risk from hazards such as fire and water. It is crucial to restore the structure to the original fire rating.

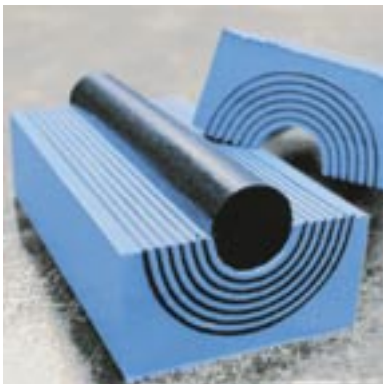
Transits are third party tested products used to seal holes made in fire rated bulkheads or decks for the routing of cables and pipes.

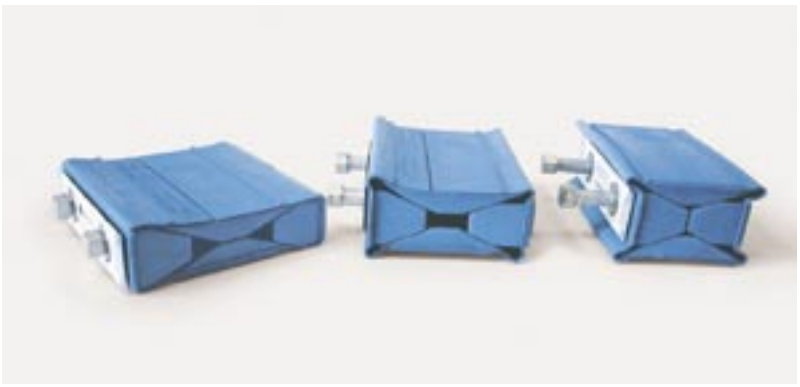
**Modular sealing system**
A modular sealing system uses a frame, compression unit and sealing modules to seal the transit. It is a mechanical seal that provides certified protection. The built in flexibility of a modular system provides features such as fast and simple installation and easy future reconfiguration.

**Roxtec sealing system**
The Roxtec sealing system gives you these benefits. But the difference between Roxtec and other modular seals is our innovative use of technology. We bring you the advantages of the modular seals but refined with our own methods. ■

**Multidiameter™ technology**
One of Roxtec´s unique features is the multidiameter module. The modules consist of two halves made out of an EPDM based rubber, and has removable layers and a center core. Thanks to the multi-layer technique, one single module can seal cables or pipes of several different diameters simply by peeling layers away from the module halves until a perfect fit is achived.

**The Roxtec wedge**
Another unmatched feature is the compression unit – the Roxtec wedge. It fits into the frame as one single component, and seals the system in just seconds. The wedge is equipped with double threaded bolts, which mechanically extends it to its original shape when dismantling it. This facilitates future changes and re-installations of the system. ■

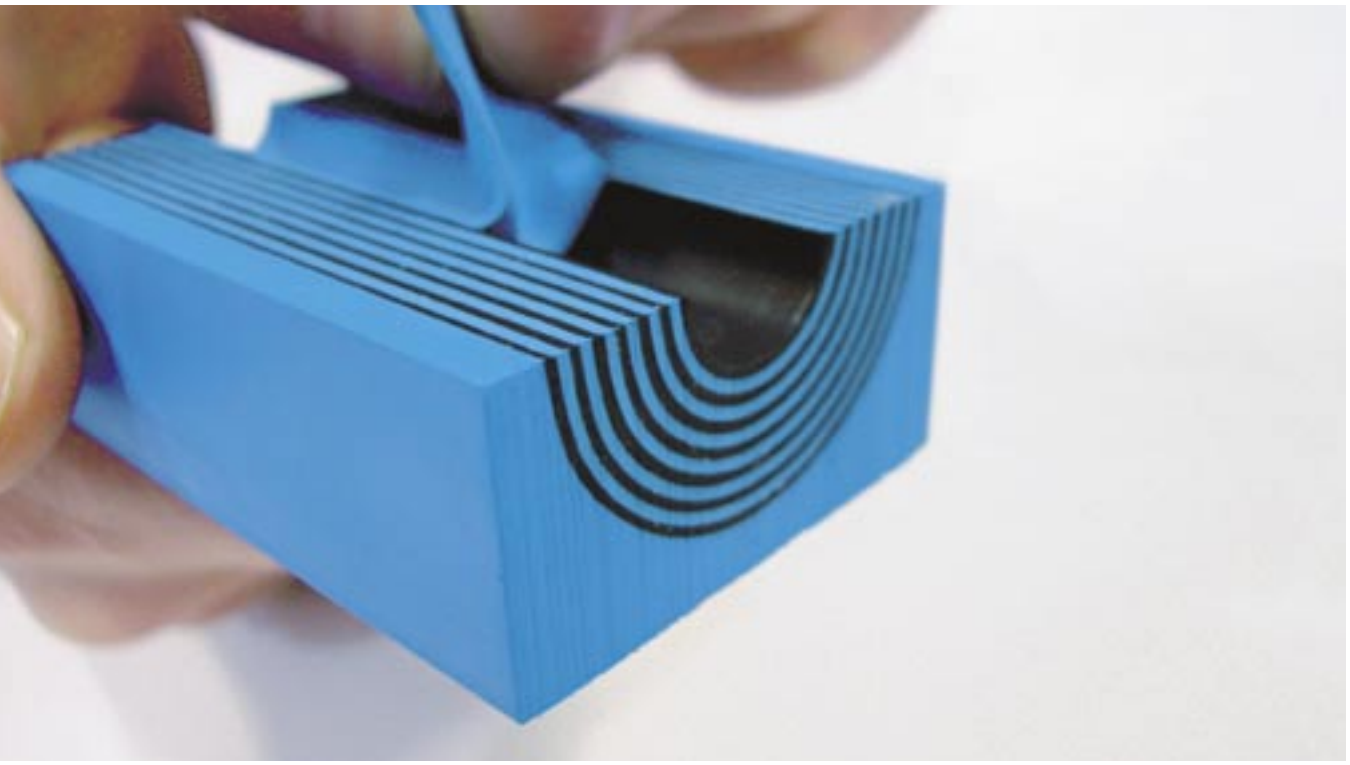




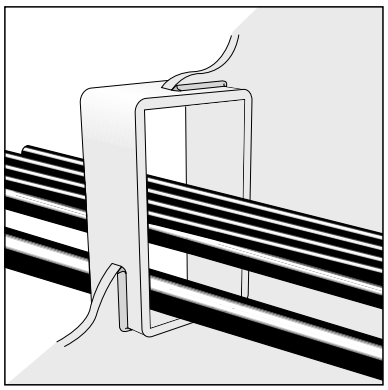
# How it works

A Roxtec transit consists of a frame, sealing modules and a compression unit. All parts are carefully designed to function together, to form a complete seal.

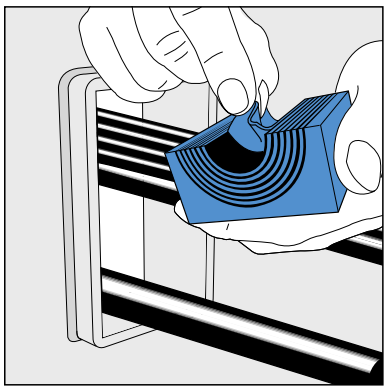
The frame is installed in the deck or bulkhead and cables or pipes are routed through the frame. The modules are adapted by peeling off layers and are then inserted around the cables or pipes inside the frame. The compression unit is inserted and when tightened it creates an intrusion-proof seal. An existing transit can easily be re-opened at a later time for cable or pipe additions or reconfiguration. ■



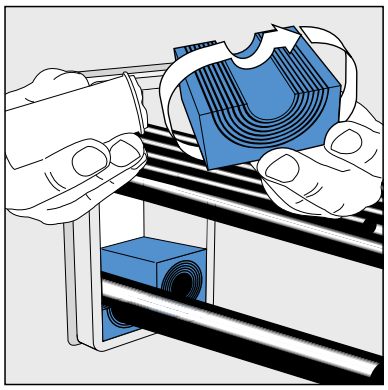
Peel away layers to adjust to different cable or pipe diameters.



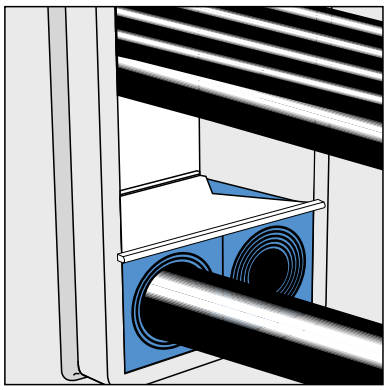
Install the frame and route the cables or pipes through.



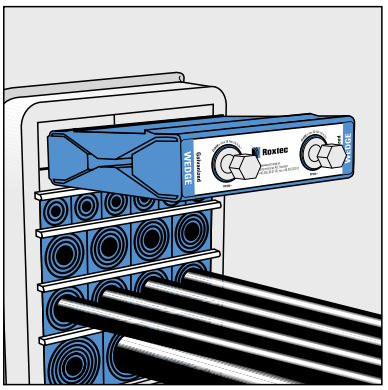
Adapt the modules to fit the cable or pipe diameter.



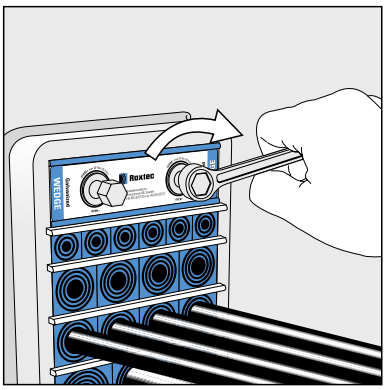
Lubricate the modules to facilitate installation and to achieve a tight seal.



Between every row of modules a stayplate is inserted to provide sturdy mechanical anchorage.




Lubricate and insert the Roxtec wedge. The wedge can be placed in a top, bottom or middle position in the frame.




Tighten the bolts (max torque 20 Nm) to compress and obtain an intrusion-proof seal.

# Commitment to safety

Behind the performance of our products lie extensive tests and trial installations in our on-site laboratories and in third party laboratories.

**Certified protection**
Roxtec's cable and pipe transits helps to ensure operational reliability by preventing the spread of fire, smoke, water and gas through cable or pipe passages. In addition a special EMC version can be used to prevent electromagnetic disturbances from interfering with equipment.

**Industry approved**
As the marine and naval industries set very stringent demands, the Roxtec sealing system is constantly subject to extensive testing. Many tests are performed in third party laboratories, but a great number of tests are also performed at Roxtec's premises.

The Roxtec sealing system is approved for use in, according to IMO 754(18), A- and H-class rated sections. The system is approved



for water- and gastightness up to 4 bar. We also comply to the marine equipment directive (MED), which is shown on products and certificates by the steering wheel mark.

The Roxtec sealing system has obtained a great number of certificates and type approvals from the majority of classification societies and other authorities. Among those authorities you will find the Lloyd's Register of Shipping, Det Norske Veritas, Bureau Veritas, American Bureau of Shipping, U.S. Navy and Quinetiq.

Since certification is constantly updated, please contact your local representative for further information.

### On-site fire laboratory

In 1999, Roxtec invested in a fully equipped fire laboratory at our headquarters in Sweden. This on-site testing facility makes it possible to expediently verify product performance and materials. In addition, specific customer solutions can be tested and thus modified accordingly to meet individual requirements.

The test laboratory is equipped to simulate deck and bulkhead installations and can perform the following tests: A-class fires, H-class fires and catastrophic fires. ■

# Roxtec - to your advantage

The characteristics of our products and the multidiameter technology give numerous practical advantages. All saving time and money in a marine or offshore project.

## Wide product range

The system can be used to seal cable and pipe penetrations in different areas of vessels or platforms. Regardless of whether there are strict ratings for water and fire or installations in cabinets and enclosures with other types of demands, Roxtec has the product.

**One supplier**
We have complete sealing solutions regardless of whether the opening is round or rectangular, and products include the flexibility of the multidiameter technology. By using products from one supplier there will be little room for confusion and mistakes during purchasing and installation. ■

# Low stock


Our transits seal cables and pipes from 4 to 99 millimeters in diameter with only six standard module sizes. With a small number of parts and sizes, stocks can be kept to a minimum and logistics becomes easy.

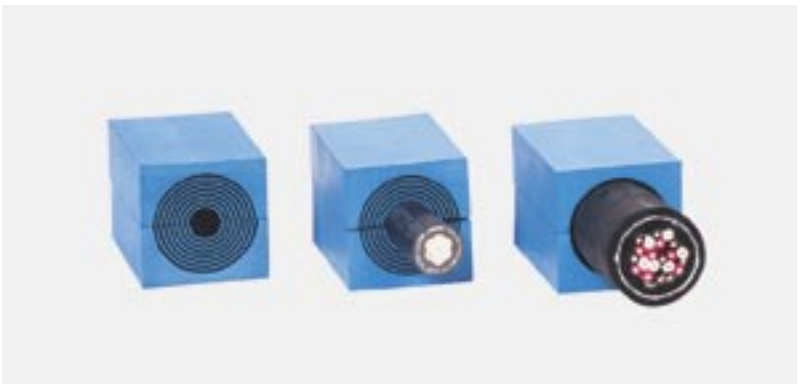
**Lower costs**
Using Roxtec transits, with its few components, means that you can reduce storage and costs without loss of flexibility for the installers. The simplicity of the system saves time and material through all phases, from design to maintenance. ■

# Future included


**Built in spare capacity**
Any unused modules in the frame are an excellent spare capacity. New cables or pipes can easily be added during construction work or throughout the lifetime of the vessel.

**Easy maintenance**
When new cables or pipes are routed the modules center cores are removed and the existing modules adapted to the correct diameter. The modules will be there when you need them which enhance safety and lowers overall cost. ■

# Easy planning and installation



**Planning**
Designing a Roxtec transit is easy. Simply use the Cable Transit Manager, our user-friendly software that allows you to design the transits in a convenient way. The designer can identify and label each cable in the transit. Material lists and packing plans can be printed and handed to purchasers and installers.

**Installation**
Roxtec's multidiameter modules can be individually adapted to accommodate a wide range of cable and pipe diameters. A feature that means you don't need to make exact measurements ahead to be sure to get a tight seal. The installation can always be completed even if any cable or pipe differs from the specification. ■

# We seal your world

Roxtec is a company dedicated to smart solutions, efficient use of technology and continuous development, to make sure our customers get what they need. We seal your world.

Our vision encompasses not only the product we manufacture, but also the added value that we provide for our partners and the people in different environments around us.

**Leading the way**
Roxtec was established in 1990 in an empty garage and has since earned a market leading position. During recent years, Roxtec has been one of the fastest growing industrial companies in Europe.

**Local support-globally**
We are wherever our customers are. With an established network of subsidiaries and representatives in more than 70 markets, we take pride in being able to deliver local support wherever and whenever it is needed.

**A selection of our customers**

Aker Maritime, Alstom, Austal Ships, Chantiers de L'Atlantique, Dalian New Shipyard, Diamond Offshore, Fincantieri, Guangzhou Shipyard International, Hyundai Heavy Industries, Keppel Fels, Kvaerner Oil & Gas, Meyer-Werft, Mitsubishi Heavy Industries, NASSCO, Northrop Grumman Avondale, Samsung Heavy Industries, Shanghai Edward Shipyard, Siemens, STN Atlas Elektronik and Royal Van Lent.

**Short delivery times**
In the marine and offshore industry delivery times are crucial. Local stocks worldwide means that we can deliver on short notice after an order has been placed. The products will be delivered to warehouses or directly to a production location.

**Continuous development**
We constantly work to improve our products to meet new requirements regarding materials and standards. We also take pride in meeting our customers demands concerning flexibility and functionality, all within the framework of the SS-EN ISO 9001-quality management system. ■





# Solutions for every application

Whatever your needs are, we have a sealing solution. All of them are based on our multidiameter technology providing flexible and reliable products to ensure safety of investments and personnel.

**Regular solutions**
Roxtec's regular system is suitable where there are requirements for fire classification, water tightness or other types of demands regulated by classifications societies. Depending on where cables or pipes need to be sealed various solutions are available. Frames are available in different sizes, depending on the amount of cables or pipes that need to be sealed, and materials. The most common solution is to weld the frame to the construction, but frames for bolting are also available for situations such as additional installations late in the construction process or during repairs/upgradings where welding is not suitable. Regular multidiameter modules and a compression unit are used in all versions of these frames.

R and RS seals are used in round holes for multiple or single cable or pipe penetrations. They are fitted into sleeves that can be bolted or welded onto the bulkheads or decks. Both solutions have integrated compression units.

**Shielded applications**
The Roxtec EMC system is designed for applications where electromagnetic compatibility is of prime importance. The Roxtec EMC system provides a current path between cable shields and ground. The screens of all cables passing through one transit opening are

# Marine applications

The pictures should only be seen as examples of where our products can be used. The wide product range means that there is virtually no restriction of where our transits can be installed.

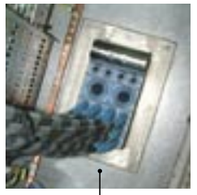
Roxtec RS for single cables or pipes, in this case sprinkler system application.

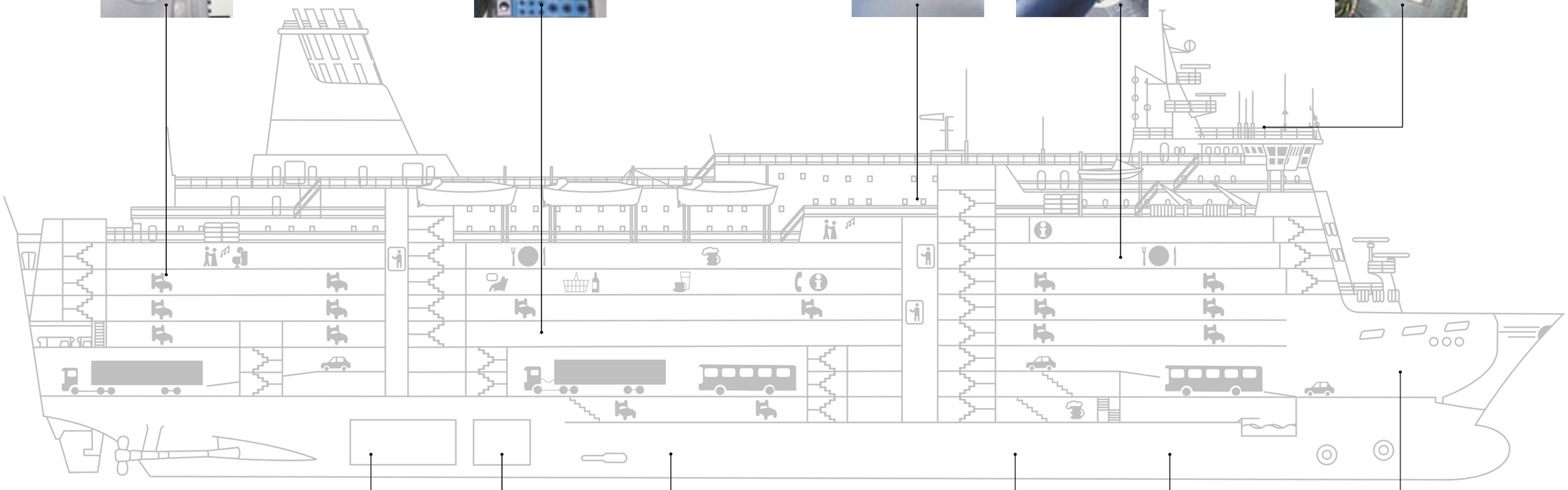
Roxtec CF 32 for enclosure installation in engine control room.

Round seal for external lighting fittings.

Roxtec plastic pipe seal for PP and PVC pipes.

Roxtec EMC installation for radar and navigation equipment in wheelhouse.





Roxtec RS seals for pipes in main engine room.

Welded frame for switchboard installation.

Frame with rounded corners (SRC) avoids cracks in the bulkheads around cable or pipe inlets.

Roxtec S frame with power cables for generator sets.

Combination frame for fireproof, watertight bulkheads or decks.

Roxtec R frame for hydraulic or pneumatic tubes.

# Offshore applications

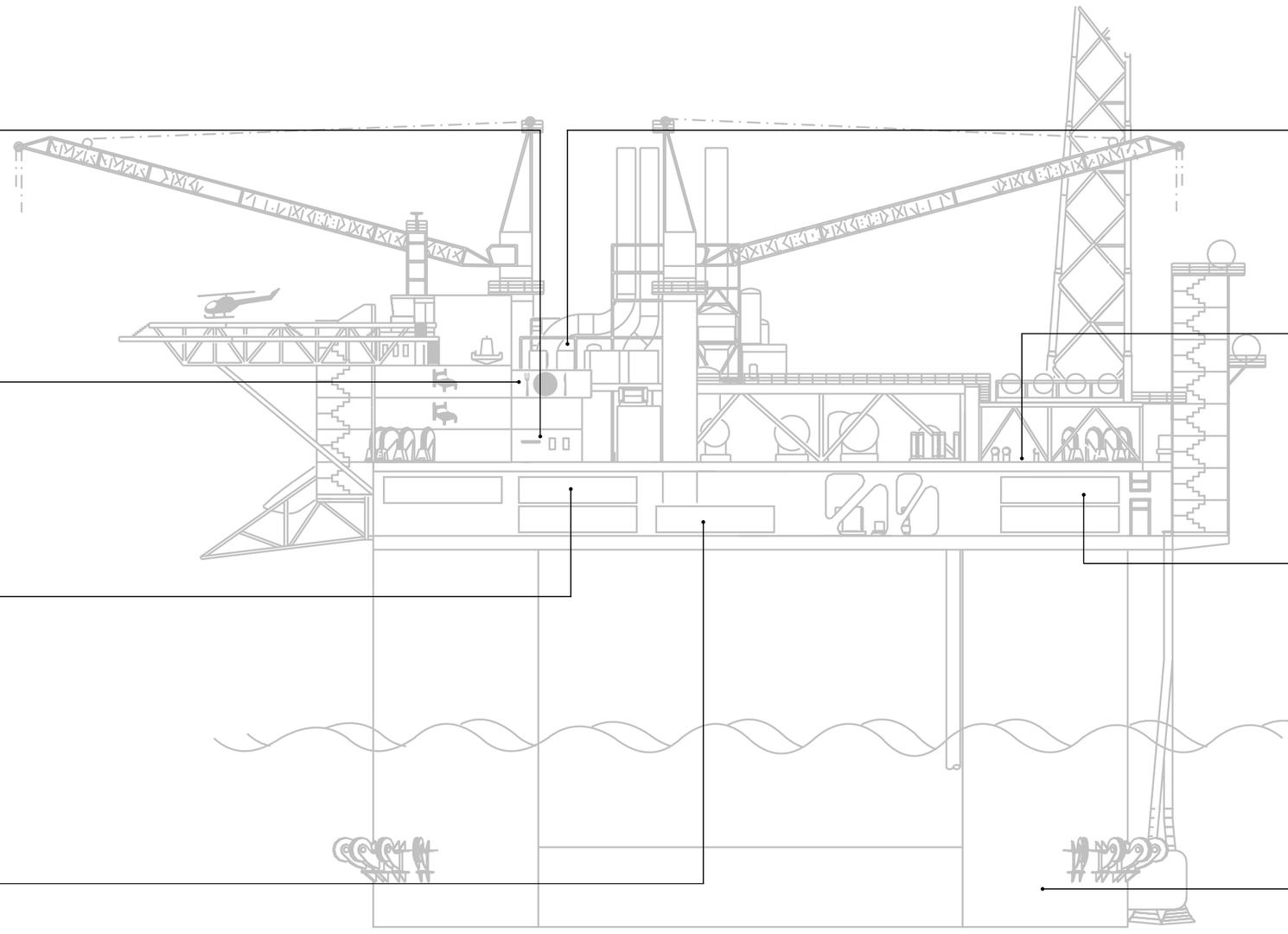
The pictures should only be seen as examples of where our products can be used. The wide product range means that there is virtually no restriction of where our transits can be installed.

Round seals for external lighting fittings.

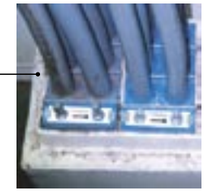
Roxtec RS seal for sprinkler system in kitchen.

Roxtec S frame for power cables.

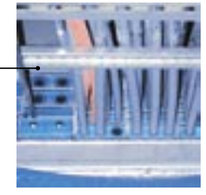
Roxtec installation in switchboard.



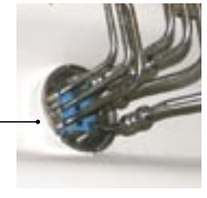
Roxtec EMC products for shielded installations.



Roxtec transit in main deck with SK frame.



Roxtec installation in fire-proof bulkheads or decks.



Roxtec R frame for hydraulic or pneumatic pipes.

grounded via the sealing modules and the frame. Conductive layers inside the modules also stop electromagnetic waves which would otherwise pass between the cables from one side of the transit to the other. These layers are also grounded via the frame. Please refer to Roxtec's EMC catalog for more detailed information about EMC.

### EEx e/ATEX

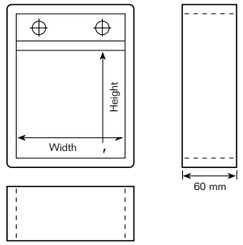
A number of Roxtec products are approved for use in hazardous areas (areas with explosive air/gas mixtures). They are all with the protection type Exx e and are intended to be used mainly in enclosures of that same category. Please contact your representative for more information.

### Compact solutions

Our compact solutions are easy to install and suitable for example in cabinets where IP rating or similar is the maximum requirement. The frames accommodate cables and pipes up to 32.5 millimeters in diameter and CM multidiameter modules are used for the installations. Please refer to Roxtec's Enclosure catalog for more detailed information about compact solutions. ■



# Regular solutions for marine and offshore applications




The sizes and packing spaces of the S-series frames and the GHM frame are typical and characteristic for how most Roxtec frames are combined.

S-series frames and the GHM frame come in four basic sizes, 2, 4, 6 and 8 referring to the internal height.

Frames are available either with only one opening or in a wide variety of combinations with several openings. For example, S 4+4x3 means that the frame consists of two frame openings on top of each other (4+4) and three openings in width (x3), see fig. 1.

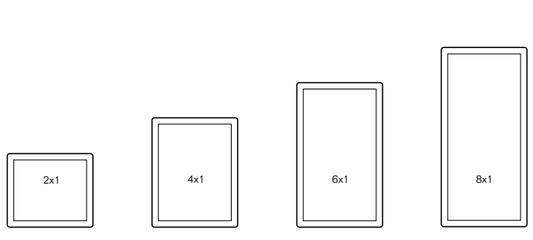
### Packing space*

Frame type

| S, SF, SRC**, SR, SK, SBTB, GHM: | 2x1 | 4x1 | 6x1 | 8x1 | 1x1 | 3x1 | 5x1 | 7x1 |
|---|---|---|---|---|---|---|---|---|
| Packing space height (mm): | 60 | 120 | 180 | 240 | 60 | 120 | 180 | 240 |
| Packing space width (mm): | 120 | 120 | 120 | 120 | 60 | 60 | 60 | 60 |

*The packing space is the available space inside each frame for sealing modules and cables/pipes.

**The packing space in the SRC frame is reduced with 344 $mm^2$ (r20) or 1376 $mm^2$ (r40) due to the rounded corners.



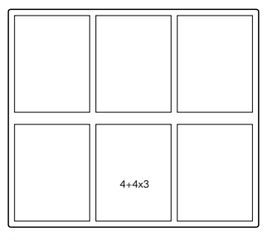



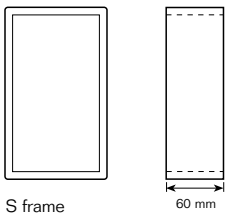

Fig. 1

# International material standards

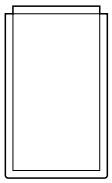
Several of our frames are available in various kinds of materials. Below is a list of the materials that we use and the corresponding standards.

| Material | ISO | Europe | GB | GER | SWE | USA/ASTM |
|---|---|---|---|---|---|---|
| Mild steel | ISO 3573/Quality 02 | EU 142-79/FeP 02G | BS 2989/Grade Z-2 | 1.0226/St 02 Z | SS 1151 | A 537 |
| | ISO 630/Fe 360B | EN 10025/S235JRG2 | BS 4360/40 B | 1.0038/R-St 37-2 | SS 1312 | A 501 |
| Stainless steel | ISO 683/13:1986/11 | EN/X4CrNi 18-10 | BS 970:Part 1:1991/304S15 | 1.4301/X5CrNi 1810 | SS 2333 | AISI 304 |
| Acid proof | ISO 683/13:1986/20a | EN/X4CrNiMo 17-13-3 | BS 970:Part 1:1991/316S33 | 1.4436/X5CrNiMo 17 13 3 | SS 2343 | AISI 316 |
| stainless steel | ISO 683/13:1986/20 | EN/X4CrNiMo 17-12-2 | BS 970:Part 1:1991/316S31 | 1.4401/X5CrNiMo 17 12 2 | SS 2347 | AISI 316 |
| | ISO 683/13:1986/21 | EN/X2CrNiMo 17-12-2 | BS 970:Part 1:1991/320S31 | 1.4571/X6CrNiMo 17 12 2 | SS 2350 | AISI 316Ti |
| | ISO 683/13:1986/19a | EN/X2CrNiMo 18-14-3 | BS 970:Part 1:1991/316S13 | 1.4435/X2CrNiMo 18 14 3 | SS 2353 | AISI 316L |
| Aluminum | ISO 6361/Al-Si1MgMn | EN AW-6082 | BS 1470/H30 | 3.2315/AlMgSi 1 | SS 4212 | AA6082 |
| Composite | PA 6.6 | PA 6.6 | PA 6.6 | PA 6.6 | PA 6.6 | PA 6.6 |
| Plastic | PP | PP | PP | PP | PP | PP |

# Roxtec S frame




S frame

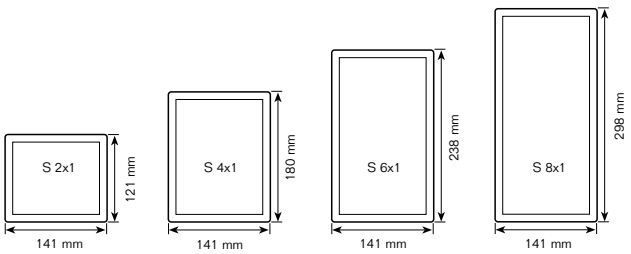


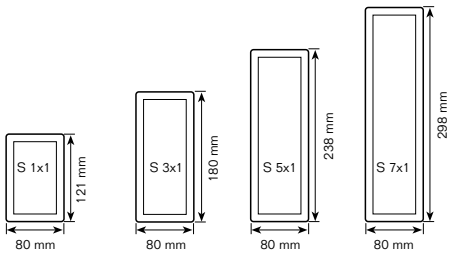
SO frame

The S frame is the basic frame type for welding. It is available as a single frame and in combinations with several openings.

The SO frame is an openable version of the S frame, spot welded at the top side and is used for installation around existing cables or pipes. It is also available as a single frame or with multiple openings.

- The S frames are available in primed mild steel, acid proof stainless steel or aluminum, see page 21.
- Material thickness: 10 mm.
- S frames are certified for A- and H-class bulkheads or decks, watertight and gastight. For details on standards and certificates please contact your Roxtec representative.
- Packing space, see page 20.

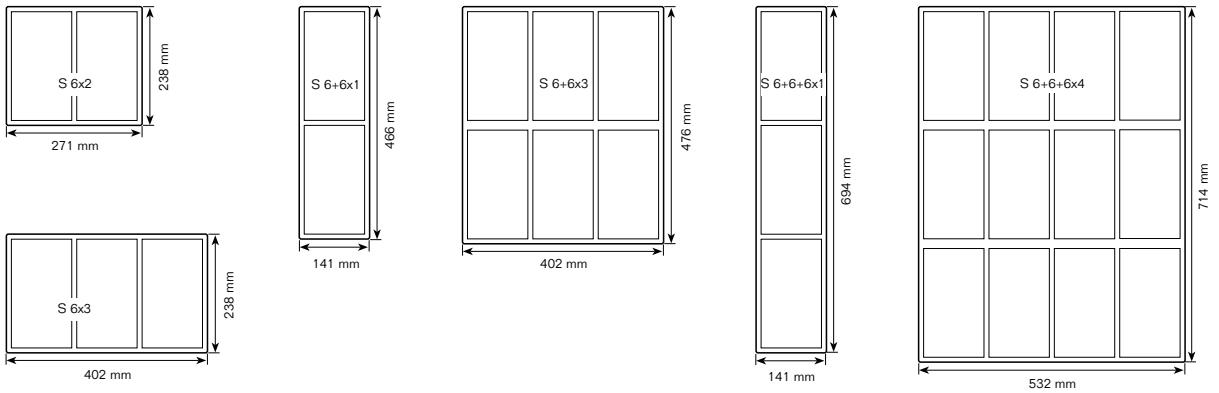


## External dimensions

| Frame | Height (mm) | | Width (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1 opening in width | >1 opening in width | x1 | x2 | x3 | x4 | x5 | x6 | x7 |
| S 2 | 121 | 121 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| S 2+2 | 232 | 242 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| S 2+2+2 | 343 | 363 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| S 4 | 180 | 180 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| S 4+4 | 349 | 359 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| S 4+4+4 | 519 | 539 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| S 6 | 238 | 238 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| S 6+6 | 466 | 476 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| S 6+6+6 | 694 | 714 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| S 8 | 298 | 298 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| S 8+8 | 586 | 596 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| S 8+8+8 | 874 | 894 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| S 1 | 121 | – | 80 | – | – | – | – | – | – |
| S 3 | 180 | – | 80 | – | – | – | – | – | – |
| S 5 | 238 | – | 80 | – | – | – | – | – | – |
| S 7 | 298 | – | 80 | – | – | – | – | – | – |

■ Aperture dimensions; External dimensions plus 1-2 mm. For details on installation please refer to Roxtec frame installation manual.

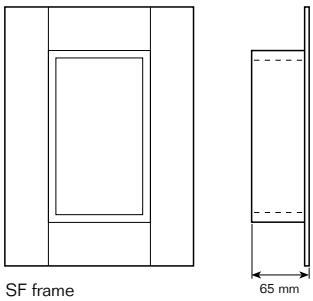


**Weights (kg), S frames in mild steel**

| Frame | x1 | x2 | x3 | x4 | x5 | x6 | x7 |
|---|---|---|---|---|---|---|---|
| S 2 | 2.2 | 3.9 | 5.6 | 7.3 | 9.0 | 10.7 | 12.4 |
| S 2+2 | 4.0 | 8.0 | 11.5 | 14.9 | 18.3 | 21.7 | 25.1 |
| S 2+2+2 | 5.7 | 12.2 | 17.3 | 22.4 | 27.5 | 32.6 | 37.8 |
| S 4 | 2.8 | 4.8 | 6.7 | 8.7 | 10.7 | 12.7 | 14.7 |
| S 4+4 | 5.1 | 9.7 | 13.7 | 17.6 | 21.6 | 25.5 | 29.5 |
| S 4+4+4 | 7.4 | 14.7 | 20.6 | 26.5 | 32.5 | 38.4 | 44.4 |
| S 6 | 3.3 | 5.6 | 7.8 | 10.1 | 12.4 | 14.6 | 16.9 |
| S 6+6 | 6.2 | 11.4 | 15.9 | 20.4 | 24.9 | 29.4 | 33.9 |
| S 6+6+6 | 9.0 | 17.1 | 23.9 | 30.7 | 37.5 | 44.2 | 51.0 |
| S 8 | 3.9 | 6.4 | 9.0 | 11.5 | 14.0 | 16.6 | 19.1 |
| S 8+8 | 7.3 | 13.1 | 18.1 | 23.2 | 28.3 | 33.4 | 38.4 |
| S 8+8+8 | 10.8 | 19.7 | 27.3 | 34.9 | 42.5 | 50.1 | 57.8 |
| S 1 | 1.7 | – | – | – | – | – | – |
| S 3 | 2.2 | – | – | – | – | – | – |
| S 5 | 2.8 | – | – | – | – | – | – |
| S 7 | 3.3 | – | – | – | – | – | – |

■ For weight specifications of frames in other materials, contact your local representative.

# Roxtec SF frame



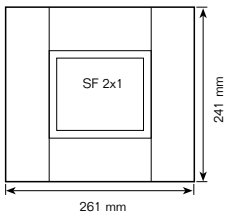

SF frame

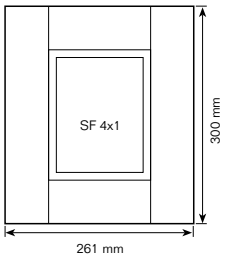
## The SF frame is a standard S frame with a 60 mm flange added.

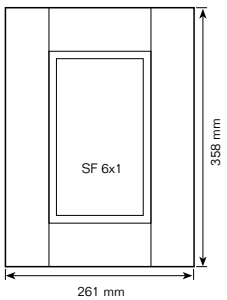
It is suitable when pre-cut holes exist which are too large for standard sizes of frames. It can either be welded or bolted onto the section.

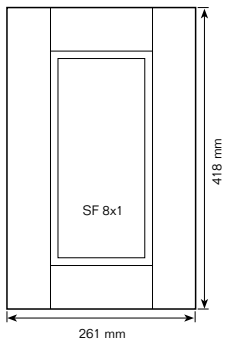
SF frames can be supplied with a fire resistant sealing strip and if required as an open version, the SFO frame.

- The SF frames are available in primed mild steel, acid proof stainless steel or aluminum.
- Material thickness: 10 mm.
- SF frames are certified for A- and H-class bulkheads or decks, watertight and gastight. For details on standards and certificates please contact your Roxtec representative.
- Packing space, see page 20.



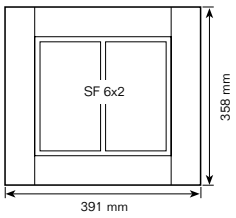



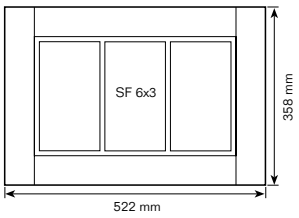



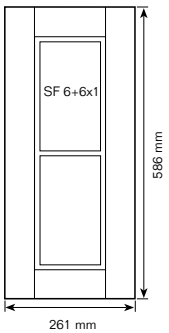
## External dimensions

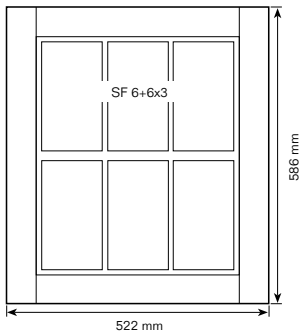
| | Height (mm) | | Width (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frame | 1 opening in width | >1 opening in width | x1 | x2 | x3 | x4 | x5 | x6 | x7 |
| SF 2 | 241 | 241 | 261 | 391 | 522 | 652 | 783 | 913 | 1044 |
| SF 2+2 | 352 | 362 | 261 | 391 | 522 | 652 | 783 | 913 | 1044 |
| SF 2+2+2 | 463 | 483 | 261 | 391 | 522 | 652 | 783 | 913 | 1044 |
| SF 4 | 300 | 300 | 261 | 391 | 522 | 652 | 783 | 913 | 1044 |
| SF 4+4 | 469 | 479 | 261 | 391 | 522 | 652 | 783 | 913 | 1044 |
| SF 4+4+4 | 639 | 659 | 261 | 391 | 522 | 652 | 783 | 913 | 1044 |
| SF 6 | 358 | 358 | 261 | 391 | 522 | 652 | 783 | 913 | 1044 |
| SF 6+6 | 586 | 596 | 261 | 391 | 522 | 652 | 783 | 913 | 1044 |
| SF 6+6+6 | 814 | 834 | 261 | 391 | 522 | 652 | 783 | 913 | 1044 |
| SF 8 | 418 | 418 | 261 | 391 | 522 | 652 | 783 | 913 | 1044 |
| SF 8+8 | 706 | 716 | 261 | 391 | 522 | 652 | 783 | 913 | 1044 |
| SF 8+8+8 | 994 | 1014 | 261 | 391 | 522 | 652 | 783 | 913 | 1044 |

- External dimensions include frame and flange, see bottom drawings.
- For aperture dimensions please refer to Roxtec frame installation manual.



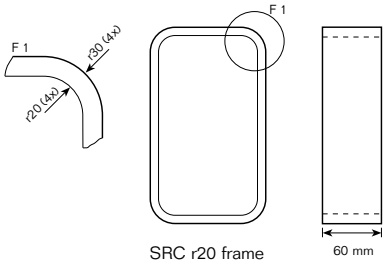



**Weights (kg), SF frames in mild steel**

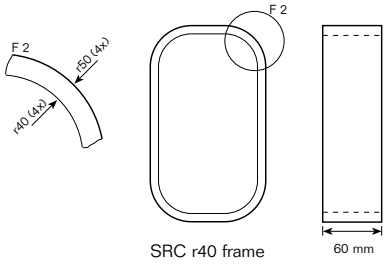
| Frame | x1 | x2 | x3 | x4 | x5 | x6 | x7 |
|---|---|---|---|---|---|---|---|
| SF 2 | 5.9 | 8.9 | 11.8 | 14.8 | 17.8 | 20.7 | 23.6 |
| SF 2+2 | 9.2 | 14.0 | 18.6 | 23.3 | 28.0 | 32.6 | 37.2 |
| SF 2+2+2 | 13.6 | 19.1 | 25.4 | 31.8 | 38.2 | 44.6 | 50.9 |
| SF 4 | 7.0 | 10.2 | 13.5 | 16.7 | 20.0 | 23.2 | 26.3 |
| SF 4+4 | 11.2 | 16.5 | 21.8 | 27.0 | 32.2 | 37.4 | 42.5 |
| SF 4+4+4 | 16.9 | 22.9 | 30.1 | 37.3 | 44.5 | 51.7 | 58.7 |
| SF 6 | 8.1 | 11.6 | 15.2 | 18.7 | 22.2 | 25.7 | 29.1 |
| SF 6+6 | 13.7 | 19.5 | 25.3 | 31.1 | 36.9 | 42.6 | 48.1 |
| SF 6+6+6 | 21.4 | 27.4 | 35.4 | 43.5 | 51.5 | 59.5 | 67.4 |
| SF 8 | 9.3 | 13.1 | 16.9 | 20.7 | 24.5 | 28.3 | 31.9 |
| SF 8+8 | 16.0 | 22.4 | 28.7 | 35.1 | 41.4 | 47.4 | 53.9 |
| SF 8+8+8 | 25.4 | 31.7 | 40.6 | 49.5 | 58.3 | 67.2 | 75.9 |

■ For weight specifications of frames in other materials, contact your local representative.

# Roxtec SRC frame




SRC r20 frame

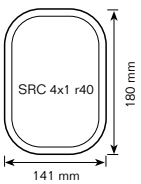


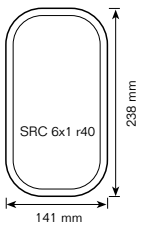

SRC r40 frame

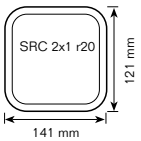
The SRC frame is suitable for thin, weight-optimized bulkheads as well as constructions that are subject to stress.

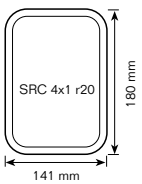
The design helps avoiding cracks around cable and pipe inlets. The SRC is available in two different versions, inner radius 20 mm, outer radius 30 mm and inner radius 40 mm, outer radius 50 mm.

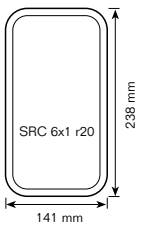
- The SRC frames are available in primed mild steel. Other materials are available on request.
- Material thickness: 10 mm.
- SRC frames are certified for A- and H-class bulkheads or decks, watertight and gastight. For details on standards and certificates please contact your Roxtec representative.
- Packing space, see page 20.
- The SRC frames are used with corner modules, see page 43.



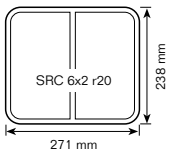



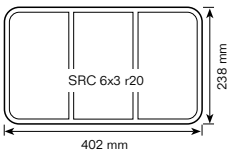



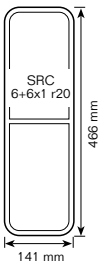
## External dimensions

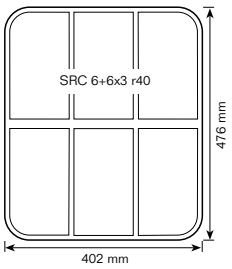
| | Height (mm) | | Width (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frame | 1 opening in width | >1 opening in width | x1 | x2 | x3 | x4 | x5 | x6 | x7 |
| SRC 2 r20 | 121 | 121 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| SRC 2+2 r20 | 232 | 242 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| SRC 2+2+2 r20 | 343 | 363 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| SRC 4 r20 | 180 | 180 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| SRC 4+4 r20 | 349 | 359 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| SRC 4+4+4 r20 | 519 | 539 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| SRC 6 r20 | 238 | 238 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| SRC 6+6 r20 | 466 | 476 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| SRC 6+6+6 r20 | 694 | 714 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| SRC 4 r40 | 180 | 180 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| SRC 4+4 r40 | 349 | 359 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| SRC 4+4+4 r40 | 519 | 539 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| SRC 6 r40 | 238 | 238 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| SRC 6+6 r40 | 466 | 476 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |
| SRC 6+6+6 r40 | 694 | 714 | 141 | 271 | 402 | 532 | 663 | 793 | 924 |

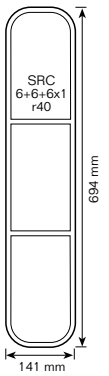
■ Aperture dimensions; External dimensions plus 1-2 mm. For details on installation please refer to Roxtec frame installation manual.



**Weights (kg), SRC frames in mild steel**

| Frame | x1 | x2 | x3 | x4 | x5 | x6 | x7 |
|---|---|---|---|---|---|---|---|
| SRC 2 r20 | 2.0 | 3.7 | 5.4 | 7.1 | 8.8 | 10.5 | 12.3 |
| SRC 2+2 r20 | 3.8 | 7.8 | 11.3 | 14.7 | 18.1 | 21.5 | 24.4 |
| SRC 2+2+2 r20 | 5.5 | 12.0 | 17.1 | 22.2 | 27.3 | 32.4 | 37.6 |
| SRC 4 r20 | 2.6 | 4.6 | 6.5 | 8.5 | 10.5 | 12.5 | 14.5 |
| SRC 4+4 r20 | 4.9 | 9.5 | 13.5 | 17.4 | 21.4 | 25.3 | 29.3 |
| SRC 4+4+4 r20 | 7.2 | 14.5 | 20.4 | 26.3 | 32.3 | 38.2 | 44.2 |
| SRC 6 r20 | 3.1 | 5.4 | 7.6 | 9.9 | 12.2 | 14.4 | 16.7 |
| SRC 6+6 r20 | 6.0 | 11.2 | 15.7 | 20.2 | 24.7 | 29.2 | 33.7 |
| SRC 6+6+6 r20 | 8.8 | 16.9 | 23.7 | 30.5 | 37.3 | 44.0 | 50.8 |
| SRC 4 r40 | 2.4 | 4.4 | 6.4 | 8.4 | 10.3 | 12.3 | 14.3 |
| SRC 4+4 r40 | 4.7 | 9.3 | 13.3 | 17.3 | 21.2 | 25.2 | 29.1 |
| SRC 4+4+4 r40 | 7.0 | 14.3 | 20.2 | 26.2 | 32.1 | 38.1 | 44.0 |
| SRC 6 r40 | 3.0 | 5.2 | 7.5 | 9.7 | 12.0 | 14.3 | 16.5 |
| SRC 6+6 r40 | 5.8 | 11.0 | 15.5 | 20.0 | 24.5 | 29.0 | 33.6 |
| SRC 6+6+6 r40 | 8.7 | 16.8 | 23.5 | 30.3 | 37.1 | 43.8 | 50.6 |

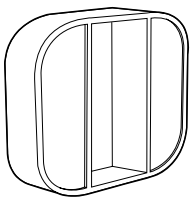
■ For weight specifications of frames in other materials, contact your local representative.

# Roxtec SR, SK and SBTB frames

These frames are all versions of the S frame and developed for special demands. They are available in various combinations and suitable for welding.

## Roxtec SR frame

The SR frame is designed for use in decks and bulkheads subject to high degrees of stress and is reinforced with a banded construction.

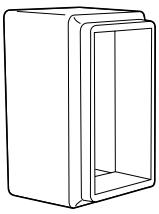


SR frame

- The SR frame is available on request. Contact your local representative for more detailed information.
- The frame is available in primed mild steel, acid proof stainless steel or aluminum.
- Material thickness: 10 mm.
- SR frame are certified for A- and H-class bulkheads or decks, water-tight and gastight. For details on standards and certificates please contact your Roxtec representative.
- Packing space, see page 20.

## Roxtec SK frame

The SK frame is recommended in rough environments where transits should be 10–15 cm above deck level.

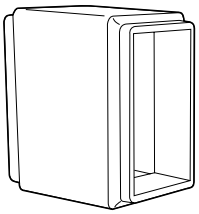


SK frame

- The SK frame is available on request. Contact your local representative for more detailed information.
- The frame is available in primed mild steel, acid proof stainless steel or aluminum.
- Material thickness: 10 mm.
- SK frames are certified for A- and H-class bulkheads or decks, watertight and gastight. For details on standards and certificates please contact your local representative.
- Packing space, see page 20.

## Roxtec SBTB frame

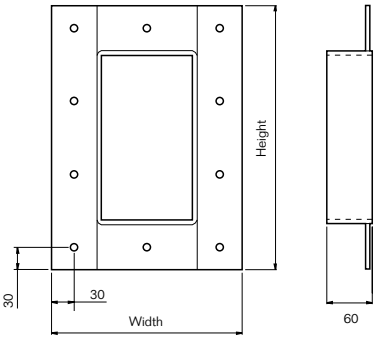
The SBTB frame has transits at each end and is developed for extreme security demands against pressure and fire, such as hydro-carbon and jet-fire.



SBTB frame

- The SBTB frame is available on request. Contact your local representative for more detailed information.
- The frame is available in primed mild steel, acid proof stainless steel or aluminum.
- Material thickness: 10 mm.
- SBTB frames are certified for A- and H-class bulkheads or decks, watertight and gastight. For details on standards and certificates please contact your local representative.
- Packing space, see page 20.

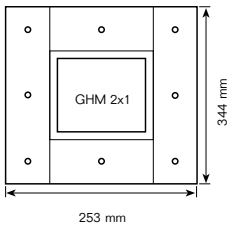
# Roxtec GHM frame

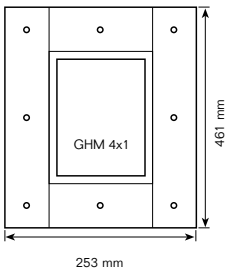


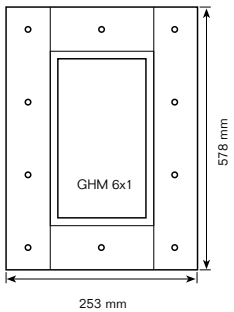

## The GHM frame was developed for applications where welding is not suitable. It is bolted to bulkheads or decks.

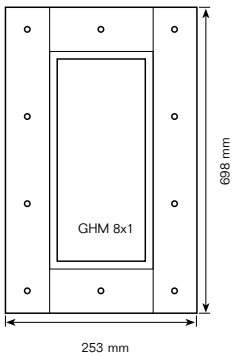
The frame has a hole pattern adapted to marine environments and is delivered with a TSL 15x6 sealing strip. It's relatively low weight makes it easier to handle during installation. It is available in various sizes and combinations.

- The GHM frames are available in primed mild steel and acid proof stainless steel.
- Material thickness: 6 mm.
- Flange width: 60 mm.
- GHM frames are certified for A-class bulkheads or decks, watertight and gastight. For details on standards and certificates please contact your Roxtec representative.
- Packing space, see page 20.



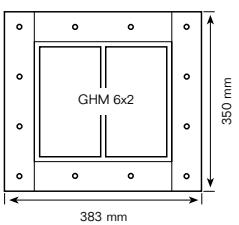



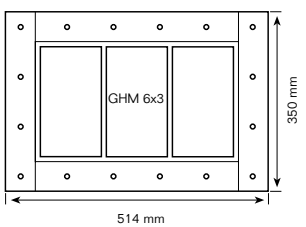



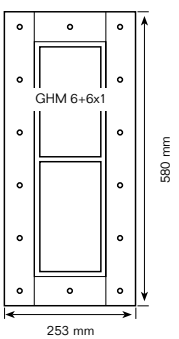
## External dimensions

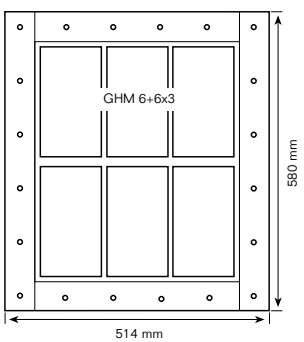
| | Height (mm) | | Width (mm) | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Frame | 1 opening in width | >1 opening in width | x1 | x2 | x3 | x4 | x5 | x6 | x7 |
| GHM 2 | 233 | 233 | 253 | 383 | 514 | 644 | 775 | 905 | 1036 |
| GHM 2+2 | 344 | 346 | 253 | 383 | 514 | 644 | 775 | 905 | 1036 |
| GHM 2+2+2 | 455 | 459 | 253 | 383 | 514 | 644 | 775 | 905 | 1036 |
| GHM 4 | 292 | 292 | 253 | 383 | 514 | 644 | 775 | 905 | 1036 |
| GHM 4+4 | 461 | 463 | 253 | 383 | 514 | 644 | 775 | 905 | 1036 |
| GHM 4+4+4 | 631 | 635 | 253 | 383 | 514 | 644 | 775 | 905 | 1036 |
| GHM 6 | 350 | 350 | 253 | 383 | 514 | 644 | 775 | 905 | 1036 |
| GHM 6+6 | 578 | 580 | 253 | 383 | 514 | 644 | 775 | 905 | 1036 |
| GHM 6+6+6 | 806 | 810 | 253 | 383 | 514 | 644 | 775 | 905 | 1036 |
| GHM 8 | 410 | 410 | 253 | 383 | 514 | 644 | 775 | 905 | 1036 |
| GHM 8+8 | 698 | 700 | 253 | 383 | 514 | 644 | 775 | 905 | 1036 |
| GHM 8+8+8 | 986 | 990 | 253 | 383 | 514 | 644 | 775 | 905 | 1036 |

- External dimensions include frame and flange, see bottom drawings.
- For aperture dimensions please refer to Roxtec frame installation manual.



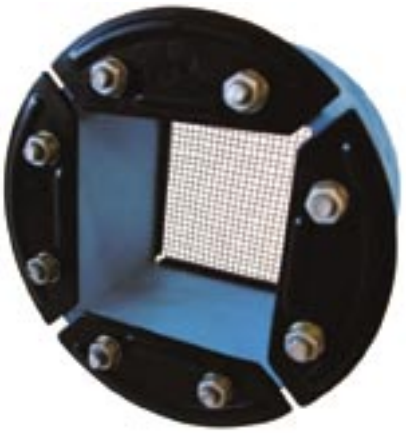



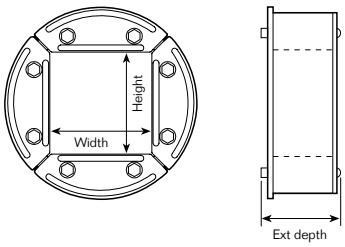
**Weights (kg), GHM frames in mild steel**

| Frame | x1 | x2 | x3 | x4 | x5 | x6 | x7 |
|---|---|---|---|---|---|---|---|
| GHM 2 | 3.4 | 5.4 | 7.4 | 9.3 | 11.3 | 13.3 | 15.3 |
| GHM 2+2 | 5.3 | 8.6 | 11.8 | 15.0 | 18.1 | 21.3 | 24.5 |
| GHM 2+2+2 | 7.1 | 11.8 | 16.2 | 20.6 | 25.0 | 29.4 | 23.8 |
| GHM 4 | 4.1 | 6.3 | 8.6 | 10.8 | 13.1 | 15.3 | 17.9 |
| GHM 4+4 | 6.6 | 10.5 | 14.2 | 17.9 | 21.7 | 25.4 | 29.2 |
| GHM 4+4+4 | 9.1 | 14.6 | 19.8 | 25.0 | 30.3 | 35.5 | 40.7 |
| GHM 6 | 4.8 | 7.3 | 9.8 | 12.3 | 14.9 | 17.4 | 19.9 |
| GHM 6+6 | 7.8 | 12.4 | 16.7 | 20.9 | 25.2 | 29.5 | 33.8 |
| GHM 6+6+6 | 11.1 | 17.4 | 23.5 | 29.5 | 35.6 | 41.6 | 47.7 |
| GHM 8 | 5.5 | 8.3 | 11.1 | 13.9 | 16.7 | 19.5 | 22.3 |
| GHM 8+8 | 9.3 | 14.3 | 19.2 | 24.0 | 28.9 | 33.7 | 38.6 |
| GHM 8+8+8 | 13.2 | 20.3 | 27.2 | 34.1 | 41.0 | 47.9 | 54.8 |

■ For weight specifications of frames in other materials, contact your local representative.



# Roxtec R frame




## The R frame is a sealing system for multiple cable or pipe penetrations through round holes.

R Frames are easily installed in pipe sleeves or holes. The frame is filled with standard modules and when compressed the R frame expands both inwards and outwards, providing excellent mechanical anchorage for itself as well as the cables or pipes routed through. R frames are available with a net installed on the back side for easier horizontal installation except for sizes R 70 and R 75. They can be cut open for installation around existing cables or pipes.

- The R frames are available with front/rear fittings in hot dip galvanized mild steel from sizes R 100 and up. The body is made of Roxylon rubber.
- Fittings for all R frames are available in acid proof stainless steel (AISI 316).
- R frames are certified for A- and H-class, watertight and gastight bulkheads or decks. For details on standards and certificates please contact your Roxtec representative.
- The R frames are also available in an EMC version, see page 46.

| Frame | Packing space* (mm) | | External dimensions (mm) | | Rec. hole diameter |
|---|---|---|---|---|---|
| | Height | Width | Diameter | Depth | |
| R 70 | 40 | 40 | 70 | 79 | 70-72 |
| R 75 | 40 | 40 | 75 | 79 | 5-77 |
| R 100 | 60 | 60 | 100 | 85 | 100-102 |
| R 125 | 80 | 80 | 125 | 79 | 125-127 |
| R 127 | 80 | 80 | 127 | 79 | 127-129 |
| R 150 | 90 | 90 | 150 | 86 | 150-152 |
| R 200 | 120 | 120 | 200 | 86 | 200-202 |

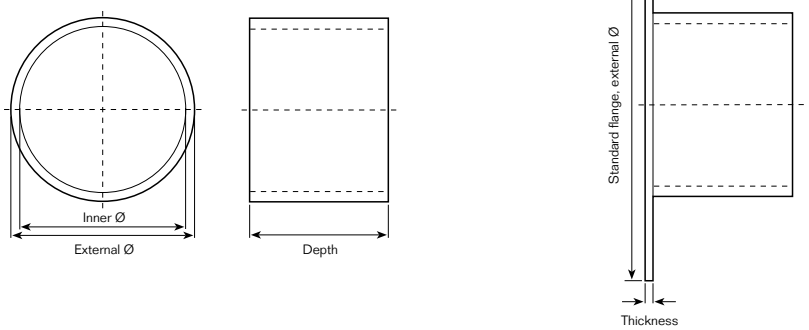
*The packing space is the available space inside each frame for sealing modules and cables/pipes.

# Sleeves with/without flange

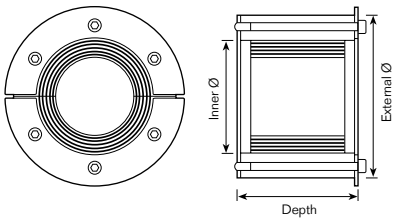
The R frames are installed in sleeves. Sleeves with flange are used for installations where hot work or precise hole-cuts are not possible.

| | | All types | | Without flange | With flange | |
|---|---|---|---|---|---|---|
| Type | Fits frame | Depth (mm) | Inner Ø (mm) | Ext. Ø (mm) | Ext. Ø (mm) | Thickness (mm) |
| SLR or SLFR 70 | R 70 | 55±1 | 71.3 | 82.5 | 160 | 4 |
| SLR or SLFR 75 | R 75 | 55±1 | 77 | 85 | 165 | 4 |
| SLR or SLFR 100 | R 100 | 55±1 | 101.7 | 114.3 | 195 | 4 |
| SLR or SLFR 125 | R 125 | 55±1 | 125.5 | 139.7 | 213 | 4 |
| SLR or SLFR 127 | R 127 | 55±1 | 128.5 | 139.7 | 213 | 4 |
| SLR or SLFR 150 | R 150 | 55±1 | 150.7 | 168.3 | 236 | 4 |
| SLR or SLFR 200 | R 200 | 55±1 | 201.5 | 219.1 | 290 | 4 |

- The sleeves are available in primed mild steel. Other materials are available on request. Please note that for sleeves in other materials dimensions can differ from the table above.



# Roxtec RS seal




## The RS seal is a round seal for single cable or pipe penetrations in metal sleeves.

The two halves are adjustable to fit different cable and pipe diameters and the split construction makes it easy to install around existing cables or pipes. The RS seal is available in ten sizes.

- The RS seals are available with front/rear fittings in acid proof stainless steel (AISI 316)/Roxylon rubber.
- RS seals are certified for A- and H-class, watertight and gastight bulkheads or decks. For details on standards and certificates please contact your Roxtec representative.
- The RS seals are also available in different EMC versions, see page 46.

| Seal | Inner diameter (mm) | External dimensions (mm) | | Rec. hole diameter |
|---|---|---|---|---|
| | | Diameter | Depth | |
| RS 23 | 0+3.6-11 | 23 | 44 | 23-24 |
| RS 25 | 0+3.6-12 | 25 | 44 | 25-26 |
| RS 31 | 0+4-17 | 31 | 44 | 31-32 |
| RS 43 | 0+4-23 | 43 | 86 | 43-44 |
| RS 50 | 0+8-30 | 50 | 86 | 50-51 |
| RS 68 | 0+26-48 | 68 | 86 | 68-70 |
| RS 75 | 0+26-48 | 75 | 86 | 75-77 |
| RS 100* | 0+48-70 | 100 | 91 | 100-102 |
| RS 125* | 0+66-98 | 125 | 92 | 125-127 |
| RS 150* | 93-119 | 150 | 92 | 150-152 |

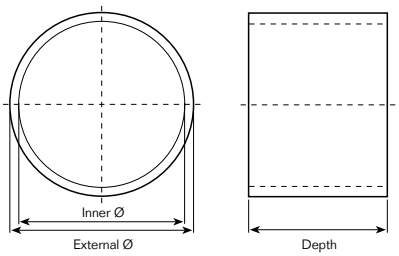
*RS 100 and RS 125 are also available without solid center core (RS 100 woc, RS 125 woc). RS 150 is supplied without solid center core.

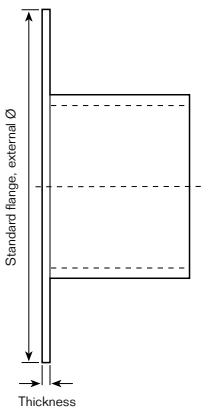
# Sleeves with/without flange

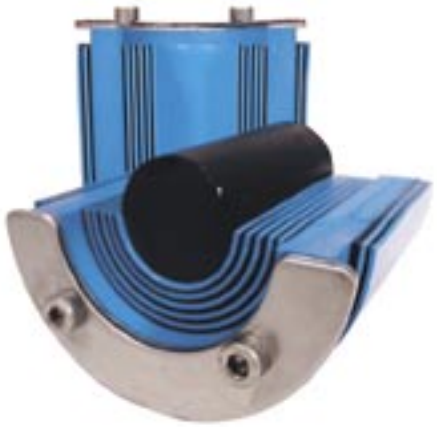
The RS seals are installed in sleeves. Sleeves with flange are used for installations where hot work or precise hole-cuts are not possible.

| | All types | | | Without flange | With flange | |
|---|---|---|---|---|---|---|
| Type | Fits frame | Depth (mm) | Inner Ø (mm) | Ext. Ø (mm) | Ext. Ø (mm) | Thickness (mm) |
| SLRS or SLFRS 23 | RS 23 | 35±1 | 24 | 32 | 92 | 3 |
| SLRS or SLFRS 25 | RS 25 | 35±1 | 26 | 36 | 96 | 3 |
| SLRS or SLFRS 31 | RS 31 | 35±1 | 32 | 42 | 102 | 3 |
| SLRS or SLFRS 43 | RS 43 | 65±1 | 44 | 52 | 110 | 3 |
| SLRS or SLFRS 50 | RS 50 | 65±1 | 51 | 60 | 140 | 4 |
| SLRS or SLFRS 68 | RS 68 | 65±1 | 69 | 75 | 155 | 4 |
| SLRS or SLFRS 75 | RS 75 | 65±1 | 77 | 85 | 165 | 4 |
| SLRS or SLFRS 100 | RS 100 | 65±1 | 101.7 | 114.3 | 195 | 4 |
| SLRS or SLFRS 125 | RS 125 | 65±1 | 125.5 | 139.7 | 213 | 4 |
| SLRS or SLFRS 150 | RS 150 | 65±1 | 150.7 | 168.3 | 236 | 4 |

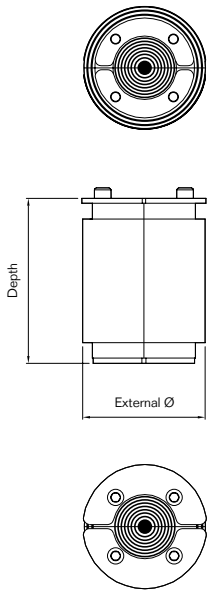
■ The sleeves are available in primed mild steel. Other materials are available on request. Please note that for sleeves in other materials dimensions can differ from the table above.





# Roxtec RS OMD




## Roxtec RS OMD was developed to increase flexibility for the customers even further.

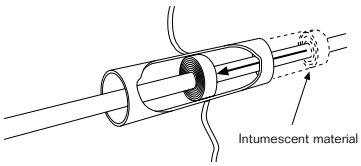
The seal features interior and exterior layers which means that the RS OMD can be adapted to the routed pipe or cable as well the sleeve it is inserted into. When you already have sleeves in stock or for maintenance when sleeves are installed, RS OMD is the perfect sealing solution.

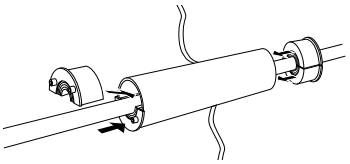
- The RS OMD seals are available with front/rear fittings in acid proof stainless steel (AISI 316)/Roxylon rubber.
- The RS OMD certified for A-class, watertight and gastight bulkheads or decks. For details on standards and certificates please contact your Roxtec representative.

| Type | Cable/pipe diameter (mm) | External diameter (mm) | Depth (mm) | Sleeve range inner Ø (mm) |
|---|---|---|---|---|
| RS 23 OMD | 3.6-11 | 23-27.5 | 41 | 23-28 |
| RS 31 OMD | 4-17 | 31-35.5 | 41 | 31-37 |
| RS 43 OMD | 4-23 | 43-51 | 80 | 43-52 |
| RS 50 OMD | 8-30 | 50-58 | 80 | 50-59 |
| RS 68 OMD | 26-48 | 68-76.5 | 80 | 68-78 |
| RS 100 OMD* | 48-70 | 100-108 | 83 | 100-109 |
| RS 125 OMD* | 68-98 | 125-143 | 83 | 125-144 |
| RS 150 OMD* | 93-119 | 150-167 | 85 | 150-168 |

*RS 100 and RS 125 are also available without solid center core (RS 100 woc, RS 125 woc). RS 150 is supplied without solid center core.

# Roxtec PPS seal



## Roxtec Plastic Pipe Sealing is developed specifically to seal plastic pipes onboard vessels.

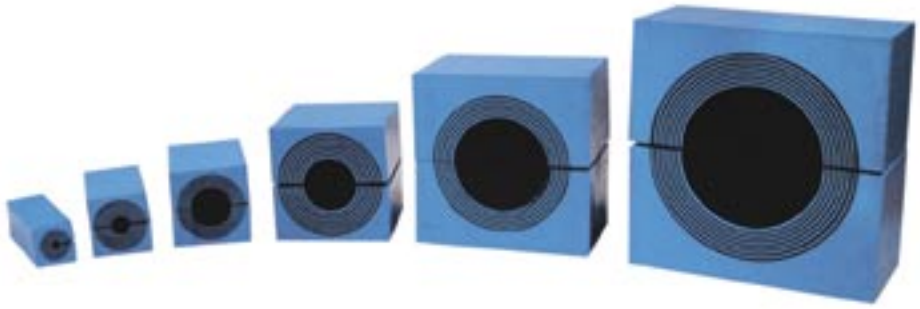
The seal consists of two Roxtec RS or C RS seals and an intumescent sealing strip. When exposed to heat the intumescent material expands and seals the transit. In case of water- or gas pressure the RS or C RS seals keep the installation tight.

- The PPS seals are available in acid proof stainless steel fittings/Roxylon rubber.
- PPS seals are certified for A-class, watertight and gastight bulkheads or decks. For details on standards and certificates please contact your Roxtec representative.

| Type | Pipe range (mm) | External diameter (mm) | Rec. hole diameter (mm) | Sleeve length* (mm) |
|---|---|---|---|---|
| PPS RS 31 | 0+16-17 | 31 | 31-32 | 156 |
| PPS C RS 43 | 0+16-23 | 43 | 43-44 | 156 |
| PPS C RS 50 | 0+16-30 | 50 | 50-51 | 156 |
| PPS C RS 68 | 0+26-48 | 68 | 68-70 | 156 |
| PPS C RS 75 | 0+26-48 | 75 | 75-77 | 156 |
| PPS C RS 100** | 48-70 | 100 | 100-102 | 156 |
| PPS C RS 125** | 66-98 | 125 | 125-127 | 156 |
| PPS C RS 150** | 93-110 | 150 | 150-152 | 156 |

*Sleeves are not included in the kit packing.

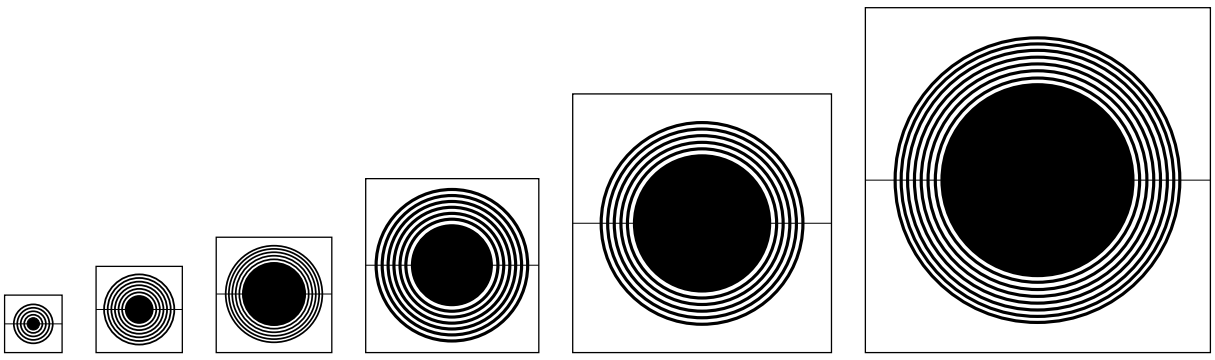
**PPS C RS 100, 125 and 150 are supplied without a solid center core.



# Roxtec RM modules

S-series, GHM frames and R frames are filled with RM modules around cables or pipes, as spare capacity or as compensation. RM modules have a depth of 60 mm and accommodate cables or pipes ranging from 3.5 to 99 millimeters.

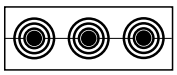
| Standard modules | For cable/pipe diameter (mm) | External dim. (mm) (height x width x depth) |
|---|---|---|
| RM 20 | 0+4-14.5 | 20x20x60 |
| RM 30 | 0+10-25 | 30x30x60 |
| RM 40 | 0+ 21.5-34.5 | 40x40x60 |
| RM 60 | 0+28-54 | 60x60x60 |
| RM 90 | 0+48-71 | 90x90x60 |
| RM 120 | 0+67.5-99 | 120x120x60 |

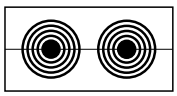


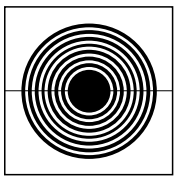
# Roxtec RM additional modules

| Additional modules | For cable/pipe diameter (mm) | External dim. (mm) (height x width x depth) |
|---|---|---|
| RM 15 | 0+3.5-10.5 | 15x15x60 |
| RM 15w40 | 3x0+3.5-10.5 | 15x40x60 |
| RM 20w40 | 2x0+3.5-16.5 | 20x40x60 |
| RM 40 10-32 | 0+9.5-32.5 | 40x40x60 |
| RM 20/15 | 15 | 20x20x60 |
| RM 20/16 | 16 | 20x20x60 |

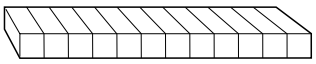

RM 15

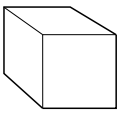

RM 15w40


RM 20w40


RM 40 10-32

# Roxtec RM solid compensation modules

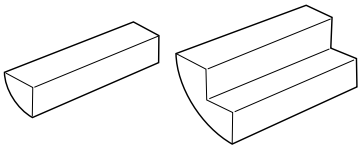

RM 10/0x12


RM 30/0

| Module type | External dimensions (mm) (height x width x depth) |
|---|---|
| RM 5/0x24 | 5x5x60 x24 pcs |
| RM 10/0x12 | 10x10x60 x12 pcs |
| RM 15/0 | 15x15x60 |
| RM 20/0 | 20x20x60 |
| RM 30/0 | 30x30x60 |
| RM 40/0 | 40x40x60 |
| RM 60/0 | 60x60x60 |

- Compensation modules are solid blocks, used to fill out surplus space in the frame.

# Roxtec Corner modules for SRC frames


RM 20/0 RC RM 40/0 RC

| Module type | Fits frame | External dimensions (mm) (height x width x depth) |
|---|---|---|
| RM 20/0 RC | SRC r20 | 20x20x60 |
| RM 40/0 RC | SRC r40 | 40x40x60 |

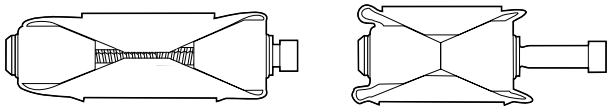
- Corner modules are solid blocks, used to fill out the corners in the SRC frame.
- Other accessories for SRC frames, like compression unit with radius 20 mm or modules with rounded corners, are available on request.

# Accessories

## Roxtec wedgekit

- The Roxtec wedgekit assembly pack contains assembly and end sealing accessories for S, SF, SR, SRC, SO, SFO, SK, SBTB frames and GHM frames.
- Each Roxtec wedgekit pack consists of one wedge 120, five stayplates 120, one lubricant and multilingual assembly instructions.
- **Roxtec wedgekit components can also be bought individually.**

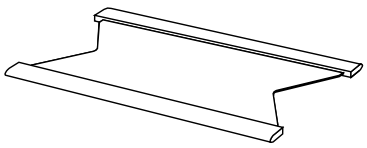
## Roxtec wedge



| | |
|---|---|
| Type: | Wedge 120 or wedge 60 |
| Material, main body part: | EPDM rubber |
| Material, fittings and bolts: | Galvanized steel or acid proof stainless steel |

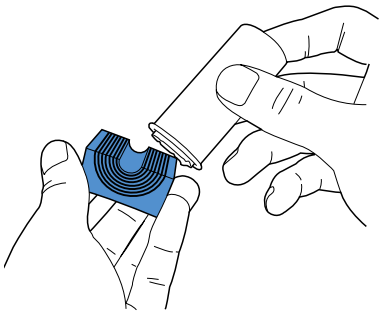
- Roxtec wedge is a compression unit for S, SF, SR, SRC, SO, SFO, SK, SBTB and GHM frames.
- Roxtec wedge 60 and related components, such as stayplates, are bought individually and used for S frames in the following combinations: 1x1, 3x1, 5x1 and 7x1.

## Roxtec stayplate



| | |
|---|---|
| Type: | Stayplate120 or stayplate 60 |
| Material: | Galvanized steel, acid proof stainless steel or aluminum |

# Lubricant

| Material: | Natural tallow |
|---|---|

- Natural tallow is used to lubricate the sealing modules and the inside of the frame. This provides a secure seal and facilitates installation.

# Roxtec installation tools

- Pre-compression tool (fig. 1) is a solution when help is needed to hold modules and stayplates in place during installation.
- Pre-compression wedge (fig. 2) is an option when pre-compression is needed to create room for the wedge.
- Stayplate clamps (fig. 3) for horizontal installations. To be used with RM stayplates, minimum width 120 mm.
- Stayplate clip (fig. 4) for use with RM stayplates, minimum width 120 mm.

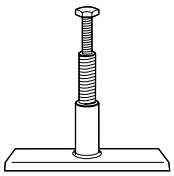


Fig. 1

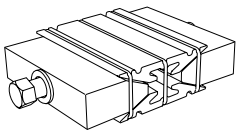


Fig. 2

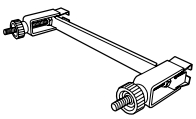


Fig. 3

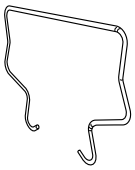
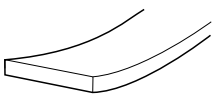
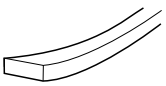
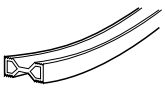


Fig. 4

# TSL sealing strip





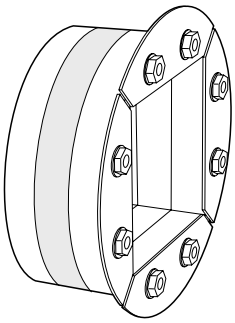


| Type: | TSL 60x5 | TSL 15x6 | TSL 50x18 |
|---|---|---|---|
| Dimensions (mm): | 60x5 | 15x6 | 50x18 |
| Material: | Roxylon rubber | EPDM cell rubber | Roxylon rubber |
| Recommended to use with: | SF frame | SF and GHM frame | SF frame |

- TSL sealing strips for use with flanged frames.

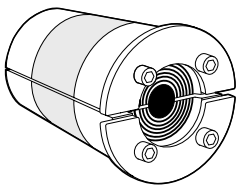
# Roxtec products for shielded solutions

Roxtec's standard frames, if properly grounded, can be used with EMC modules in EMC applications. However the design of the R frame and RS seal makes it necessary to use special EMC versions.



## Roxtec R EMC frame

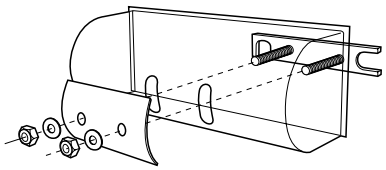
- The R EMC has a conductive foil that runs through the rubber body. The foil of the modules and the frame creates a current path.
- Depending on desired protection the R EMC frame is filled with either ES or PE modules, see page 48-49.
- A grounded sleeve must be used in order to provide a path to ground.



## Roxtec RS EMC seal

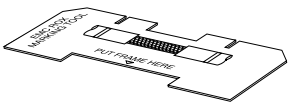
- The RS EMC comes in two versions, ES and PE. Both the ES and PE versions have conductive foil which establishes a full 360 degrees low transfer impedance contact with each individual cable screen, thereby leading the induced disturbances via the frame to ground.
- Apart from the conductive foil the ES also has a conductive rubber screen, which effectively shields against electromagnetic fields.
- The RS ES and RS PE must be used in conjunction with a properly grounded sleeve.

# Roxtec wedge cover ES



- The Roxtec wedge cover ES is carefully designed to prevent airborne electromagnetic disturbances and is fitted to the wedge.
- Wedge cover ES is available in yellow chromated mild steel or electro-polished stainless steel.

# Roxtec EMC marking tool




- A quick and easy to use gauge which shows you where to strip sheets on penetrating cables in a frame, and to add check marks on the cable before assembly to make sure that the cable and uncovered cable screen is positioned correctly inside the module.

# Roxtec RM ES and RM PE modules

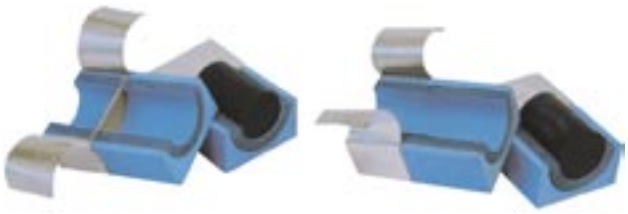
The RM ES and RM PE modules have a conductive foil which establish a full 360 degrees low transfer impedance contact with each individual cable screen, thereby leading the induced disturbances via the frame to ground. The ES version has a conductive rubber screen, which effectively shields against electromagnetic fields.

| Standard modules | For cable/pipe diameter (mm) | External dim. (mm) (height x width x depth) |
|---|---|---|
| RM 20 ES or PE | 0+4-14.5 | 20x20x60 |
| RM 30 ES or PE | 0+10-25 | 30x30x60 |
| RM 40 ES or PE | 0+22-32.5 | 40x40x60 |
| RM 60 ES or PE* | 0+28-54 | 60x60x60 |
| RM 90 ES or PE* | 0+48-71 | 90x90x60 |
| RM 120 ES or PE* | 0+67.5-99 | 120x120x60 |

| Additional modules | For cable/pipe diameter (mm) | External dim. (mm) (height x width x depth) |
|---|---|---|
| RM 15 ES or PE | 0+3.5-10.5 | 15x15x60 |
| RM 15w40 ES or PE | 3x0+3.5-10.5 | 15x40x60 |
| RM 20w40 ES or PE | 2x0+4-14.5 | 20x40x60 |
| RM 40 10-32 ES or PE | 0+9.5-32.5 | 40x40x60 |

*RM 60 ES or PE, RM 90 ES or PE and RM 120 ES or PE are also available without solid center core.

- Minimum accommodation diameter of the module refers to the minimum cable screen diameter.
- Maximum accommodation diameter of the module refers to the maximum cable sheath diameter.
- The RM ES and RM PE modules are also available as solid compensation modules.



# Roxtec RM ES B and RM PE B modules

ES B and PE B modules differ from ordinary ES and PE modules by having the conductive foil attached to the back of the module instead of the center. These modules are appropriate when protection from hazards, such as water and gas, are needed from one side only. Installation is made easier.

| Standard modules | For cable/pipe diameter (mm) | External dim. (mm) (height x width x depth) |
|---|---|---|
| RM 20 ES B or PE B | 0+4-14.5 | 20x20x60 |
| RM 30 ES B or PE B | 0+10-25 | 30x30x60 |
| RM 40 ES B or PE B | 0+22-32.5 | 40x40x60 |
| RM 60 ES B or PE B | 0+28-54 | 60x60x60 |
| RM 90 ES B or PE B | 0+48-71 | 90x90x60 |
| RM 120 ES B or PE B | 0+67.5-99 | 120x120x60 |

| Additional modules | For cable/pipe diameter (mm) | External dim. (mm) (height x width x depth) |
|---|---|---|
| RM 15 ES B or PE B | 0+3.5-10.5 | 15x15x60 |
| RM 15w40 ES B or PE B | 3x0+3.5-10.5 | 15x40x60 |
| RM 20w40 ES B or PE B | 2x0+4-14.5 | 20x40x60 |
| RM 40 10-32 ES B or PE B | 0+9.5-32.5 | 40x40x60 |

■ The RM ES B and RM PE B modules are also available as solid compensation modules.

# Welding and insulation

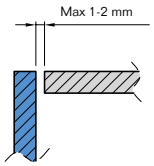
There are two important matters when it comes to installing a transit that must not be overlooked; welding and insulation.

Welding and insulation are important in order to get your Roxtec transit to function safely. The information on the following pages should be seen as general examples of how this should be done.

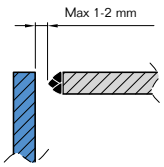
It is important that the specific certificates that are used in each project always are followed. They are based on placement, size and type of installation, as well as the amount of cables or pipes.

For more information on installation of frames please refer to the Roxtec frame installation manual. ■

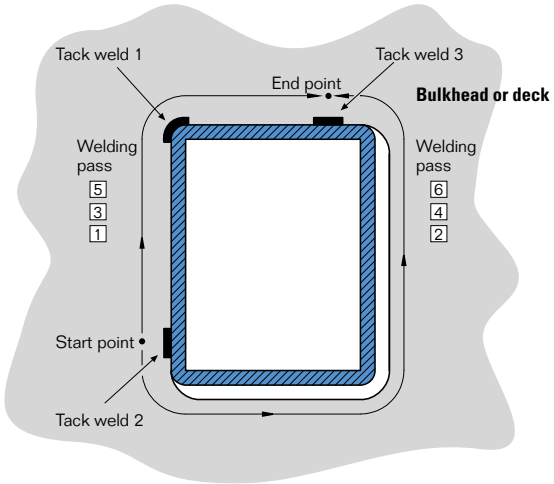
# Welding examples

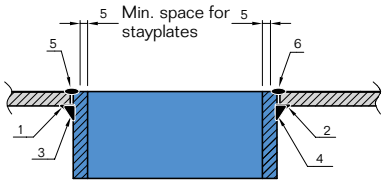



Max allowable root gap for fillet joint.



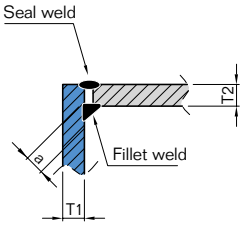

Buttering of fillet joint. Buttering shall be performed on the deck/ bulkhead.




The example depicts two passes fillet-weld.

Important: Weld pass no. 5-6 is not to be started until welding no. 1-4 are completed and the temperature of welding pass no. 1-4 has cooled down to min. preheat temperature.

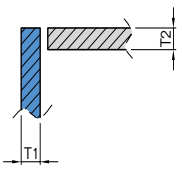



| Fillet weld – weld sizes |
|---|
| When T2 ≥ T1a ≤ 0.7xT1 but max 7 mm<br>When T2 < T a ≤ 0.7xT2 but max 3 mm |
| a = required fillet weld size (mm)<br>T1 = thickness frame plate (mm)<br>T2 = thickness deck or bulkhead plate (mm) |
| Frames: multipass welding is required if a ≥ 5 mm |

| Mild steel welding, preheat temperature | |
|---|---|
| Combined thickness (mm) | Minimum preheat temperature |
| 50 and less<br>80 and less | 10° C<br>50° C |

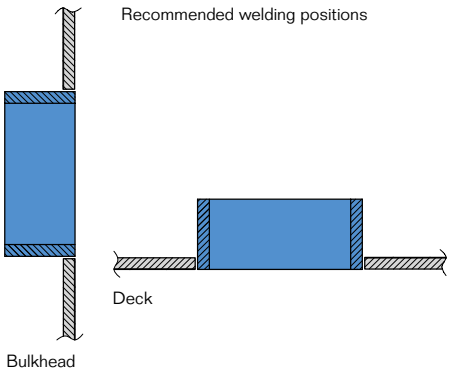
| Aluminum welding, preheat temperature | |
|---|---|
| Combined thickness (mm) | Minimum preheat temperature |
| 25 and less<br>30 – 50 | 10° C<br>50° C |

Stainless steel welding, no preheat




Combined thickness = T1+T2

Recommended welding positions



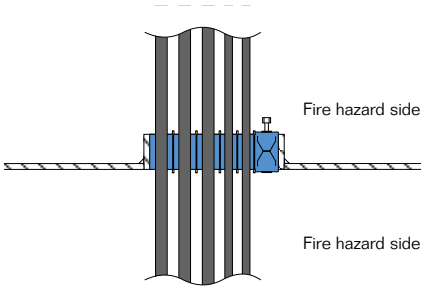
# Insulation examples

Roxtec's products for marine and offshore applications are tested according to IMO 754 (18) for use in A- and H-class bulkheads or decks.

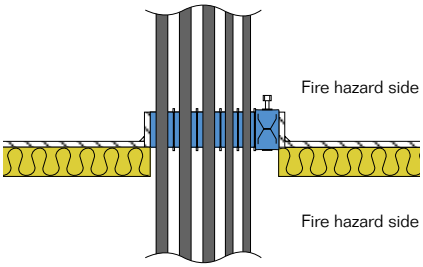
- Guidance regarding insulation should be sought from the individual certificate for each project.

## Deck

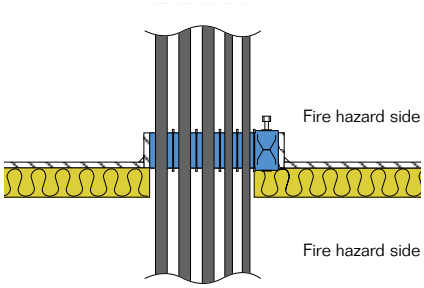
### A-0



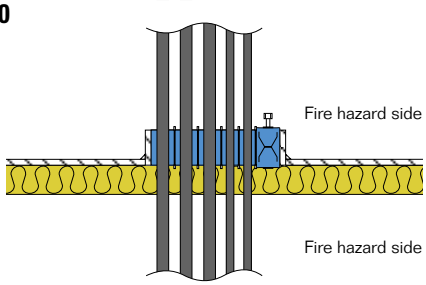

### A-60




### H-60

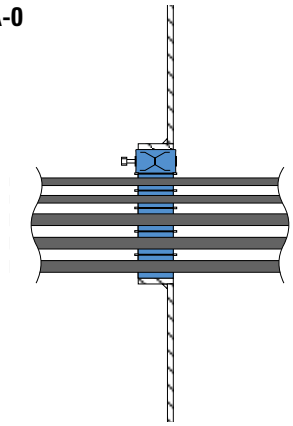



### H-120



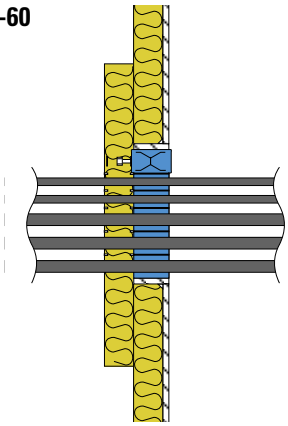
## Bulkhead

### A-0



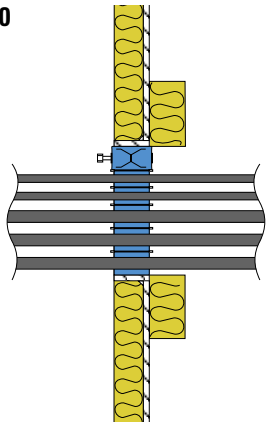
Fire hazard side Fire hazard side

### A-60



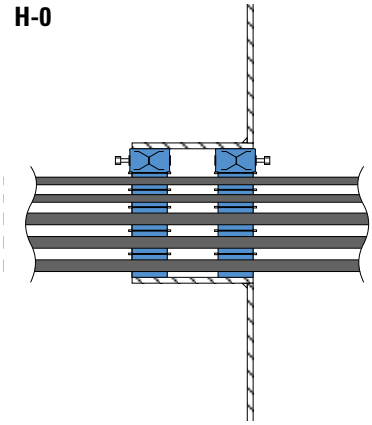
Fire hazard side Fire hazard side

### A-60



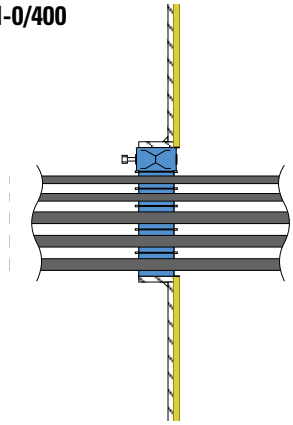
Fire hazard side Fire hazard side

### H-0



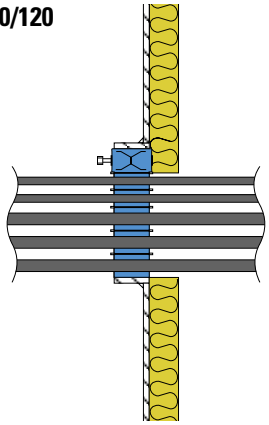
Fire hazard side

### H-0/400



Fire hazard side

### H-60/120



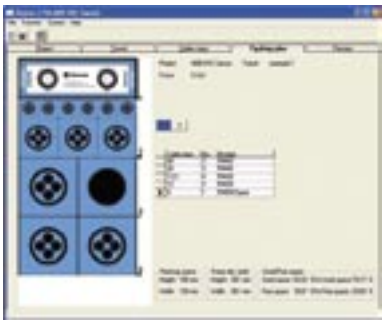
Fire hazard side

# Transit planning tools

How many cables can be fitted into a frame and which modules should be used? These questions are easiest answered by drawing a transit plan.

**Designing a transit**
For Roxtec this can either be done manually, by use of the packing plans at page 56-57, or by using software. The Roxtec Cable Transit Manager (CTM) is a software that makes it easy to plan a cable installation in the marine and offshore industry.

**Cable Transit Manager**
The user-friendly CTM software assists designers and installers in planning a Roxtec installation. The program also provides two additional advantages: easier purchasing with quick and easy material list print-outs and easier installation with pre-planned packing print-outs.



The designer fills in the amount of cables and their sizes, or simply imports an Excel file or text file into the software, and the software automatically creates a packing plan. An opening can be designed with spare capacity included. It is also possible to plan the transit manually.

Once completed, the designer simply prints out a materials list from the packing plan and the purchasing department can use it to order the required components. A complete transit plan can also be printed which means that you get a useful installation aid. There is even a possibility to identify each cable in the transit.

The transit plan can then be saved in .dxf format that allows import into CAD drawing sotfware. CTM is compatible with Windows 95, 98, ME, XP and Windows NT 4.0, 2000 platforms.

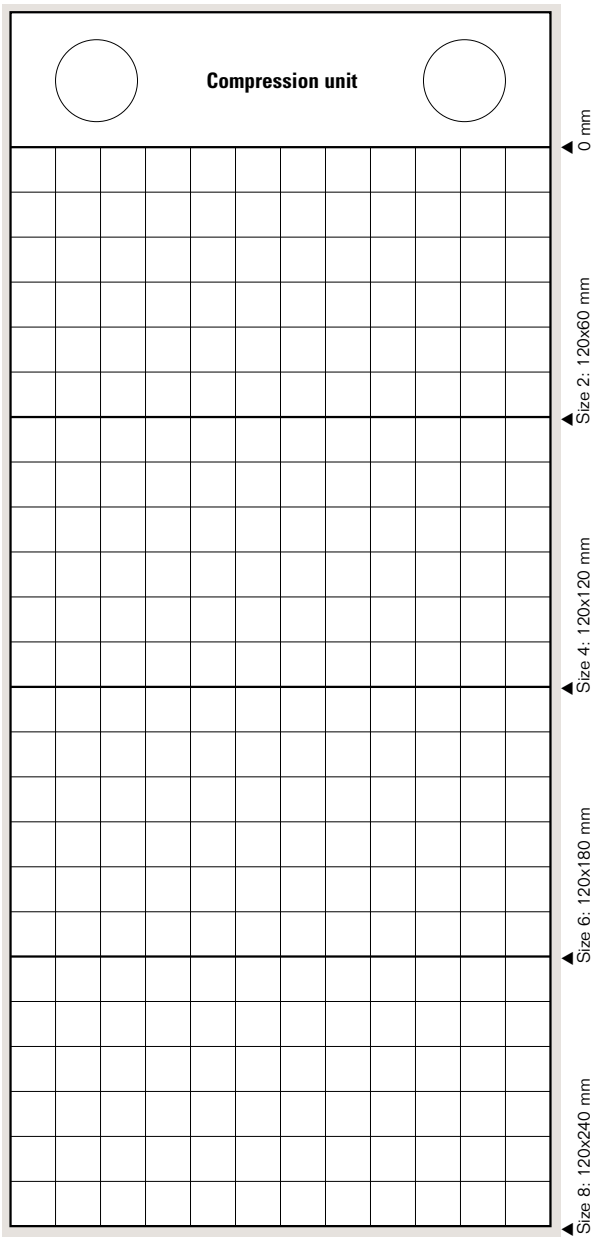
### Manual packing plans

An alternative is to draw a packing plan by hand. Determine from the technical pages, which frames and modules to use. Use the packing plans at the following pages to design the packing space. Note the numbers and sizes of selected modules and draw the packing plan. Try to place the larger cables and modules at the bottom of each frame if possible. Use a packing plan for each transit. Be sure to mark the plans with identifications according to your project. ■

# Packing plan for S series and GHM frames

Fill the frames packing space with RM modules. The diameter of the cables and pipes decides which modules are the most appropriate to use. ■

### Roxtec S and GHM frames




Grid size 1 square = 10x10 mm

### Cables/pipes

| Ø (mm) | Quantity | Module |
|---|---|---|
| | | RM |
| | | RM |
| | | RM |
| | | RM |
| | | RM |
| | | RM |
| | | RM |
| | | RM |
| | | RM |
| | | RM |
| | | RM |
| | | RM |
| | | RM |
| | | RM |

### Standard RM modules

| Cable/pipe Ø (mm) | Module | HxW (mm) |
|---|---|---|
| 0+4-14.5 | RM 20 | 20x20x60 |
| 0+10-25 | RM 30 | 30x30x60 |
| 0+21.5-34.5 | RM 40 | 40x40x60 |
| 0+28-54 | RM 60 | 60x60x60 |
| 0+48-71 | RM 90 | 90x90x60 |
| 0+67.5-99 | RM 120 | 120x120x60 |

### Additional RM modules

| Cable/pipe Ø (mm) | Module | HxW (mm) |
|---|---|---|
| 0+3.5-10.5 | RM15 | 15x15x60 |
| 3x0+3.5-10.5 | RM 15w40 | 15x40x60 |
| 2x0+3.5-16.5 | RM 20w40 | 20x40x60 |
| 0+9.5-32.5 | RM 40 10-32 | 40x40x60 |

Roxtec

# Packing plan for R frames

Fill the frames packing space with RM modules. The diameter of the cables and pipes decides which modules are the most appropriate to use. See diameter range for each module on page 42-43. ■

**Cables/pipes**

| Ø (mm) | Quantity | Module |
|---|---|---|
| | | RM |
| | | RM |
| | | RM |
| | | RM |
| | | RM |
| | | RM |
| | | RM |
| | | RM |
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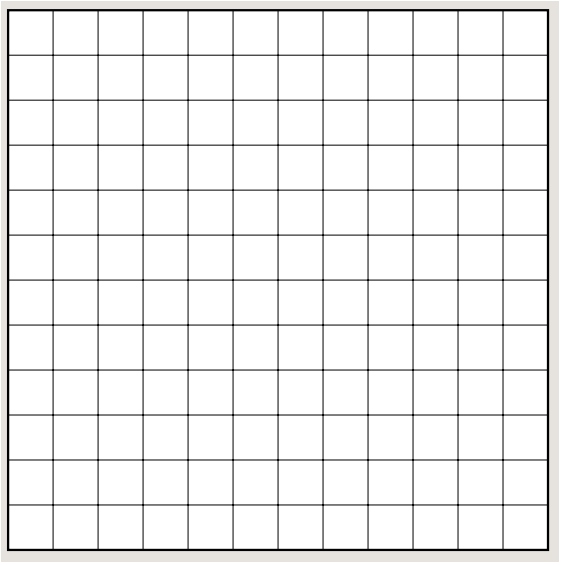
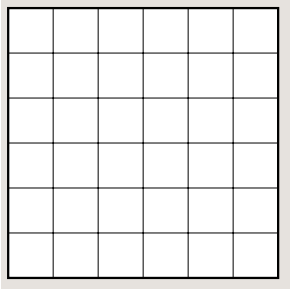
| | | RM |

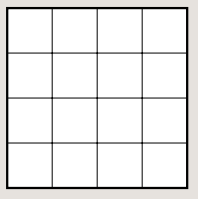
**Roxtec R 200**
packing space 120x120 mm



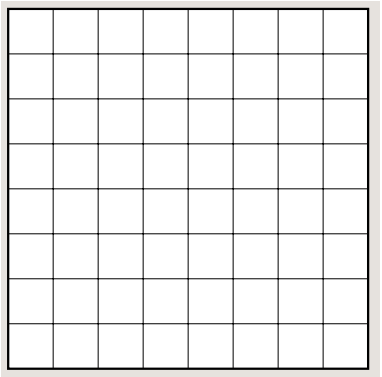
**Roxtec R 100**
packing space 60x60 mm



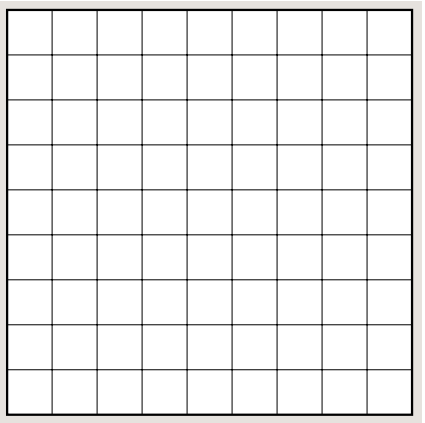
**Roxtec R 70/R 75**
packing space 40x40 mm



**Roxtec R 125/R127**
packing space 80x80 mm



**Roxtec R 150**
packing space 90x90 mm



Grid size 1 square = 10x10 mm

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