



## **Cable and pipe transits**

FOR OFFSHORE OIL AND GAS APPLICATIONS

**We Seal Your World™**

#### **ABOUT ROXTEC**

- World leader in seals for multiple cables and pipes
- Founded in Sweden in 1990
- Inventor of Multidiameter™
- Local support in more than 70 markets
- Certified according to ISO 9001/14001 and EN 13980
- More than 250 product certifications and safety listings



# Ensure safety and operational reliability

Roxtec cable and pipe seals are recommended by oil and gas rig owners and operators as well as by design engineers, shipyards, installers and offshore service companies worldwide. Our solutions bring superior protection and meet the high safety demands in the offshore industry. Roxtec simplifies everything from greenfield design and installation through to brownfield maintenance and upgrades.

Our seals are certified to protect life and assets against fire, blast load, vibration, gas, salt, dust, and water. They can also prevent the risk of explosion or pull-out and provide safe solutions for EMC, bonding and grounding. The aim is always to reduce operational hazards and maintain peace of mind.

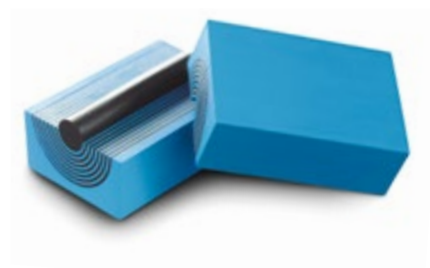
## Easy to use

Roxtec seals are made to save engineering time. We offer the free web-based tool Roxtec Transit Designer™ to simplify product selection and improve the entire process of planning, installing and inspecting. Our concept speeds up installation and minimizes the need for stock

and logistics. Just specify Roxtec if you want to hold down the total cost of ownership and increase your return on investment!

## Efficient upgrades

Most of our seals are adaptable to single or multiple cables and pipes of different sizes. They provide built-in spare capacity for quick changes at the yard, smooth maintenance during operation and cost-efficient brownfield upgrades, which is beneficial throughout the lifecycle of your offshore unit. Select us as your partner providing installation training, quick deliveries and onsite inspection services.



**DESIGN**

**CONSTRUCTION**

**MAINTENANCE**

**RETROFIT**

GREENFIELD

BROWNFIELD

Roxtec represents safety and simplicity all the way from design, engineering and purchasing through to installation, inspection, service, maintenance and retrofit.



# Covering many sealing needs



## ELECTRICAL MOTORS, CRANES, PUMPS AND OTHER EQUIPMENT

Safe and reliable solutions for continuous operation. The Roxtec system design makes it easy to route cables with terminations.

### Values

- Easy installation/termination of cables thanks to modular system that adapts to cables and pipes of different sizes
- Protects the cables from vibrations
- IP and UL/NEMA rated
- Reliable protection for salty environments
- EMC solution available
- Ex solution available

## EMC AND BONDING AND GROUNDING SOLUTIONS

Solutions for frequency converters, remote I/O and other disturbing or sensitive equipment as well as for termination of conduits, armored and metal clad cables in control cabinets and junction boxes.

### Values

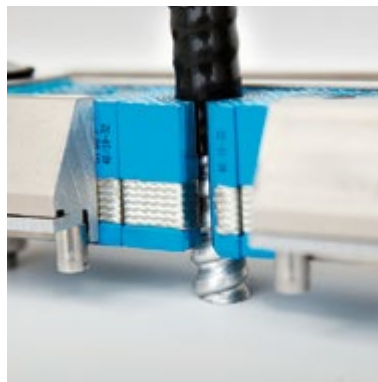
- Protection against electromagnetic threats
- IP and UL/NEMA rated
- Area efficient – route more cables using less space
- Save time by designing openings instead of cable configurations
- Certified electrical safety
- Lightning protection
- Fire rated, gas- and watertight

## HAZARDOUS AREAS

Well-proven solution for use between hazardous (Ex) and safe areas providing protection for Ex rated cabinets and equipment.

### Values

- Protection against the risk of explosion
- Approved for use in hazardous locations
- Certified according to the ATEX Directive and the IECEx, International Certification Scheme
- National Ex certificates for different markets



Roxtec has a wide range of cable and pipe sealing solutions developed to meet the varying requirements on all types of offshore rigs and vessels. You can use the seals in decks, bulkheads, cabinets and enclosures – wherever there is a demand for safety and a capability of sealing single or large quantities of cables or pipes. Discover some application examples below, and find out more on the following pages.



### **CABLE TRANSITS IN DECKS AND BULKHEADS**

Round and rectangular solutions for sealing of cables through decks and bulkheads in all areas of a rig or platform.

#### **Values**

- Certified protection against water, gas and fire (A, H class and Jet-fire)
- Easy to adapt to cables of different sizes
- Frame with rounded corners available for stress exposed bulkheads
- Frames and sleeves available in different materials such as mild steel, aluminum and stainless steel
- Frames and sleeves available in different shapes to fit varying hole dimensions

### **PIPE TRANSITS IN DECKS AND BULKHEADS**

Easy-to-install solutions for metal and plastic pipes.

#### **Values**

- Gasket, watertight and fire-proof in one solution
- Vibration damping for long-term protection
- Adapted solutions for flanged pipes
- Off-center solutions available

### **RETROFIT SOLUTIONS**

Flexible sealing solutions that simplify modifications, repairs and upgrades.

#### **Values**

- Ability to add or change cables or pipes
- Optimize for long-term performance
- Certified non-weld solutions for offshore units in operation
- Versions for limited space and irregular angles
- Openable frames to fit around existing cables or pipes
- Possibility to design for extra capacity



# Certified protection

Do you fear a fire, water flooding between compartments or even an explosion? Specify our sealing solutions and let them bring peace of mind to your project.



Roxtec seals have undergone hundreds of officially registered tests and approvals and received more than 250 certificates showing their excellent performance, integrity and resistance to hazards. We are thereby the proven leader within cable and pipe penetration seals – and able to meet any global or local demand.

## Reliable protection

Roxtec products are fire tested and approved for use in A, B, H class and Jet-fire rated sections according to IMO Res. A.754 (18), ISO 22899-1, SOLAS Ch. II-2 Regulation 9.3, and tightness tested according to DNV type approval program 8-471.19-1. Our solutions are also

certified for use in ATEX/IECEX rated areas and in EMC applications.

## Verified by inspectors

Roxtec solutions are certified by the world's leading classification societies such as Lloyd's Register of Shipping, American Bureau of Shipping, Bureau Veritas, DNV-GL and Russian Maritime Register of Shipping.

## Total safety awareness

Our product development is supported by our testing procedures. We have our own test lab, including fire lab, and we perform third part witnessed tests as well as testing of our products externally.

### TESTED AND APPROVED

- A and B class fire (standard, fibrous)
- H class fire (hydrocarbon, oil-based)
- Jet-fire
- Water pressure tests
- Gas pressure test
- Pull-out tests
- Periodic cycling
- IP rating tests
- EMC testing
- Vibration testing and analyzing



Roxtec seals are qualified for any challenge. You can find more information in our Tests and Certificates brief and in our Product Database on [www.roxtec.com](http://www.roxtec.com).

# Roxtec Transit Designer™

The Roxtec Transit Designer™ is a free, web-based engineering tool. It allows auto-planning, drives project efficiency and reduces the risk of mistakes in all project phases.

The Roxtec Transit Designer™ simplifies product selection as well as the entire process of designing, purchasing and installing cable and pipe transits. Its batch import with auto validation feature helps designers create and update thousands of transits automatically and take full control of their largest project designs. They can also validate their complete project by using the Roxtec CAD symbols and the Roxtec Transit Designer™ for easy incorporation of transits into the design of the entire rig.

## **Always available, everywhere**

The Roxtec Transit Designer™ is accessible online. You can share your work with project teams anywhere in the world, and Roxtec experts are always available through the chat function. To start using it, just register on [www.roxtec.com](http://www.roxtec.com).

## **Features**

- Free web-based application, available online
- Simple product selection
- Copy and paste for cable or pipe schedule inputs
- Manufacturer-approved engineering outputs
- Improves project efficiency and flexibility
- Batch import with auto validation
- Import multiple transits to speed up design work
- Reduces project risks



### **SIMPLE USER INPUT**

Cable/pipe schedule or estimates  
Sealing/certification requirements  
Installation preferences  
Material quality selection

### **APPROVED OUTPUT**

2D drawings in DXF and PDF  
3D STEP  
Bill of material in Excel  
Installation instructions



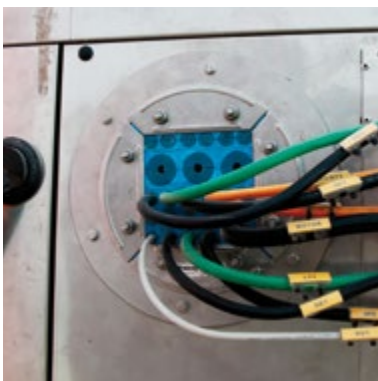
# Cable entry solutions for decks and bulkheads

Roxtec cable transits for decks, bulkheads, floors and walls are successfully used in the offshore industry. They protect against fire, gas, water and even blast. The demands vary from rig type to rig type and from area to area. We provide optimized sealing solutions for all applications and requirements – including frames that can be bolted instead of welded to the structure.

When your project requires multiple cables penetrating structures that must meet certain ratings, even EMC and Ex, Roxtec is your one-source solution. Our solutions for multiple cables require less space than cable glands and provide more flexibility for expansion and maintenance than other sealing methods.

## A wide range of solutions

Roxtec frames are available in different designs and materials, and can be attached to the structure through bolting, welding or fitting into sleeves. Roxtec sealing modules in six sizes cover a cable diameter range of 3 to 99mm (0.118"-3.898") and the mechanical compression is secured by the Roxtec Wedge.



The Roxtec R and RS solutions are fire-proof, watertight and available in corrosion resistant material. They are available either with flanged sleeves to be bolted or non-flanged sleeves to be welded to decks or bulkheads.



Stress exposed bulkhead. Roxtec SRC has rounded corners to reduce stress in bulkheads around cable penetrations. Available in different versions and dimensions.



Frames that can be bolted to the structure, like the Roxtec SFHM, are suitable for insulated panels and sandwich or non-weld demand installations.



### Wall/bulkhead types

Roxtec has standard products to provide your project with a turnkey sealing solution for walls or bulkheads.

- Pre-fabricated/insulated walls
- Corrugated metal
- Steel and aluminum (bulkhead)

### Floor/deck types

Roxtec solutions meet the construction and protection requirements for the floor and deck entries of your project.

- Steel and aluminum (deck penetrations)
- Steel (E-house entries)



The Roxtec S frame – our standard frame for welding – is available in many versions, sizes, and back-to-back solutions.



The Roxtec SK (raised) is used when there is a need for a deeper frame, like for a thicker bulkhead or a frame that needs to be raised above the deck (kickplate).



The Roxtec CHP (Catastrophic High Pressure) is a solution for use where you have temporary higher requirements. It is used in projects such as columns and pontoons of semi-sub rigs, and SPAR platform hull structures.

# Pipe entry solutions

Roxtec seals protect pipe applications against fire, water ingress and gas. They are designed to maintain the integrity of various types of fire rated decks and bulkheads after they have been penetrated by piping systems.

We have developed a wide range of seals for pipes of different materials such as steel, copper, stainless steel, plastic, multilayer and glass fiber in order to provide solutions that fit the relevant requirements for fire integrity and water pressure.

## Smart solutions

With a portfolio of pipe sealing solutions ranging from single to multiple penetrations and from 3.6mm up to 580mm in diameter, we have the ability to meet your pipe sealing

needs. For example, to reduce the need for welding during the installation process, we have developed non-welding pipe sealing products.

## Easy installation

In addition, Roxtec is able to provide solutions that can be installed from only one side of the deck or bulkhead to increase flexibility within the installation process. We have considered all your needs – in greenfield as well as brownfield projects.

- Flexible solutions
- Solution choices to fit applicable requirements
- Single or multiple metal and plastic pipe penetrations
- Certified protection for various types of metal and thermoplastic pipe
- Single side installation benefits
- Certified fire, water and gas protection



Roxtec RS seal – for a single metal pipe.



Roxtec S frame – multiple metal pipe penetrations through a single square or rectangular opening in the deck or bulkhead.

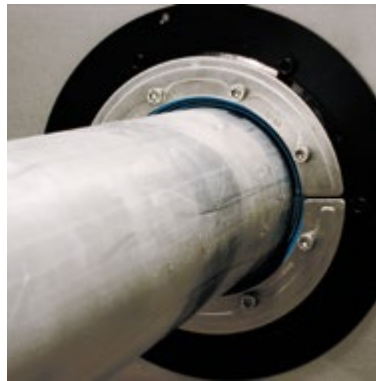


The Roxtec Sleeve-it™ Fire penetration seal is a single side installation solution which protects single plastic pipe penetrations against fire hazards. Its openable aspect specifically benefits retrofit as well as new-build projects.

# Metal pipe solutions

Roxtec provides first class sealing solutions for single and multiple metal pipes. Platform operators and shipyards can rely on the excellent fire-stopping and watertight features of our systems to ensure high degrees of safety and security.

Roxtec transits for metal pipes are available in a wide range of types and sizes for various environments and uses. There are frames for circular or rectangular openings as well as frames specifically designed to maintain the structural integrity of certain openings when located in high demand areas.



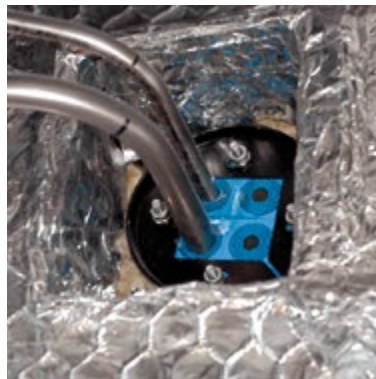
Roxtec RS X seal – single metal pipe installed without any need for welding or drilling holes for the bolts during the installation process.



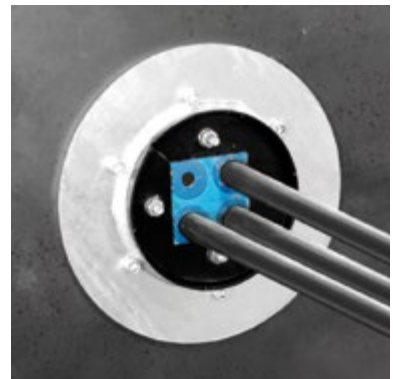
Roxtec RS OMD seal – single metal pipe in a non-standard sized sleeve. A perfect solution for brownfield installations where the new pipe is being routed through existing sleeves.

## EXAMPLES OF APPLICATION AREAS

- Mud pump pipelines
- Potable water pipes
- Waste water pipes
- Ballast water system pipes
- Chilled water pipes
- Hydraulic pipes
- Pneumatic pipes
- Transfer and distribution pipes
- Sprinkler and CO2 system pipes
- Venting system pipes



Roxtec R frame – multiple metal pipe penetrations through a single circular opening in the deck or bulkhead.



Roxtec R X seal – multiple metal pipes installed without any need for welding during the installation process.

# Plastic pipe solutions

Roxtec plastic pipe seals are available in a wide range of styles and sizes.

Seals can be fitted for circular or rectangular openings and for either single or multiple plastic pipe penetrations.

Plastic pipe penetration seals require an additional level of protection. In the event of a fire, the plastic pipe will melt, disappear and leave a hole in the deck or bulkhead through which the fire can spread into the next compartment. Roxtec solutions for plastic pipes react during a fire in order to block the hole created by the disappearing plastic pipe, and to reduce the risk of the fire spreading.

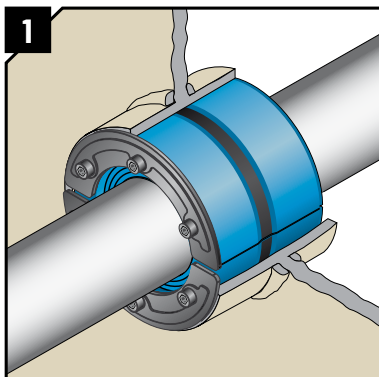
Roxtec Sleeve-it™ solutions and the Roxtec R and RS PPS series contain a compound mix of intumescent based material. When exposed to the high temperatures of a fire, the intumescent based material reacts by expanding many times its original volume. This creates a pressure inside the sleeve or casing, crushes the softening pipe to form a plug of material which fills the seal, and blocks the opening to stop the fire and smoke from spreading into the next room.

## EXAMPLES OF APPLICATION AREAS

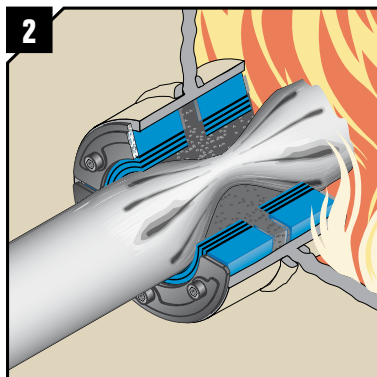
- Potable water pipes
- Waste water pipes
- Ballast water system pipes
- Fresh water generation and treatment systems
- Sprinkler system pipes
- Venting system pipes

## How it works

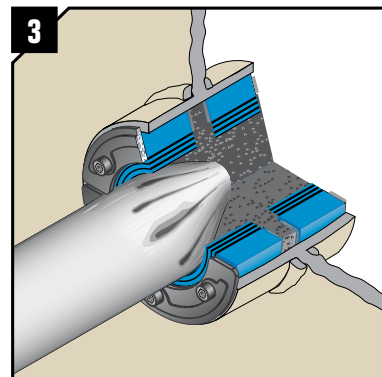
The example shows the Roxtec RS PPS/S in action. The functionality of the Roxtec plastic pipe solutions is fundamentally the same.



The Roxtec RS PPS/S seals the thermoplastic pipe against leakage of water and gas through the steel division. Inside the seal, we have added an intumescent material reactive to fire.



This material will expand and close the middle void of the pipe whenever exposed to high temperatures, such as during a fire.



Should a fire occur and the plastic pipe start to burn and melt, the opening will close completely to prevent fire and smoke from spreading through the bulkhead or deck.



# Simplifies the use of plastic pipes

To overcome the issue of softening plastic pipe during a fire, Roxtec utilizes the SE PPS extension frame as an accessory to the standard S frame. Inside the extension frame is a layer of intumescent based material which will react in a fire the same way as for the single plastic pipe solutions. The concept encases Roxtec modules and also allows you to include extra capacity for future plastic pipe installations.

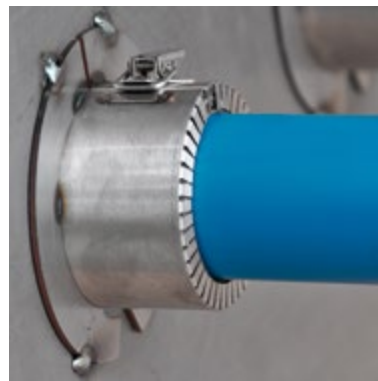
Roxtec solutions make it easy for owners and shipyards to use plastic pipes which may lead to lighter vessels or structures, lower fuel costs, less corrosion issues and reduced maintenance costs. Our plastic pipe sealing solutions are not only tested and certified safety products. They are also contributing to a safe and secure method of reducing the total cost of ownership for our customers.



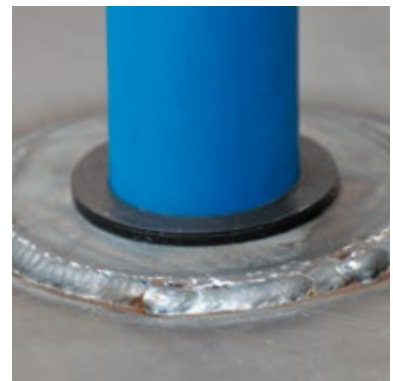
Roxtec SE PPS extension frame – multiple plastic pipe penetrations through a single square or rectangular opening in the deck or bulkhead.



Roxtec RS PPS (back-to-back solution) – single plastic pipe penetration through a circular opening in the deck or bulkhead.



Roxtec Sleeve-it™ Fire penetration seal – single plastic pipe penetration through a circular opening in the deck or bulkhead. The openable aspect of the design benefits brownfield as well as greenfield projects.



The Roxtec Sleeve-it™ Watertight penetration seal is a circular solution which protects single plastic pipe penetrations against the risks of fire and water.

# Roxtec transits in cabinets and enclosures

Use our multi-cable entries for your cabinets, junction boxes and other electrical and instrumentation enclosures. Save money and size on your enclosures and reduce engineering hours spent on cable data and gland configurations.

Roxtec solutions allow for very high cable density. Designers and engineers can reduce the number, size and weight of cabinets and concentrate on designing openings instead of cable configurations if there is limited access to cable data.

## Replacing cable glands

Roxtec seals are a direct replacement to cable glands in hazardous and industrial applications. One

cut-out is enough for sealing dozens of cables. You gain space by sealing multiple cables in one opening. In fact, you can increase cable capacity by up to 40 percent when comparing to traditional cable glands!

## More cables, less cabinet

With Roxtec compact and lightweight solutions, you seal more cables in a smaller area than with any cable gland system. Reduce

the need for multiple knock-outs in cabinets, for cut-outs in walls and floors, and for heavy metal cable glands. Cut costs instead of holes and eliminate errors due to all removing and re-attaching of cable connectors.



Terminal and junction boxes. The Roxtec GHM in stainless steel is a popular choice for bolting to cabinets (while the Roxtec S frame is used when welding is preferred). It is suitable for indoor as well as outdoor applications and available in both Ex and EMC versions.



The Roxtec HD 32 is our new lighter frame, a bolted alternative that is suitable for both indoor and outdoor applications. It is also available in a version for EMC.



Power distribution panels and switchboards. The Roxtec GHM is frequently used as it simplifies design and accommodates a large amount of cables. It is bolted to the enclosure. There are also openable Roxtec frames available if there is a need to fit around existing cables.

### Solutions for specific needs

Roxtec cable entries also exist in versions for hazardous locations (Ex) as well as for areas demanding solutions for bonding, grounding and electromagnetic compatibility (EMC). We often work in close cooperation with instrument and electrical engineers in order to find, provide and even create the optimal sealing solutions for their control cabinets, junction boxes and other electrical enclosures.

### Ready for changes

The Roxtec flexibility further reduces the time and labor needed since the seals have built-in spare capacity making them ready for last minute changes. It is never too late to add cables in your cabinets. With Roxtec, you can secure, seal and protect equipment within stainless steel, metal, plastic and composite enclosures.



Control and safety systems. Roxtec provides a range of options making it possible to seal more cables in smaller cabinets.



Remote I/O. Use our Ex classified EMI solutions to seal large quantities of cables.



Indoor enclosures in offshore environment. Roxtec has a wide range of solutions available to seal from IP4x to IP67, as well as Ex and EMC versions in different frame materials. This picture shows a Roxtec C KFO, a plastic frame that handles large amount of cables in a small footprint.

# Roxtec transits in offshore equipment

Roxtec sealing solutions for cables and pipes are beneficial for both original equipment manufacturers and end-users.

The earlier you specify and design-in Roxtec seals, the better. The benefit of the Roxtec flexibility is that you can manufacture cabinets, machines and equipment without knowing the exact cable or pipe configurations in advance. You might manage with fewer and smaller cabinets, and the installers can quickly, easily and safely seal multiple pre-terminated cables of different sizes in the same opening.

## **Better space management**

Whatever you produce, it is convenient to work with neat and area-efficient cable seals. The Roxtec design simplifies everything from installation to maintenance. The flexibility even allows you to seal at the factory and modify or upgrade onsite.

## **Tested and approved**

Generator and turbine components, for example, might have to withstand

exposure to fire, gas, water, salt and electromagnetic interference. The solution is to standardize with Roxtec seals: our system is tested and approved for offshore safety requirements.



Motors, generators and thrusters – Roxtec provides sealing solutions for continuous reliable operation. Ex and EMC versions available.



Pumps – Roxtec seals allowing multiple cables of all different kinds in one opening. Ex and EMC versions available.



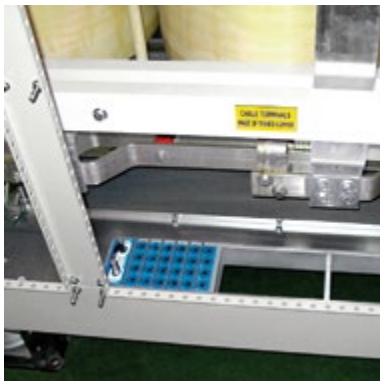
Cranes – corrosion-proof, watertight solutions from Roxtec covering many cable sizes and sealing requirements.



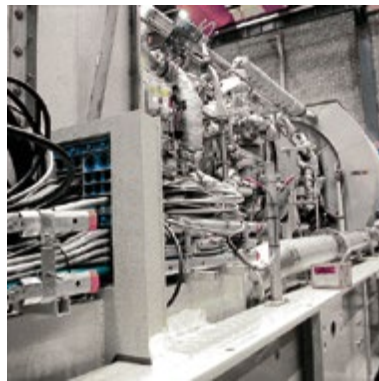


### Long-term benefits

Our seals are easy to inspect and suitable for a wide variety of applications in control cabinets, motors, and generators. Install them before or after routing cables – and open them up anytime to perform maintenance or improvements.



Transformer terminal boxes – Rextec sealing solutions provide flexibility when it comes to cable amount, diameters and installation compared with glands when routing many stiff power cables.



Turbines – Rextec sealing system for use in various applications in turbine package such as skids, enclosures and sandwich panels.



Compressors – easy-to-install seals from Rextec that adapt to cables of different sizes.

# Certified for hazardous locations

The Roxtec Ex product family protects life, equipment and operations in hazardous locations, or potentially explosive atmospheres.

The Ex protection requirement often occurs in offshore oil and gas projects for equipment placed in, for example, topside production areas of FPSO's. Roxtec solutions are often used in building structures as well as in machines and E/I enclosures situated in hazardous locations.

## Our products

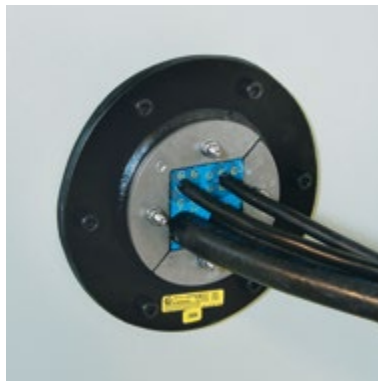
Roxtec products to be used in hazardous locations are Ex classified. For decks and bulkheads

there is no authority demand for Ex classified cable seals, so standard gas-tight Roxtec products can be used. For Ex classified machines and enclosures in hazardous locations, Ex classified cable seals are mandatory. We work with your team and inspectors to provide proper product selection and installation support based on applications. Our cable sealing system is certified according to the ATEX directive and the IECEx, International Certification Scheme.

Roxtec has also national Ex certificates for different markets. Please contact your local supplier or send an email to [info@roxtec.com](mailto:info@roxtec.com) for more information.



Roxtec Ex seals are made for use in, for example, machines or junction boxes in explosive atmospheres.



Roxtec Ex products are available in different sizes and materials. Here is a Roxtec R 100 B Ex, a round solution in mild steel that is to be bolted onto structures.



The "future included" feature ensures that Roxtec solutions provide built-in spare capacity for additional installations and upgrades.

# Roxtec solutions for EMC

The increasing use of sophisticated equipment onboard has resulted in an extensive need for protection against EMI, electromagnetic interference.

Ensuring EMC, electromagnetic compatibility, is a two way thinking process. You have to make sure your equipment is not affected by other sources of EMI and that it operates effectively without becoming a disturbing source itself.

## Multiple risk prevention

Roxtec EMC solutions can combine bonding, grounding and EMI protection with protection against fire, smoke, water, gas, explosion and

vibration. A good example is cable entries into E-houses where it is common to have separate solutions for bonding of cable armor and the fire barrier. Why use many components, labor time and space when one Roxtec system is enough? In an industry focusing on personal safety and the protection of financial investments, owners can feel safe in the knowledge that our EMC product range is performing multiple risk prevention functions at the same time.

## Electromagnetic threats

Among the high frequency threats are lightning strikes and disturbances from technical systems. Also ordinary bonding and grounding for electrical safety can be either a source for, or a protection against interference depending on the earthing system. Electromagnetic disturbances either travel conducted along a metallic object or propagate through air.

## More cables, increased EMI

Rigs and vessels have miles of cable routed through their structure. The conductive armor in a cable can carry also unwanted signals and cause interference in a system far away from the original source, so it is crucial for designers, engineers and owners or operators to consider the risk of EMI exposure. In order to eliminate such risks, ground connections must be short and have large contact areas exposed to its mating surface. With flat and wide conductors (tin-plated copper tape or braid) and a barrier embedded inside each module, Roxtec EMC solutions ensure the very best properties over the full frequency spectra.



### Plan to reduce risk and cost

Protective earthing, equipotential bonding and lightning protection cannot be managed without considering EMC aspects. We recommend including EMC into the initial electrical design to avoid compromising the performance of any EMC solution added later on. Malfunction of systems due to EMI can cause severe operational difficulties and identifying the cause afterwards is a difficult process.

### Best practice

Roxtec provides EMC solutions that manage a tight fit against a stripped braided armored cable. A consistent connection is a key for securing the bonding to earth while maximizing EMI protection. You do not have to know the dimension of each cable as our products with Multidia-meter™ are separately adaptable for both the outer sheet and the armor/shield.

The seals support best practice EMI protection principles by providing a single entry and by integrating the earth path. Combination frames with several openings solve the issue of cable segregation and cable to cable interference.

### Electromagnetic shielding

All cables going in or out of electromagnetically sealed enclosures have to be shielded and connected to earth, and cables with tight shields are required to protect inner conductors from interfering signals. The gaps between the cables must be sealed so that the cable entry extends the conductive wall and prevents conducted and radiated electromagnetic signals from penetrating.

Roxtec also provides solutions with a barrier in each module sealing the gaps between the cable shield and the frame, or via the adjacent modules. They are tested to a

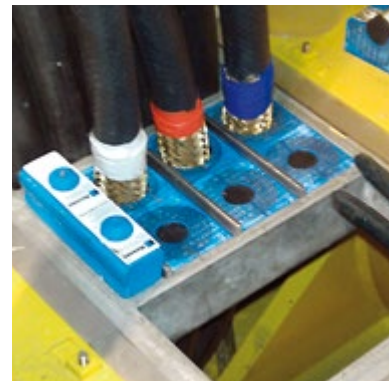
minimum of 18GHz to prove the shielding effectiveness. Transfer impedance from cable shield to frame is measured up to 30MHz.

### Solutions for bonding and grounding

The Roxtec BG™ B and BG™ (Bonding & Grounding) product family is our cable entry system for sealing large quantities of metal clad or armored cables in the least amount of space. Use it in building structures, cabinets and enclosures to save design and installation time – and to reduce weight and costs!



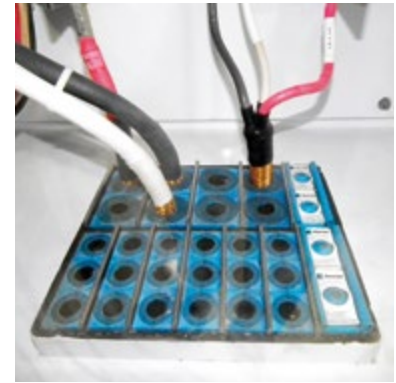
Roxtec frames must be properly connected to earth. For this purpose, we provide a ground lug for dedicated termination point.



### TYPICAL EMC APPLICATION AREAS

- Terminal and junction boxes
- Control cabinets
- Frequency converters and EI motors
- E-houses





### Save space and money

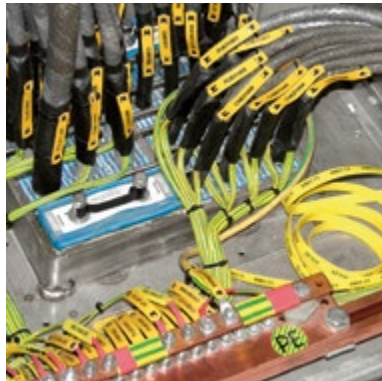
Roxtec BG™ B and BG™ solutions are lighter and up to 70 percent more area efficient than cable glands and a direct replacement to glands for terminating metal clad and armored cable types. With a single cable entry from Roxtec, you can seal varying outside diameters of single or multiple cables while ensuring a certified bonding or grounding termination.

### More cables, less cabinet

For cabinets and electrical enclosures, Roxtec BG™ B and BG™ solutions allow for the size and weight of cabinets to be greatly reduced. A single cut-out for a standard Roxtec CF 32 BG™ B kit can accommodate up to 32 cables, which drastically reduces the amount of space required when compared to 32 individual cable glands.

### Features and benefits

- Bond and ground metal clad and armored cables
- Ensure electrical safety and protect life and assets
- Reduce the area required by 70% compared to cable glands
- Perfect for walls, floors, cabinets and enclosures
- Fire rated and available for hazardous locations (Ex)



### Replacing “pig-tails”

Flattened braids, combining large copper masses in a flat form, are often used to ensure earth paths for higher frequencies. The Roxtec BG™ B and BG™ solution has such a braid embedded and surrounded by the solid metal frame. This solution can easily replace weak EMC solutions such as “pig-tails” – individual earthing conductors connecting the cable armor to the earthing bar.

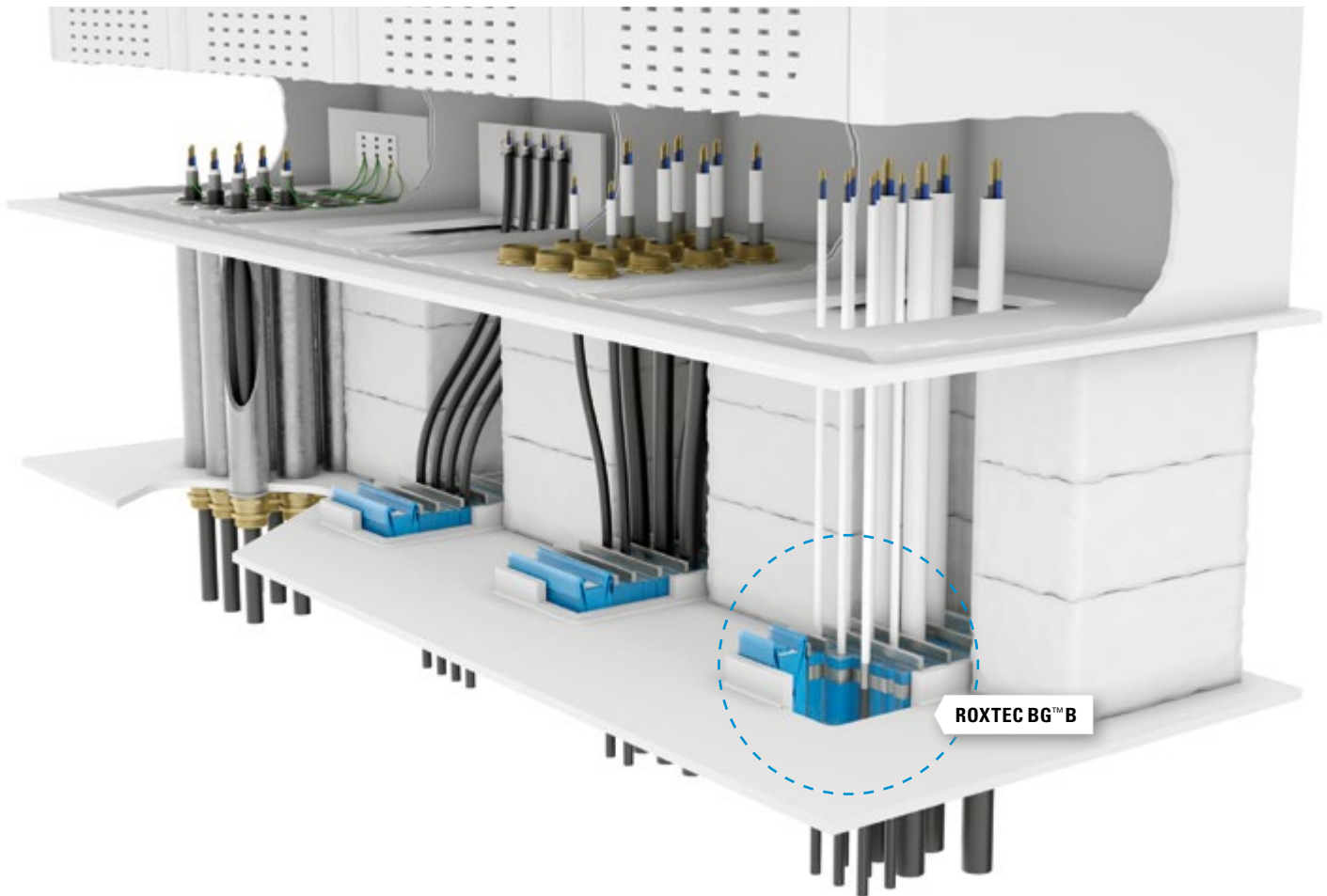
### Perfect for retrofit

The Roxtec BG B™ and BG™ modules can be used with most Roxtec frames for offshore applications. This makes them suitable also for retrofit projects if electrical and environmental/galvanic aspects are considered. Applying such methods for all earthing needs ensures that EMC requirements are met.

### Roxtec solutions

- work very well with rigid and irregular cable armor
- withstand high currents if a fault occurs within the system
- withstand surges from lightning strikes
- provide efficient protection against conducted interference

# Roxtec in E-houses



Roxtec BG™ solutions are a revolutionary and easy way of combining fire protection barriers with the need for terminating cable armor when entering electrical buildings (E-houses). The illustration shows various traditional methods of combining a separate fire protection barrier with different bonding and grounding solutions such as glands, copper bars with clamps or earthing straps, and the time-consuming method of welding steel pipes to gland or conduit couplings. It is

widely known that clamping or pig-tailing cables inside cabinets can sometimes increase the risk of EMI difficulties when used in certain application areas.

## **Save time and space**

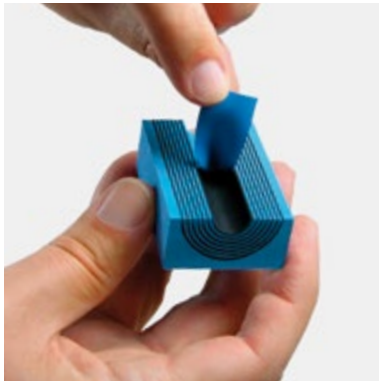
However, the Roxtec BG™ B solutions eliminate many of these component parts and their associated risks and also drastically reduces the installation time when compared with these alternative methods. Other benefits arising from a Roxtec

BG™ B installation are the significant space savings, and the ability to separate cables and reduce the bending ratio when connecting them inside the cabinet.

Roxtec BG™ solutions follow “best practice” earthing methodologies for electromagnetic compatibility and simplify the implementation of an electromagnetic zone concept.

# Safety relies on installation quality

Roxtec Multidiameter™ makes sure you always have the right product at hand. But the final result of an installation depends on installer skills and motivation – even with the most flexible sealing system. In order to make life easier for owners, operators, installers and inspectors, we develop smart solutions and provide installation trainings as well as inspections.



With Multidiameter™, you know that you always have the right product at hand!

Roxtec Multidiameter™ is an invention based on modules with removable layers. You can adapt each sealing module to cables and pipes of different sizes which minimizes the need for material. You can even plan for extra capacity from the start. This is useful and time-saving for designers who want to make changes, add cables or pipes or upgrade in the future as well as for installers who do not want any bad surprise onsite regarding the number or the size of cables or pipes.

## Everything you need onsite

Roxtec Multidiameter™ makes it easy to optimize inventory so that all installations can be finished offshore. Have you ever summarized the consequences in time and money in case of any missing sealing material onsite?

- 6 module sizes to cover cable diameter range 3-99mm
- Flexible system to accommodate unforeseen changes
- Simplifies logistics and minimizes stock keeping
- Quick and easy to install, reinstall and maintain
- Local support and services offering fast deliveries

# Trainings and inspections

How are your existing cable and pipe transits? Are they installed and secured according to the applicable requirements? Is your rig or vessel safe if an accident or catastrophic event occurs?



Roxtec installation experts often educate installers at shipyards and project sites.

High safety standards require correctly installed and easily inspected products. Onsite installation training for contractors and post-installation inspection are part of our full line of service. The Roxtec training program for installers includes extensive versions for supervisors and internally appointed installation

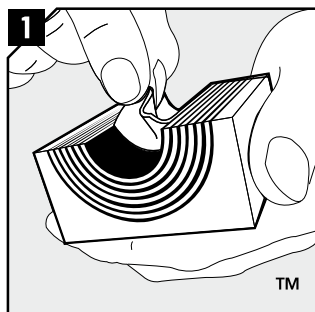
trainers or inspectors located at the shipyard or at the offshore facility. Every year, we educate thousands of people to ensure installation quality and increase awareness on how important the cable and pipe transit solutions are when striving to protect life and assets.

## Your own instructor

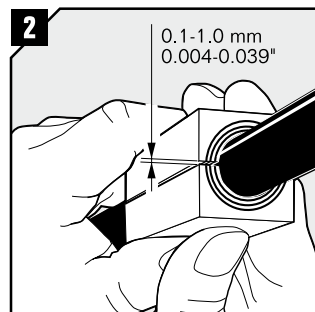
We can even dedicate a specific Roxtec instructor to work side by side with your team during the installation phase. Safety is our top priority, so we simply adjust according to your needs.

## Basic steps

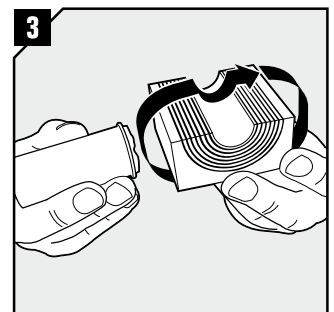
in the assembly of a modular-based Roxtec sealing solution



Adapt modules, which are to hold cables or pipes, by peeling off layers until you reach the gap seen in pic. 2. The halves may not differ by more than one layer.



Achieve a 0.1-1.0 mm gap between the two halves when held against the cable/pipe.



Lubricate all modules for the frame thoroughly, both the inside and the outside surfaces.





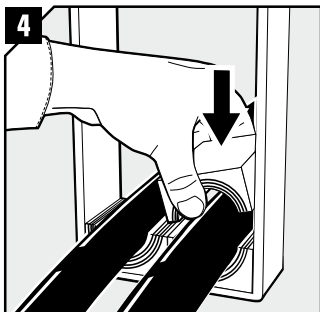
### Class society cooperation

The installation training is not only offered to installation teams or engineers. We cooperate closely with classification societies and frequently educate surveyors and inspectors in how to visually inspect a Roxtec transit to verify if it is correctly installed.

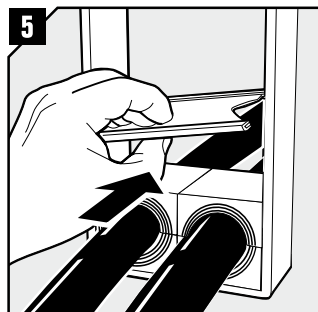
- Reduce design and installation time
- Save material and labor costs
- Ensure quality installation
- Tools made for Roxtec products
- Instruction videos available online

### Installation tools

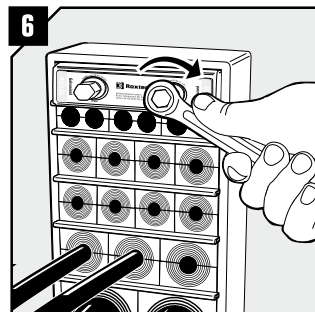
We have also developed a range of practical tools to simplify welding as well as quick and safe onsite installations and reinstallations. Include them in your specification or bill of materials.



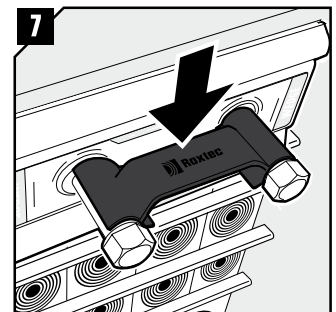
Insert the modules according to your installation plan (transit plan). It is recommended to seal cables/pipes at the bottom of the frame and put spare modules on top.



Insert a stayplate on top of every finished row of modules.



Insert the Roxtec Wedge and tighten the screws until full stop.



Attach the Wedge Clip to the wedge bolts to check that the wedge is properly tightened.

# Roxtec as your partner in brownfield

It is crucial to be able to optimize drill-rig or production facility performance throughout the lifecycle of a project by changing or adding new equipment. We help owners, engineers and service companies find the right sealing solution for any retrofit or upgrade project.

Typical retrofit projects include drilling upgrades, injection solutions, replacement of pipe systems or E&I control system modifications. As a result of these upgrades, many new cables and pipes are likely to be added. These additions often present a challenge as installers and engineers have to adapt to existing conditions which might mean limited working space, irregular angles or non-welding situations if the rig is still operating. There is also often uncertainty about which classifications apply to which area. At Roxtec, we are experienced in these situations and can act as your partner.

## **All along your project**

Dedicated to first class safety, we continuously offer everything from installation quality trainings and inspection services through to design support and customized solutions. Our offering ranges from web-based applications for design through to inspections in yards and offshore.

## **Long-term partnership**

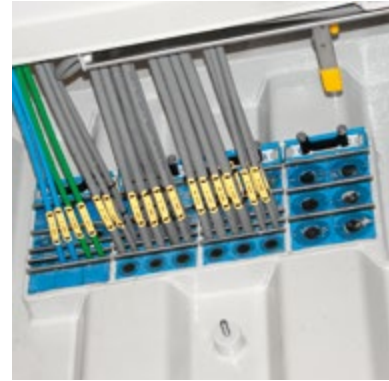
Our goal is to help you ensure that all deck and bulkhead penetrations are correctly and safely sealed against fire, gas and water. And we are eager to follow and support your project for years to come.











### **Experienced inspectors**

Our team of experienced installation inspectors is always ready to go onsite to make sure that our seals are properly installed, to follow-up projects and to help customers plan for upgrades. They conduct visual inspections of our transits at shipyards and offshore units all over the world. The standardized inspection process results in a detailed report, to be used for your planned maintenance activities.

### **Action list**

The visual inspection report includes documentation enabling our customers to understand the status of each one of their installed transits. This report is then used by our customers to evaluate safety concerns and also to generate a priority list if changes or corrective actions are needed.

We help you keep track of your cable and pipe transits. It is, for example, a great advantage to know all facts about earlier changes when you make plans for future upgrades.

### **Built-in spare capacity**

Roxtec modular-based sealing solutions are often designed or sized to include spare capacity when a new offshore unit is being built. This spare capacity offers a flexible, time-saving and cost-reducing possibility to add extra pipes and cables during future repairs or upgrades. You simply open up the compression unit in your existing transit and either re-use an existing module or replace with new ones inside the frame. Planning for future capacity during the initial design and installation phase will reduce service and upgrade costs along the lifecycle of the offshore rig or vessel.

Please contact your local Roxtec representative for further details and information on how we can offer a customized package for your fleet.

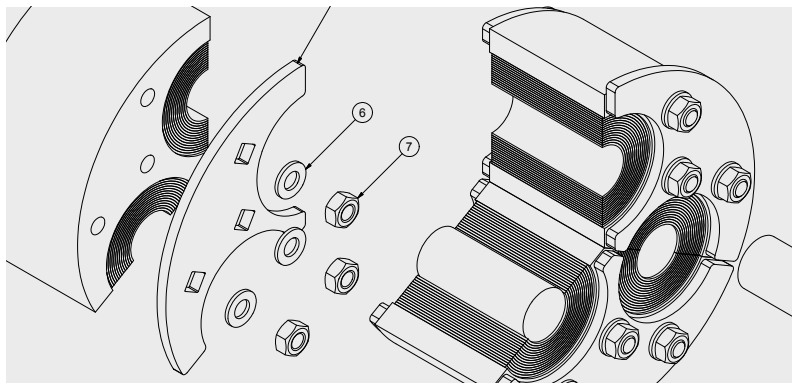
#### **WE OFFER:**

- Trainings
- Inspections
- Design and engineering
- Tailored solutions
- Documentation
- Built-in spare capacity
- Easy maintenance



# Customized solutions – especially for you

The addition of new transit seals to an existing off-shore rig or vessel often presents a challenge as you have to adapt the seals to existing conditions. Roxtec engineers are ready to help you by creating customized solutions.



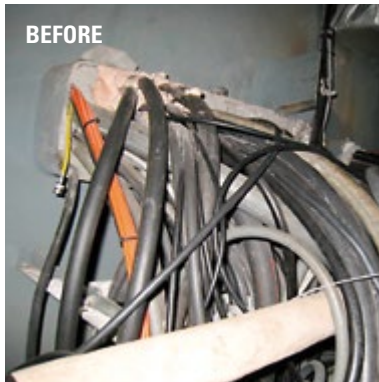
In fact, we are often able to deliver customized sealing solutions based upon slight modifications of our existing certified standard products – even in specific cases that might look very complicated. This design capability and flexibility along with our close cooperation with many of the classification societies normally results in a project specific approval being granted.

## Creating upon request

We know how important a short response and delivery time is during a retrofit project and we work hard to deliver a high level of service.

On the next page, you find some examples of our customized solutions. However, please contact your Roxtec representative to learn more about our product ranges and capabilities.

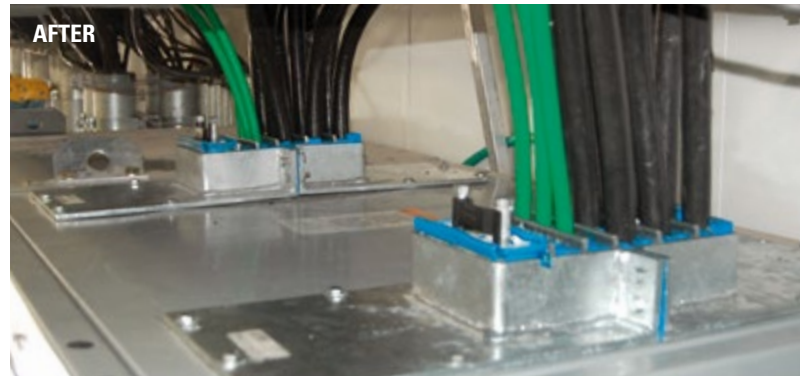
- Openable solutions for existing cables/pipes
- Non-weld sealing solutions
- Off-center solutions
- Frames for corrugated walls
- Seals to increase cable amounts (capacity expansion)
- Water-cut modules for irregular shapes
- Different materials for high/low temperatures
- Different materials for aggressive fluids exposure
- Busbar penetration

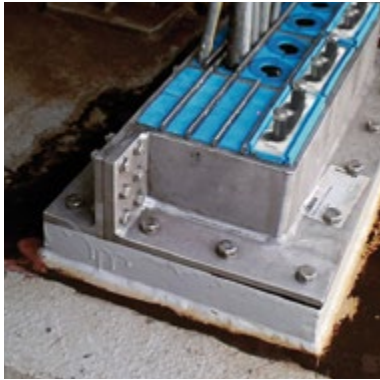


### **Superior flexibility**

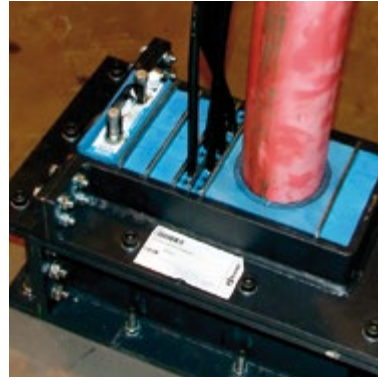
Many standard Roxtec sealing solutions are suitable for the offshore brownfield environment. You might need to add a brand new cable and pipe transit, but you can also easily use the Roxtec sealing system to replace an old inferior transit. Flexibility is a key feature of the Roxtec design, and we provide frames that can either be welded or bolted to decks, bulkheads or cabinets as well as openable versions that can be used to seal an exist-

ing opening with cables and pipes already passing through it. Roxtec frame flanges can also be adjusted to fit the dimension of the hole. Roxtec is often asked to solve inferior installation issues. Regardless if these are found in the rig structure, equipment or cabinets we have many solutions to solve it. Existing cables and non-welding demand – no problem!





Roxtec SKFOH is suitable for mounting around existing cables or pipes going through old holes/frames/sleeves in areas where welding is not allowed.



Roxtec SFOH with extension is a replacement solution for old inferior transits, available with or without extensions if you need to build a distance from the existing opening.



Roxtec SLFO/RI is an openable sleeve to fit around existing pipes. It is bolted to the deck or bulkhead. Both standard seals and water-cut solutions available to fit different pipe diameters.



Roxtec offcenter solution is to be used as pipe seal where pipes are going off-centered through the sleeve. It allows the off-center core to rotate and fit the pipe position.



Roxtec water-cut solution to fit busbars or busbar trunks.



Special water-cut modules can be perfectly adapted to fit non-round services penetrating structures, and H seals can also be adapted to the shape of the cable or pipe.

Other appreciated retrofit solutions include the Roxtec SLF corrugated flange and our special modules/seals with NBR (nitrile based rubber). The Roxtec SLF is for use in modification projects where it is necessary to penetrate existing

corrugated sandwich walls with both fire protection and water/gas tightness demands. The seals with NBR are supplied for applications requiring solutions that withstand direct contact with chemicals or solvents during a long period of time.



### Local presence worldwide

Roxtec is the world-leading provider of flexible cable and pipe seals. Our solutions are used to ensure safety, efficiency and operational reliability. We are present on 70 markets worldwide in order to ensure local support and product availability.

**Sweden**, Roxtec International AB, HQ  
**Argentina**, INGIAR Representaciones SRL  
**Australia**, Roxtec Australia Ltd  
**Belgium**, Roxtec b.v.b.a/s.p.r.l  
**Brazil**, Roxtec Latin América Ltda  
**Chile**, FACOR Ltda  
**China**, Roxtec Sealing System (Shanghai) Co. Ltd  
**Croatia**, Roxtec d.o.o.  
**Czech Republic**, Roxtec CZ s.r.o  
**Denmark**, Roxtec Denmark ApS  
**Finland**, Roxtec Finland Oy  
**France**, Roxtec France SAS  
**Germany**, Roxtec GmbH  
**Hungary**, Glob-Prot Trade and Service Ltd  
**India**, Roxtec India Pvt Ltd  
**Israel**, C&P Co. Ltd  
**Italy**, Roxtec Italia S.r.l  
**Japan**, Roxtec Japan K.K  
**Lithuania**, SWELBALT UAB  
**Mexico**, Roxtec de México, S.A. de C.V  
**Nigeria**, Structured Resource Business Ltd  
**The Netherlands**, Roxtec BV  
**Norway**, Roxtec AS  
**Peru**, Synixtor S.A.C  
**Poland**, Pionet Sp.zo.o  
**Russia**, Roxtec RU  
**Romania**, Roxtec RO s.r.l.  
**Singapore/Indonesia**, Roxtec Singapore PTE Ltd  
**South Africa**, Roxtec Africa (PTY) Ltd  
**South Korea**, Roxtec Korea Ltd  
**Spain**, Roxtec Sistemas Pasamuros S.L  
**Switzerland**, Agro AG  
**Turkey**, Roxtec Yalıtım Çözümleri San. ve Tic. Ltd. Şti.  
**UAE**, Roxtec Middle East F.Z.E  
**UK/Ireland**, Roxtec Ltd,  
**USA/Canada**, Roxtec Inc  
**Venezuela**, Grupo ES Escorihuela Sornes, C.A

For other markets and detailed contact information, please visit [www.roxtec.com](http://www.roxtec.com)



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