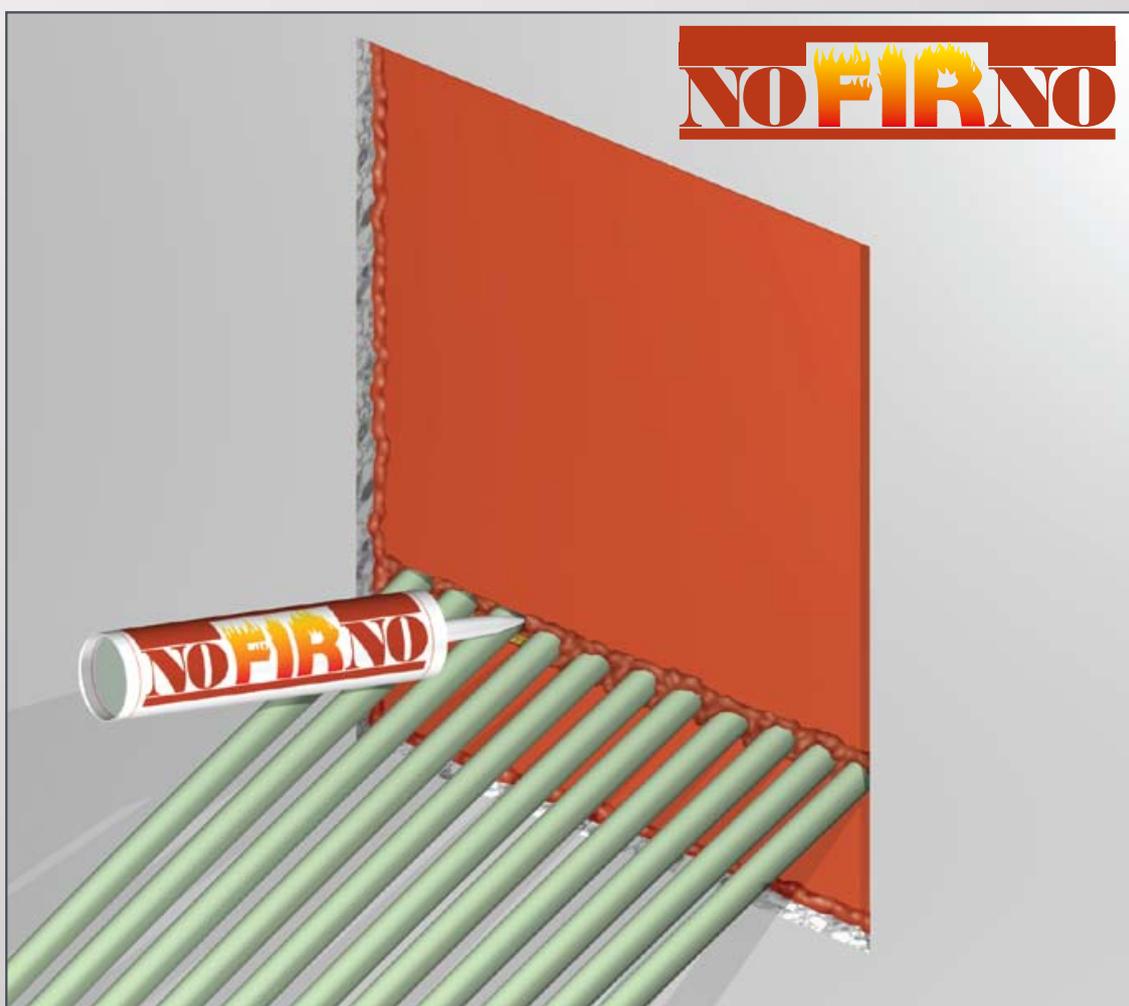


# NOFIRNO® FIRESTOP SYSTEM FOR CABLES/CABLE WAYS IN BUILDING AND INDUSTRIAL PLANTS



**SUCCESSFULLY TESTED ACCORDING TO  
EN 1366-3:2004; FIRE RESISTANCE  
EI90/E120 ACCORDING TO EN 13501-2:2003  
CERTIFICATE 2006-EFECTIS-R0834**



## BEELE ENGINEERING BV CSD INTERNATIONAL BV

BEELE Engineering and CSD International have been working in the field of water and gas tight and fireproof sealing of conduits for pipes and cables for more than 35 years. In the field of passive fire prevention, we have invested substantial amounts of money in the development of systems which are capable withstanding fires for extended periods of time. Passive fire prevention is a very complicated matter due to the fact that cable and pipe penetrations have to be designed to the actual circumstances at site and not for a laboratory test. In case of a catastrophe penetrations are subject not only to flame erosion and very high temperatures, but also

to mechanical loads due to collapsing cableways and possibly a jet of fire-fighting water. This means that the performance in actual situations can differ dramatically from that in a regular fire test. In fact, the systems could only be applied as tested to guarantee the required fire safety.

**And this means discussions and limitations!**

We have ensured that our systems will function under all circumstances, and the classification societies have awarded us signed and stamped installation drawings of our sealing systems. Approved for steel and aluminium partitions. Guaranteed safety in your installation will be the result.

*The R&D department of BEELE Engineering is constantly working in the field of rubber and systems techniques to optimize the existing systems and to develop new concepts for cable and pipe conduits on board of vessels and offshore installations. Although installation of the CSD sealing systems is in fact an easy matter, a full training programme can be given in-house by our engineers. Because the advantages and possibilities of passive fire prevention and evacuation signposting can most effectively be discovered in an environment that matches the practical situation as closely as possible, we have constructed an unique research and development centre. As far is known, this R&D centre is the only institute world-wide where visitors can experience for themselves all the aspects of fire prevention and evacuation signposting systems.*



Above an impression of the research and development centre with a training and schooling institute for passive fire prevention products and systems and for the improvement of evacuation signposting systems in buildings and on board ships. The centre consists of a presentation theatre seating up to 45 persons, and a mock-up covering about 500 square metres in which various evacuation signposting systems are installed to enable their effectiveness to be

determined in the dark.

The behaviour of escaping persons inside the test facility is recorded from a separate technical area (with an associated showroom) by means of infra-red cameras and an audio-video system.

In addition the centre comprises three laboratories with a total surface area of about 300 square metres in which, respectively, large-scale fire tests, mechanical tests, and light emission investigations are performed.



# NO FIRNO

## INNOVATIVE TECHNOLOGY

*The BEELE product range is tailored to a variety of markets and areas of application. BEELE's philosophy is that a building, structure or installation should be regarded as a total project when it comes to sealing openings and realizing passive fire prevention.*

*This cannot be accomplished if just a single product is supplied. In many cases, passive fire prevention also is a matter for 'retrofit'.*

For this purpose BEELE has developed technologies to cope with all kinds of situations. Reference is made to ACTIFOAM® and FIRSTO® cable and cable run penetrations and to the RISE® cable and pipe penetrations. These systems are all based on the ACTIFIRE® technology, whereby ACTIFOAM® has an added technology with regard to thermal insulation and expansion properties.

The purpose of ACTIFIRE® technology is to ensure that during a fire the rubbers, thermoplastics and compounds used for the seal will produce such an amount of fire retardant material that major deformations or displacements can easily be followed. As a result the penetration will remain fire-tight. The higher the temperature, the more fire retardant material will be produced. Because of this "active material production", in the event of a fire an elevated pressure will be formed inside the penetration. The result is that a virtually solid rubber mass forms inside the penetration, with which its fire resistant and sealing capacity is effortlessly maintained.

In addition, "excess" new material produced is forced out of the penetration at the exposed side (together with all the softened plastic materials of the cable sheaths). The expansion caused in this way not only effectively lengthens the penetration but it also compensates for the displacements and substantially extends the withstand time in a fire.

This production of extra fire retardant material during fire is not only necessary in order to absorb the resultant deformations and displacements of the construction and conduits. This extra fire retardant material also fills up the openings which are left by the softening and combustion of cable sheathing and insulation.

The development of the ACTIFIRE® technology has the added benefit that the sealing systems which are manufactured on the basis of this technology are far less vulnerable for inadequate maintenance than existing systems.

Even if a cable is removed from the penetration without sealing the remaining opening, the ACTIFIRE® technology will ensure that this opening is immediately compressed in the event of subsequent fire or elevated temperature.

Lately BEELE has also developed the NOFIRNO® technology. Other than with the ACTIFIRE® technology the objective is not to produce new material when exposed to fires, but to create a protective shield to maintain the initial properties of the fire retardant rubbers (reference is made to the SLIPSIL® sealing plugs), sealant and coating.

The numerous fire tests carried out with NOFIRNO® compounds have shown that the rubber, sealant and coating are able to withstand fire and thermal loads without showing any dramatic colour change or carbonization at the unexposed side. At the exposed side the compounds will NOT be consumed by the fire due to the protective shield and char formed. This means that the NOFIRNO® products stay in place there.

Based on the ACTIFIRE® and the NOFIRNO® technology it has proved possible to produce mixtures of rubbers and thermoplastics having an oxygen index far in excess of the minimum value of 30 LOI (Limiting Oxygen Index) which is specified for flame-suppressant materials. Rubber mixtures have even been formulated which exhibit an oxygen index of 85 (an oxygen-rich environment of 85% is required for the rubber to ignite!).

To obtain the flame-suppressant properties, the ACTIFIRE® and NOFIRNO® technologies do not make use of halogens, such as chlorine, bromine and fluorine. As a result, a number of rubber formulations (depending on the base elastomer) have been found to comply effortlessly with the values relating to the smoke index and the toxicity of fumes generated by rubber products as set by the Naval Engineering Standard.

After severe testing ACTIFOAM® and RISE® rubber have meanwhile also been approved for use in installations of London Underground. NOFIRNO® is undergoing investigation. A series of tests have already been carried out successfully.

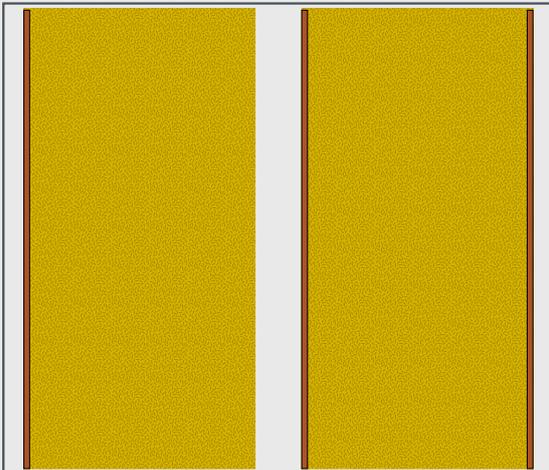
An important feature of all products is that they are not based on so-called intumescent properties so that smoke emission and toxicity of the fumes are therefore minimized.



# NO FIRNO

## INNOVATIVE TECHNOLOGY

*To obtain optimum fire safety in construction use is generally made of the ACTIFOAM® and/or FIRSTO® systems. However, sometimes wall and floor openings are oversized which means that expensive material has to be used to fill these oversized openings. To overcome this problem a system technology has been developed on the basis of a combination of ACTIFOAM® and NOFIRNO® coated mineral wool boards.*



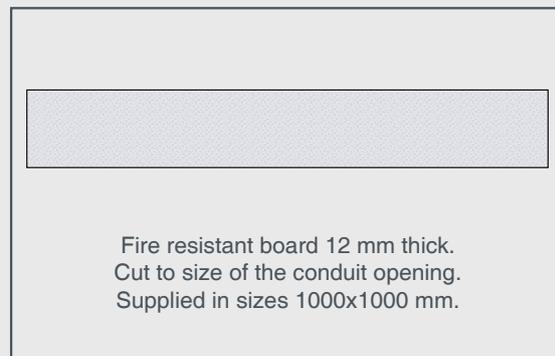
NOFIRNO® mineral wool boards are supplied measuring 1000 x 600 mm with a 1.2 - 1.5 mm thick layer of NOFIRNO® coating on *one* or *both* sides. The NOFIRNO® mineral wool boards are 60 mm thick (without coating) and have a density of 152 kg/m<sup>3</sup>. The boards can easily cut to size at site. In case of fire the NOFIRNO® coating will form a ceramic protective shield at the exposed side. This shield is also a thermal barrier. Furthermore it prevents moisture from escaping from the inside of the mineral wool board so that no shrinkage will occur during fire exposure. The NOFIRNO® coating is water resistant. To avoid water absorption of the mineral wool, NOFIRNO® sealant has to be applied all around for outdoor applications. For mechanical stability it is of the utmost importance that the boards fit snugly in the conduit opening and that the boards are sealed all around with NOFIRNO® sealant.

*The possibilities with the NOFIRNO® system are numerous:*

- 1) For normal sized openings the NOFIRNO® solo board system can be used whereby NOFIRNO® sealant is applied in between and on top of the ducted cables*
- 2) In case of highly filled penetrations, for ease of fire safe separation of the ducted cables, RISE® insert sleeves can be used instead of the sealant.*
- 3) For oversized openings with a view to later extensions, fire safe sealing of the ducted cables with ACTIFOAM®, a NOFIRNO® compression plate and fitting NOFIRNO® boards is the ultimate solution.*

For oversized penetrations the NOFIRNO® mineral wool boards are used to fill the remaining open space in the most economic way. For the fire rated filling around the cables preferably ACTIFOAM® sheets are used. To obtain a fair degree of tightness, the foam filling should be compressed. To achieve sufficient compression a NOFIRNO® fire proof plate is placed between the ACTIFOAM® filing and the NOFIRNO® mineral wool board(s). In this way also the mechanical stability of the fire safe penetration is improved.

In cases of limited wall thickness NOFIRNO® rubber insert sleeves are applied around each of the cables to obtain the required thermal insulation.

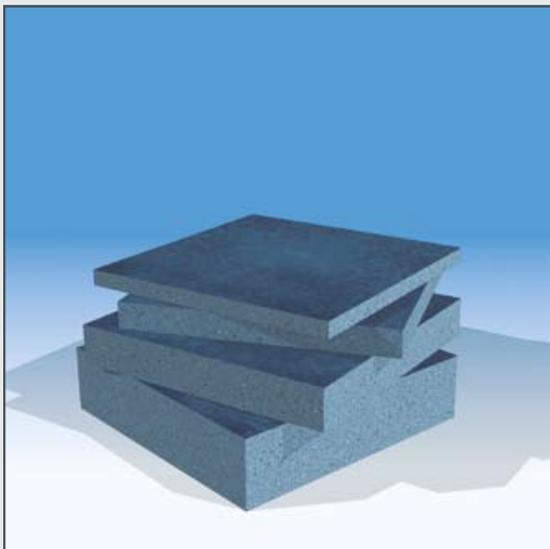


# NO FIRE NO

## INNOVATIVE TECHNOLOGY

ACTIFOAM® is used to fill any cavities or gaps in constructions. In case of fire the cavity will be totally filled with the expanding rubber, offering a perfect fire seal for a very long duration. Oxygen index 40% (>30% is flame retardant). ACTIFOAM® can also be used for other sealing purposes. An advantage is that ACTIFOAM® does not absorb water. Tested at 2.5 bar water pressure during 24 hours.

Due to the closed cell structure, the rubber has good thermal insulation properties. The K value at 10 °C according to NEN-EN 12667 is 12.3 mk/W. The density of the rubber at 23 °C is between 0.35 and 0.4 g/cm³ in accordance with ISO 2781. Compression set of the foam rubber is 14% which stands for a good "memory". Good weathering, UV and ozone resistance. Temperature range from -15 °C tot +70 °C.



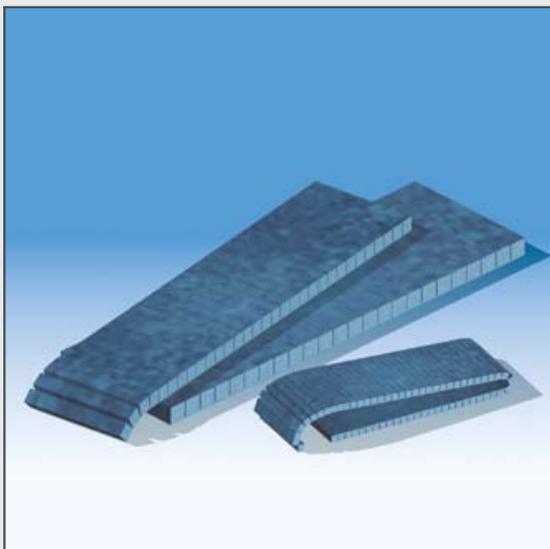
ACTIFOAM® foam rubber is supplied in sheets with a thickness ranging from 10 up to 25 mm.

Sheets are delivered in sizes:

500x500x7 mm	
500x500x10 mm	
500x500x15 mm	1000x500x15 mm
500x500x20 mm	1000x500x20 mm
500x500x25 mm	1000x500x25 mm

They can easily be cut to size with a sharp knife.

The colour is dark blue/grey.



ACTIFOAM® sheets and pre-slit sheets are delivered in sizes:

300x100x10 mm	600x100x10 mm
300x100x15 mm	600x100x15 mm
300x100x20 mm	600x100x20 mm
300x100x25 mm	600x100x25 mm
300x150x10 mm	600x150x10 mm
300x150x15 mm	600x150x15 mm
300x150x20 mm	600x150x20 mm
300x150x25 mm	600x150x25 mm
300x200x10 mm	600x200x10 mm
300x200x15 mm	600x200x15 mm
300x200x20 mm	600x200x20 mm
300x200x25 mm	600x200x25 mm
300x250x10 mm	600x250x10 mm
300x250x15 mm	600x250x15 mm
300x250x20 mm	600x250x20 mm
300x250x25 mm	600x250x25 mm

The 10 mm thick sheets have 30 (60) pre-cut profiles 10x10 mm, the 15 mm thick sheets 20 (40) profiles 15x15 mm, the 20 mm thick sheets 15 (30) profiles 20x20 mm and the 25 mm thick sheets 12 (24) profiles 25x25 mm.



# NO FIRNO

## INNOVATIVE TECHNOLOGY



NOFIRNO® is a fire-resistant sealant based on a single component silicone compound.

**NOFIRNO® is also water-repellent**

**High bonding strength**

**UV and Ozone resistant**

The numerous fire tests we have carried out with NOFIRNO® sealant has shown that the sealant is able to withstand fire and thermal loads without showing any dramatic colour change or carbonization at the unexposed side. At the exposed side the sealant will NOT be consumed by the fire due to the protective layer and char formed. This means that the sealant stays in place there.

NOFIRNO® sealant is halogen free, does not harden during service life, has outstanding weathering properties, does not shrink during fire exposure, has an oxygen index of 45% (>30% is flame retardant) and a low smoke index. NOFIRNO® sealant can be used in a very wide temperature range.

### *optimum combination of viscosity, flow and bonding capacity of NOFIRNO® sealant*

#### PRODUCT INFORMATION

01) colour	red brown
02) specific gravity	1.40 ± 0.03 g/cm <sup>3</sup>
03) curing of top layer	0.5 - 1 hour depending on temperature and air humidity
04) service temperature	-50 °C up to +180 °C
05) tensile strength	1.5 MPa
06) elongation at break	200%
07) hardness	45 Shore A
08) elastic deformation	approx. 50%
09) resistance	UV, Ozone, arctic conditions
10) ageing	more than 20 years
11) supplied in	310 ml cartridges
12) storage	to be stored cool and dry min/max temperature = +5/+30° C
13) storage life	guaranteed 6 months; when applied later than 6 months after date of manufacturing, curing and adhesive properties have to be checked before application



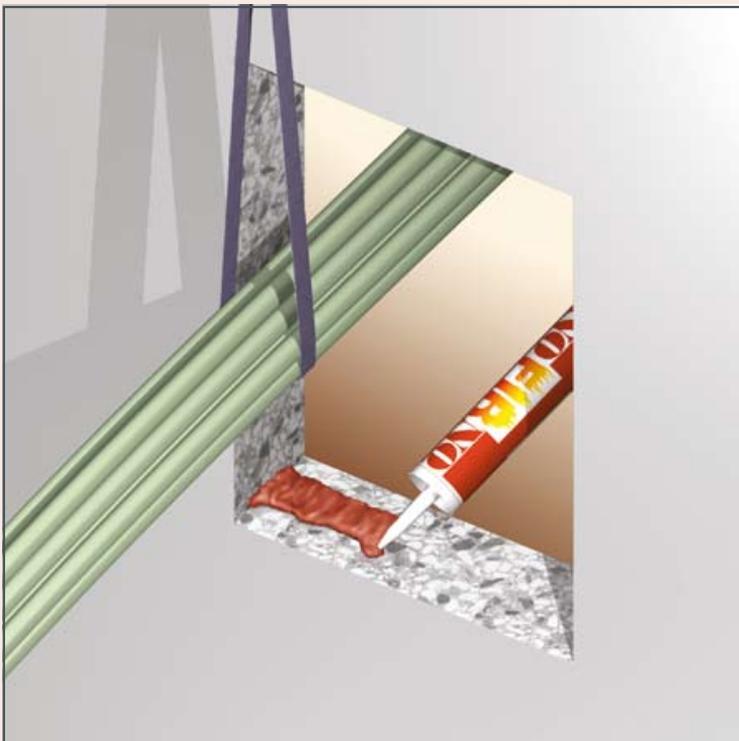
*NOFIRNO® is a paste-like compound which is simple to use.*

*NOFIRNO® has a balanced viscosity and can be applied above head. After applying the sealant, it can be smoothed by means of a wet cloth or by hand. Because the sealant adheres very tightly the cloth and hands should be wetted with water before use to prevent sealant from sticking to them.*

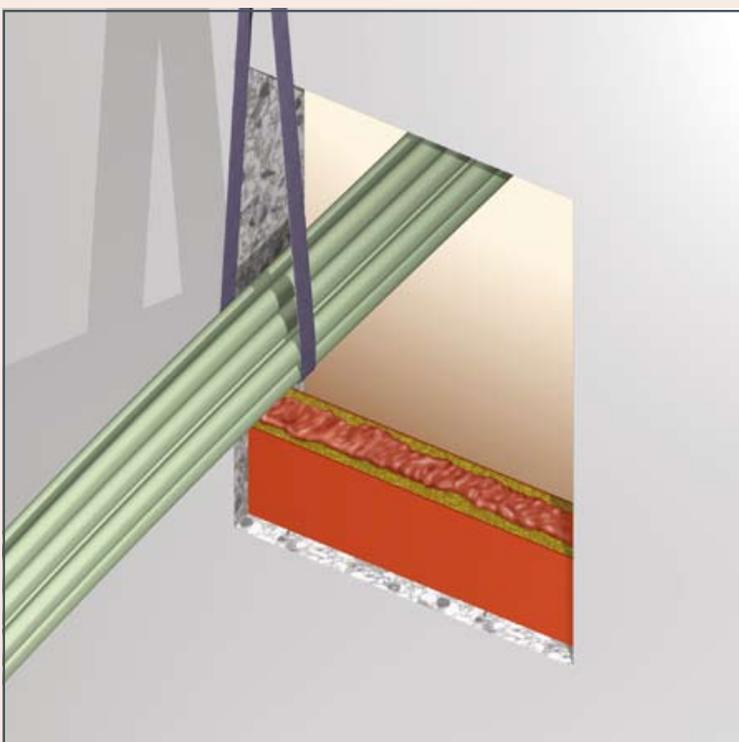


## NOFIRNO® - SOLO BOARD INSTALLATION INSTRUCTIONS

1) For smaller sized conduit openings or for penetrations with a low cable fill the NOFIRNO®-SOLO board system can be applied. Use is made of NOFIRNO® boards and NOFIRNO® sealant. In this case more sealant is needed to obtain sufficient mechanical stability.

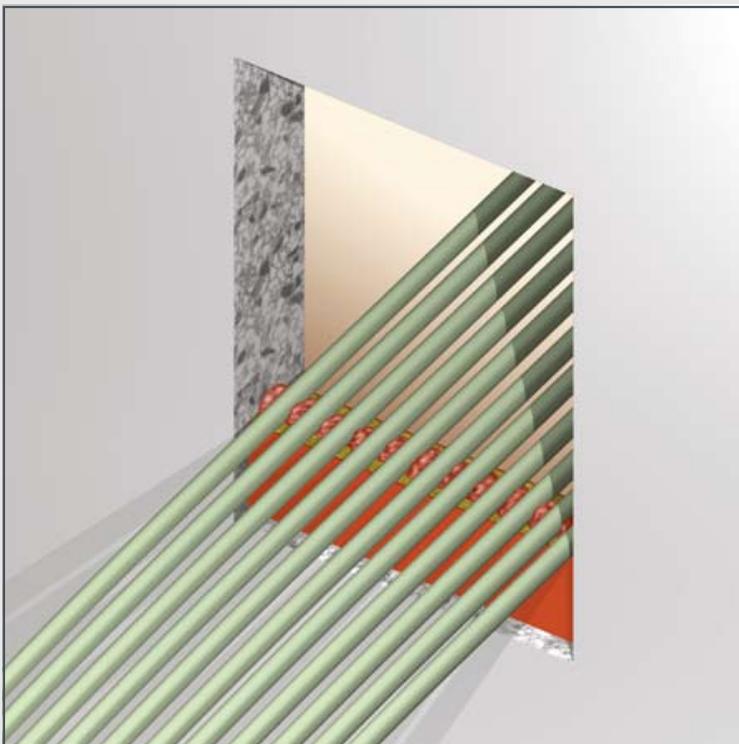


2) A NOFIRNO® board is placed fittingly inside the penetration on top of the layer of NOFIRNO® sealant. A layer of NOFIRNO® sealant is also applied on top of the board as well, in order to assure effective stability and smoke tightness.

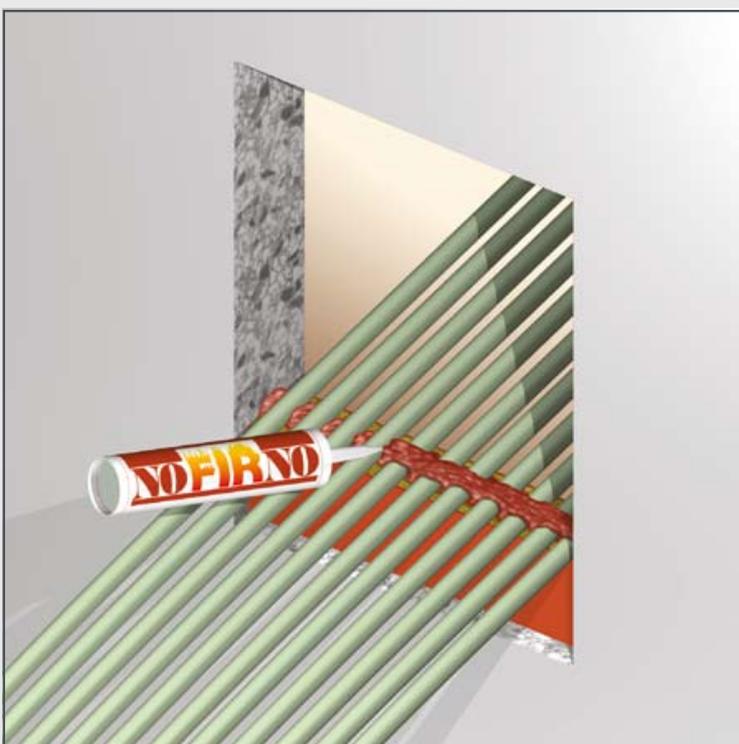


## NOFIRNO® - SOLO BOARD INSTALLATION INSTRUCTIONS

3) Then the cables are spread out on the NOFIRNO® board inserted at the bottom of the conduit opening. Care has to be taken that sufficient NOFIRNO® sealant is applied in between the cables. Separation of the cables preferably about 5-10 mm.

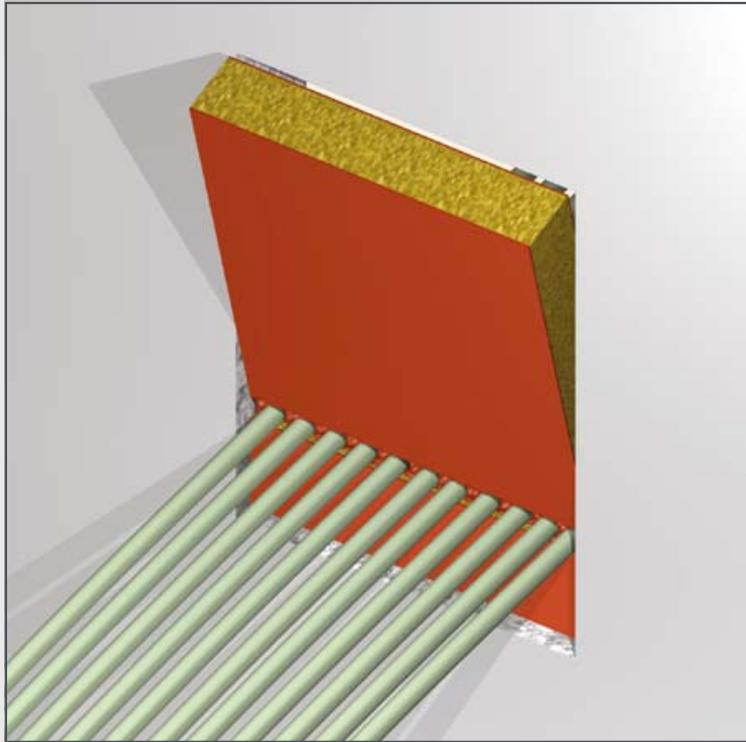


4) On top of the cable set another layer of NOFIRNO® sealant is applied to obtain optimum tightness between each of the cables and between the cables and the NOFIRNO® boards. This also improves mechanical stability of the penetration seal.



## NOFIRNO® - SOLO BOARD INSTALLATION INSTRUCTIONS

5) The top NOFIRNO® board is cut to size and tightly inserted into the open space of the conduit. The NOFIRNO® board should be a bit oversized and can be forced into the opening using a piece of wood and a hammer.



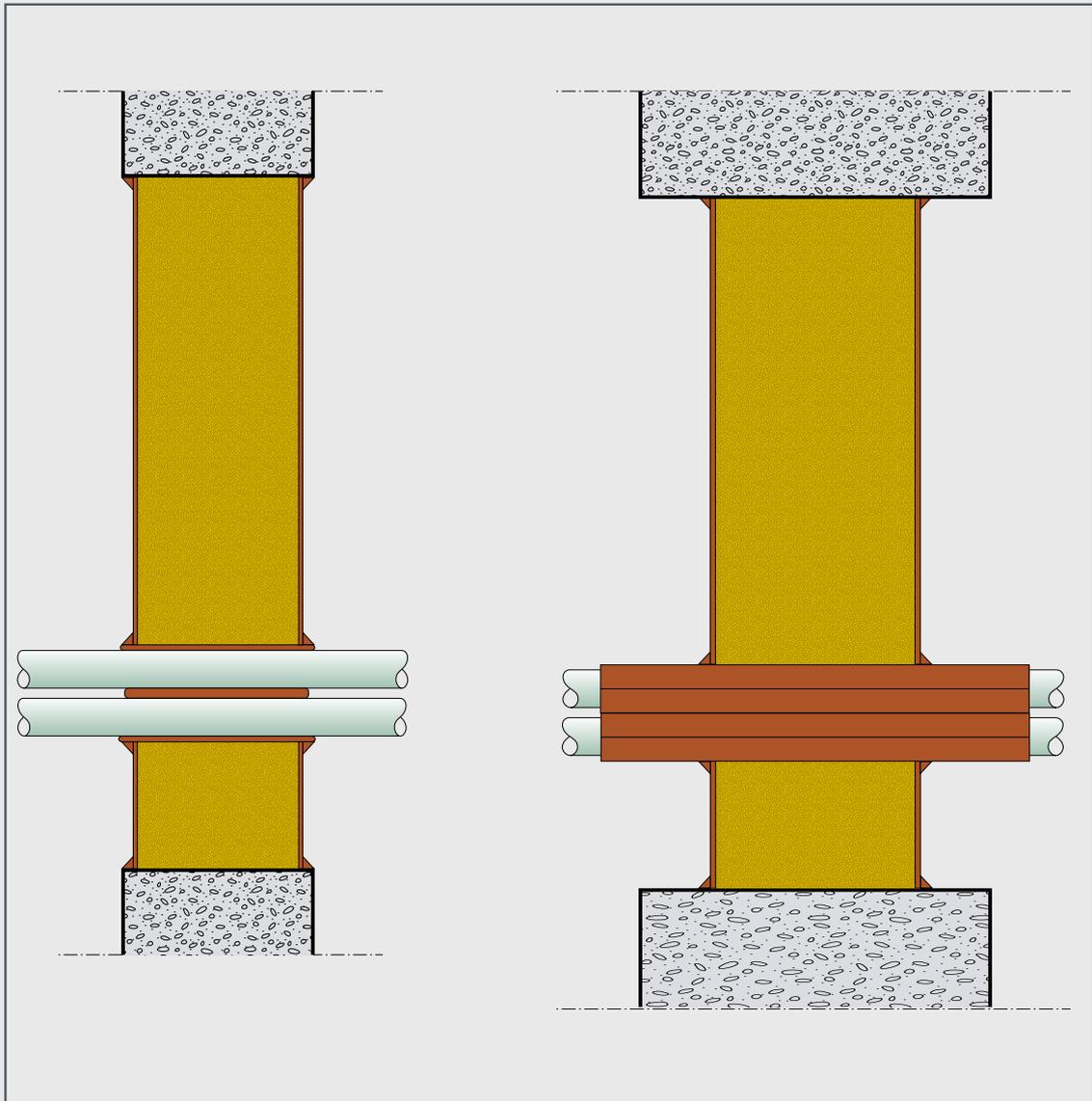
6) Finally all seams around the NOFIRNO® boards are sealed with NOFIRNO® sealant. The NOFIRNO® sealant can be smoothed by hand. Wet the hand with soap and water to avoid sealant sticking to the hand.



# NO FIRNO

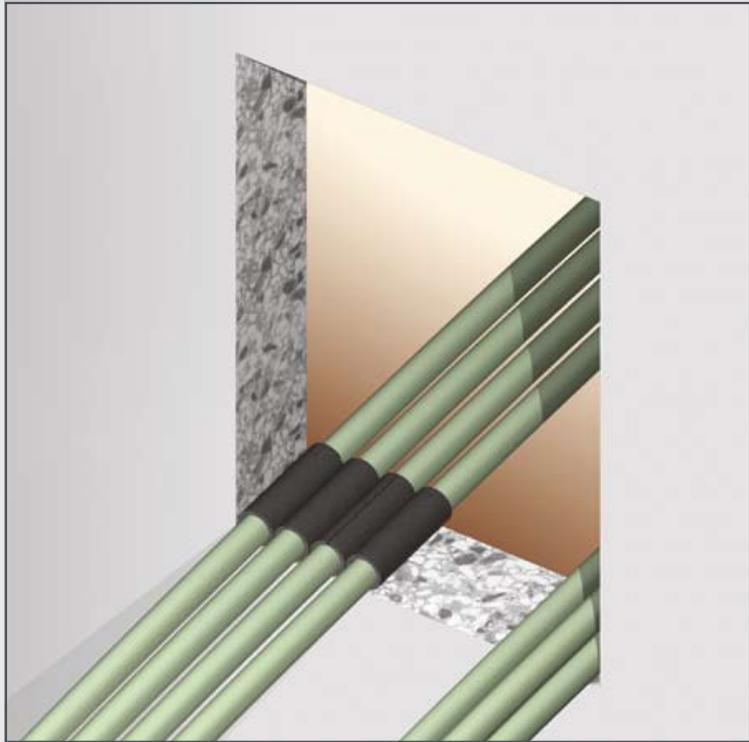
## INNOVATIVE TECHNOLOGY

*The biggest advantage of the NOFIRNO® boards is that they offer a very economic solution for the sealing of larger open spaces in conduit openings. Fire tests have shown that application of the superb NOFIRNO® coating on the boards offers a high degree of thermal insulation. A double sided coated board can easily pass F-60 ratings. In order to pass thermal insulation with the cables as well, NOFIRNO® rubber sleeves can be applied around the cables.*

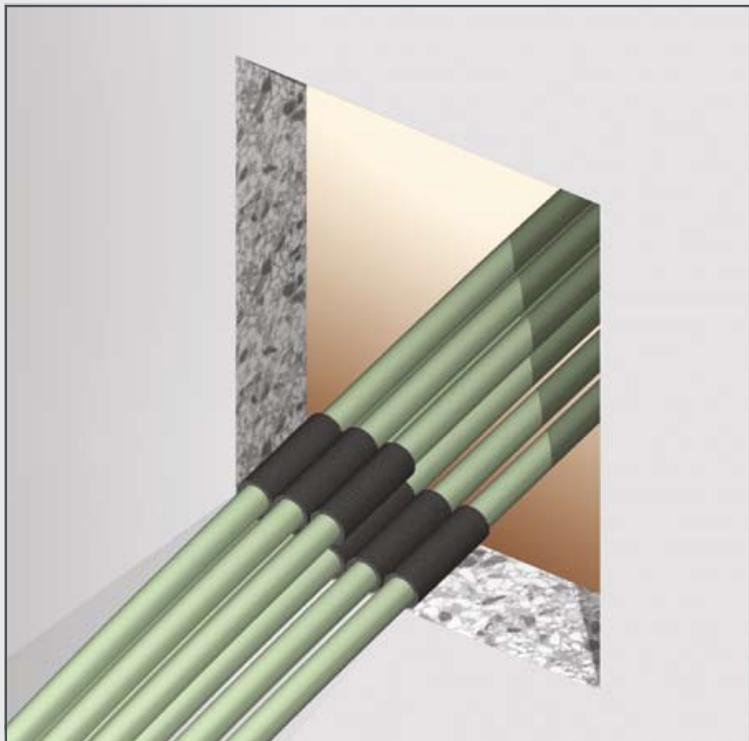


# NOFIRNO® - RISE® INSTALLATION INSTRUCTIONS

1) In the case of highly filled cable penetrations, it may be easier to separate the cables with RISE® insert sleeves rather than ACTIFOAM® profiles. The sleeves are split lengthwise and can be fitted easily around the cables.

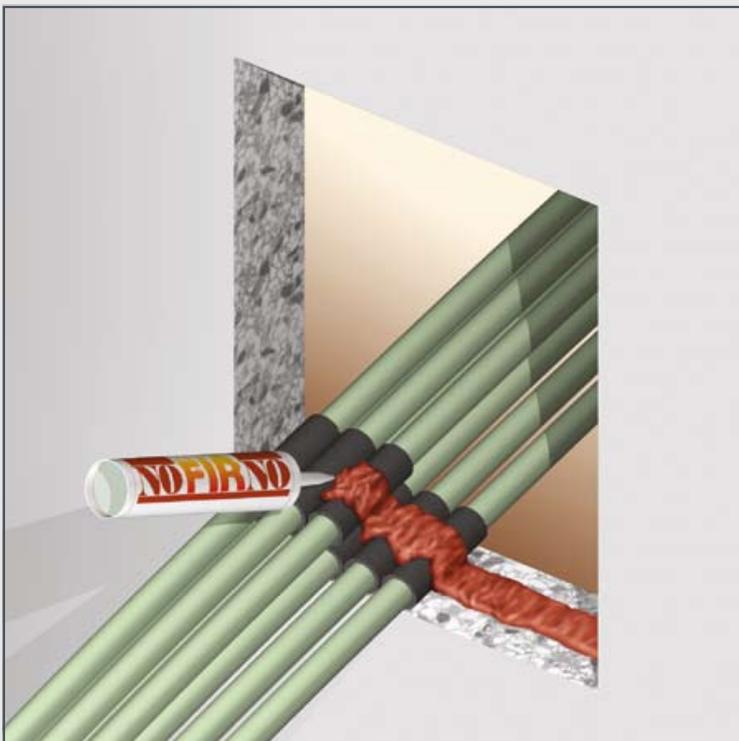


2) Depending on the required fire rating the RISE® insert sleeves should have an appropriate length. In case the depth of the penetration is too short, NOFIRNO® sleeves with a longer length can be placed around each of the cables.



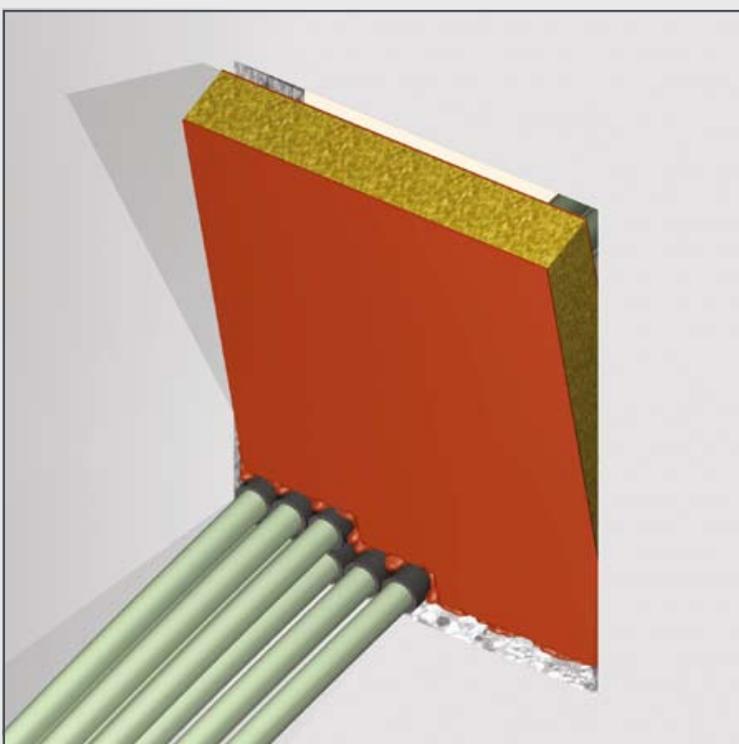
## NOFIRNO® - RISE® INSTALLATION INSTRUCTIONS

3) The RISE insert sleeves should have a tight fit around the cables. NOFIRNO® sealant is applied underneath, in between and on top of the bundle of insert sleeves. In this way a fair degree of initial smoke tightness is obtained.



**NOFIRNO**  
INNOVATIVE TECHNOLOGY

4) A NOFIRNO® board is cut to size and tightly inserted into the open space of the conduit opening. The NOFIRNO® board should be a bit oversized and can be forced into the opening using a piece of wood and a hammer.

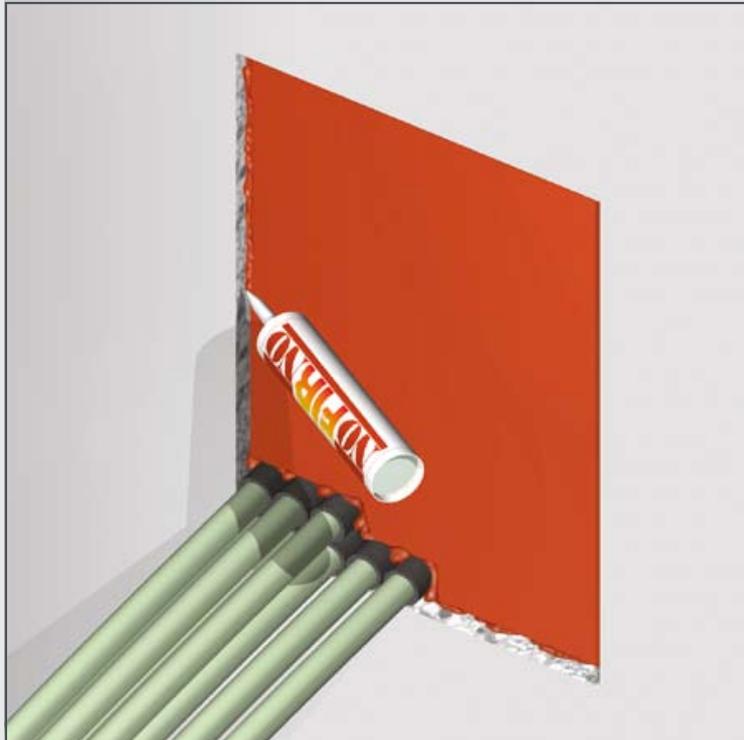


**NOFIRNO**  
INNOVATIVE TECHNOLOGY



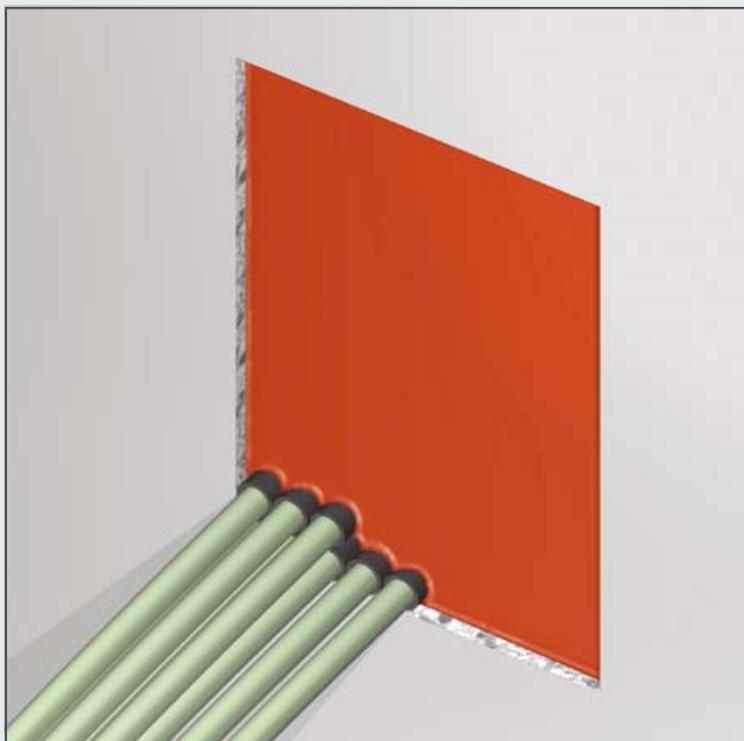
## NOFIRNO® - RISE® INSTALLATION INSTRUCTIONS

5) The NOFIRNO® board is sealed all around with NOFIRNO® sealant to obtain optimum tightness. This will also improve mechanical stability. The NOFIRNO® sealant is to be applied at both sides of the penetration.



**NOFIRNO**  
INNOVATIVE TECHNOLOGY

6) The finished NOFIRNO® - RISE® multi-cable penetration. The NOFIRNO® board can be removed for extra cables to be added. For higher fire ratings single coated NOFIRNO® boards can be installed at both sides of the conduit opening.



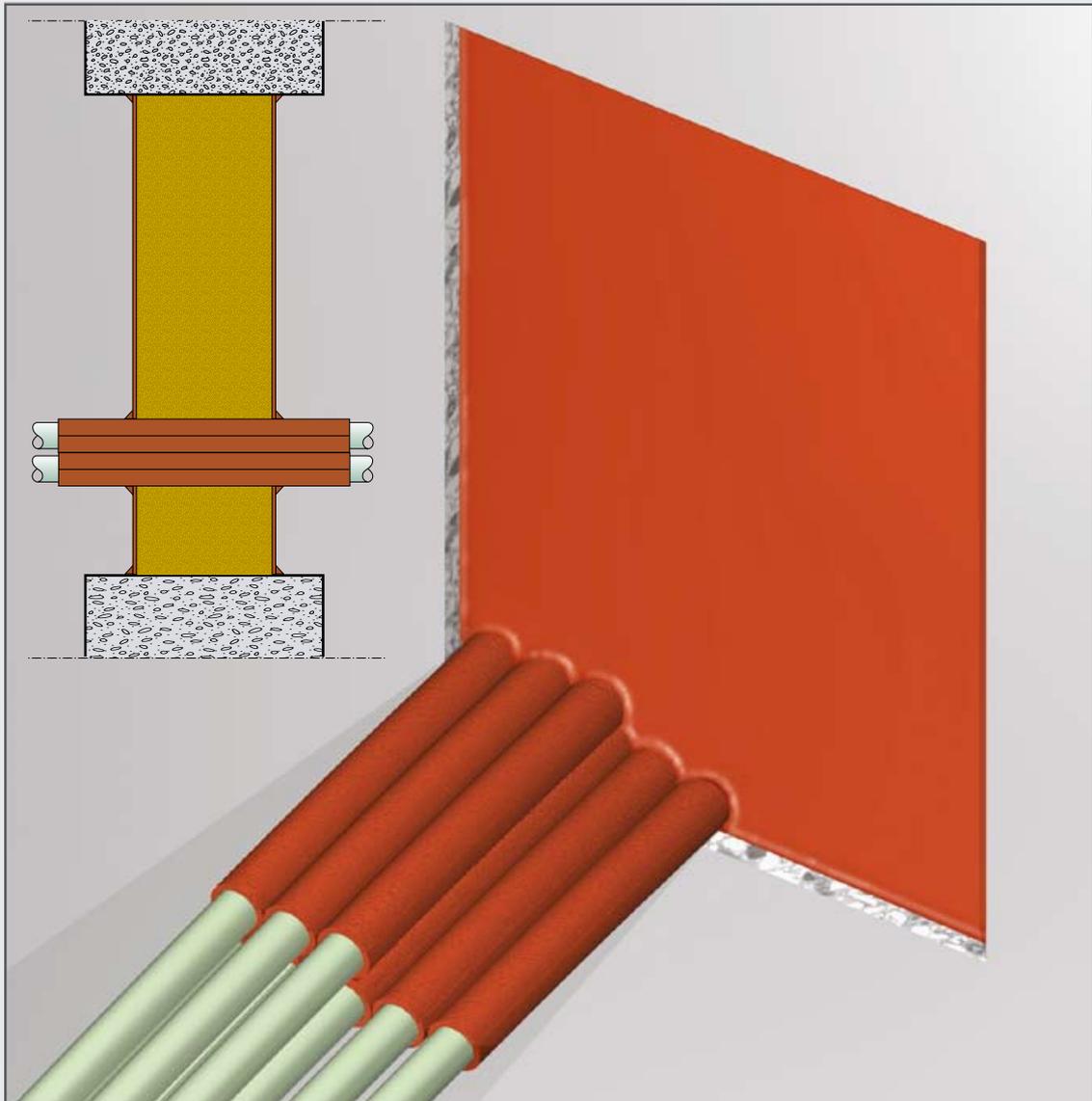
**NOFIRNO**  
INNOVATIVE TECHNOLOGY



# NO FIRNO

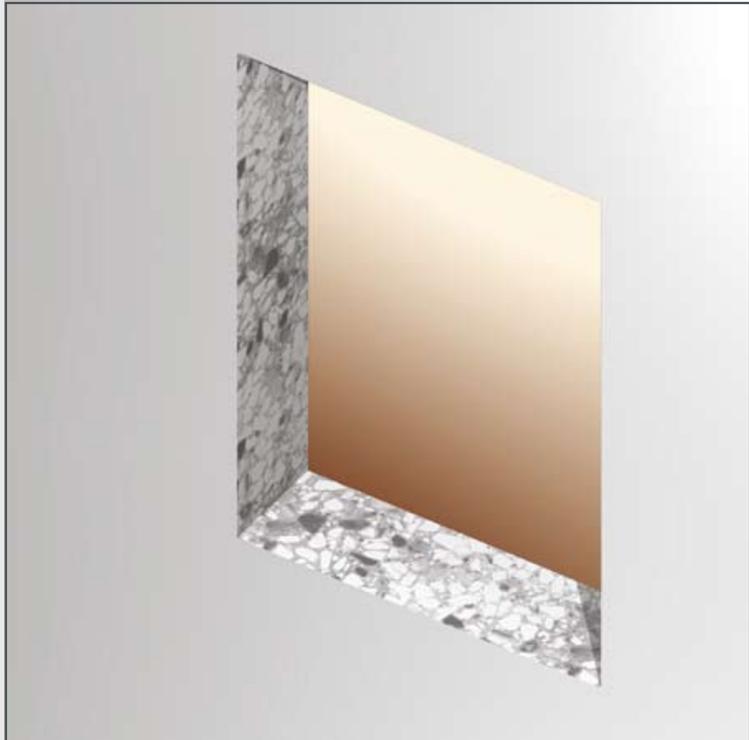
## INNOVATIVE TECHNOLOGY

*Two single sided coated boards, applied for the fire safe sealing of ducts for several cable runs, fulfil EI90/E120 classification, which stands for minimum two hours flame tight and 90 minutes thermal insulation. Large diameter cables with heavy copper conductors 4 x 185 mm<sup>2</sup> transmit substantial heat from the fire side. This influences thermal insulation performance up to E120. By applying longer NOFIRNO® insert sleeves around the cables this classification can be achieved easily.*

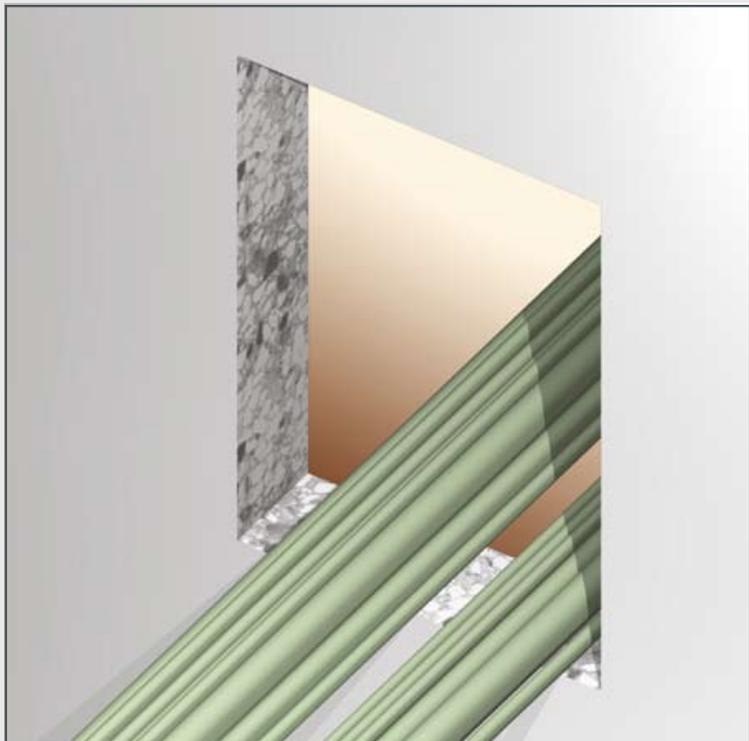


## NOFIRNO® - ACTIFOAM® INSTALLATION INSTRUCTIONS

1) If the walls inside the conduit opening exhibit large irregularities, they should be locally smoothed with NOFIRNO® fire safe sealant. Otherwise insufficient smoke tightness will be obtained.

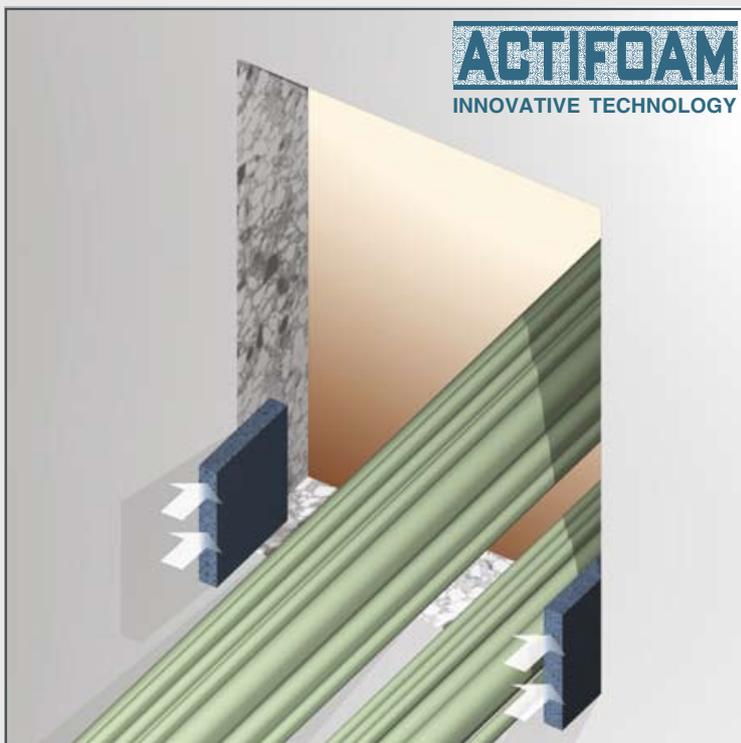


2) The cables can be ducted through the conduit opening in random order. It is most important that they are not pulled too tight in order not to hamper their separation at a later stage.

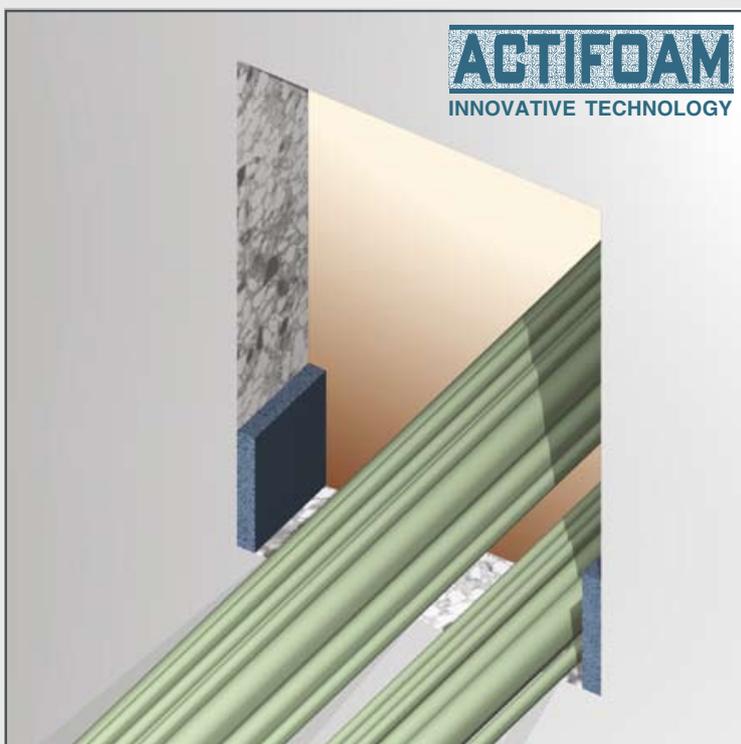


## NOFIRNO® - ACTIFOAM® INSTALLATION INSTRUCTIONS

3) ACTIFOAM® rubber sheets are cut into strips fitting to the size of the walls inside the conduit opening and the expected height of the cable set. For this purpose sheets with a thickness of 25 mm are used.

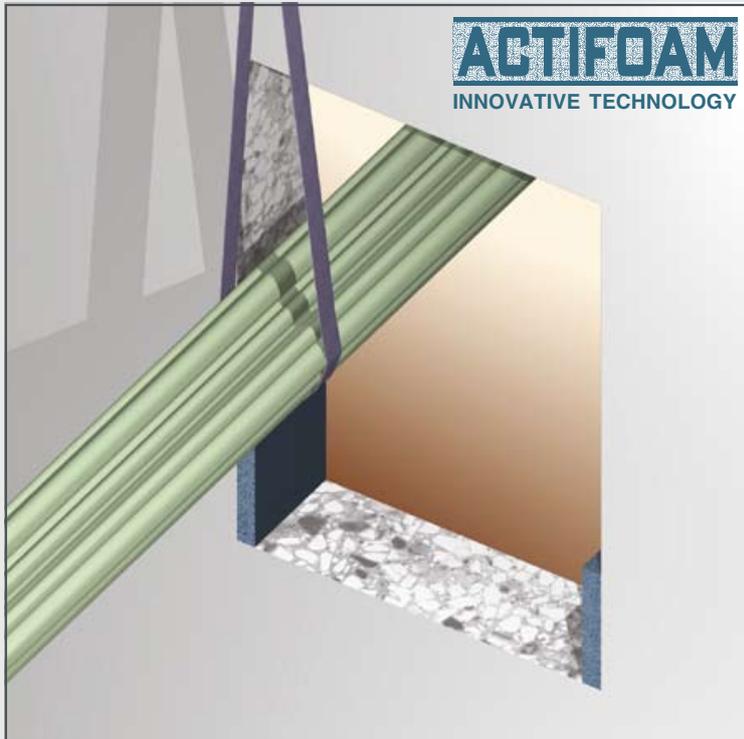


4) The ACTIFOAM® rubber sheets can easily be cut to size with a sharp knife. ACTIFOAM® rubber sheets are supplied in a variety of sizes, widths and thickness. See page 4 for more details.

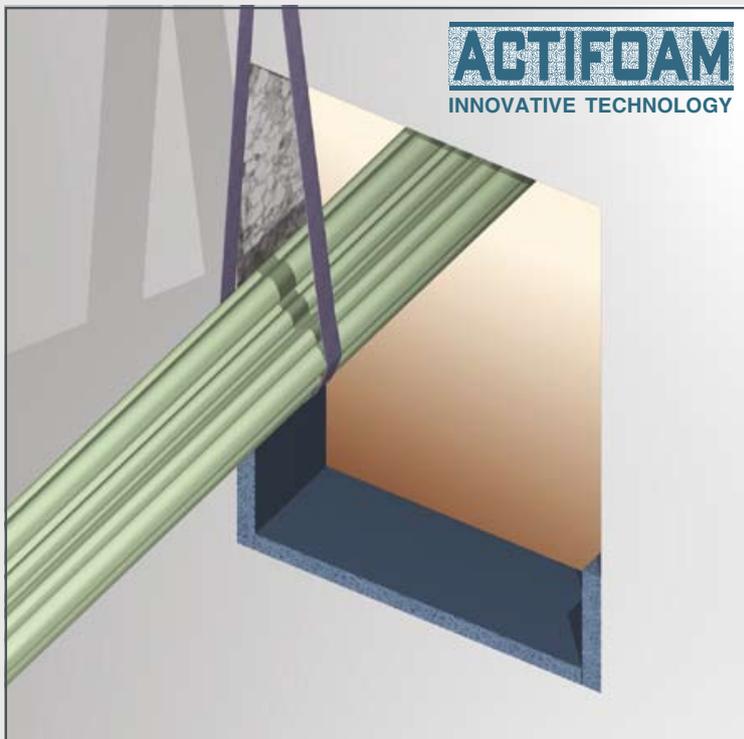


## NOFIRNO® - ACTIFOAM® INSTALLATION INSTRUCTIONS

5) An ACTIFOAM® rubber sheet must also be placed in the conduit opening underneath the layer of cables.  
A band is placed around the cable bundle to lift the bundle of cables.

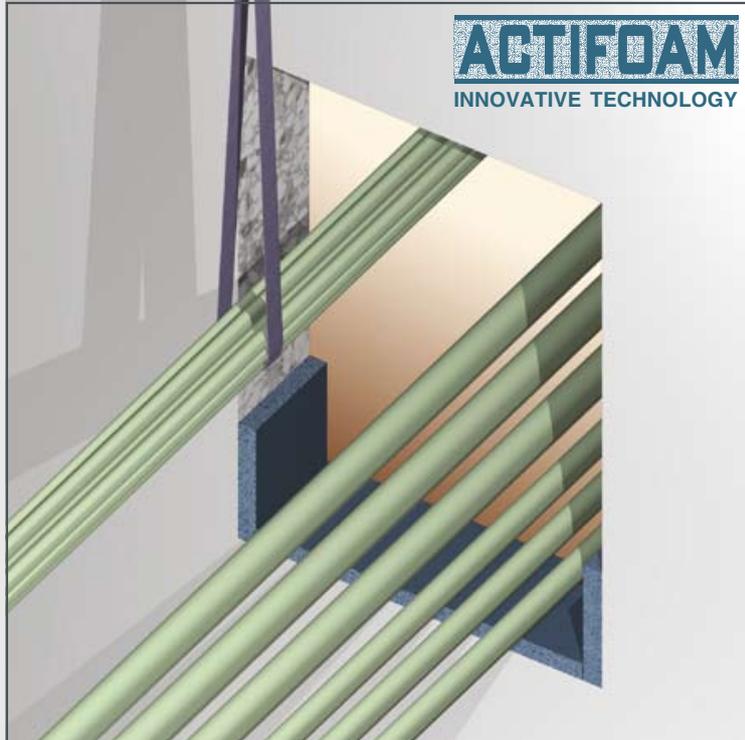


6) A slightly oversized strip of ACTIFOAM® rubber with a thickness of 25 mm is placed inside the conduit opening underneath the cables.  
The sheet should fit snugly between the sheets against the side walls.

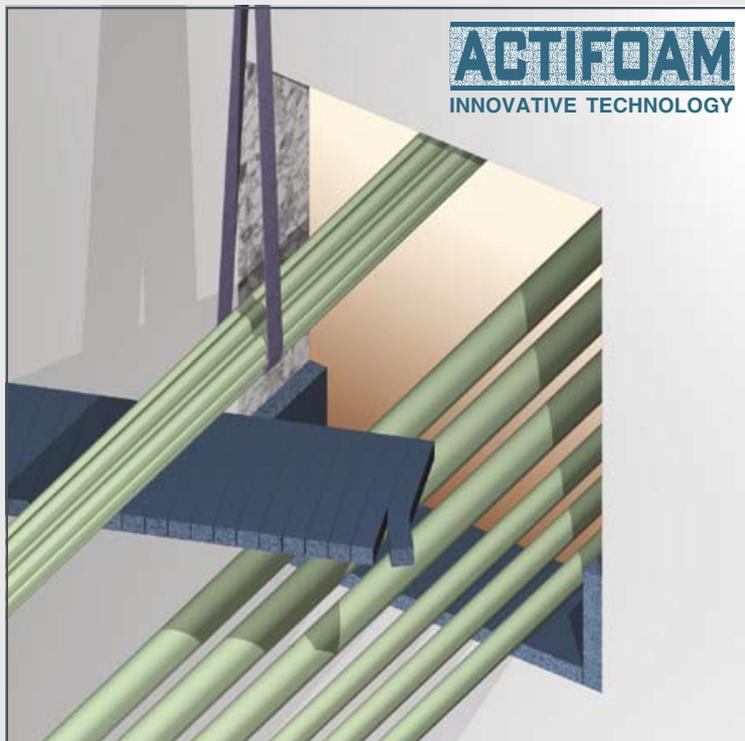


## NOFIRNO® - ACTIFOAM® INSTALLATION INSTRUCTIONS

7) One layer of cables is spread out on the ACTIFOAM® rubber sheet at the bottom of the conduit opening. The other cables are lifted to make room for further finishing the first layer.

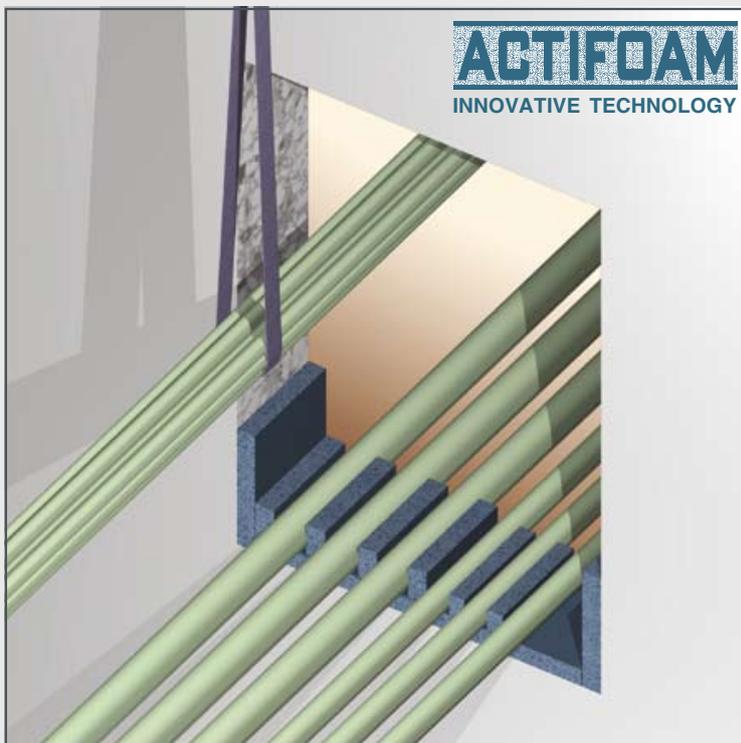


8) For proper cable separation, square profiles are torn off the pre-slit ACTIFOAM® rubber sheets. The sizes of the profiles should be equivalent to the cable diameters.

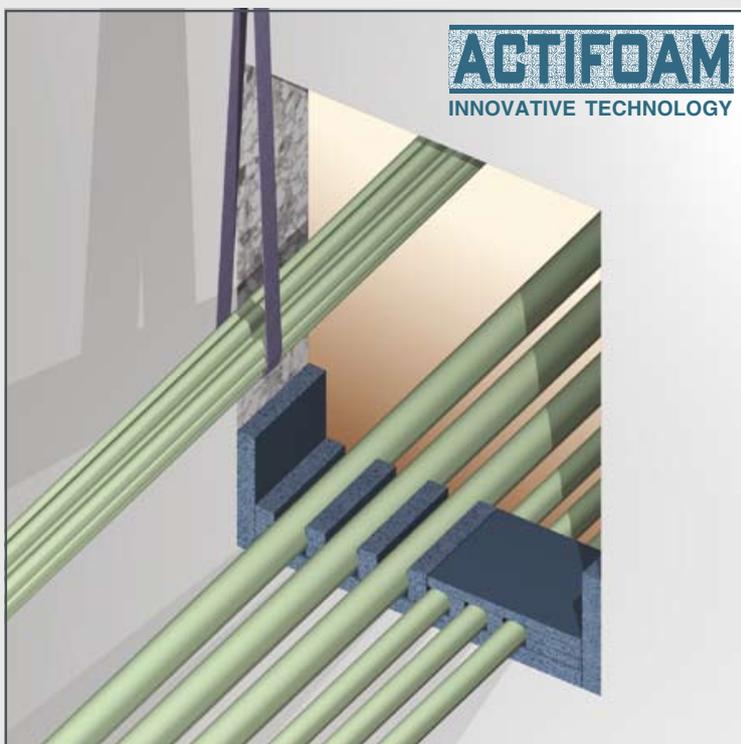


## NOFIRNO® - ACTIFOAM® INSTALLATION INSTRUCTIONS

9) Profiles are slit in sizes of 10x10, 15x15, 20x20 and 25x25 mm. This enables an easy fit for corresponding cable sizes. Cables larger than 25 mm should be separated by a minimum of 25 mm.



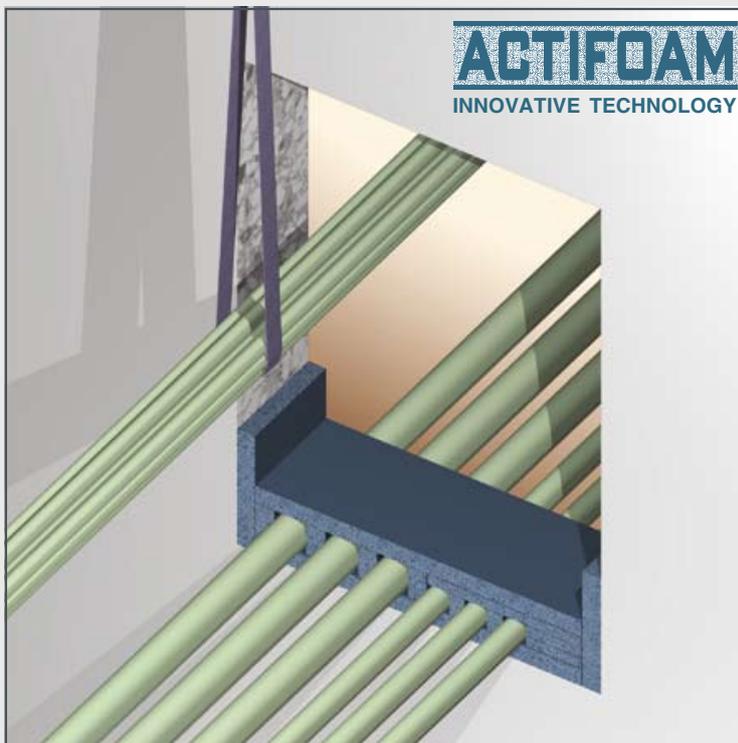
10) Adjacent to the first layer of cables and profiles, one or more extra sheets of ACTIFOAM® rubber are fitted to create a level layer for further filling the conduit opening.



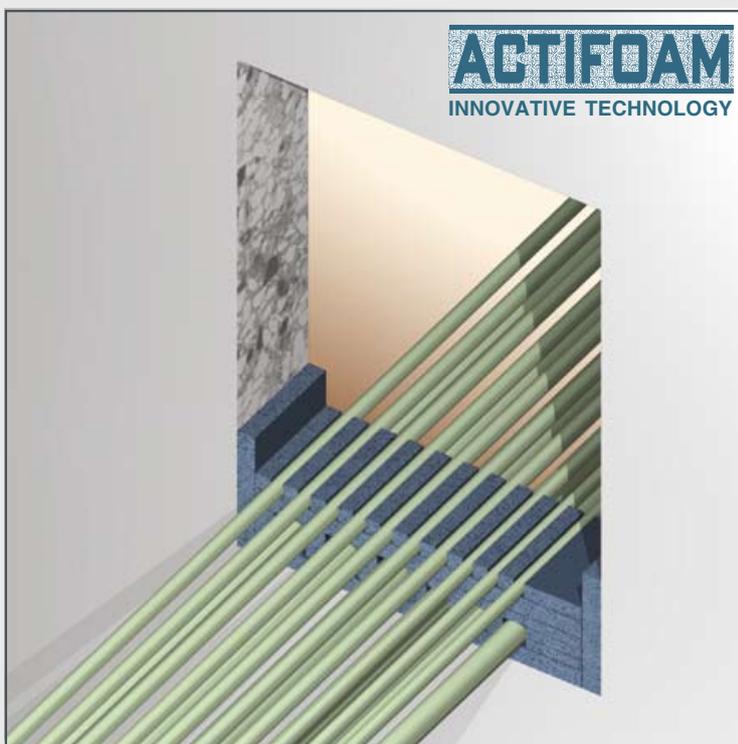
# NOFIRNO® - ACTIFOAM® INSTALLATION INSTRUCTIONS

11) An intermediate ACTIFOAM® rubber sheet is inserted in the conduit opening on top of the levelled first layer.

The thickness of the intermediate layer is dependent on the maximum cable diameter.

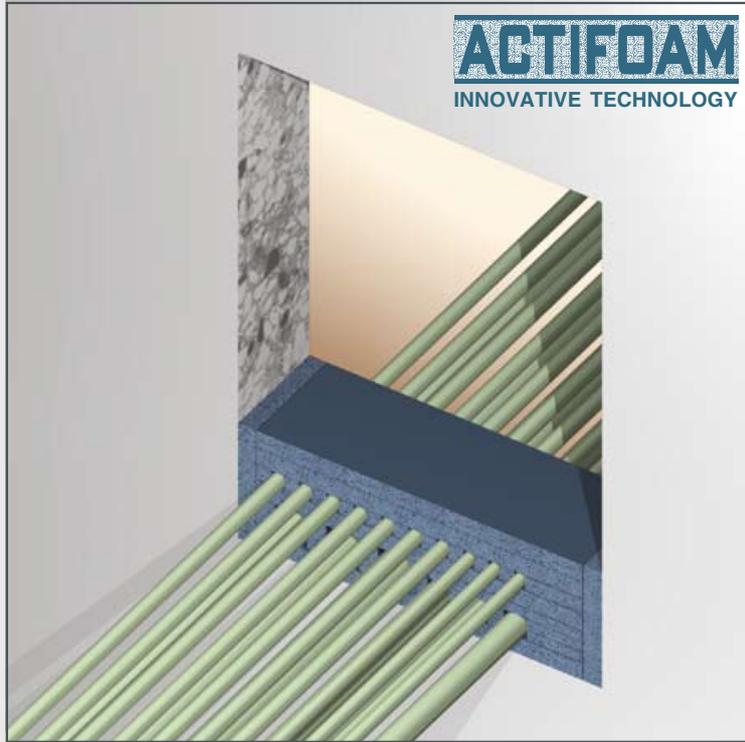


12) The next layer of cables is spread out and in the same way as with the first layer of cables, the cables are separated with the ACTIFOAM® pre-slit profiles and levelled with one or more ACTIFOAM® sheets.

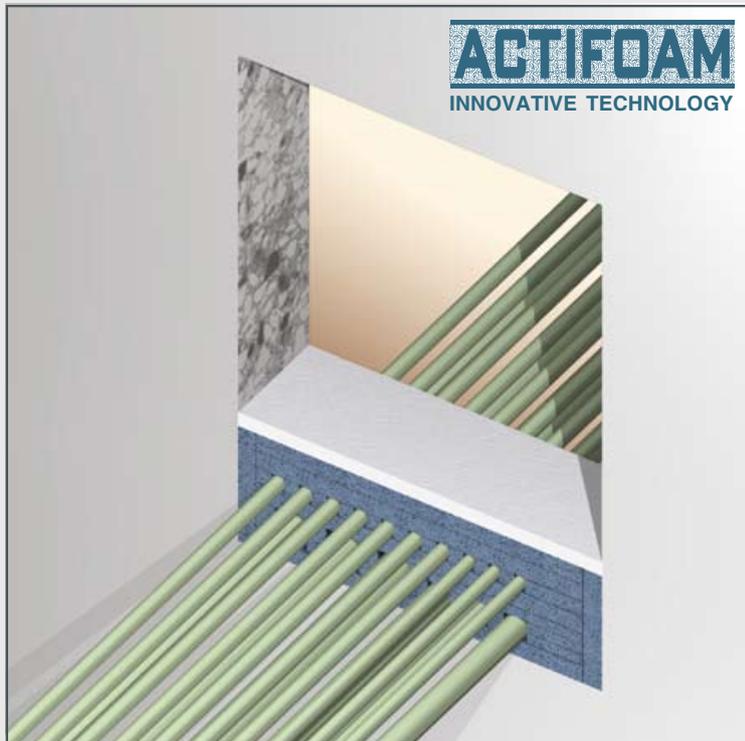


# NOFIRNO® - ACTIFOAM® INSTALLATION INSTRUCTIONS

13) The remaining space between the sheets, placed against the walls, is filled with one or more ACTIFOAM® sheets. All sheets should fit tightly in the conduit opening to obtain a fair degree of smoke tightness.

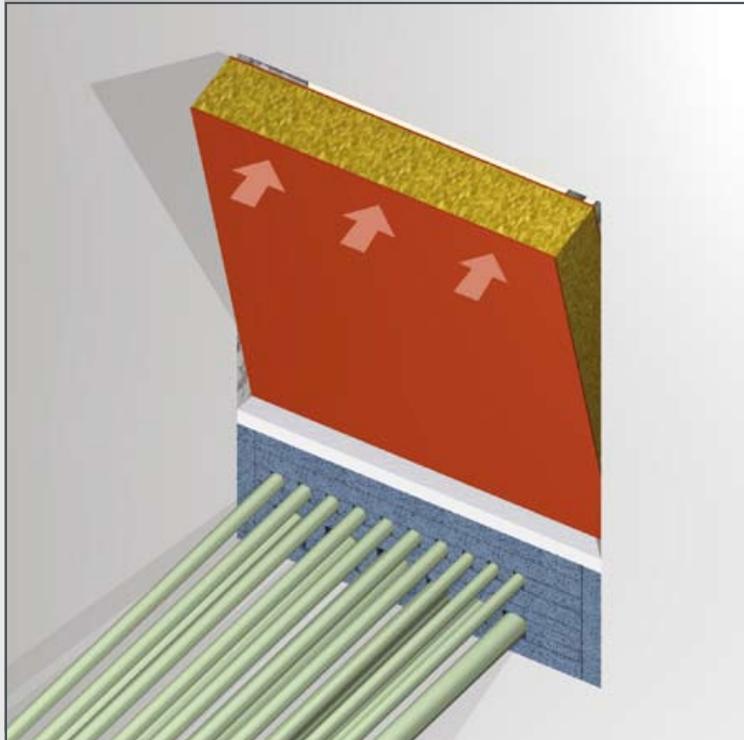


14) A fire safe compression plate is placed on top of the ACTIFOAM® filling to obtain controlled expansion during fire exposure. The plate is also needed to compress the ACTIFOAM® filling in order to improve tightness.

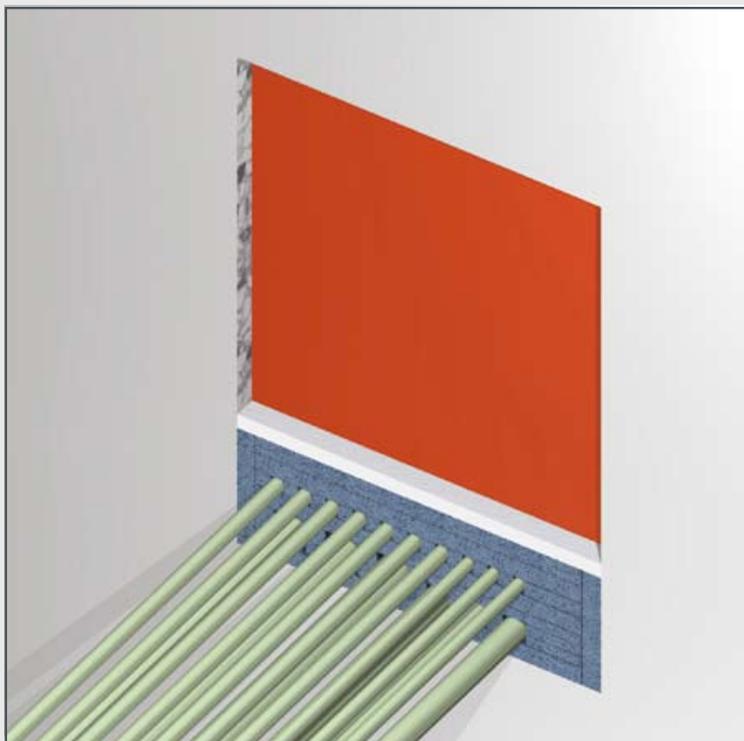


## NOFIRNO® - ACTIFOAM® INSTALLATION INSTRUCTIONS

15) A NOFIRNO® coated board is cut to size and tightly fitting inserted into the open space of the conduit opening. The NOFIRNO® board should be a bit oversized in height with a view to compress the ACTIFOAM® filling.

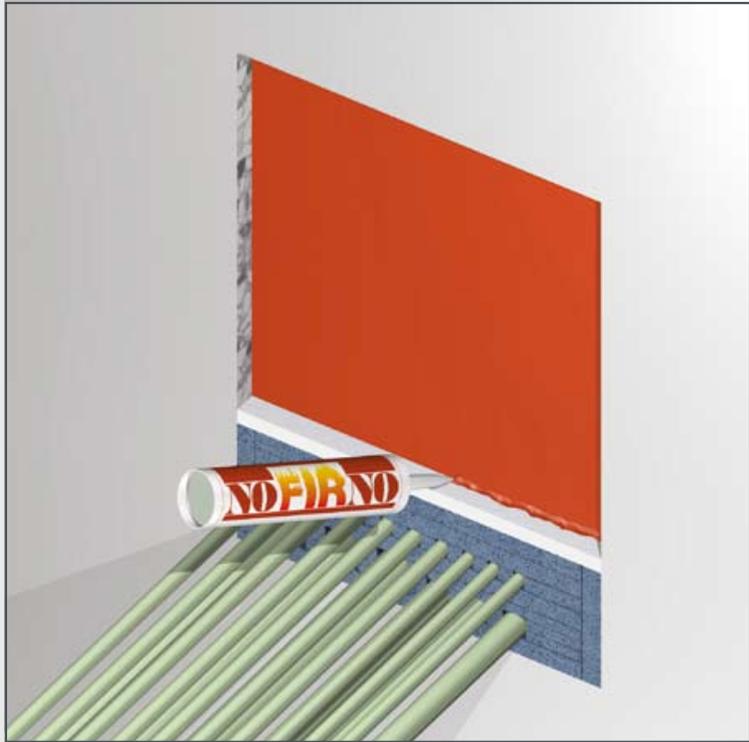


16) Depending on the required fire rating a single NOFIRNO® board coated on both sides can be inserted in the conduit opening. For higher fire ratings two boards coated on one side only can be placed on top of the compression plate.



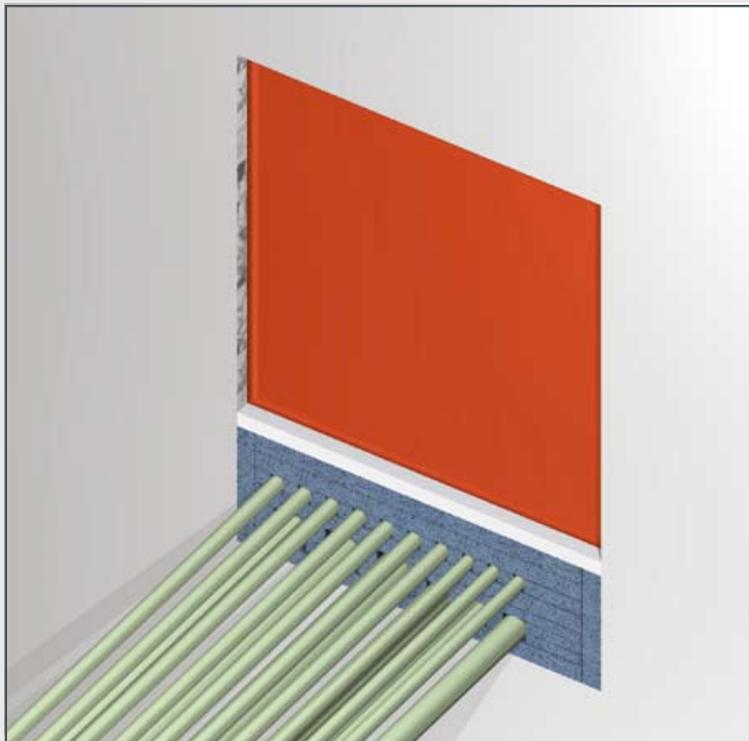
## NOFIRNO® - ACTIFOAM® INSTALLATION INSTRUCTIONS

17) The NOFIRNO® board is sealed all around with NOFIRNO® sealant to obtain optimum tightness and to avoid dehydration of the mineral wool. This will also improve mechanical stability. The NOFIRNO® sealant is to be applied at both sides of the penetration. The sealant can be smoothed by hand.



**NOFIRNO**  
INNOVATIVE TECHNOLOGY

18) The finished NOFIRNO® - ACTIFOAM® multi-cable penetration. For adding extra cables the NOFIRNO® board can be removed and the fire safe plate compression plate lifted. The ACTIFOAM® filling allows easy access for ducting more cables.



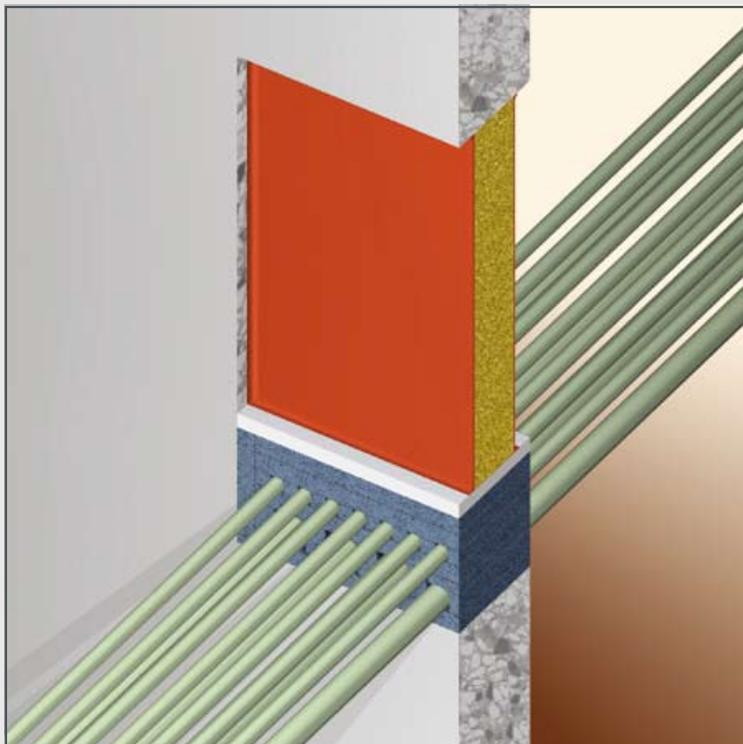
**NOFIRNO**  
INNOVATIVE TECHNOLOGY



## NOFIRNO® - ACTIFOAM® INSTALLATION INSTRUCTIONS

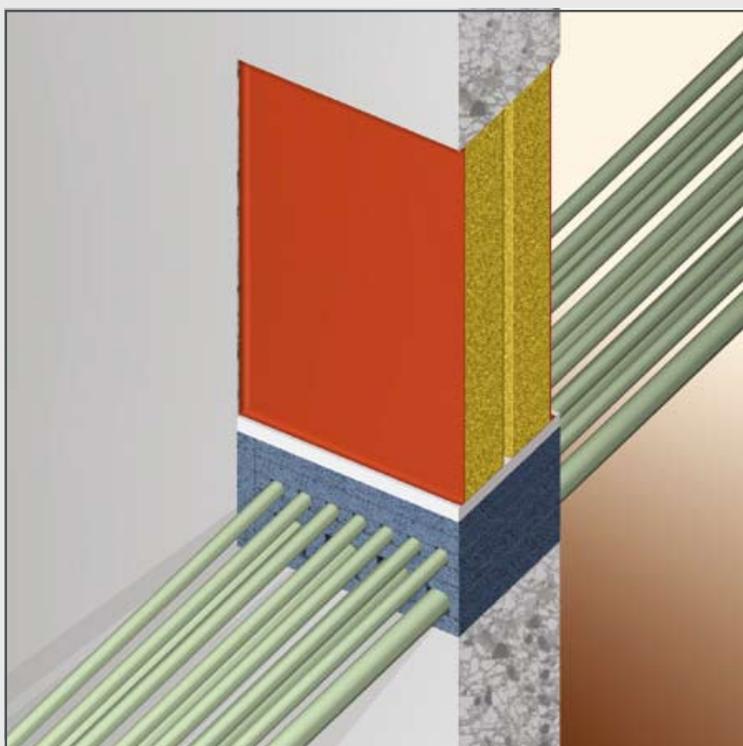
19) The finished NOFIRNO® - ACTIFOAM® multi-cable penetration with a single NOFIRNO® board coated on both sides.

Fire rating is dependent on the wall thickness and the amount of NOFIRNO® boards applied.



20) The finished NOFIRNO® - ACTIFOAM® multi-cable penetration with two NOFIRNO® boards coated on one side only.

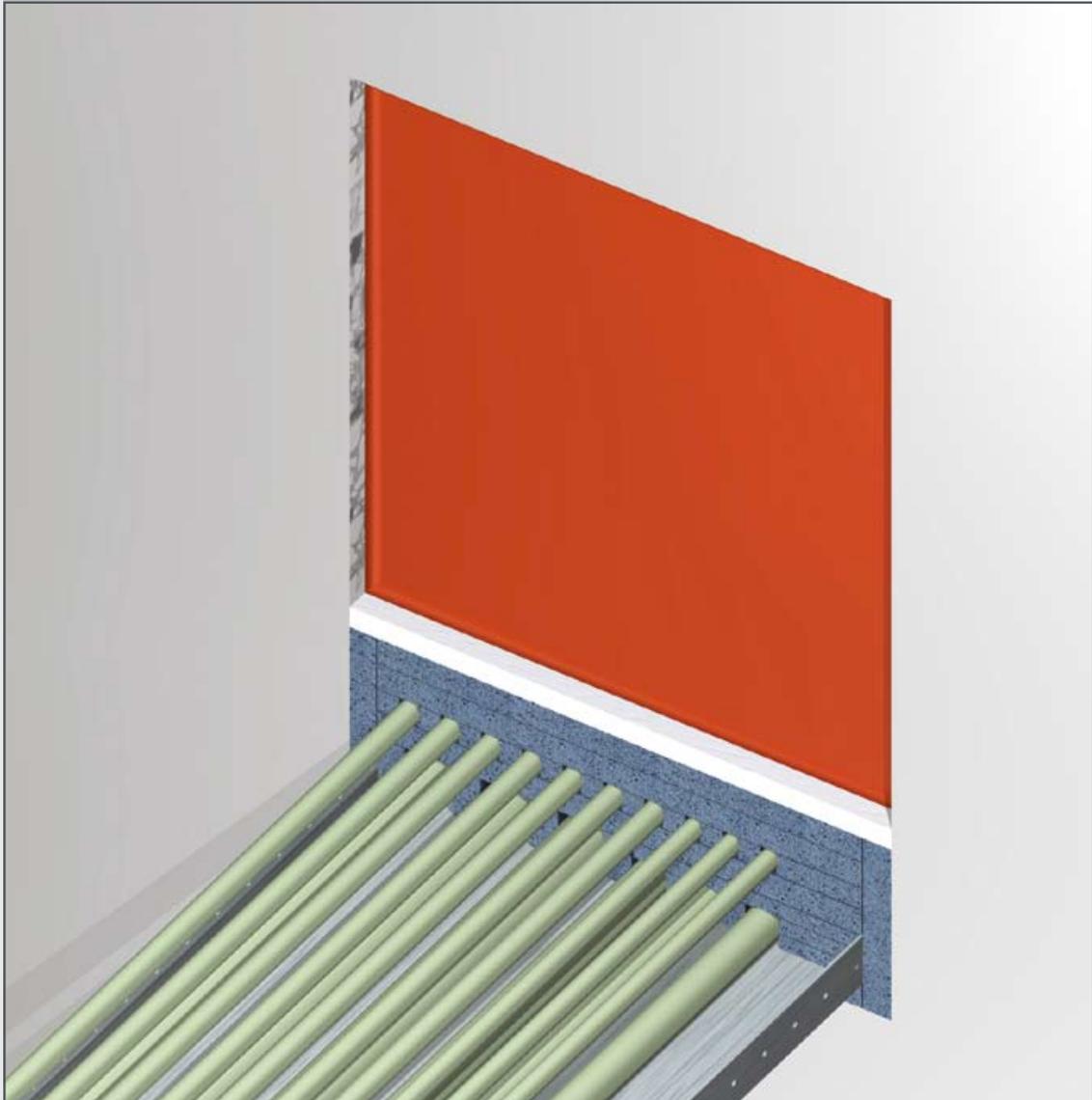
Fire rating is dependent on wall thickness and the amount of NOFIRNO® boards applied.



# NO FIR NO

## INNOVATIVE TECHNOLOGY

*The advantage of the NOFIRNO® - ACTIFOAM® sealing system is to allow for a spare space in the conduit opening which is sealed in a very easy and economic way. ACTIFOAM® allows, if required, the tray to be passed through the conduit opening. Furthermore it is not necessary to coat the cables and/or cable tray because of the outstanding thermal insulation properties of ACTIFOAM®, which therefore minimizes maintenance costs.*



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

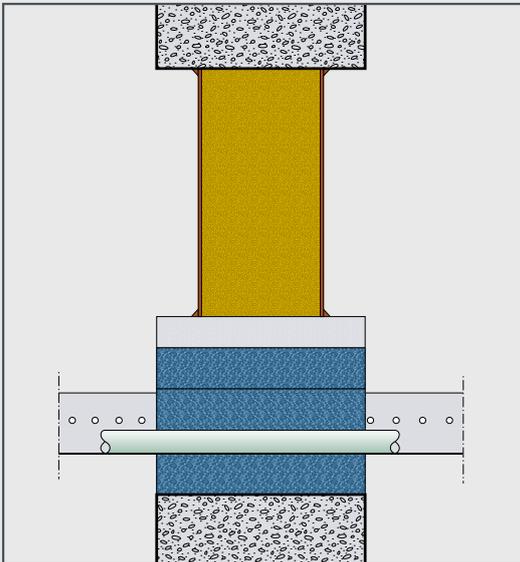
Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES

# NO FIRNO

## INNOVATIVE TECHNOLOGY

*Based on the combination of the NOFIRNO® and ACTIFOAM® technology, numerous configurations are possible. In our opinion the most friendly way of sealing is to use ACTIFOAM® for sealing around the cables and/or cable tray and NOFIRNO® boards for closing off the remaining open space in the conduit opening. To add extra cables, it is only necessary to remove the NOFIRNO® board and replace it after the work on the cable set is finished.*



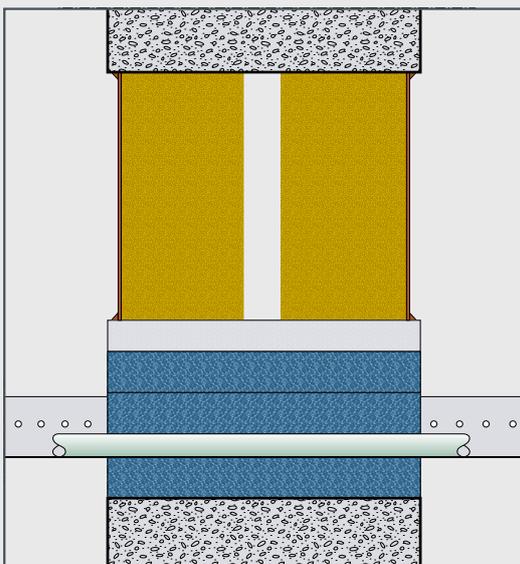
NOFIRNO® mineral wool board coated at each side with NOFIRNO® coating 1,2 - 1,5 mm thick; thickness of the mineral wool board 60 mm (without coating), mass of mineral wool about 152 kg/m<sup>3</sup>.

In case of fire the NOFIRNO® coating will form a ceramic protective shield at the exposed side. This shield is also a thermal barrier. Furthermore it prevents moisture from escaping from the inside of the mineral wool board. In this way no shrinkage will occur during fire exposure.

Seal seams around the NOFIRNO® mineral wool board with NOFIRNO® fire resistant sealant.

Apply a sufficient amount of ACTIFOAM® sheets underneath, on and between the cables over a width of at least 150 mm. Place a NOFIRNO® fire safe plate on top of the ACTIFOAM® filling. Finally the NOFIRNO® mineral wool board can be fittingly inserted.

**Important: it is advisable to apply a sticker on or next to the penetration to indicate the importance of the fire resistant conduit and that it should only be modified under the supervision of a qualified maintenance engineer.**



NOFIRNO® mineral wool boards each coated at one side with NOFIRNO® coating 1,2 - 1,5 mm thick; thickness of the mineral wool board 60 mm (without coating), mass of mineral wool about 152 kg/m<sup>3</sup>.

In case of fire the NOFIRNO® coating will form a ceramic protective shield at the exposed side. This shield is also a thermal barrier. Furthermore it prevents moisture from escaping from the inside of the mineral wool board. In this way no shrinkage will occur during fire exposure.

Seal seams around the NOFIRNO® mineral wool board with NOFIRNO® fire resistant sealant.

Apply a sufficient amount of ACTIFOAM® sheets underneath, on and between the cables over a width of at least 200 mm. Place a NOFIRNO® fire safe plate on top of the ACTIFOAM® filling. Finally the NOFIRNO® mineral wool boards can be fittingly inserted.

**Important: it is advisable to apply a sticker on or next to the penetration to indicate the importance of the fire resistant conduit and that it should only be modified under the supervision of a qualified maintenance engineer.**



# NO FIRNO

## INNOVATIVE TECHNOLOGY

*Numerous fire tests have been carried out to determine the quality of the NOFIRNO® coating applied on the NOFIRNO® boards in a thickness of 1,2-1,5 mm by airless spraying. All the tests have proved that no smoke emission is released by the coating or the mineral wool board itself, and also that no moisture and vapours could escape from the mineral wool boards. During a two-hour fire test, the surface of the NOFIRNO® boards even remained unchanged at the unexposed side.*



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES

# NO FIRNO

## INNOVATIVE TECHNOLOGY

*The main objective of the NOFIRNO® coating is to avoid any release of moisture and vapours from the coated mineral wool boards. Loss of moisture will automatically cause shrinkage of the boards, thereby resulting in loss of mechanical stability during fire exposure. Fire tests have shown that after only 10-15 minutes testing a substantial amount of moisture will already escape from an uncoated board. With NOFIRNO®, this is not the case and mechanical stability is maintained.*



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES

# RISE/NOFIRNO®: THE ULTIMATE SEALING SYSTEM FOR MULTI-ALL- MIX TRANSITS® (PIPES AND CABLES)



**SUCCESSFULLY TESTED ACCORDING TO  
EN 1366-3:2004; FIRE RESISTANCE  
EI90/EI120 ACCORDING TO EN 13501-2:2003  
CERTIFICATES 2008-EFECTIS-R0763-64**



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES

## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM

*RISE<sup>®</sup>/NOFIRNO<sup>®</sup> pipe penetrations:  
based on high-tech NOFIRNO<sup>®</sup> technology*

Non-insulated steel partitions are most dangerous in fire conditions. Generally certificates for use on boards ships and offshore constructions are issued on the basis of a successful A-60 test for A-0 up to A-60 class. However, if the approval is for A-0 up to A-60 without the remark that the system is approved for steel partitions without insulation, this means that for these applications insulation has to be applied (insulated) as tested for A-60 class. This may not be observed in practice since such partitions are generally not insulated at all. The fire integrity may then be very doubtful in such a case.

The market place tends to think that A-0 is less severe than A-60. This is not the case! Due to the missing insulation it is just the opposite.

The intense heat of the construction will cause all materials in the direct vicinity to ignite spontaneously. The radiation heat can be so immense that ignition might occur even at several meters distance.



Specially with A-0 decks the rising radiation heat of the deck, reaching temperatures of more than 700 °C, contributes to even more severe conditions. It will be obvious that the impact on sealing systems will be extreme. Based on "no insulation", the development of the RISE<sup>®</sup>/NOFIRNO<sup>®</sup> sealing system was started. As proven with the SLIPSIL<sup>®</sup> plugs, the NOFIRNO<sup>®</sup> rubber will not be consumed by fire. For A-0 class it is of utmost importance to keep the sealing system inside the penetration. In contrast to the regular RISE<sup>®</sup> system only a limited expansion of the rubber will take place. No material will fall off during fire exposure at the unexposed side. The NOFIRNO<sup>®</sup> sealant will follow any deformation of the division.

The thermal insulation of the transit is maintained and no excessive temperatures will arise on the NOFIRNO<sup>®</sup> rubber/sealant. Furthermore no smoke emission will occur, also limiting any ignition possibilities at the unexposed side.



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM

*RISE<sup>®</sup>/NOFIRNO<sup>®</sup> pipe penetrations:  
based on high-tech NOFIRNO<sup>®</sup> technology*

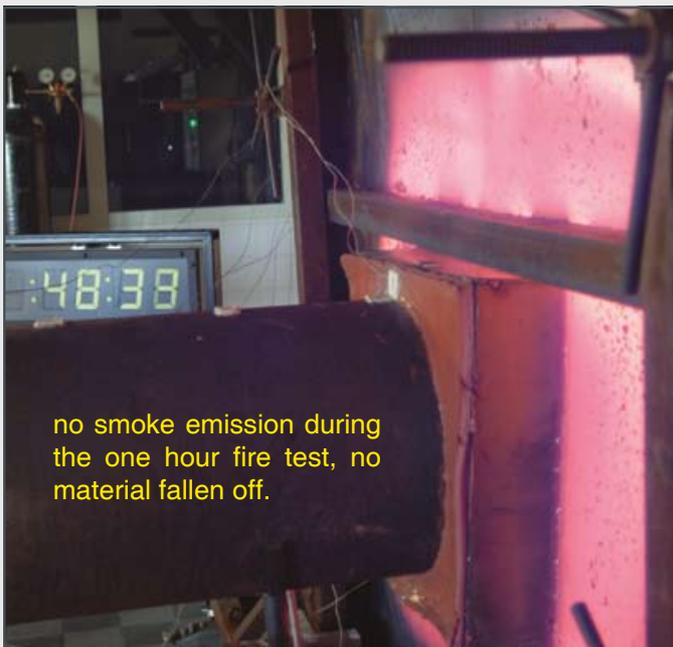
The NOFIRNO<sup>®</sup> rubber has excellent properties regarding exposure to fire and excessive temperatures. Specially for A-0 class divisions this is an advantage because the sealing system will be exposed to hot metal parts all around; the steel division, the coaming/conduit sleeve and the ducted metallic pipe will all get extremely hot up to red glowing. The picture below left shows the red glowing bulkhead and coaming.

At the end of the one hour fire test, temperatures measured on the coaming were over 420 °C, and at a distance 25 mm away from the sealing system over 350 °C on the ducted steel pipe. Another unique property of the RISE<sup>®</sup>/NOFIRNO<sup>®</sup> system is its very high thermal insulation value. On the surface of the sealing system 23 mm away from the coaming and 23 mm away from the ducted steel pipe the temperature had only risen about 160 °C.

The picture below right shows the non-consumable feature of the rubber.



now also successfully tested for H-0 class partitions at furnace temperatures of 1150 °C.



no smoke emission during the one hour fire test, no material fallen off.



proof after dismantling that the rubber and sealant are only partly affected by the hot coaming



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES

## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM

*RISE<sup>®</sup>/NOFIRNO<sup>®</sup> pipe penetrations:  
based on high-tech NOFIRNO<sup>®</sup> technology*

It will be obvious that the RISE<sup>®</sup>/NOFIRNO<sup>®</sup> sealing system, once so successfully tested for A-0 divisions, is also most suitable for A-60 penetrations.

First of all the fire test in an A-0 division has shown that the surface of the sealing system does not exceed the thermal insulation requirements of the A-60 criteria according to IMO Resolution A.754(18).

Secondly it has been proven that the NOFIRNO<sup>®</sup> rubber will not be consumed by fire exposure. This phenomenon has also been shown with the fire tests on the SLIPSIL<sup>®</sup> plugs.

So, in fact it is only a matter of sufficient insulation of the conduit sleeve and the ducted pipe to fulfill E/EI classification.

Based on the achievements with the RISE/NOFIRNO<sup>®</sup> sealing system for A-0, it has been possible to reduce the conduit depth even to 150 mm. Officially tested according to EN1366-3:2004 and classified according to EN 13501-2:2003.



The properties of the RISE<sup>®</sup>/NOFIRNO<sup>®</sup> sealing system have been optimized:

- 1) the NOFIRNO<sup>®</sup> rubber shows minimum permanent deformation and optimizes mechanical stability on long term.
- 2) the NOFIRNO<sup>®</sup> rubber can be exposed to high temperatures (up to 180 °C), making the RISE/NOFIRNO<sup>®</sup> sealing system suitable for steam lines.
- 3) the NOFIRNO<sup>®</sup> sealant/rubber has improved fire stopping properties:
  - a) creates immediately a protective layer at the fire side
  - b) will not be consumed under fire exposure
  - c) prevents smoke emission
- 4) higher thermal insulation values under fire load with the RISE/NOFIRNO<sup>®</sup> system
- 5) shorter conduit depths with the RISE<sup>®</sup>/NOFIRNO<sup>®</sup> system
- 6) approved for A-0 class without the use of any insulation.



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM

*RISE<sup>®</sup>/NOFIRNO<sup>®</sup> pipe penetrations:  
based on high-tech NOFIRNO<sup>®</sup> technology*

For manufacturing NOFIRNO<sup>®</sup> sleeves and sealant use is made of a high quality polymer. NOFIRNO<sup>®</sup> rubber has excellent weathering properties, UV and ozone resistance and long term behaviour. Service life of the sleeves and sealant easily exceeds 20 years under normal environmental conditions.

The sleeves and sealant can be used in a very wide temperature range. Even at low temperatures down to -50° C the rubber stays flexible and does not harden excessively as other rubber types will do. This guarantees tightness even at low temperatures. The rubber can also be used in applications up to +180° C.

A single rubber grade is now capable of satisfying almost all sealing conditions. Sealing systems are safety devices. Only highest quality can do the job, not only when newly installed but also after a long service life.

With NOFIRNO<sup>®</sup> this safety is guaranteed for a very long time!



The NOFIRNO<sup>®</sup> rubber grade, which is compounded under strict conditions in our factory, is suitable for gas and water tight ducting and for fire rated applications as well. We have been involved with fire resistant rubbers for decades. The drawbacks of certain fire resistant types are halogen content, hardness of the highly filled rubbers, hardening during lifetime, and high permanent deformation sets. All these features will have an impact on performance in the long run.

NOFIRNO<sup>®</sup> rubber does not have the above drawbacks.

The processing conditions for optimized compounding in our factory assure highest performance of the rubber.

NOFIRNO<sup>®</sup> rubber is traceable to prevent counterfeiting and to guarantee users that they get the quality they are paying for. From the way of surface charring and the rubber residues inside the product, it can easily be determined whether or not NOFIRNO<sup>®</sup> has been used.



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM

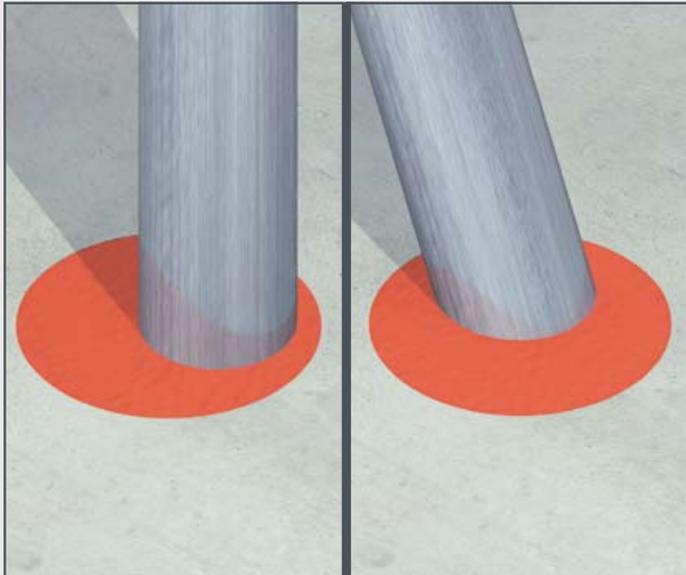
*RISE<sup>®</sup>/NOFIRNO<sup>®</sup> pipe penetrations:  
based on high-tech NOFIRNO<sup>®</sup> technology*

The RISE/NOFIRNO<sup>®</sup> pipe sealing system is a most adaptive system for sealing eccentrically and angled pipe penetrations in fire-rated/watertight walls and floors. Use is made of non-split, hollow NOFIRNO<sup>®</sup> filler sleeves type 18/12 and 27/19 made of high-tech NOFIRNO<sup>®</sup> rubber to fill the space around the ducted pipe inside the penetration.

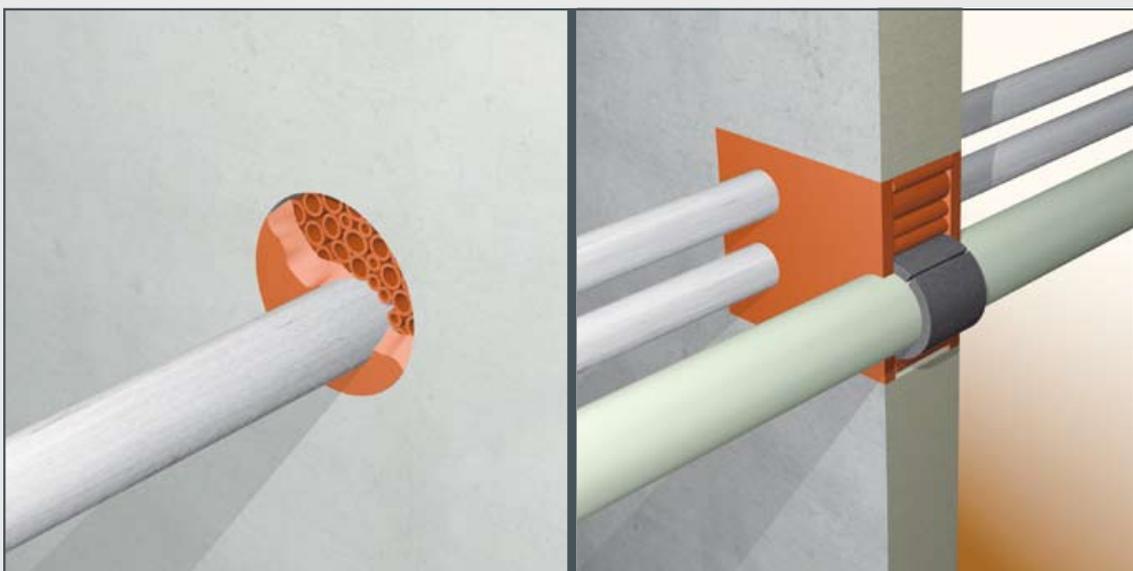
In case of plastic pipes a RISE<sup>®</sup>/ULTRA crusher is placed around the ducted pipe and the remaining space is filled with NOFIRNO<sup>®</sup> filler sleeves. The RISE<sup>®</sup>/ULTRA crusher expands when exposed to heat/flames and will then crush the softened plastic pipe.

On both sides of the penetration a layer of NOFIRNO<sup>®</sup> sealant is applied.

**Only halogen free, non-intumescent, non-ageing components with a low smoke index.**



*RISE<sup>®</sup>/NOFIRNO<sup>®</sup> pipe penetrations:  
ultimate flexibility, maintenance friendly*



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES

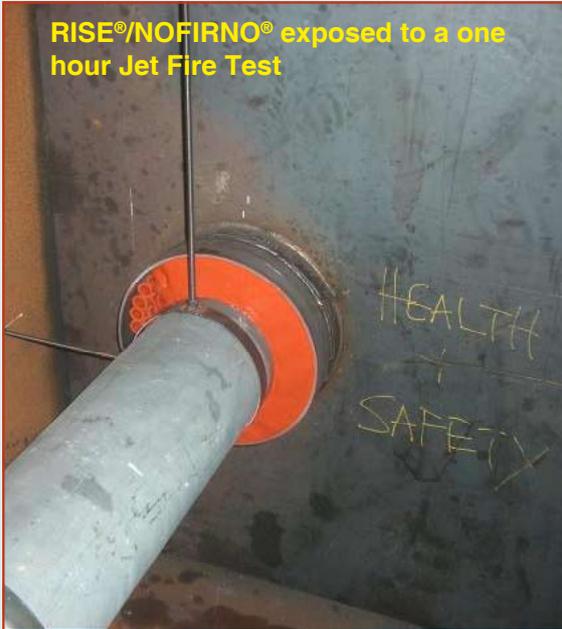
## **RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM**

*RISE<sup>®</sup>/NOFIRNO<sup>®</sup> pipe penetrations:  
based on high-tech NOFIRNO<sup>®</sup> technology*

SYSTEM WILL NOT BE CONSUMED WHEN EXPOSED TO FIRE  
ALL COMPONENTS ARE TOTALLY HALOGEN FREE  
IN CASE OF FIRE: NON-TOXIC, LOW SMOKE INDEX  
EC (MED) AND TYPE APPROVAL CERTIFICATES ISSUED  
SUCCESSFULLY TESTED ACCORDING TO EN 1366-3  
NO METAL PARTS, NO CORROSION  
HIGH LEVEL OF EMC AND SOUND DAMPING  
SHOCK AND VIBRATION PROOF  
LONG LASTING FLEXIBLE SYSTEM:  
NO MECHANICAL STRESSES TRANSFERRED TO THE DIVISION  
UP TO 50 YEARS SERVICE LIFE  
TEMPERATURE CHANGES ARE EASILY ABSORBED  
CAN BE USED IN ARCTIC CONDITIONS  
WEATHERING, UV AND OZONE RESISTANT  
PROVIDES CATHODIC PROTECTION  
ALLOWS LONGITUDINAL/RADIAL MOVEMENT  
FOR METALLIC, PLASTIC AND GRP PIPES  
APPROVED FOR MULTI-MIX PIPE PENETRATIONS  
MOST EASY TO INSTALL: REDUCES LABOUR COSTS  
NO INSULATION REQUIRED FOR NON-INSULATED DIVISIONS  
SHORTEST POSSIBLE CONDUIT LENGTH  
APPROVED FOR CONCRETE, STEEL AND ALUMINIUM PARTITIONS  
MAINTENANCE FRIENDLY



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM



RISE<sup>®</sup>/NOFIRNO<sup>®</sup> exposed to a one hour Jet Fire Test



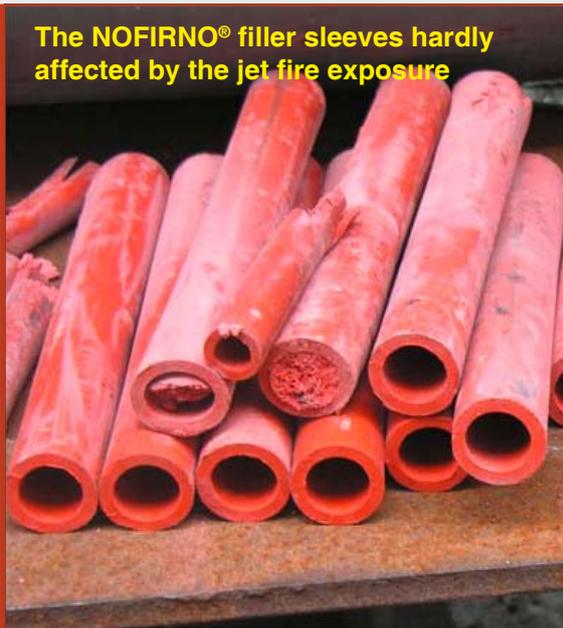
Unexposed side directly after the jet fire test



An indicative Jet Fire Test to support Health and Safety Laboratories to test out the new Jet Fire Test procedures they are currently writing for HSE. After exposure for 1 hour the performance of RISE<sup>®</sup>/NOFIRNO<sup>®</sup> is almost identical to that in the A-0 fire tests according to IMO Resolution A.754(18). The NOFIRNO<sup>®</sup> rubber is hardly affected.



The NOFIRNO<sup>®</sup> filler sleeves hardly affected by the jet fire exposure



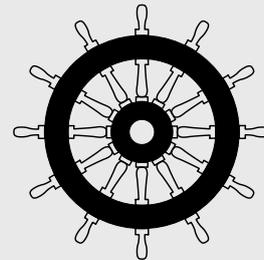
The NOFIRNO<sup>®</sup> filler sleeves hardly affected by the jet fire exposure



# RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM



EC (MED) certificates according to EUROPEAN UNION COUNCIL DIRECTIVE 96/98 EC on MARINE EQUIPMENT have been issued by Det Norske Veritas certificates N° MED-B-4906 for RISE/ULTRA, N° MED-B-4908 for RISE/NOFIRNO multi-pipe and multi-all-mix penetrations and N° MED-B-4941 for SLIPSIL plugs and by Bureau Veritas certificates N° 09156/B2 EC for RISE, RISE/NOFIRNO and RIACNOF multi-cable penetrations and extended multi-cable penetrations, N° 11301/B0 EC for RISE-EMC multi-cable penetrations, N° 11302/A2 EC for RISE busbar penetrations and certificates N° 10035/B0 EC and N° 10710/B1 EC for RISE single and multi-pipe penetrations for metallic and plastic pipes.



AMERICAN BUREAU of Shipping . . . *CERTIFIED*  
 BUREAU VERITAS  
 CHINA CLASSIFICATION SOCIETY  
 CHINA CORPORATION REGISTER of Shipping  
 DET NORSKE VERITAS . . . . . *CERTIFIED*  
 GERMANISCHER Lloyd  
 KOREAN REGISTER of Shipping  
 Lloyd's REGISTER of Shipping  
 Nippon Kaiyokai  
 RUSSIAN MARITIME REGISTER of Shipping  
 TRANSPORT CANADA via DNV CERTIFICATES  
 USCG via MED CERTIFICATES

**APPLIED FOR**



CERTIFIED BY  
 THE MAJOR  
 CLASSIFICATION  
 SOCIETIES

*Note: configurations may differ per classification society.*



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
 SERVICES

## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM

*only two different components for a  
NOFIRNO<sup>®</sup> pipe transit: sleeves and sealant*



sleeve type	sleeve length (standard)	sleeve length (standard)	sleeve length (standard)	wall thickness
18/12*	110	140	160	3
27/19*	110	140	160	4

\* filler sleeves are supplied non-split for ease of filling dimensions in mm



*NOFIRNO rubber is absolutely HALOGEN FREE (tested according to Naval Engineering Standard NES 713: Issue 3).*

*Furthermore NOFIRNO rubber has a low smoke index (NES 711: Issue 2: 1981) and a high oxygen index (ISO 4589-2: 1996).*

### RISE<sup>®</sup>/NOFIRNO<sup>®</sup> pipe penetrations: non-toxic, halogen free components

Our most superior rubber grade, which is suitable for fire rated applications as well, has been selected for NOFIRNO<sup>®</sup> sleeves.

For decades we have been involved with fire resistant rubbers. The drawbacks of certain fire resistant types are halogen content, hardness of the highly filled rubbers, hardening during lifetime and high permanent deformation sets. All these features will have an impact on performance in the long run. NOFIRNO<sup>®</sup> rubber does not have the above drawbacks.

NOFIRNO<sup>®</sup> rubber is traceable to prevent counterfeiting and to guarantee users that they get the CSD quality they are paying for.



**RISE<sup>®</sup>/NOFIRNO<sup>®</sup> filler sleeves are made of NOFIRNO<sup>®</sup> rubber which will not be consumed in fire conditions. From the way of surface charring and the rubber residues inside the product, it can easily be determined whether or not NOFIRNO<sup>®</sup> has been used.**



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES

## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM

*only two different components for a  
NOFIRNO<sup>®</sup> pipe transit: sleeves and sealant*



NOFIRNO<sup>®</sup> is a fire-resistant sealant based on a single component silicone compound.

**NOFIRNO<sup>®</sup> is also water-repellent**

**High bonding strength**

**UV and Ozone resistant**

The numerous fire tests we have carried out with NOFIRNO<sup>®</sup> sealant has shown that the sealant is able to withstand fire and thermal loads without showing any dramatic colour change or carbonization at the unexposed side. At the exposed side the sealant will NOT be consumed by the fire due to the protective layer and char formed. This means that the sealant will stay in place there.

NOFIRNO<sup>®</sup> sealant is halogen free, has outstanding weathering properties, does not shrink during fire exposure, has an oxygen index of 45% (>30% is flame retardant), a low smoke index and is non-toxic.

The cured sealant layer maintains its original hardness during service life. NOFIRNO<sup>®</sup> sealant can be used in a very wide temperature range.

*optimum combination of viscosity, flow and  
bonding capacity of NOFIRNO<sup>®</sup> sealant*

### PRODUCT INFORMATION

01) colour	red brown
02) specific gravity	1.40 ± 0.03 g/cm <sup>3</sup>
03) curing of top layer	0.5 - 1 hour depending on temperature and air humidity
04) service temperature	-50 °C up to +180 °C
05) tensile strength	1.5 MPa
06) elongation at break	200%
07) hardness	45 Shore A
08) elastic deformation	approx. 50%
09) resistance	UV, Ozone, arctic conditions
10) ageing	more than 20 years
11) supplied in	310 ml cartridges
12) storage	to be stored cool and dry min/max temperature = +5/+30° C
13) storage life	guaranteed 6 months; when applied later than 6 months after date of manufacturing, curing and adhesive properties have to be checked before application



*NOFIRNO<sup>®</sup> is a paste-like compound which is simple to use.*

*NOFIRNO<sup>®</sup> has a balanced viscosity and can be applied overhead.*

*After applying the sealant, it can be smoothed by means of a wet cloth or by hand.*

*Because the sealant adheres very tightly, the cloth and hands should be wetted with water before use to prevent sealant from sticking to them.*



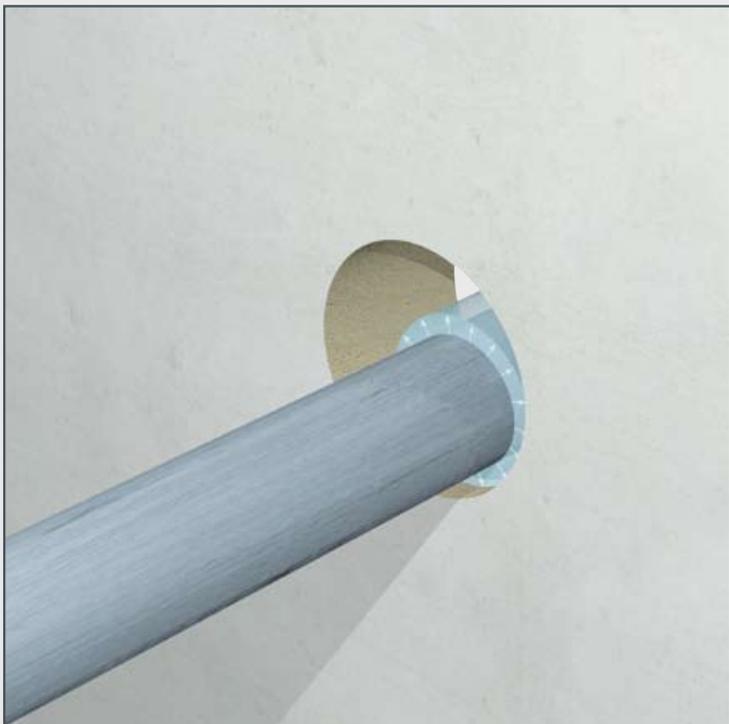
## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM

1) The metallic pipe can be passed through the conduit opening in any position, provided there is enough space between the wall of the conduit opening and the ducted pipe (see 2). The conduit opening should be minimum 150 mm deep for E190/E120 ratings.

*Quality System Approval  
SMS.W.I.CE.D/2357/A.0 and ISO  
9001:2001 Certificate NL7001684  
issued by Bureau Veritas*



2) Make sure that the minimum space between the pipe and the wall of the conduit opening is in accordance with the minimum allowed distance as certified.



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

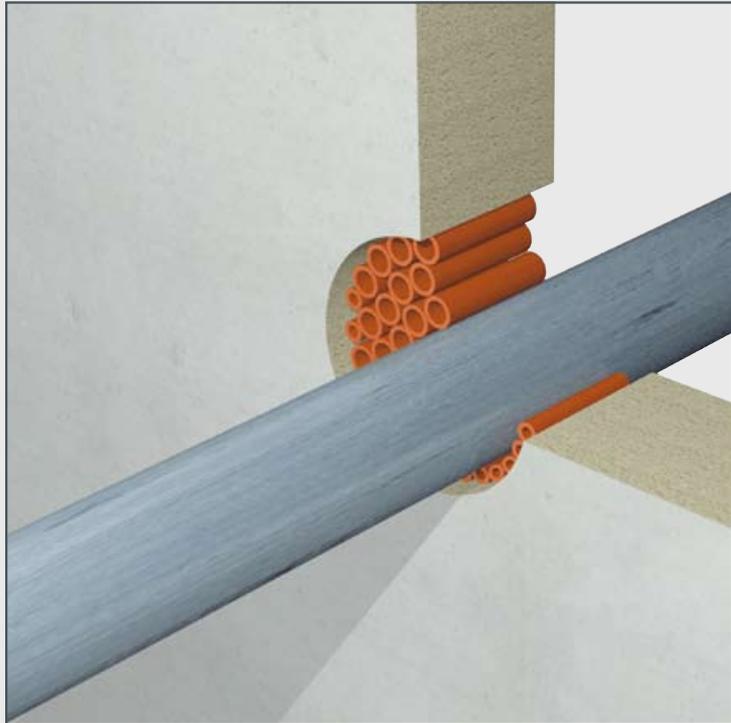
GENERAL  
*Marine*  
SERVICES

## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM

3) The free space in the conduit is filled with RISE<sup>®</sup>/NOFIRNO<sup>®</sup> filler sleeves type 27/19 and 18/12.

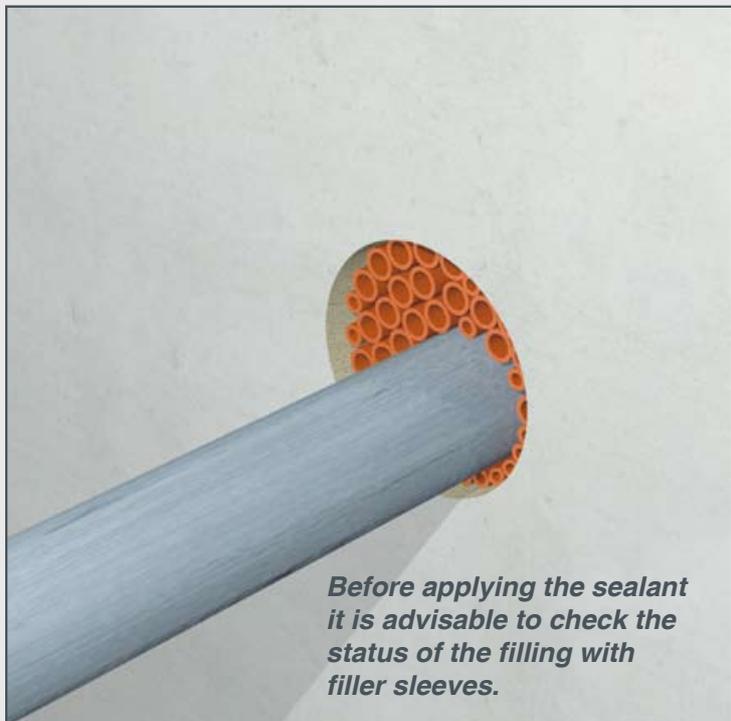
For ease of filling the RISE<sup>®</sup>/NOFIRNO<sup>®</sup> filler sleeves are delivered non-split.

The ratio 27/19 to 18/12 should be about 2:1.



4) Push the insert/filler sleeves into the conduit in such a way as to leave about 20 mm free space at the front.

The whole set of filler sleeves should tightly fit into the conduit to offer sufficient mechanical stability.

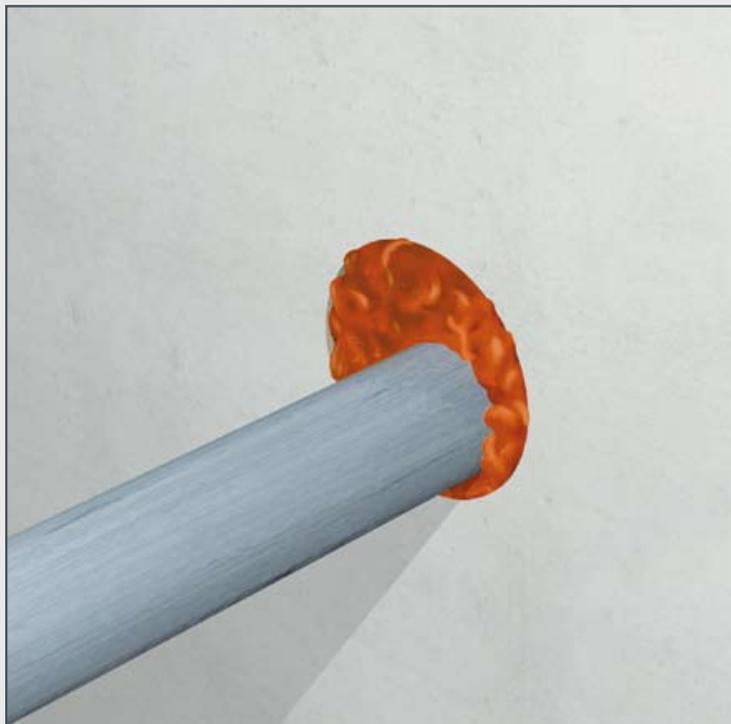


## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM

5) A 20 mm thick layer of NOFIRNO<sup>®</sup> sealant is applied at each side of the conduit. Clean and dry the conduit opening and the pipe thoroughly and remove any dirt, rust or oil residues before applying the sealant.



6) The conduit should be overfilled with NOFIRNO<sup>®</sup> sealant, because some sealant will be pushed between and into the empty filler sleeves during further finishing. This will contribute to obtain higher tightness ratings.



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM

7) To smooth the surface of the NOFIRNO<sup>®</sup> sealant layer, a cloth is sprayed with water. This prevents the sealant from sticking to the cloth.

Note: do not use soap water!

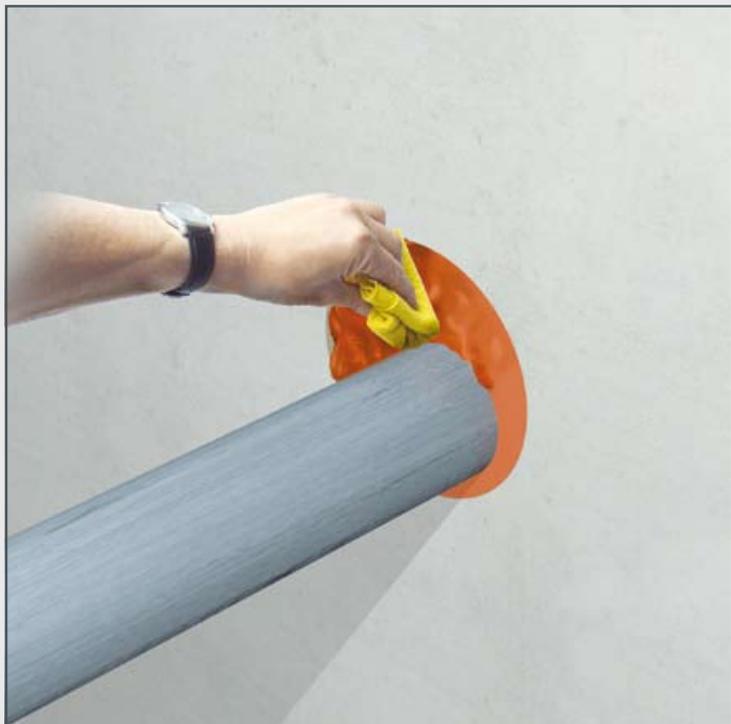


**NOFIRNO**

**CSO**

8) The cloth is then used to press down the sealant layer.

People with sensitive skin should use gloves when working with the NOFIRNO<sup>®</sup>. Please refer to the Safety Data Sheet for more information.



**NOFIRNO**



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

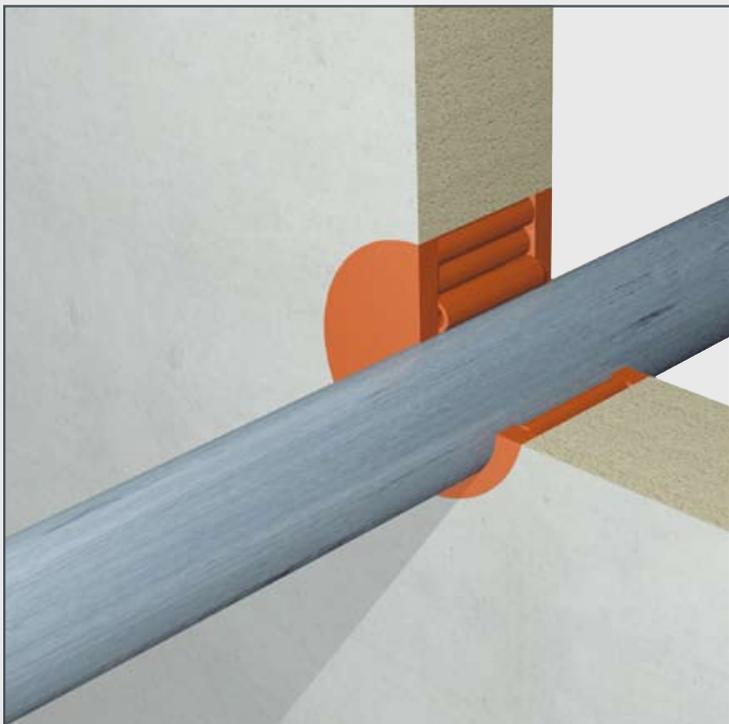
GENERAL  
*Marine*  
SERVICES

## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM

9) The surface can further be smoothed by hand. Just wet the hand thoroughly with soap and water. No dirty hands when working with NOFIRNO<sup>®</sup>. People with sensitive skin should use gloves when working with NOFIRNO<sup>®</sup>.



10) Successfully tested for >120 minutes (E120) fire integrity according to EN 1366-3:2004. For EI classification (fire integrity plus thermal insulation), the larger metallic pipes have to be insulated.

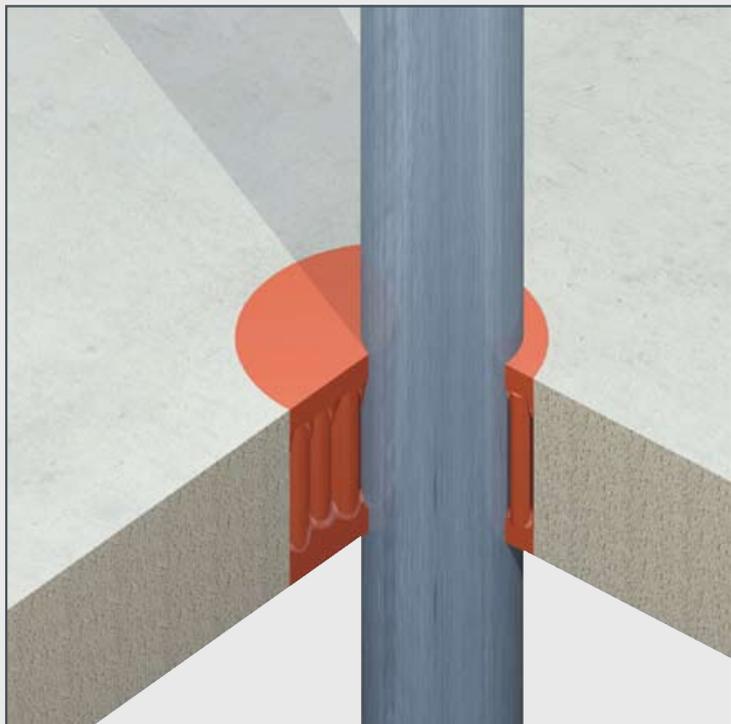


## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM

11) Vertical transits are easy to install as well. To prevent the filler sleeves from falling out of the larger conduit openings during installation, they can be bundled with a tie-wrap.



12) A 20 mm thick layer of NOFIRNO<sup>®</sup> sealant is applied at each side of the conduit. Clean and dry the conduit opening and the pipe thoroughly and remove any dirt, rust or oil residues before applying the sealant.



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM

13) The optimized viscosity and the superb adhesion properties of the NOFIRNO<sup>®</sup> sealant make applying the sealant overhead an easy matter. NOFIRNO<sup>®</sup> sealant does not sag and will not drip off.

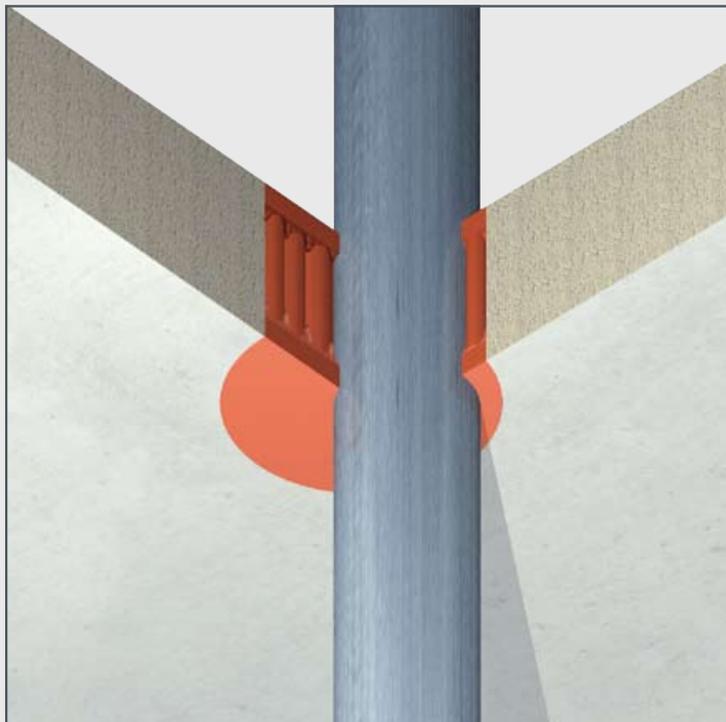


*See page 30 for professional sealant dispensers. Hand fatigue is prevented and optimum flow of the sealant is obtained.*

**NOFIRNO**

**CSA**

14) Successfully tested for >120 minutes (E120) fire integrity according to EN 1366-3:2004. For EI (fire integrity plus thermal insulation) classification, the larger metallic pipes have to be insulated.



**NOFIRNO**



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

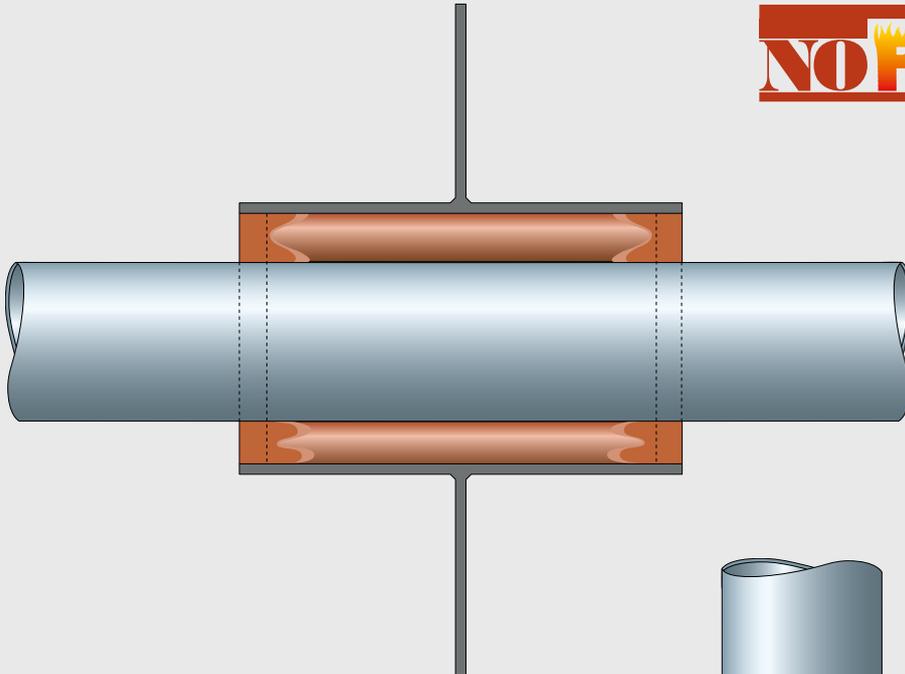
65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

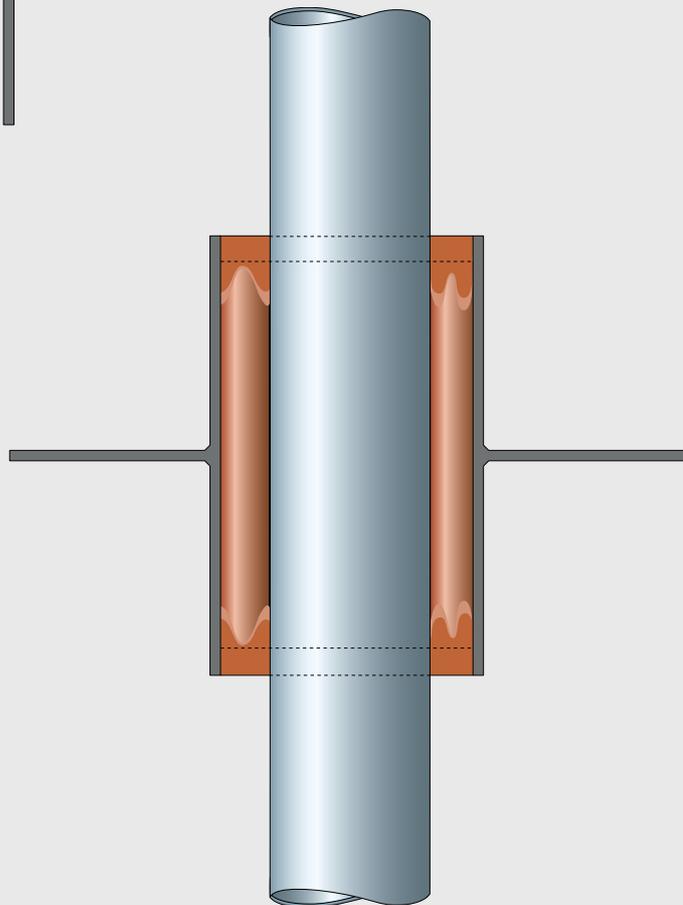
GENERAL  
*Marine*  
SERVICES

## RISE®/NOFIRNO® TRANSITS: THE RAPID® SEALING SYSTEM

The RISE®/NOFIRNO® sealing system has been specially developed for most severe fire conditions as for instance non-insulated steel divisions. Non-consumable rubber, no smoke emission during fire exposure and high thermal insulation values guarantee optimum fire safety in harshest fire environment.

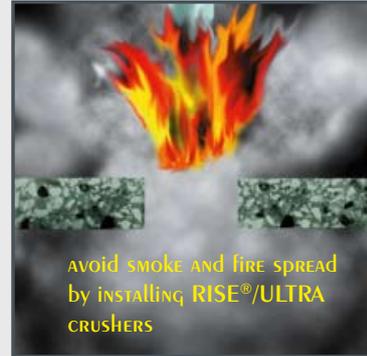
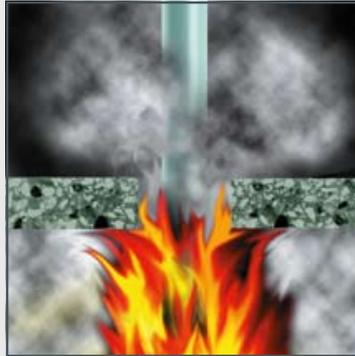
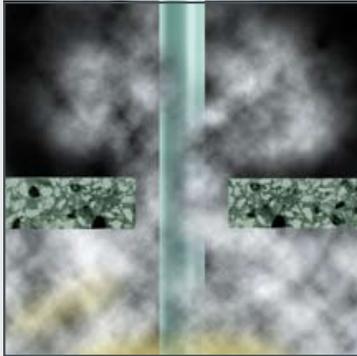


For A-0 class RISE®/NOFIRNO® penetrations, the conduit length is 250 mm (instead of 180 mm). The conduit sleeves have to be welded in symmetrically to cope with the extreme heat of the red glowing partition. Approved for steel/stainless steel (408 mm OD), Cu/CuNi (420 mm OD) and GRP (222 mm OD) pipes. NOFIRNO®: high-tech in fire safety.



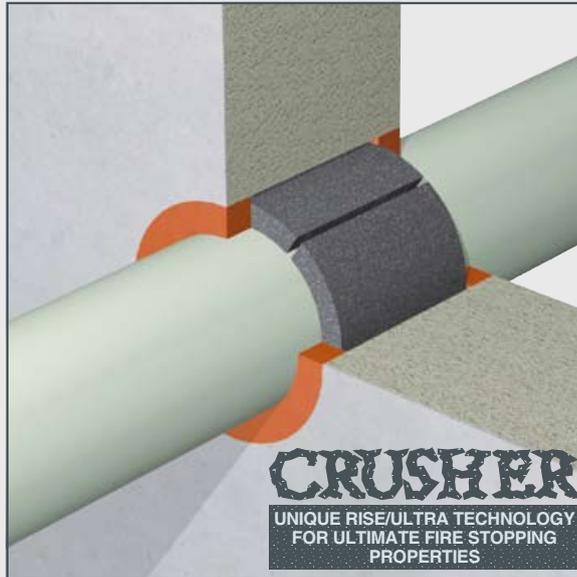
## RISE®/NOFIRNO® + RISE®/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

*Plastic pipes which pass through fire-rated bulkheads and decks as part of, for example, sanitation systems, are a potential source of serious problems in case of fire. Most plastic pipes start to soften at a temperature of about 75 °C and ignite at a temperature of about 140 °C. This means that, should a fire occur, a hole will be formed by the softened or combusted plastic pipe, allowing fumes and flames to spread freely. To meet this problem, BEELE Engineering has developed the CRUSHER® technology.*



AVOID SMOKE AND FIRE SPREAD  
by installing RISE®/ULTRA  
CRUSHERS

Based on the CRUSHER® technology it is now possible to make fire stop penetrations for plastic pipes just by inserting a single RISE®/ULTRA crusher into the conduit opening. The RISE®/ULTRA crusher is placed around the ducted plastic pipe. For conduits which should also be air or water tight, a combination of RISE®/ULTRA and NOFIRNO® sealant is used. The design of the crusher allows for a balanced amount of hot air penetrating around the crusher. The time to close off the opening left by the burned or softened plastic pipe must be very short. Otherwise a chimney effect will occur causing the pipe at the unexposed side to melt. The unique RISE®/ULTRA rubber reacts at two different temperature levels to speed up compression. The first reaction transfers the rubber under limited expansion to a very adhesive substance. Adhesive sealing all around causes the



trapped air to expand rather fast. In this way compression of the plastic pipe starts already at an early stage of the fire. The unique RISE®/ULTRA crusher allows for smallest conduit openings. For oversized openings ACTIFOAM® fillers can be used and for multi-penetrations use is made of or NO-FIRNO® filler sleeves and sealant. Based on the properties of the RISE®/ULTRA rubber, ultimately a hard solid rubber mass adhering to the wall of the conduit and the remaining part of the plastic pipe is formed. In this way the penetration keeps tight. Official fire tests according to IMO Resolution A.754(18) have successfully been carried out at the EFECTIS (formerly TNO) test institute, including multi-mix (cables, metallic and plastic pipe) transits. RISE®/ULTRA crushers have also been tested according to EN1366-3:2004 for a fire rating of two hours and lately in-house for a four hour fire rating.

# CRUSHER®



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

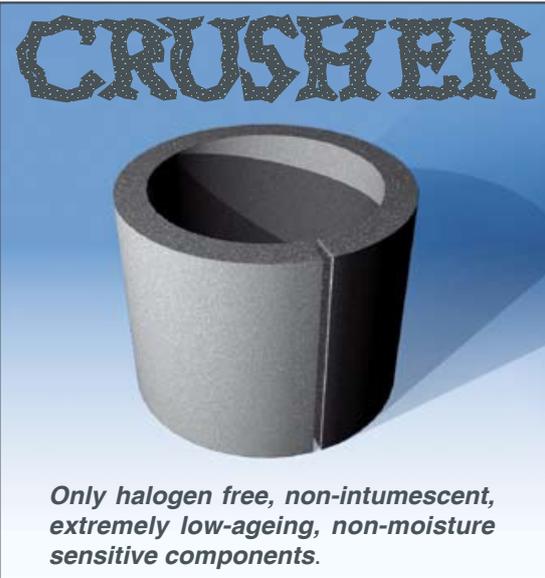
65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES

## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

*RISE<sup>®</sup>/NOFIRNO<sup>®</sup> combined with RISE<sup>®</sup>/ULTRA  
for plastic pipe and multi-all-mix transits*



pipe OD	crusher type	wall thickness	crusher lengths	conduit opening
16	24/16	4	140	25-30
18	24/18	3	140	25-30
20	28/20	4	140	28-34
25	33/25	4	140	33-40
32	40/32	4	140	40-48
40	48/40	4	140	49-55
50	58/50	4	140	60-66
63	75/63	6	140	75-83
75	90/75	7.5	140	90-100
90	105/90	7.5	140	105-115
110	138/110	14	140	139-160
125	160/125	17.5	140	160-180
140	180/140	20	140	180-200
160	200/160	20	140	200-220

Note: 140 mm length only in combination with 20 mm NOFIRNO<sup>®</sup> sealant at both sides.

For more information we refer to the RISE<sup>®</sup>/ULTRA brochure.

*RISE<sup>®</sup> insert sleeves to be used for the  
ducted cables in the multi-all-mix transit*



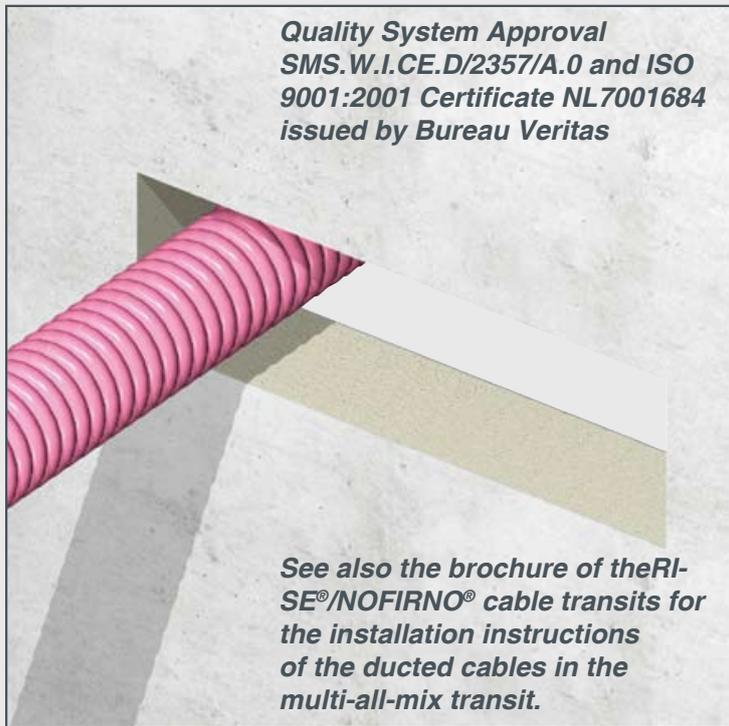
sleeve type	cable diameter	sleeve length (A-class)	sleeve length (H-class)	wall thickness
12/6	5 - 7	160	210	3
14/8	7 - 9	160	210	3
16/10	9 - 11	160	210	3
18/12	11 - 13	160	210	3
20/14	13 - 15	160	210	3
22/16	15 - 17	160	210	3
27/19	17 - 21	160	210	4
31/23	21 - 25	160	210	4
35/27	25 - 29	160	210	4
39/31	29 - 33	160	210	4
46/36	33 - 39	160	210	5
52/42	39 - 45	160	210	5
58/48	45 - 51	160	210	5
64/54	51 - 57	160	210	5
70/60	57 - 63	160	210	5

For more information we refer to the RISE<sup>®</sup> brochure.

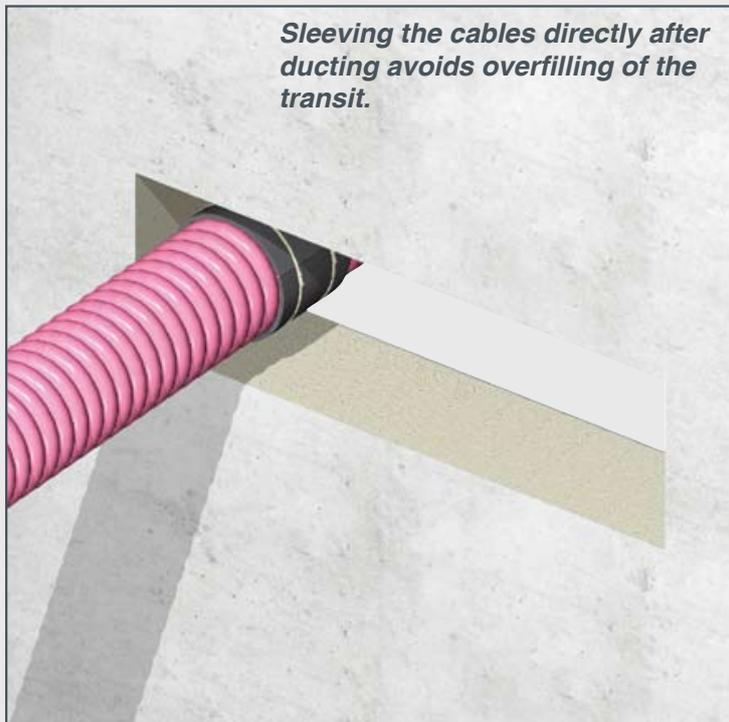


## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

1) The cables can be ducted through the conduit sleeve/frame in random order. After the cables have been ducted, RISE<sup>®</sup> insert sleeves are applied around each cable.

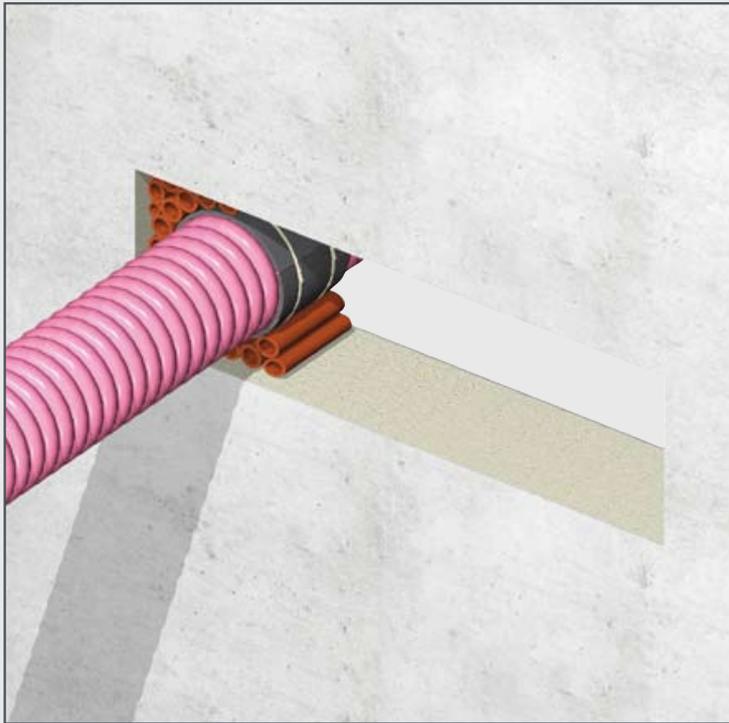


2) The RISE<sup>®</sup> insert sleeves are split lengthwise and can therefore be fitted around the cables in front of the conduit. For cable sizes > 64 mm a RISE<sup>®</sup> wrap with thickness 5 mm is applied. The wraps can be fixed with a tie-wrap.



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

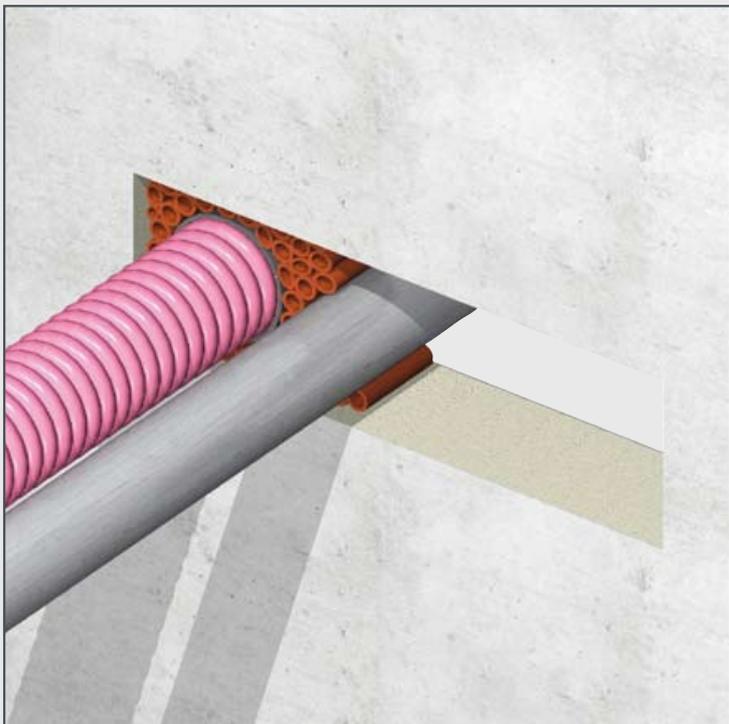
3) The system is also approved for ducting steel/stainless steel pipes. The minimum interspacing should be regarded according to the specifications on the approved installation drawings.



**RISE**

**NOFIRNO**

4) Separation of the metallic pipes is provided by NOFIRNO<sup>®</sup> filler sleeves all around the ducted pipe(s). NOFIRNO<sup>®</sup> filler sleeves are available in sizes 18/12 and 27/19 and are non-split for ease of installation.

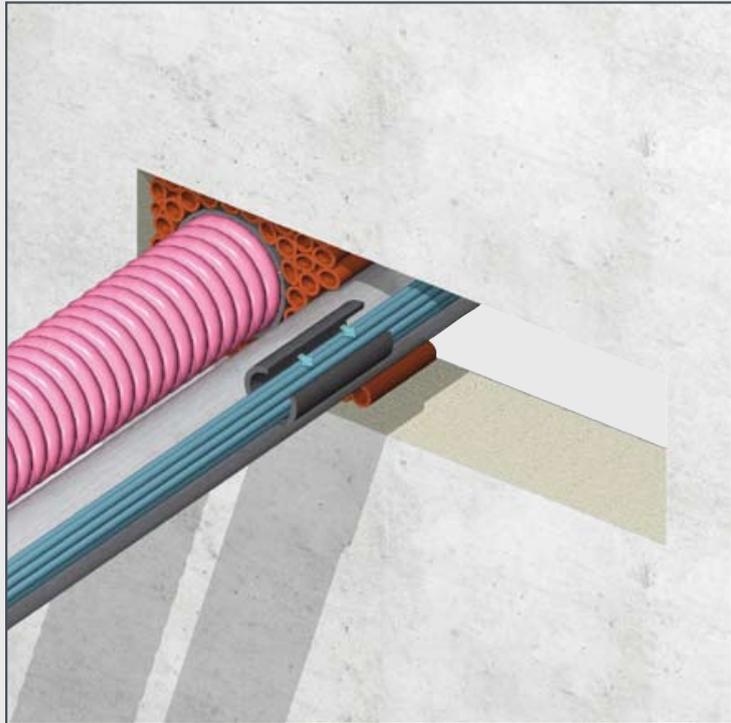


**RISE**

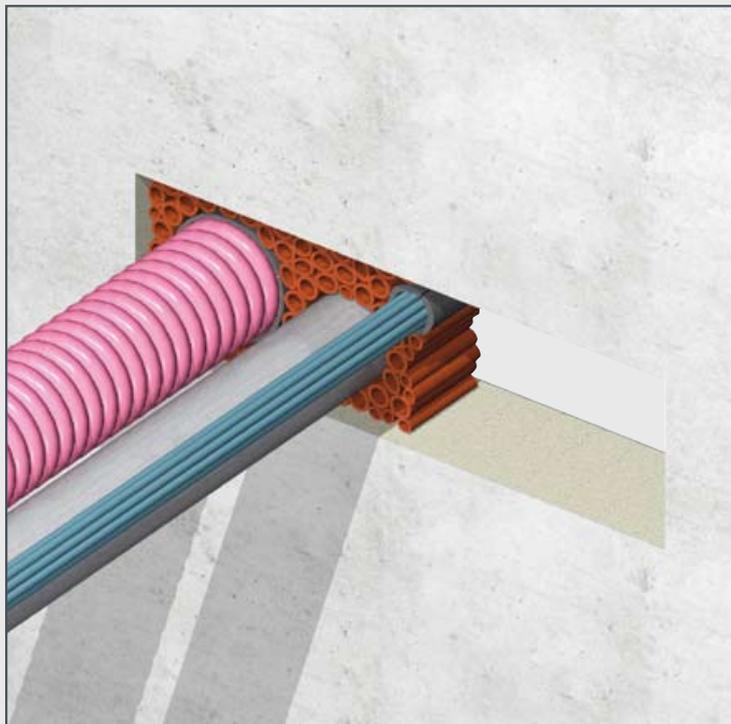


## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

5) Bundled cable sets are allowed in the RISE<sup>®</sup>/NOFIRNO<sup>®</sup> multi-all-mix sealing system, using only one RISE<sup>®</sup> insert sleeve. See for details the approved installation drawings.

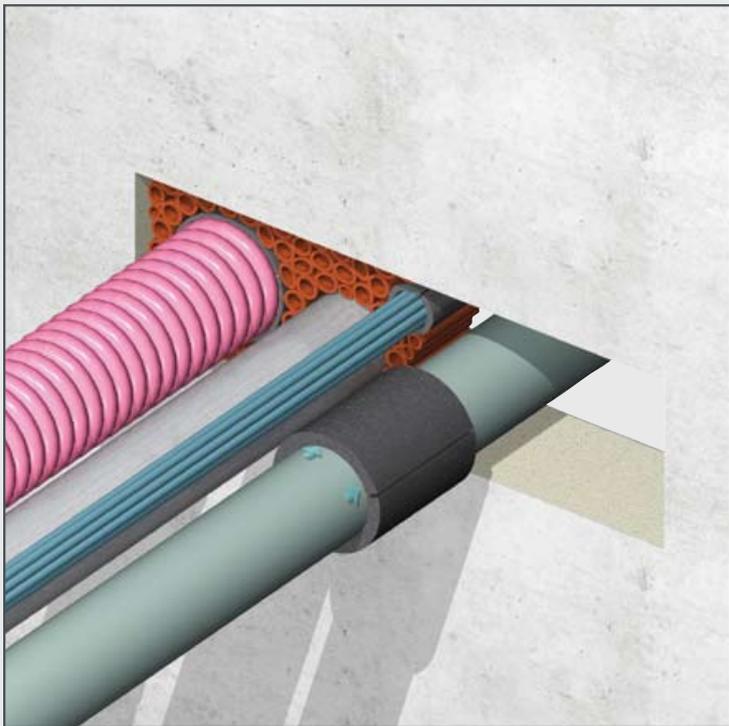


6) Open spaces in the conduit can be directly afterwards filled with NOFIRNO<sup>®</sup> filler sleeves type 27/19 and 18/12. The ratio 27/19 to 18/12 should be about 2:1.

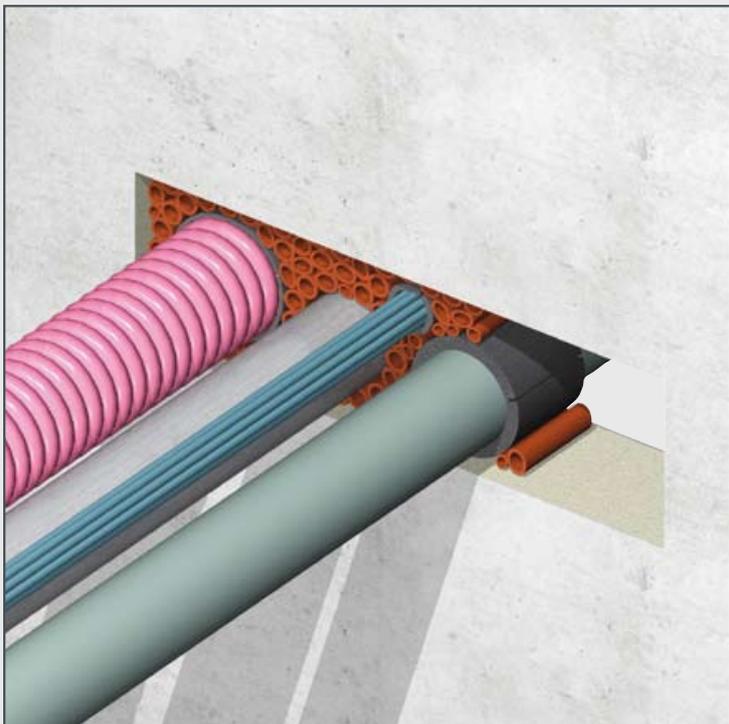


## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

7) Plastic pipes can also be ducted through the multi-all-mix transit. Place a RISE<sup>®</sup>/ULTRA crusher around the ducted pipe in front of the penetration. RISE<sup>®</sup>/ULTRA crushers are split lengthwise.

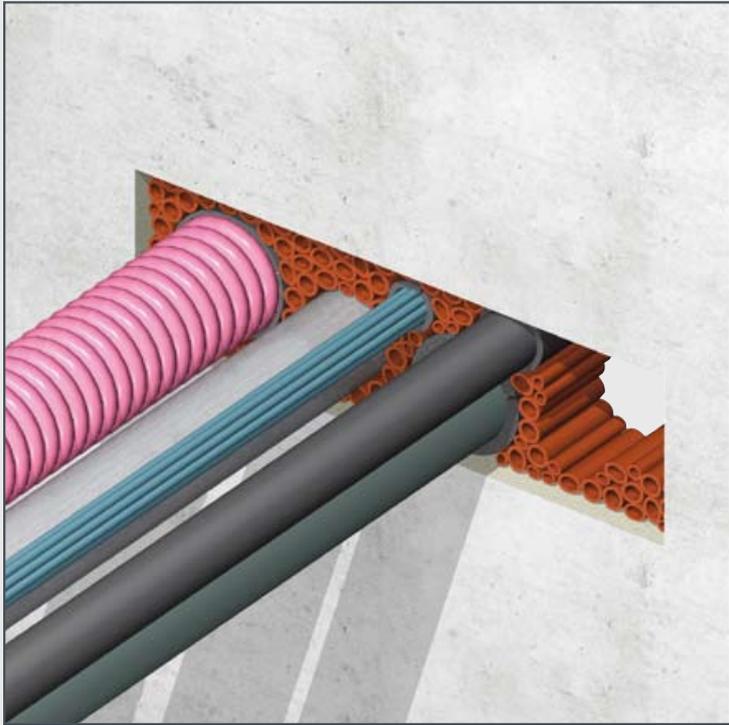


8) Push the insert/filler sleeves and the crusher into the conduit in such a way as to leave about 20 mm free space at both sides of the transit. This space is needed to apply in a later stage the NOFIRNO<sup>®</sup> sealant.

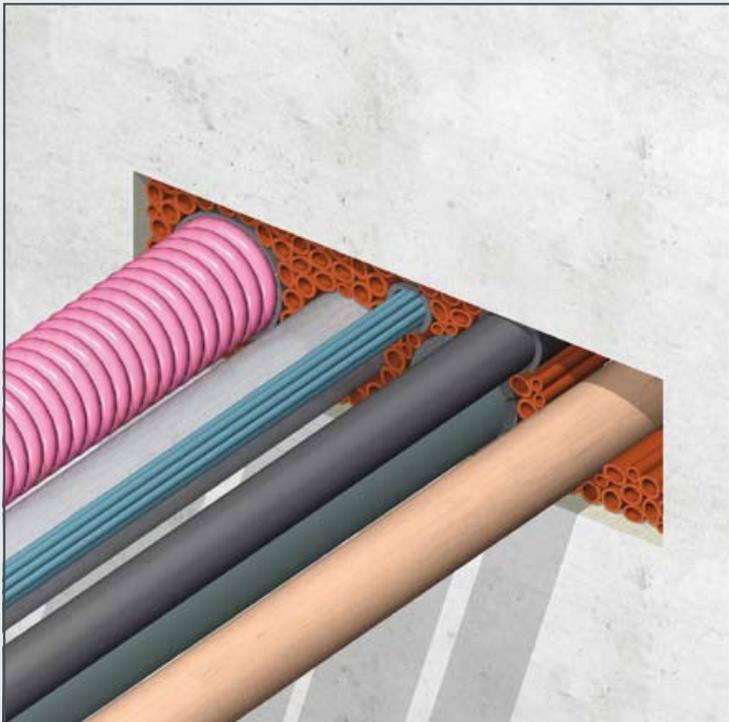


## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

9) The system allows also for insulated chilled water lines without interrupting the insulation and multi-beverage lines. A RISE<sup>®</sup>/ULTRA crusher or wrap is placed around the insulation and inserted into the penetration.

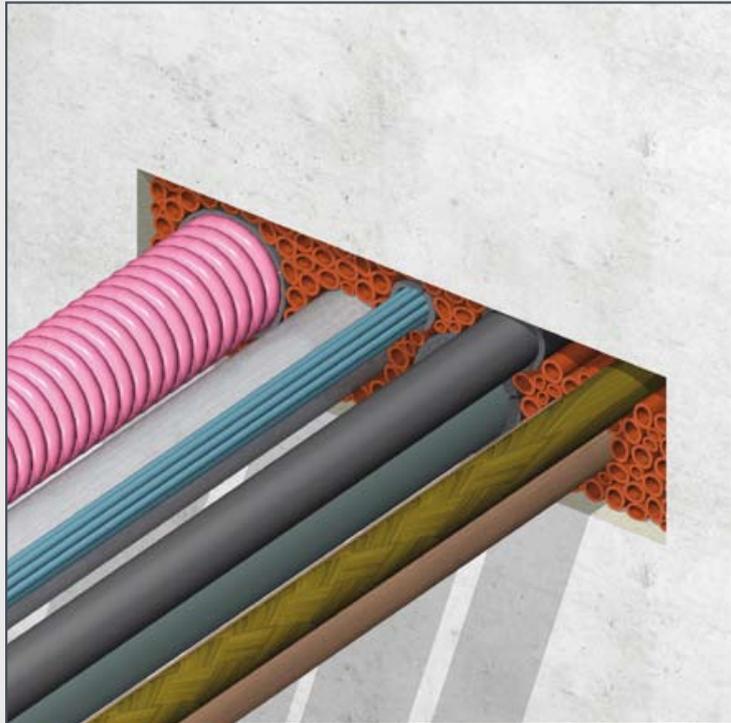


10) Copper/CuNi pipes can also be ducted through the multi-all-mix penetration. Separation of the metallic pipes is provided by RISE<sup>®</sup>/NOFIRNO filler sleeves all around the ducted pipe(s). See the approved drawings for minimum inter-spacing.



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

11) Also GRP pipes are allowed. Separation of the GRP pipes is provided by NOFIRNO<sup>®</sup> filler sleeves all around the ducted pipe(s).



**RISE**

**NOFIRNO**

12) The remaining open spaces in the transit are filled with NOFIRNO<sup>®</sup> filler sleeves.

The whole set of crushers, insert and filler sleeves should tightly fit into the conduit to offer sufficient mechanical stability.

*Before applying the sealant it is advisable to check the status of the filling with crushers, insert and filler sleeves.*



**RISE**



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

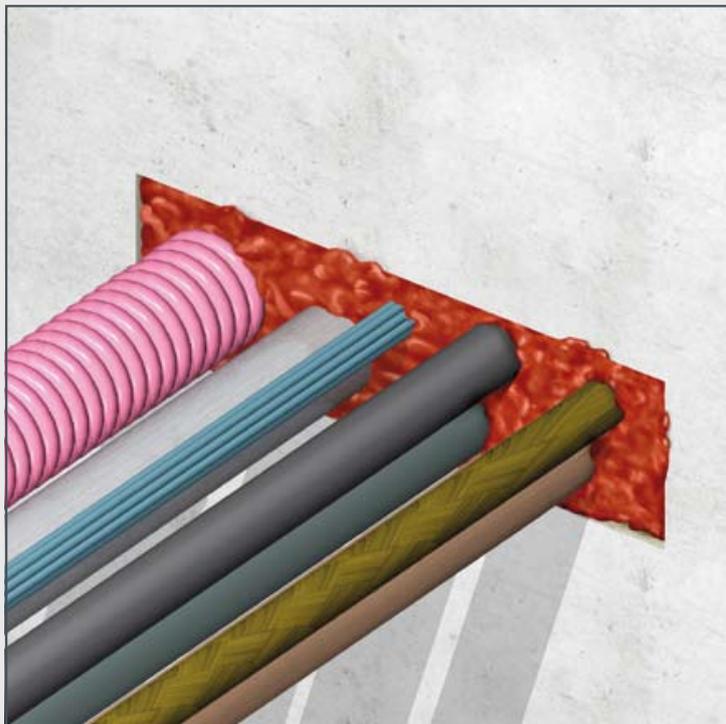
13) A 20 mm thick layer of NOFIRNO<sup>®</sup> sealant is applied at each side of the conduit. Clean and dry the conduit opening and the cables thoroughly and remove any dirt, rust or oil residues before applying the sealant.



*See page 30 for professional sealant dispensers. Hand fatigue is prevented and optimum flow of the sealant is obtained.*



14) The conduit should be overfilled with NOFIRNO<sup>®</sup> sealant, because some sealant will be pushed between and into the empty filler sleeves during further finishing. This will contribute to obtain higher tightness ratings.



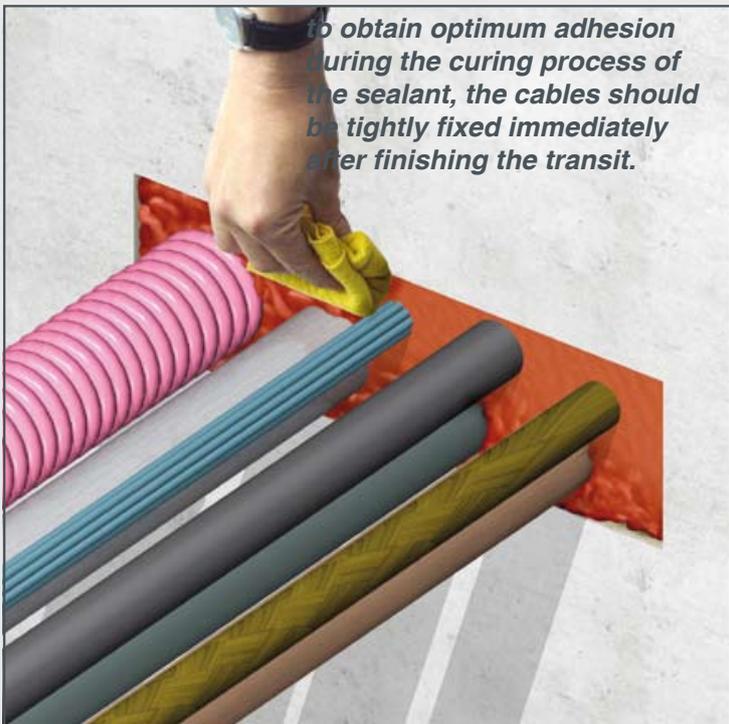
## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

15) To smooth the surface of the FIWA<sup>®</sup> sealant layer, a cloth is sprayed with water. This prevents the sealant from sticking to the cloth.

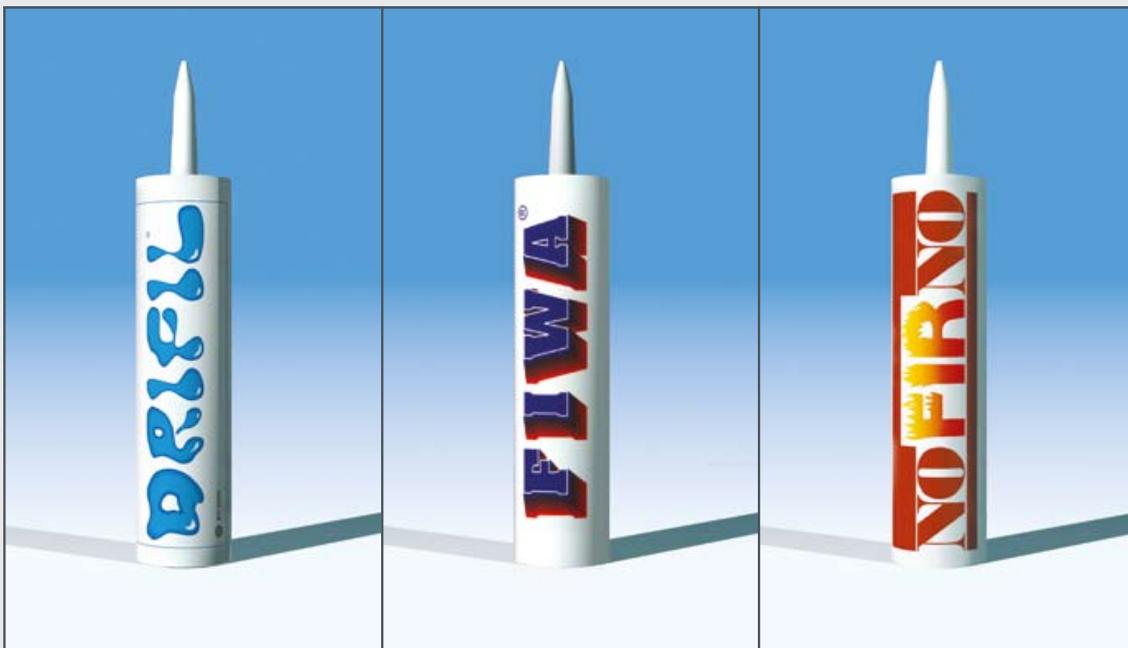
Note: do not use soapwater!



16) The cloth is then used to press down the sealant layer. People with sensitive skin should use gloves when working with the NOFIRNO<sup>®</sup>. Please refer to the Safety Data Sheet for more information.



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM



DRIFIL<sup>®</sup> is a water-repellent sealant based on a single-component silicone compound. In developing DRIFIL<sup>®</sup> sealing compound, high priority was focused on its power of adhesion to subsurfaces as occurring in the construction sector, and to cable sheathing and metal and plastic pipes.

In addition, special attention was given to the permanent flexibility of the sealant in order to permit minor settlements and movements of the cable/pipe bunch after the sealant has set. The purpose of this is to ensure that the seal remains intact in the longer term even in spite of possible mechanical loading.

DRIFIL<sup>®</sup> sealant has a very short setting time. The top layer is rapidly tack-free.

FIWA<sup>®</sup> is a fire-resistant sealant based on a single component silicone compound. FIWA<sup>®</sup> is also water-repellent. The sealant adheres well to most subsurfaces occurring in the building industry, and is permanently elastic. In the event of fire or at temperatures in excess of 200 °C the sealant expands to about five to ten times its original volume. During this process a porous mass is formed which has excellent thermal insulation properties. In contrast to conventional materials that swell under severe heat exposure, the expansion of FIWA<sup>®</sup> is not caused by intumescence, but by a chemical process.

The advantage of this is that the expansion of FIWA<sup>®</sup> is not accompanied by the formation of fumes.

NOFIRNO<sup>®</sup> is a fire-resistant sealant based on a single component silicone compound.

The numerous fire tests we have carried out with NOFIRNO<sup>®</sup> sealant has shown that the sealant is able to withstand fire and thermal loads without showing any dramatic colour change or carbonization at the unexposed side. At the exposed side the sealant will NOT be consumed by the fire due to the protective layer and char formed. This means that the sealant stays in place there. NOFIRNO<sup>®</sup> sealant is halogen free, does not harden during service life, has outstanding weathering properties, does not shrink during fire exposure, has an oxygen index of 45% (>30% is flame retardant) and a low smoke index. Can be used in a very wide temperature range.



For ease of application of very high viscosity sealants, we have selected a powerful manual applicator with a 26 : 1 trigger leverage. This means much easier dispensing and reduced fatigue. The applicator is equipped with the so-called Wear Compensating Device, which automatically removes free-play in the trigger to provide instant rod drive immediately when the trigger is pulled. Less full trigger strokes required to empty a cartridge. Extended working life of the applicator.



We have also selected a powerful pneumatic applicator for highest productivity.

Quiet operation (less than 70 dB). Air supply to suit most standard systems. Fast, easy pressure regulation for accurate flow control. High volume trigger valve for immediate sealant flow. Ergonomic design: comfort, minimal operator fatigue. Short, well balanced design, combined with lightweight engineering plastic and aluminium components. Also available for 1 liter cartridges.



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES

## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> TRANSITS: THE RAPID<sup>®</sup> SEALING SYSTEM

*ease of calculation with  
our cable and pipe penetrations*



### TRANSIT CALCULATOR

Calculate your materials requirements for our fire safe and gas and smoke tight sealing systems

RISE  
RISE/NOFIRNO  
RISE/ULTRA  
RISWAT  
RIACNOF

Free software. Can be downloaded from our website <http://www.rise-systems.com>.

After the entry of the dimensions of the conduit opening and the amount and outer diameters of the ducted cables or pipes, the software calculates the amount of RISE<sup>®</sup> or RIWAT<sup>®</sup> insert sleeves, the RISE<sup>®</sup>, RISWAT<sup>®</sup> or NOFIRNO<sup>®</sup> filler sleeves, the ACTIFOAM<sup>®</sup> spare filling sheets, the RISE<sup>®</sup> or RISE<sup>®</sup>/ULTRA crushers and the DRIFIL<sup>®</sup>, FIWA<sup>®</sup> or NOFIRNO<sup>®</sup> sealant.

It is easy to switch between the several systems and also between A-class, H-class, EMC and watertight penetrations.

After entry of the dimensions and amount and sizes of cables/pipes, a drawing appears on the screen showing also the remaining free space in the conduit opening. Furthermore the filling rate of the cable penetrations is shown.

Warnings appear for deviations of the certified configurations and for overfilling the transits or exceeding filling rates.

For a created project all calculated transits can be stored in a database. Order/calculation forms can be shown on screen for project totals and single transits. The material lists can be printed and/or exported to MS Word.

*we are there with full support for  
our cable and pipe penetrations*



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES

# RISE/NOFIRNO®: THE ULTIMATE SEALING SYSTEM FOR MULTI-ALL- MIX TRANSITS® (PIPES AND CABLES)



**SUCCESSFULLY TESTED ACCORDING TO  
EN 1366-3:2004; FIRE RESISTANCE  
EI90/EI120 ACCORDING TO EN 13501-2:2003  
CERTIFICATES 2008-EFECTIS-R0633-36**



## RISE®/NOFIRNO® SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

***RISE®/NOFIRNO® multi-cable transits: based on ACTIFIRE® and NOFIRNO® technology***

RISE®/NOFIRNO® multi-all-mix penetrations are a further development of the regular RISE® system. We have now combined the most superior compounds in our product ranges to obtain the ultimate in fire ratings and improvement of ease of installation. ACTIFIRE® and NOFIRNO® technology are utilized in an optimum way. Use is made of RISE® rubber insert sleeves (placed around the cables), RISE®/ULTRA crushers (around the plastic pipes) and NOFIRNO® filler sleeves. Based on the ACTIFIRE® technology the RISE® and RISE®/ULTRA rubber are activated when exposed to fire. NOFIRNO® however is inactive and is not consumed by the fire. On both sides of the penetration a layer of NOFIRNO® sealant is applied.

***Only halogen free components.***



***RISE®/NOFIRNO® multi-cable transits: ultimate flexibility, maintenance friendly***



RISE®/NOFIRNO® multi-all-mix penetrations offer a most simple way of installation. No precise positioning of the cables/pipes in the transit needed. The RISE®/NOFIRNO® sealing system allows cables to be ducted through conduit openings in a bent, curved or oblique way without any adverse impact on sealing performance. The RISE®/NOFIRNO® sealing system gives easy access to add or remove cables in a later stage without the necessity to disassemble the whole penetration. Just cut away a piece of the NOFIRNO® sealant layer at both sides of the penetration, remove NOFIRNO® filler sleeve(s) and pull the cable with a RISE® sleeve through and refill the opening in the sealant layer.

***It is that simple!***



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES

## RISE®/NOFIRNO® SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

*RISE®/NOFIRNO® multi-cable transits:  
also tested for bundled cable sets*



The RISE®/NOFIRNO® sealing system has been successfully tested according to EN 1366-3:2004 with sets of bundled cables. Specially in the case of ducting larger amounts of small diameter LAN cables a lot of time saving is obtained since not each and every cable has to be sleeved with a RISE® insert sleeve.

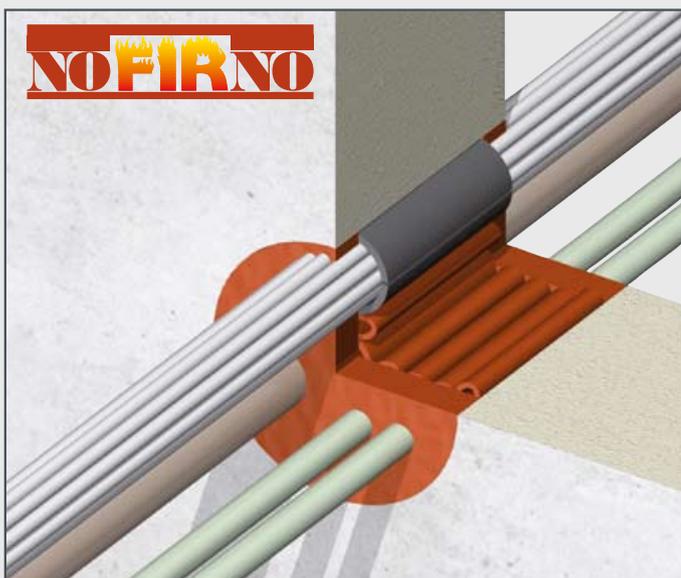
Cable sets of max. 25 LAN cables with an OD of 5 - 6 mm tightly bundled to max. 35 mm can be passed through the penetration. A single RISE® insert sleeve is then placed around the cable set and inserted into the penetration.

When applying the NOFIRNO® sealant care has to be taken that sufficient sealant is injected in between the cables and partly into the RISE® insert sleeve. This bundling is not allowed for gas and/or watertight penetrations.

*RISE®/NOFIRNO® multi-all-mix transits:  
ultimate flexibility, maintenance friendly*

The NOFIRNO® rubber grade has excellent properties and will not be consumed by the fire. The NOFIRNO® sealant forms immediately a protective layer and char when exposed to flames in his way protecting the filling of the penetration seal.

The thermal insulation is very high because of the air volume inside the penetration. The air is tightly enclosed by the sealant layer at both sides even when one side is exposed to the fire. The NOFIRNO® system has been subjected to A-0, H-0 and even Jet Fires without being severely affected. Due to the superb behaviour of our various systems the NOFIRNO® sealing system can be easily combined with RISE® and RISE®/ULTRA for the so-called multi-all-mix® system for ducting all types of pipes and cables through a single conduit. See also the RISE®/NOFIRNO® pipe brochure.



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

*RISE<sup>®</sup>/NOFIRNO<sup>®</sup> cable/pipe penetrations:  
based on high-tech NOFIRNO<sup>®</sup> technology*

For manufacturing NOFIRNO<sup>®</sup> sleeves and sealant use is made of a high quality polymer. NOFIRNO<sup>®</sup> rubber has excellent weathering properties, UV and ozone resistance and long term behaviour. Service life of the sleeves and sealant easily exceeds 20 years under normal environmental conditions.

The sleeves and sealant can be used in a very wide temperature range. Even at low temperatures down to -50° C the rubber stays flexible and does not harden excessively as other rubber types will do. This guarantees tightness even at low temperatures. The rubber can also be used in applications up to +180° C.

A single rubber grade is now capable of satisfying almost all sealing conditions. Sealing systems are safety devices. Only highest quality can do the job, not only when newly installed but also after a long service life.

With NOFIRNO<sup>®</sup> this safety is guaranteed for a very long time!



The NOFIRNO<sup>®</sup> rubber grade, which is compounded under strict conditions in our factory, is suitable for gas and water tight ducting and for fire rated applications as well. For decades we have been involved with fire resistant rubbers. The drawbacks of certain fire resistant types are halogen content, hardness of the highly filled rubbers, hardening during lifetime and high permanent deformation sets. All these features will have an impact on performance in the long run.

NOFIRNO<sup>®</sup> rubber does not have the above drawbacks.

The processing conditions for optimized compounding in our factory assure highest performance of the rubber.

NOFIRNO<sup>®</sup> rubber is traceable to prevent counterfeiting and to guarantee users that they get the quality they are paying for. From the way of surface charring and the rubber residues inside the product, it can easily be determined whether or not NOFIRNO<sup>®</sup> has been used.



# RISE<sup>®</sup>/NOFIRNO<sup>®</sup> SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

*RISE<sup>®</sup>/NOFIRNO<sup>®</sup> multi-cable transits:  
based on high-tech NOFIRNO<sup>®</sup> technology*

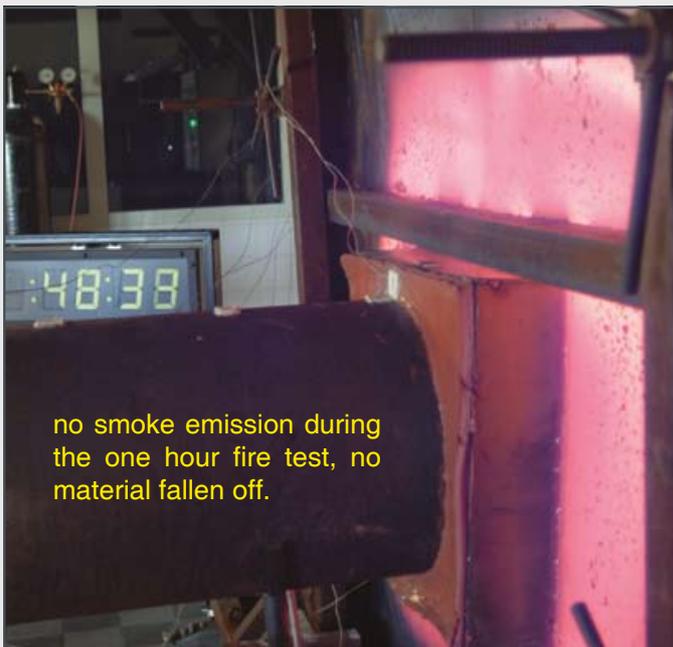
The NOFIRNO<sup>®</sup> rubber has excellent properties regarding exposure to fire and excessive temperatures. Specially for A-0 class divisions this is an advantage because the sealing system will be exposed to hot metal parts all around; the steel division, the coaming/conduit sleeve and the ducted metallic pipe will all get extremely hot up to red glowing. The picture below left shows the red glowing bulkhead and coaming.

At the end of the one hour fire test, temperatures measured on the coaming were over 420 °C, and at a distance 25 mm away from the sealing system over 350 °C on the ducted steel pipe. Another unique property of the RISE<sup>®</sup>/NOFIRNO<sup>®</sup> system is its very high thermal insulation value. On the surface of the sealing system 23 mm away from the coaming and 23 mm away from the ducted steel pipe the temperature had only risen about 160 °C.

The picture below right shows the non-consumable feature of the rubber.



now also successfully tested for H-0 class partitions at furnace temperatures of 1150 °C.



no smoke emission during the one hour fire test, no material fallen off.



proof after dismantling that the rubber and sealant are only partly affected by the hot coaming



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

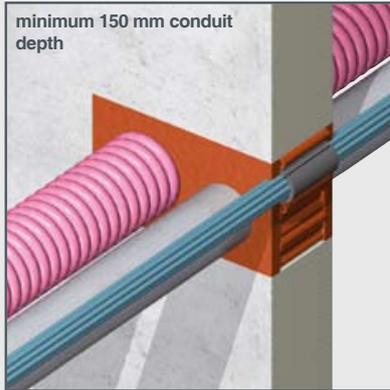
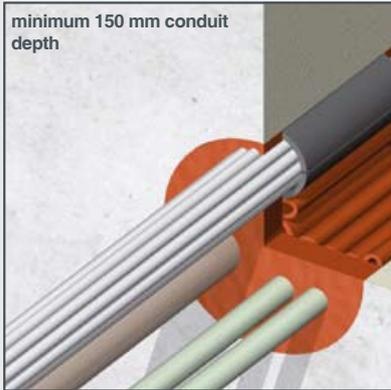
65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES

## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

*RISE<sup>®</sup>-NOFIRNO<sup>®</sup> is based on a combination of NOFIRNO<sup>®</sup> and ACTIFIRE<sup>®</sup> technology*



RISE<sup>®</sup>/NOFIRNO<sup>®</sup> cable penetrations have been tested with heavy conductor cables. The length of the conduit could be further minimized without the use of extra insulation by the thermally insulating properties of the NOFIRNO<sup>®</sup> filling. With 150 mm conduit depth already a fire classification E120/EI120 has been achieved. With increased conduit depths the rating will be higher.

*no fussing with extra insulation in front of the penetration and in between the cables*

*system compensates for the melting cable sheathings and plastic pipes*



Generally, rubbers used for multi-cable transit systems have the drawback, that these rubbers will start charring under heat and slowly but surely will shrink due to the loss of the water content in the rubber.

***This is not the case with RISE<sup>®</sup>/NOFIRNO<sup>®</sup>!***

Under fire exposure the rubber is not consumed by the fire load and stays in place.

*non-consumable NOFIRNO<sup>®</sup> combined with “active” RISE<sup>®</sup> rubber: optimum safety*



## **RISE<sup>®</sup>/NOFIRNO<sup>®</sup> SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS**

***RISE<sup>®</sup>/NOFIRNO<sup>®</sup> multi-cable transits: based  
on ACTIFIRE<sup>®</sup> and NOFIRNO<sup>®</sup> technology***

**SYSTEM WILL NOT BE CONSUMED WHEN EXPOSED TO FIRE  
ALL COMPONENTS ARE TOTALLY HALOGEN FREE  
IN CASE OF FIRE: NON-TOXIC, LOW SMOKE INDEX  
CLASSIFIED ACCORDING TO EN 13501-2:2003  
EC (MED) AND TYPE APPROVAL CERTIFICATES ISSUED  
TESTED ACCORDING TO IMO RESOLUTION A.754(18)  
NO METAL PARTS, NO CORROSION  
CAN BE USED IN ARCTIC CONDITIONS  
HIGH LEVEL OF THERMAL INSULATION AND SOUND DAMPING  
SHOCK AND VIBRATION RESISTANCE  
OVER 20 YEARS SERVICE LIFE  
CAPABLE OF ABSORBING TEMPERATURE CHANGES  
WEATHERING, UV AND OZONE RESISTANT  
NO PRE-ENGINEERING NEEDED  
NO SPECIAL CONDUIT FRAMES  
MINIMIZED NUMBER OF STRUCTURAL COMPONENTS  
MOST COMPACT INSTALLATION  
CONTRASTING COLOUR OF SEALANT FOR BETTER INSPECTION  
EXTREMELY SIMPLE TO INSTALL  
NO INSULATION IN FRONT OF THE PENETRATION  
SHORTEST POSSIBLE CONDUIT LENGTH  
LESS OVERALL INSULATION NEEDED  
APPROVED FOR CONCRETE, STEEL AND ALUMINIUM PARTITIONS  
MAINTENANCE FRIENDLY**



# RISE®/NOFIRNO® SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

*additional safety with RISE® and RISE®-NOFIRNO® multi-cable penetrations*

* Naval Engineering Standard 711: Issue 2: Determination of the smoke index	passed
* Naval Engineering Standard 713: Issue 3: Determination of the toxicity index	passed
* ISO 4589 - 2 : 1996 Determination of the oxygen index	passed
* ISO 4589 - 3 : 1996 Determination of the temperature index	passed
* IMO Resolution A.653(16) Determination of low flame spread characteristics	passed
* Artificial ageing test Determination of properties after 25-50 years	passed
* Thermal cycling test Determination of adhesion at +120 °C / ambient / -40 °C (+212 °F / ambient / -40°F)	passed
* Naval Engineering Standard 510: Issue 2, Draft B: Shock (100 g <sub>n</sub> ) and vibration test (5-350 Hz) combined with 1 bar leak test afterwards	passed
* Naval Engineering Standard 814: Shock test, acceleration level 8378/s/s in two directions combined with 6.9 bar leak test afterwards	passed
* Naval Engineering Standard 510: Issue 2, Draft B: Leak test after a one hour fire test	passed
* General classification Helium gas leak test up to 1 bar	passed
* Nordtest method NT ELEC 030, modified for conducted attenuation	20-100 dB
* Sound damping test According to EN ISO 717-1:1996	70 dB
* Rapid rise fire test According to Mil-P-24705 of the US Navy	passed
* Dynamic cycling test Displacement 10 mm, 100,000 cycles, frequency 0.5 Hz	passed

*Initially some of these tests have been carried out with the regular RISE® system. The sealant is a determining factor for successful mechanical testing. NOFIRNO® sealant has improved mechanical properties so that RISE®/NOFIRNO® can also be classed for these tests as well.*

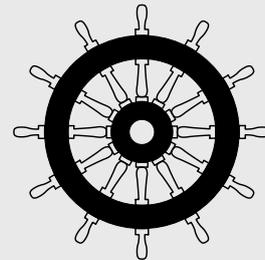
To prove the outstanding quality and safety of the RISE® cable and pipe penetrations, the basic materials (FIWA sealant and FRR/LEHF rubber) have been subjected to additional tests. These tests have been carried out by official institutes: Warrington Fire Research and RAPRA Technologies in the United Kingdom, the Fire Technology Institute of the University of Ghent in Belgium and TNO Laboratories in The Netherlands. The RISE® cable and pipe penetrations have also been subjected to additional tests at official institutes such as DELTA Danish Electronics, Light and Acoustics Testing in Denmark, QinetiQ in England, South West Research Institute in USA and in-house under survey of the classification societies. To name some: sound tests, shock and vibration tests, rapid temperature rise tests, leak tests after a one hour fire test, EMC tests, A-0 test without insulation, dynamic cycling test, several configurations on watertightness and a helium gas leak test.



# RISE<sup>®</sup>/NOFIRNO<sup>®</sup> SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS



EC (MED) certificates according to EUROPEAN UNION COUNCIL DIRECTIVE 96/98 EC on MARINE EQUIPMENT have been issued by Det Norske Veritas certificates N° MED-B-4906 for RISE/ULTRA, N° MED-B-4908 for RISE/NOFIRNO multi-pipe and multi-all-mix penetrations and N° MED-B-4941 for SLIPSIL plugs and by Bureau Veritas certificates N° 09156/B2 EC for RISE, RISE/NOFIRNO and RIACNOF multi-cable penetrations and extended multi-cable penetrations, N° 11301/B0 EC for RISE-EMC multi-cable penetrations, N° 11302/A2 EC for RISE busbar penetrations and certificates N° 10035/B0 EC and N° 10710/B1 EC for RISE single and multi-pipe penetrations for metallic and plastic pipes.



AMERICAN BUREAU of Shipping . . . *CERTIFIED*  
 BUREAU VERITAS . . . . . *CERTIFIED*  
 CHINA CLASSIFICATION SOCIETY  
 CHINA CORPORATION REGISTER of Shipping  
 DET NORSKE VERITAS . . . . . *CERTIFIED*  
 GERMANISCHER Lloyd  
 KOREAN REGISTER of Shipping  
 Lloyd's REGISTER of Shipping  
 Nippon Kaiyokai  
 RUSSIAN MARITIME REGISTER of Shipping  
 TRANSPORT CANADA via DNV CERTIFICATES  
 USCG via MED CERTIFICATES

**APPLIED FOR**



CERTIFIED BY  
 THE MAJOR  
 CLASSIFICATION  
 SOCIETIES

*Note: configurations may differ per classification society.*



# RISE®/NOFIRNO® SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

*three different components for RISE®/NOFIRNO®: sleeves, fillers and sealant*



sleeve type	cable diameter	sleeve length (standard)	wall thickness
12/6	5 - 7	140-160-210	3
14/8	7 - 9	140-160-210	3
16/10	9 - 11	140-160-210	3
18/12*	11 - 13	140-160-210	3
20/14	13 - 15	140-160-210	3
22/16	15 - 17	140-160-210	3
27/19*	17 - 21	140-160-210	4
31/23	21 - 25	140-160-210	4
35/27	25 - 29	140-160-210	4
39/31	29 - 33	140-160-210	4
46/36	33 - 39	140-160-210	5
52/42	39 - 45	140-160-210	5
58/48	45 - 51	140-160-210	5
64/54	51 - 57	140-160-210	5
70/60	57 - 63	140-160-210	5

\* filler sleeves are supplied non-split dimensions in mm

*RISE®/NOFIRNO® multi-cable transits: non-toxic, halogen free components*



sleeve type	sleeve length (standard)	wall thickness
18/12*	140-160-210	3
27/19*	140-160-210	4

\* filler sleeves are supplied non-split for ease of filling dimensions in mm

**NOFIRNO**

*The NOFIRNO rubber is absolutely HALOGEN FREE (tested according to Naval Engineering Standard NES 713: Issue 3). Furthermore the NOFIRNO rubber has a low smoke index (NES 711: Issue 2: 1981) and a high oxygen index (ISO 4589-2: 1996).*



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

*three different components for  
RISE<sup>®</sup>/NOFIRNO<sup>®</sup>: sleeves, fillers and sealant*



NOFIRNO<sup>®</sup> is a fire-resistant sealant based on a single component silicone compound.

**NOFIRNO<sup>®</sup> is also water-repellent**

**High bonding strength**

**UV and Ozone resistant**

The numerous fire tests we have carried out with NOFIRNO<sup>®</sup> sealant has shown that the sealant is able to withstand fire and thermal loads without showing any dramatic colour change or carbonization at the unexposed side. At the exposed side the sealant will NOT be consumed by the fire due to the protective layer and char formed. This means that the sealant will stay in place there.

NOFIRNO<sup>®</sup> sealant is halogen free, has outstanding weathering properties, does not shrink during fire exposure, has an oxygen index of 45% (>30% is flame retardant), a low smoke index and is non-toxic.

The cured sealant layer maintains its original hardness during service life. NOFIRNO<sup>®</sup> sealant can be used in a very wide temperature range.

*optimum combination of viscosity, flow and bonding capacity of NOFIRNO<sup>®</sup> sealant*

### PRODUCT INFORMATION

01) colour	red brown
02) specific gravity	1.40 ± 0.03 g/cm <sup>3</sup>
03) curing of top layer	0.5 - 1 hour depending on temperature and air humidity
04) service temperature	-50 °C up to +180 °C
05) tensile strength	1.5 MPa
06) elongation at break	200%
07) hardness	45 Shore A
08) elastic deformation	approx. 50%
09) resistance	UV, Ozone, arctic conditions
10) ageing	more than 20 years
11) supplied in	310 ml cartridges
12) storage	to be stored cool and dry min/max temperature = +5/+30° C
13) storage life	guaranteed 6 months; when applied later than 6 months after date of manufacturing, curing and adhesive properties have to be checked before application



*NOFIRNO<sup>®</sup> is a paste-like compound which is simple to use.*

*NOFIRNO<sup>®</sup> has a balanced viscosity and can be applied overhead.*

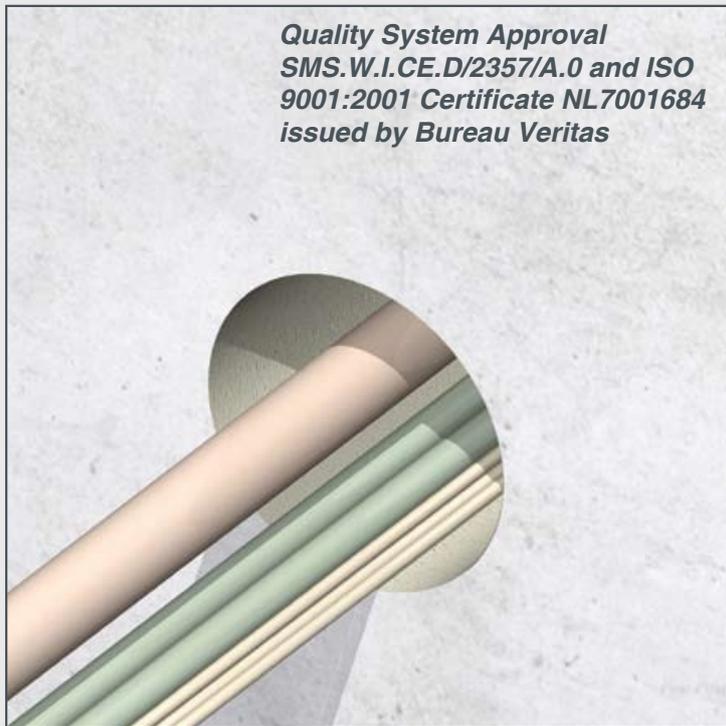
*After applying the sealant, it can be smoothed by means of a wet cloth or by hand.*

*Because the sealant adheres very tightly, the cloth and hands should be wetted with water before use to prevent sealant from sticking to them.*

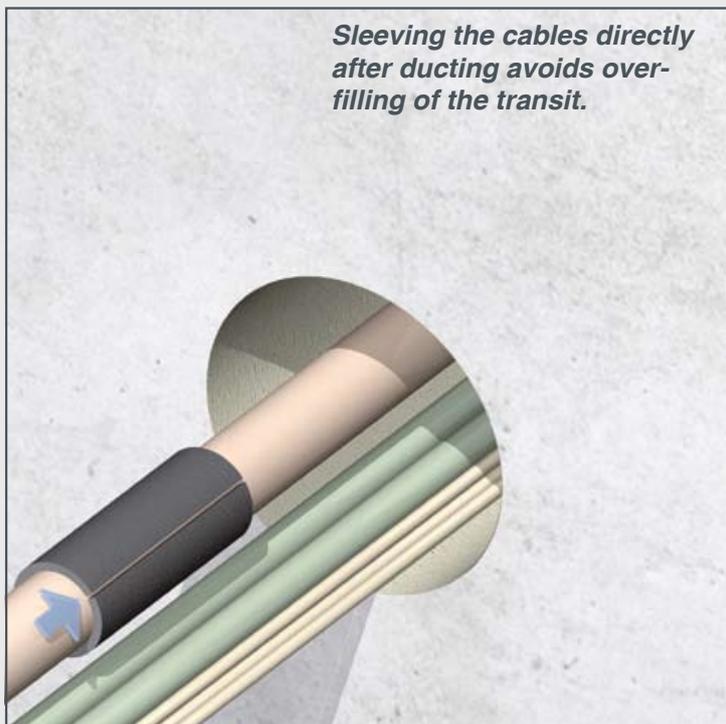


## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

1) The cables can be ducted through the conduit sleeve/frame in random order. It is most important that they are not pulled too tight in order not to hamper their separation when RISE<sup>®</sup> insert sleeves are inserted. Ask for our free installation video.



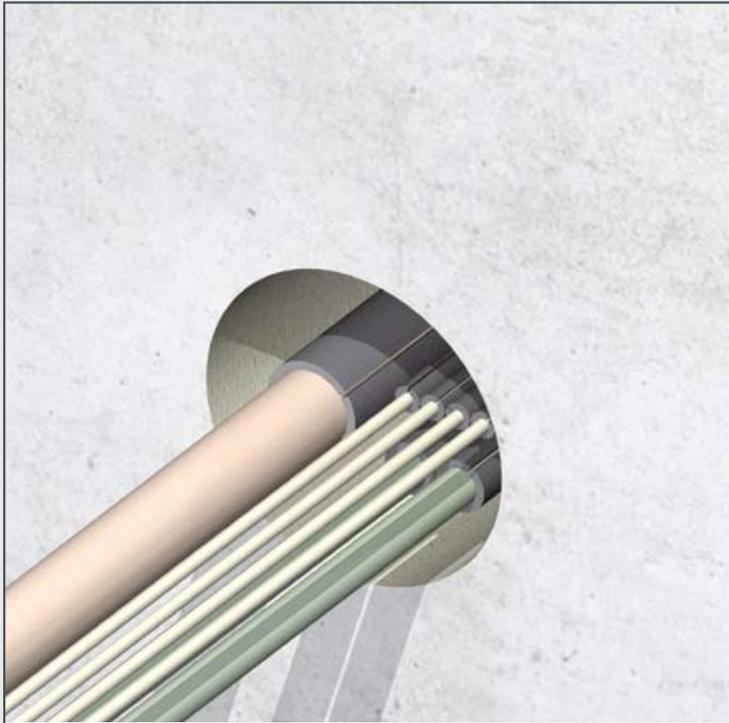
2) After the cables have been ducted, RISE<sup>®</sup> insert sleeves are applied around each cable. The insert sleeves are split length-wise and can therefore be fitted around the cables in front of the conduit. See above.



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

3) The remaining free space in the conduit is filled with NOFIRNO<sup>®</sup> filler sleeves type 27/19 and 18/12.

For ease of filling the NOFIRNO<sup>®</sup> filler sleeves are delivered non-split. The ratio 27/19 to 18/12 should be about 2:1.

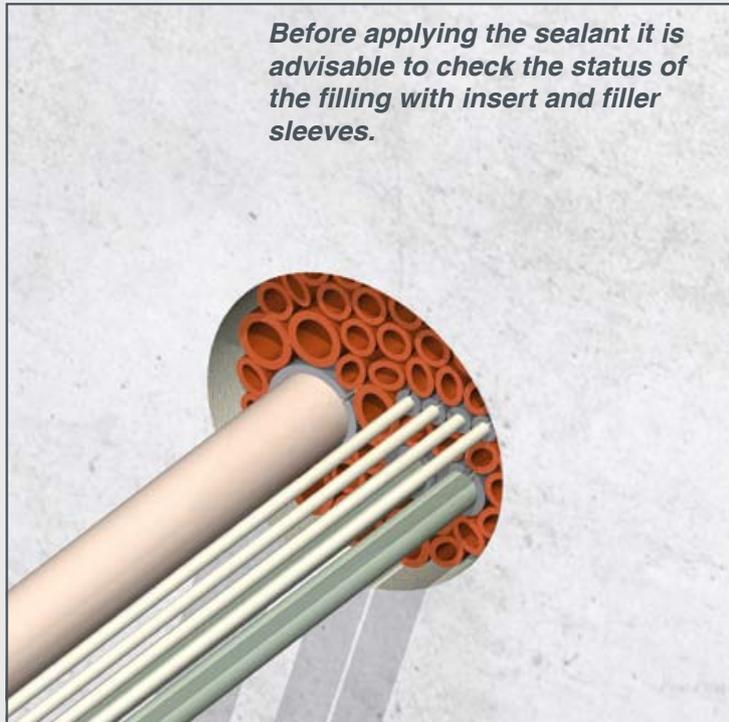


4) Push the insert/filler sleeves into the conduit in such a way as to leave about 20 mm free space at the front.

The whole set of insert and filler sleeves should tightly fit into the conduit to offer sufficient mechanical stability.

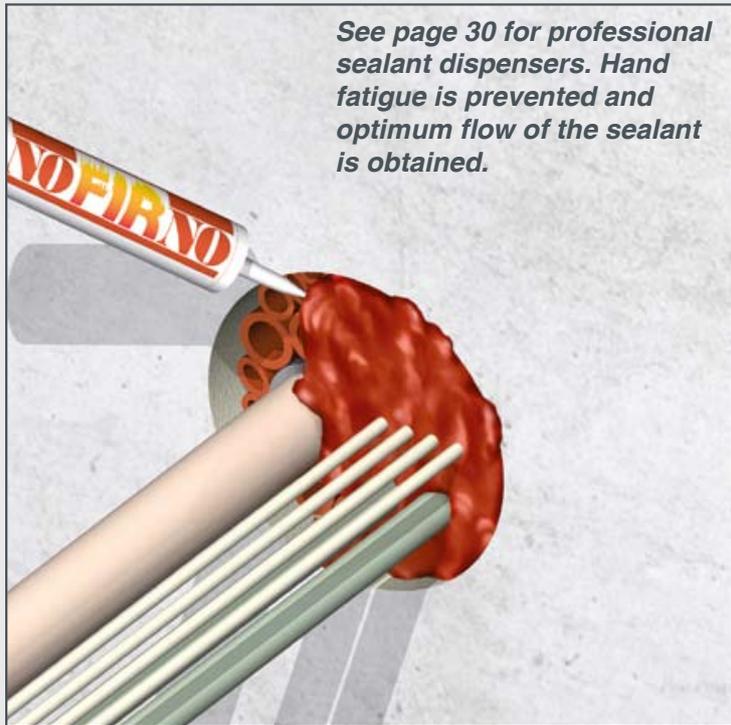


*Before applying the sealant it is advisable to check the status of the filling with insert and filler sleeves.*



## RISE®/NOFIRNO® SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

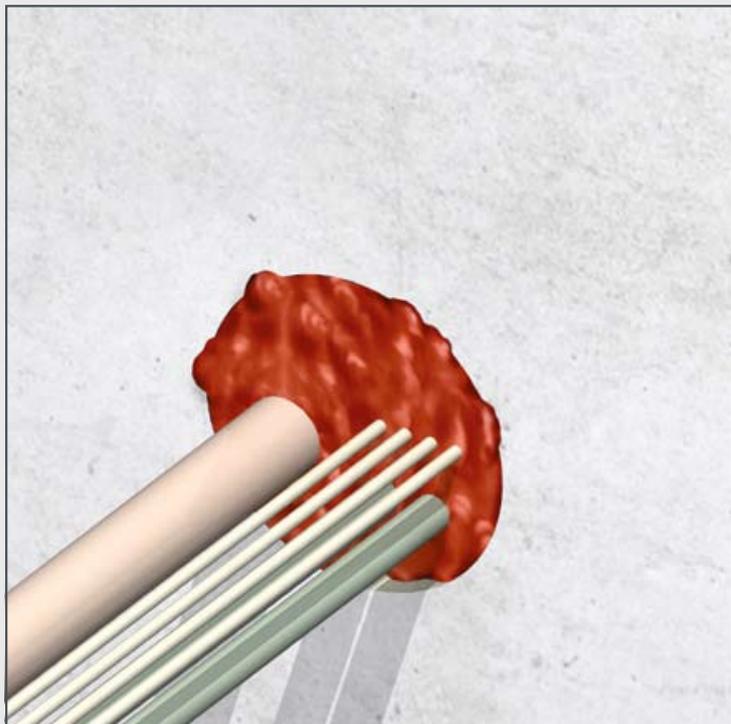
5) A 20 mm thick layer of NOFIRNO® sealant is applied at each side of the conduit. Clean and dry the conduit opening and the cables thoroughly and remove any dirt, rust or oil residues before applying the sealant.



*See page 30 for professional sealant dispensers. Hand fatigue is prevented and optimum flow of the sealant is obtained.*



6) The conduit should be overfilled with NOFIRNO® sealant, because some sealant will be pushed between and into the empty insert sleeves during further finishing. This will contribute to obtain higher tightness ratings.

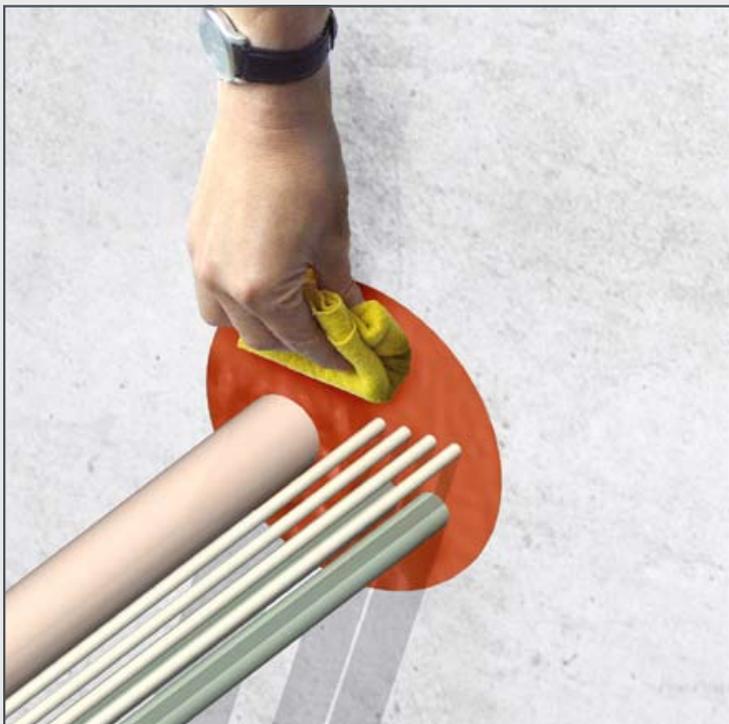


## RISE®/NOFIRNO® SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

7) To smooth the surface of the NOFIRNO® sealant layer, a cloth is sprayed with water. This prevents the sealant from sticking to the cloth.  
Note: do not use soapwater!

The logo for RISE, featuring the word in a stylized, bold, red and black font with a white outline.The logo for NOFIRNO, featuring the word in a bold, red, blocky font with a white outline. The letters 'I' and 'R' have a flame-like effect at the top.

8) The cloth is then used to press down the sealant layer. People with sensitive skin should use gloves when working with the NOFIRNO®. Please refer to the Safety Data Sheet for more information.

The logo for RISE, featuring the word in a stylized, bold, red and black font with a white outline.

## RISE®/NOFIRNO® SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

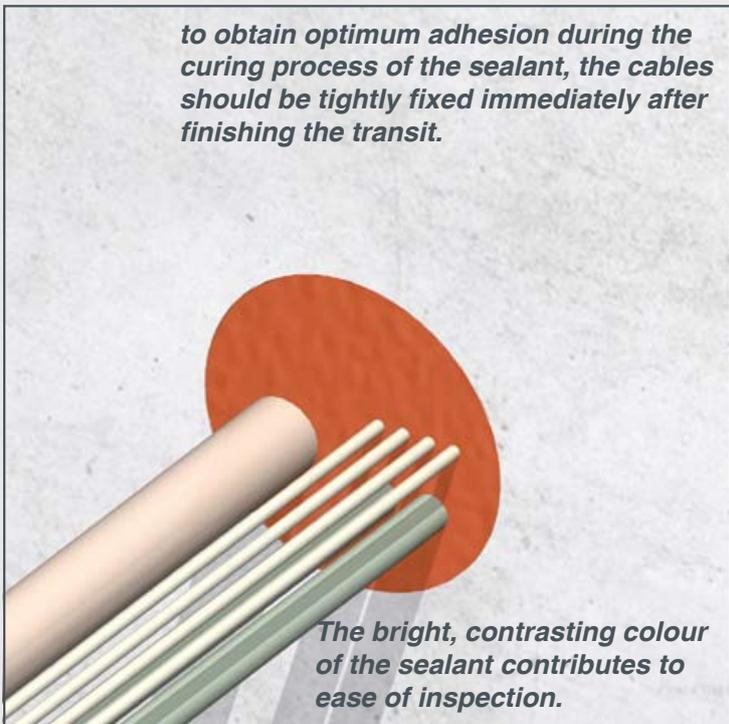
9) The surface can be further smoothed by hand. Just wet the hand thoroughly with soap and water. No dirty hands when working with NOFIRNO® and a very neat surface is the result. People with sensitive skin should use gloves when working with NOFIRNO®.



10) After smoothing is finished a last check should be taken if sufficient sealant is applied in between the cables especially at penetrations with larger amounts of cables. This is most important specially for water and gastight penetrations.



*to obtain optimum adhesion during the curing process of the sealant, the cables should be tightly fixed immediately after finishing the transit.*

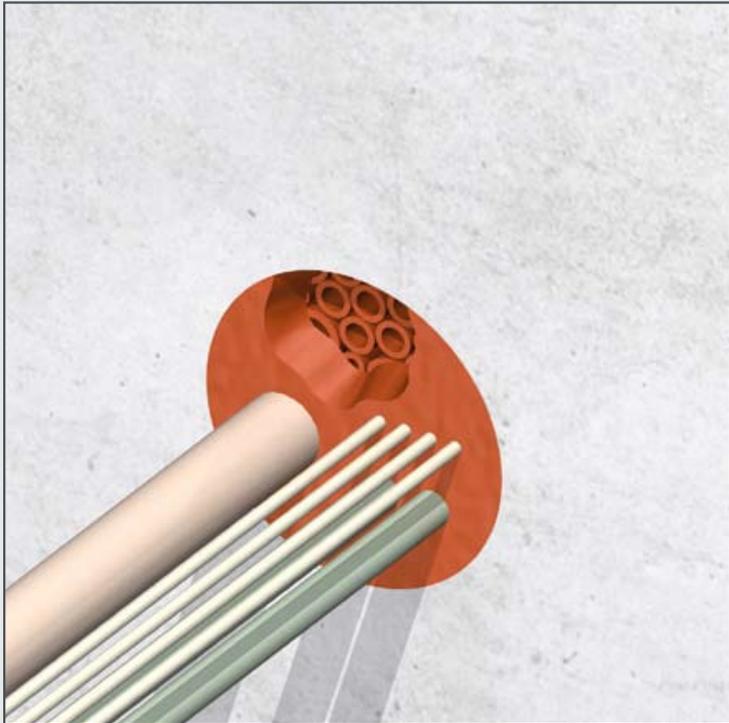


*The bright, contrasting colour of the sealant contributes to ease of inspection.*

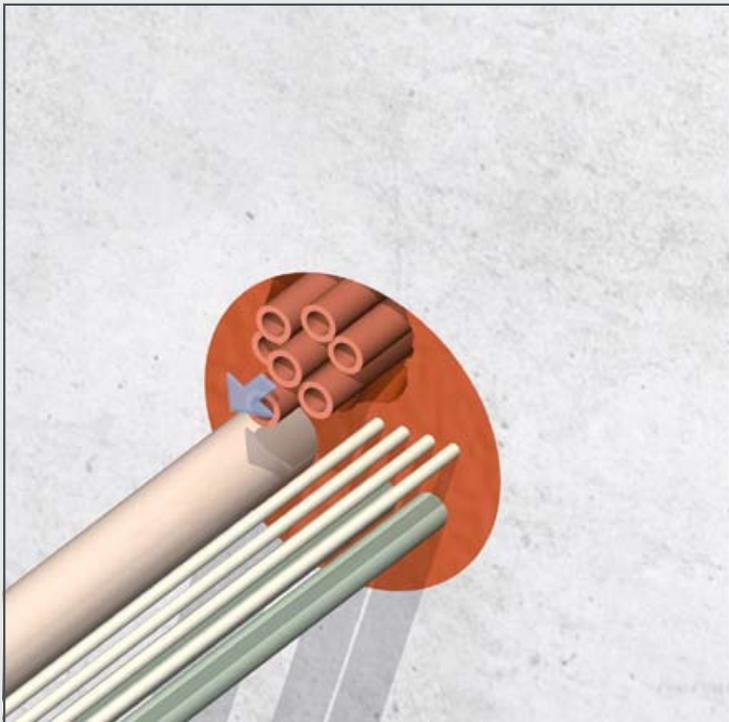


## RISE®/NOFIRNO® SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

Adding extra cables is an easy job. Cut away the sealant layer at both sides of the penetration with a knife or a hollow punch in a tapering shape. This creates a good foundation for the sealant mass to be applied later.

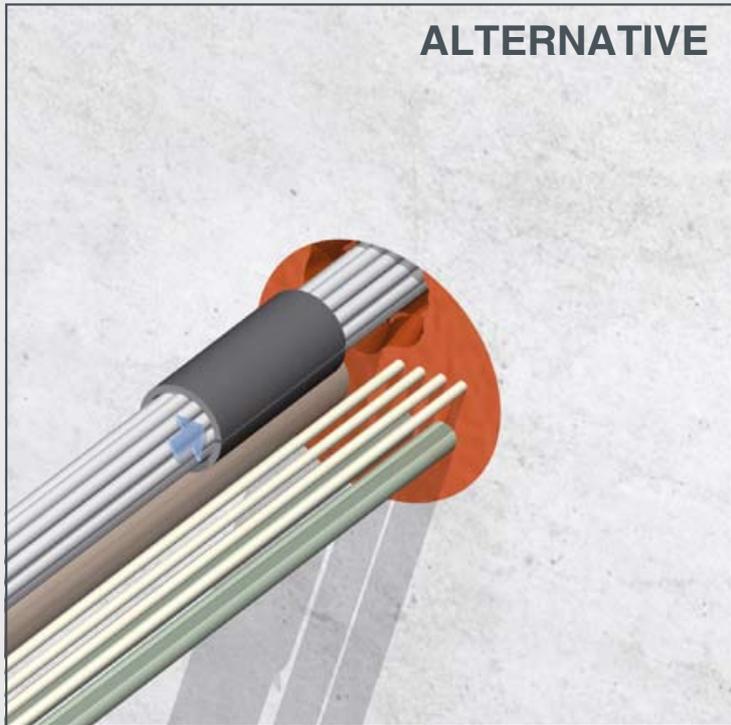


Remove one or more NOFIRNO® filler sleeves to create a fitting opening for the cable to be ducted.



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

Pull a set of bundled cables through the conduit and place a RISE<sup>®</sup> insert sleeve around the cable.  
Not to be used for gas or watertight penetrations!



Push the insert sleeve into the conduit in such a way as to leave about 20 mm free space at the front,

The conduit to be finished as described on pages 14-16.



## RISE®/NOFIRNO® SINGLE, MULTI AND MULTI-ALL-MIX TRANSITS

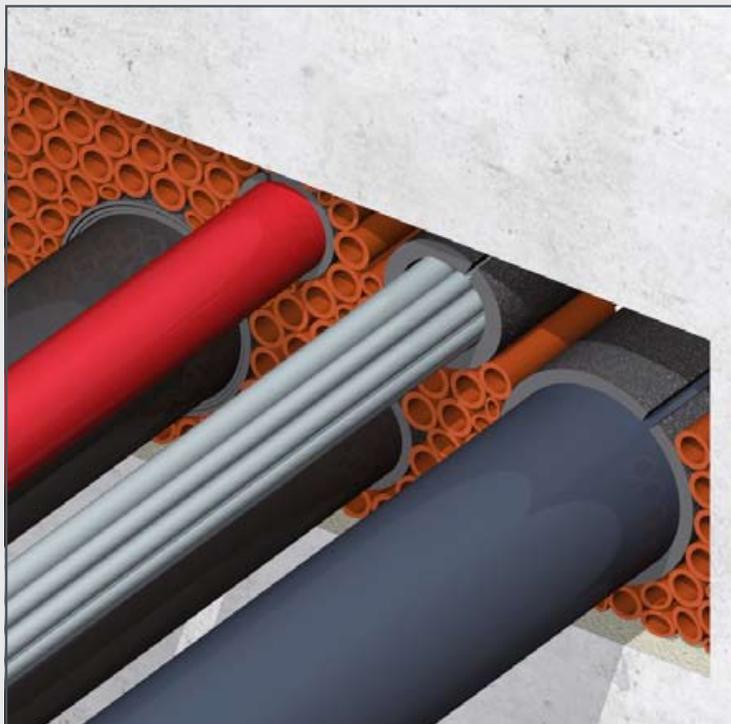
A bundle of max. 12 plastic installation pipes for cables with an OD of 12 mm can be ducted and fire safe sealed with a RISE®/ULTRA crusher and NOFIRNO® filler sleeves.

Not to be used for gas or watertight penetrations!



**CRUSHER**

Place a RISE®/ULTRA crusher around the bundled pipes in front of the penetration and push into the conduit. RISE®/ULTRA crushers are split lengthwise. NB: the pipes should be tightly bundled to avoid larger openings within the pipe set.



**CRUSHER**



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

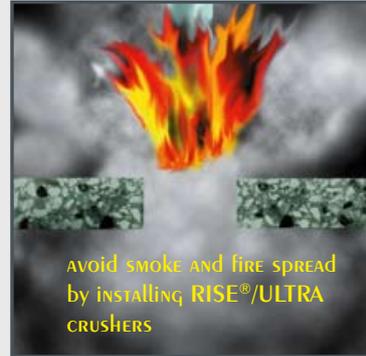
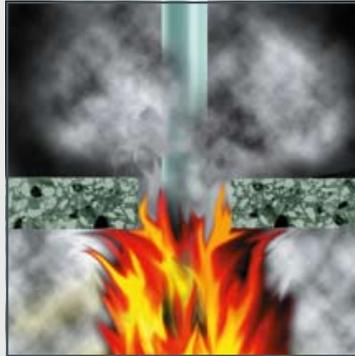
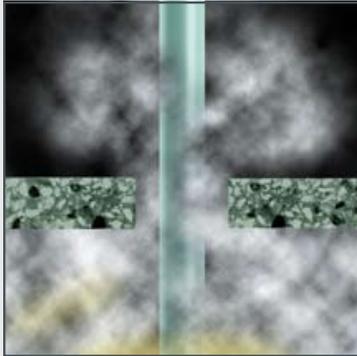
65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES

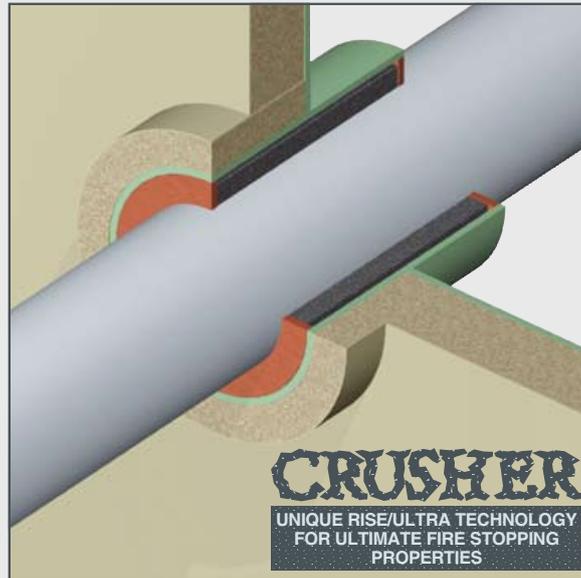
## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

Plastic pipes which pass through fire-rated bulkheads and decks as part of, for example, sanitation systems, are a potential source of serious problems in case of fire. Most plastic pipes start to soften at a temperature of about 75 °C and ignite at a temperature of about 140 °C. This means that, should a fire occur, a hole will be formed by the softened or combusted plastic pipe, allowing fumes and flames to spread freely. To meet this problem, BEELE Engineering has developed the CRUSHER<sup>®</sup> technology.



Based on the CRUSHER<sup>®</sup> technology it is now possible to make fire stop penetrations for plastic pipes just by inserting a single RISE<sup>®</sup>/ULTRA crusher into the conduit opening. The RISE<sup>®</sup>/ULTRA crusher is placed around the ducted plastic pipe. For conduits which should also be air or water tight, a combination of RISE<sup>®</sup>/ULTRA and NOFIRNO<sup>®</sup> sealant is used. The design of the crusher allows for a balanced amount of hot air penetrating around the crusher. The time to close off the opening left by the burned or softened plastic pipe must be very short. Otherwise a chimney effect will occur causing the pipe at the unexposed side to melt. The unique RISE<sup>®</sup>/ULTRA rubber reacts at two different temperature levels to speed up compression. The first reaction transfers the rubber under limited expansion to a very adhesive substance. Adhesive sealing all around causes the

trapped air to expand rather fast. In this way compression of the plastic pipe starts already at an early stage of the fire. The unique RISE<sup>®</sup>/ULTRA crusher allows for smallest conduit openings. For oversized openings and for multi-plastic pipe penetrations use is made of NOFIRNO<sup>®</sup> filler sleeves and NOFIRNO<sup>®</sup> sealant. Based on the properties of the RISE<sup>®</sup>/ULTRA rubber, ultimately a hard solid rubber mass adhering to the wall of the conduit and the remaining part of the plastic pipe is formed. In this way the penetration keeps tight. Official fire tests according to IMO Resolution A.754(18) have successfully been carried out at the EFECTIS (formerly TNO) test institute, including multi-mix (cables, metallic and plastic pipe) transits. RISE<sup>®</sup>/ULTRA crushers have also been tested according to EN1366-3:2004 for a fire rating of two hours and lately in-house for a four hour fire rating.

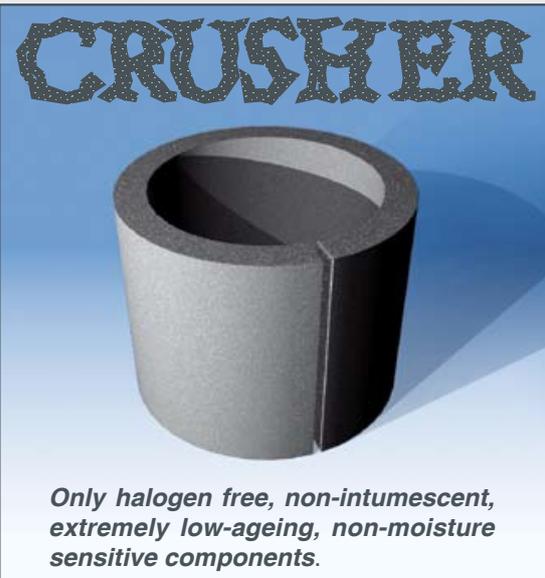


# CRUSHER<sup>®</sup>



## RISE®/NOFIRNO® + RISE®/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

*RISE®/NOFIRNO® combined with RISE®/ULTRA  
for plastic pipe and multi-all-mix transits*



pipe OD	crusher type	wall thickness	crusher lengths	conduit opening
16	24/16	4	110/160	25-30
18	24/18	3	110/160	25-30
20	28/20	4	110/160	28-34
25	33/25	4	110/160	33-40
32	40/32	4	110/160	40-48
40	48/40	4	110/160	49-55
50	58/50	4	110/160	60-66
63	75/63	6	110/160	75-83
75	90/75	7.5	110/160	90-100
90	105/90	7.5	110/160	105-115
110	138/110	14	110/160	139-160

*Note: only in combination with 20 mm NOFIRNO® sealant at both sides.*

*For more information we refer to the RISE®/ULTRA brochure.*

*RISE®/ULTRA crushers toepassen om de kunststof buizen in de multi-all-mix transit*



*Instead of using fitting RISE®/ULTRA crushers or in case no fitting crushers are available, use can be made of the RISE®/ULTRA wraps. These can be wrapped around the ducted plastic pipe and in this way made to fit at site. Wraps make material management at site very easy.*

*The sheets are available in sizes 1000x110x2.5 mm and 1000x160x2.5 mm. See the RISE®/ULTRA brochure for thickness to be applied.*

*Note: only in combination with 20 mm NOFIRNO® sealant at both sides.*



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

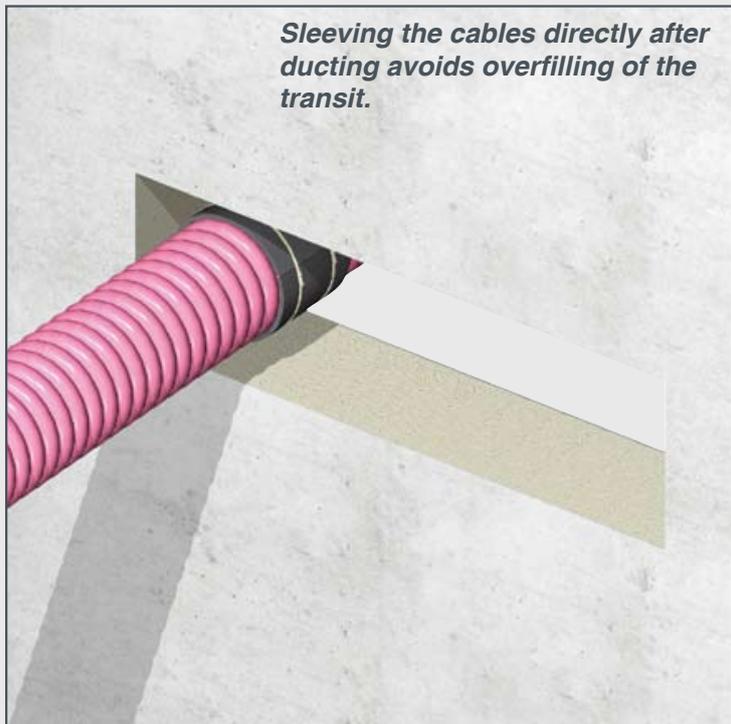
1) The cables can be ducted through the conduit sleeve/frame in random order. After the cables have been ducted, RISE<sup>®</sup> insert sleeves are applied around each cable.



*Quality System Approval  
SMS.W.I.CE.D/2357/A.0 and ISO  
9001:2001 Certificate NL7001684  
issued by Bureau Veritas*



2) The RISE<sup>®</sup> insert sleeves are split length-wise and can therefore be fitted around the cables in front of the conduit. For cable sizes > 64 mm a RISE<sup>®</sup> wrap with thickness 5 mm is applied. The wraps can be fixed with a tie-wrap.

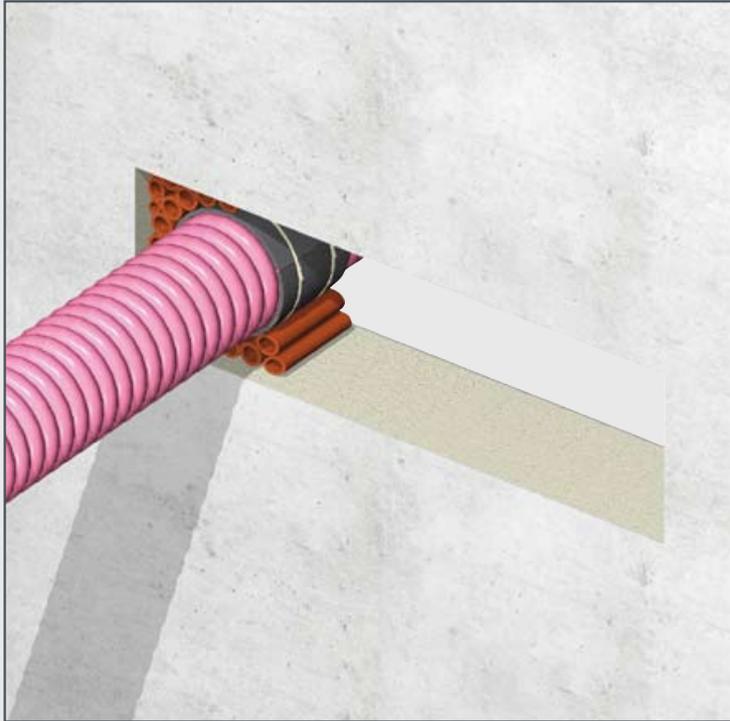


*Sleeving the cables directly after ducting avoids overfilling of the transit.*



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

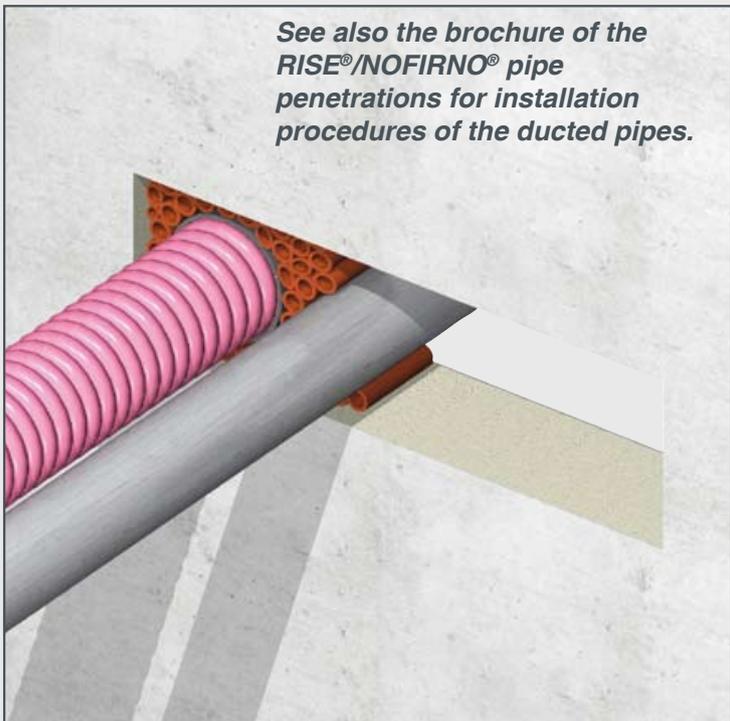
3) The system is also approved for ducting steel/stainless steel pipes. The minimum interspacing should be regarded according to the specifications on the approved installation drawings.



**RISE**

**NOFIRNO**

4) Separation of the metallic pipes is provided by NOFIRNO<sup>®</sup> filler sleeves all around the ducted pipe(s). NOFIRNO<sup>®</sup> filler sleeves are available in sizes 18/12 and 27/19 and are non-split for ease of installation.



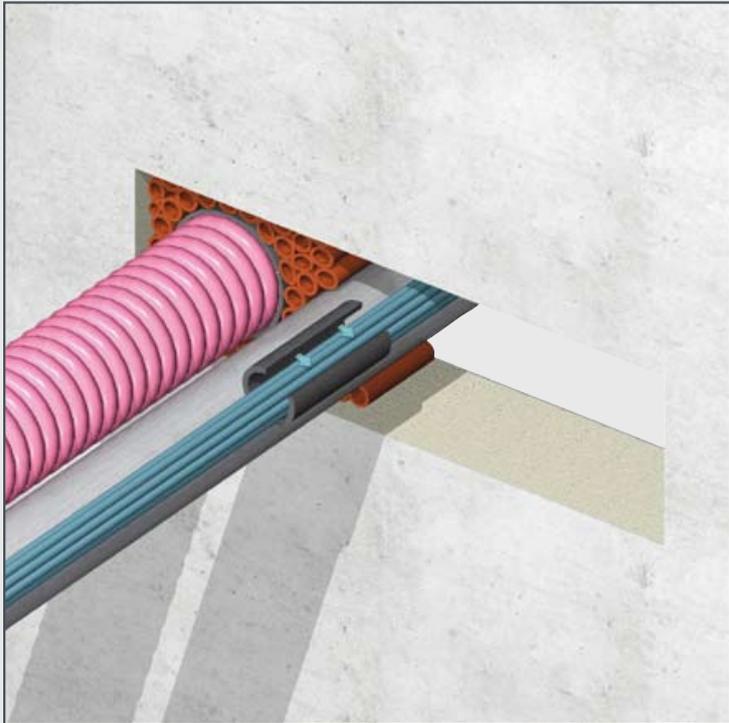
*See also the brochure of the RISE<sup>®</sup>/NOFIRNO<sup>®</sup> pipe penetrations for installation procedures of the ducted pipes.*

**RISE**

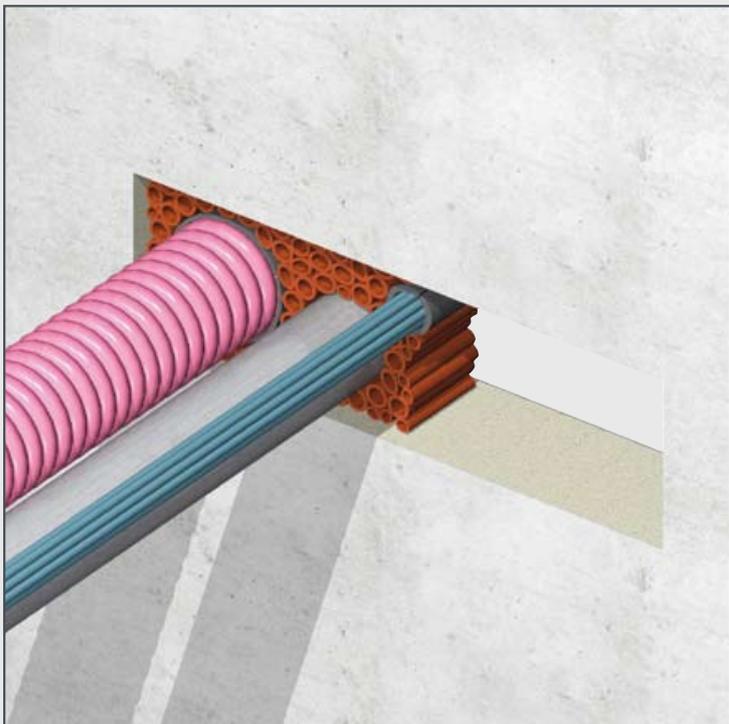


## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

5) Bundled cable sets are allowed in the RISE<sup>®</sup>/NOFIRNO<sup>®</sup> multi-all-mix sealing system, using only one RISE<sup>®</sup> insert sleeve. See for details the approved installation drawings.

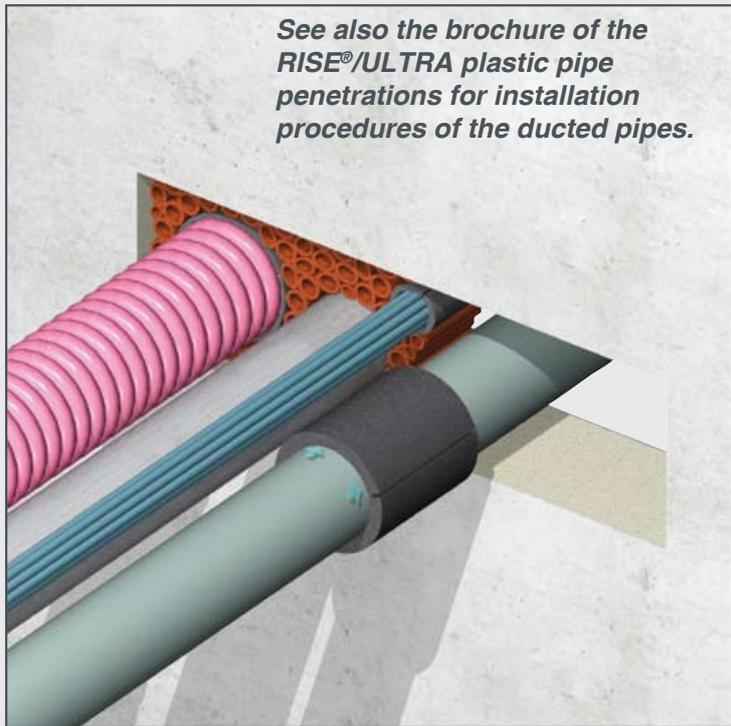


6) Open spaces in the conduit can be afterwards filled with NOFIRNO<sup>®</sup> filler sleeves type 27/19 and 18/12. The ratio 27/19 to 18/12 should be about 2:1.



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

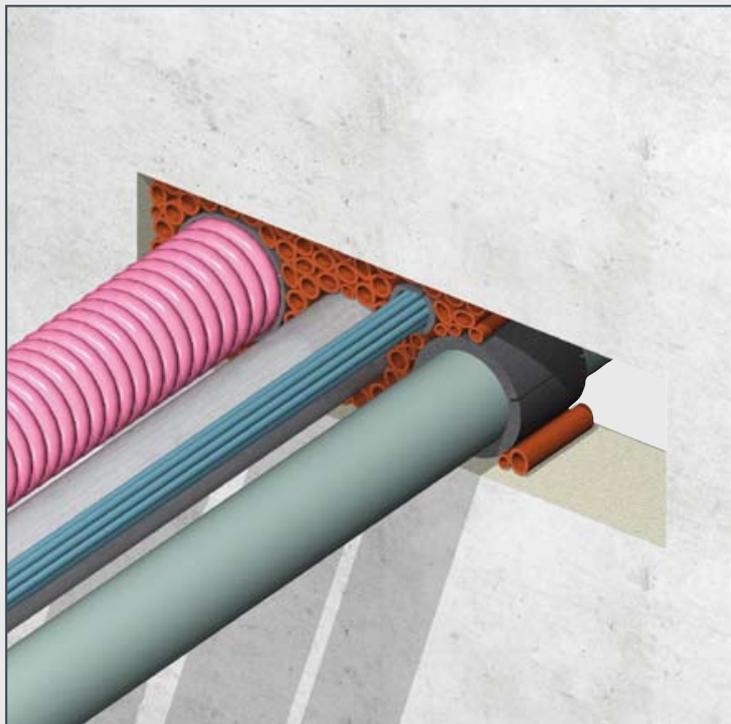
7) Plastic pipes can also be ducted through the multi-all-mix<sup>®</sup> transit. Place a RISE<sup>®</sup>/ULTRA crusher around the ducted pipe in front of the penetration. RISE<sup>®</sup>/ULTRA crushers are split lengthwise.



*See also the brochure of the RISE<sup>®</sup>/ULTRA plastic pipe penetrations for installation procedures of the ducted pipes.*



8) Push the insert/filler sleeves and the crusher into the conduit in such a way as to leave about 20 mm free space at both sides of the transit. This space is needed to apply in a later stage the NOFIRNO<sup>®</sup> sealant.



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

9) The system allows also for insulated chilled water lines without interrupting the insulation and multi-beverage lines. A RISE<sup>®</sup>/ULTRA crusher or wrap is placed around the insulation and inserted into the penetration.

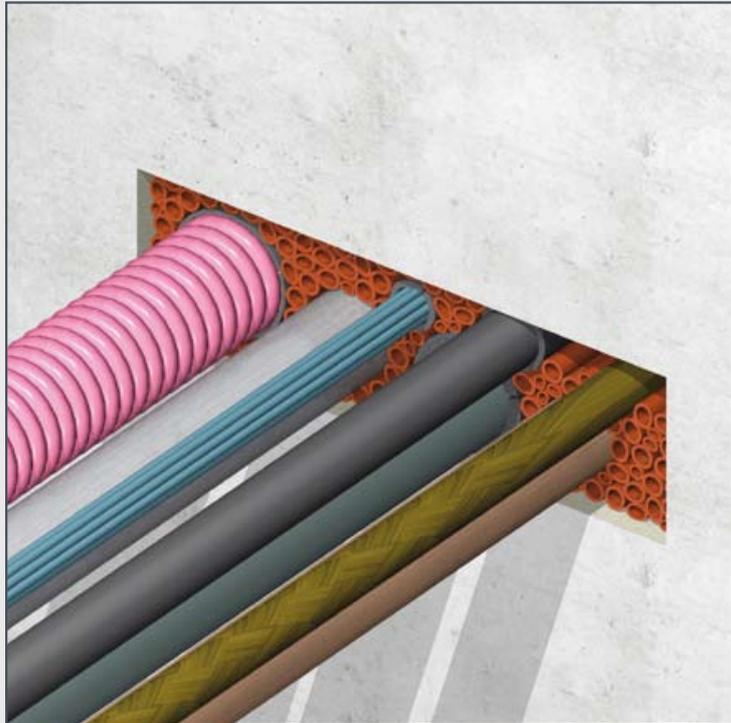


10) Copper/CuNi pipes can also be ducted through the multi-all-mix penetration. Separation of the metallic pipes is provided by RISE<sup>®</sup>/NOFIRNO filler sleeves all around the ducted pipe(s). See the approved drawings for minimum interspacing.



## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

11) Also GRP pipes are allowed. Separation of the GRP pipes is provided by NOFIRNO<sup>®</sup> filler sleeves all around the ducted pipe(s).



**RISE**

**NOFIRNO**

12) The remaining open spaces in the transit are filled with NOFIRNO<sup>®</sup> filler sleeves.

The whole set of crushers, insert and filler sleeves should tightly fit into the conduit to offer sufficient mechanical stability.

*Before applying the sealant it is advisable to check the status of the filling with crushers, insert and filler sleeves.*



**RISE**



## RISE®/NOFIRNO® + RISE®/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

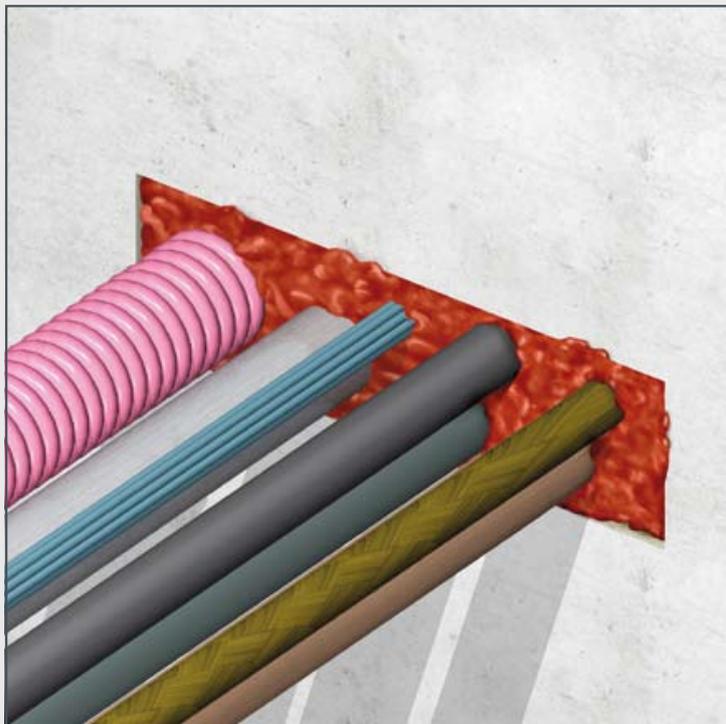
13) A 20 mm thick layer of NOFIRNO® sealant is applied at each side of the conduit. Clean and dry the conduit opening and the cables thoroughly and remove any dirt, rust or oil residues before applying the sealant.



**RISE**

**NOFIRNO**

14) The conduit should be overfilled with NOFIRNO® sealant, because some sealant will be pushed between and into the empty filler sleeves during further finishing. This will contribute to obtain higher tightness ratings.



**RISE**



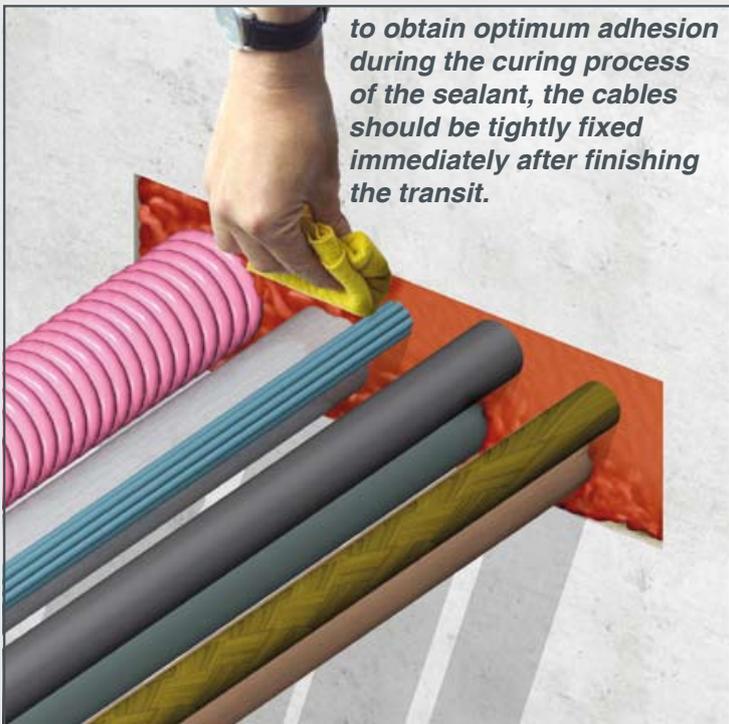
## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> + RISE<sup>®</sup>/ULTRA MULTI-ALL-MIX CABLE/PIPE TRANSITS

15) To smooth the surface of the FIWA<sup>®</sup> sealant layer, a cloth is sprayed with water. This prevents the sealant from sticking to the cloth.

Note: do not use soapwater!



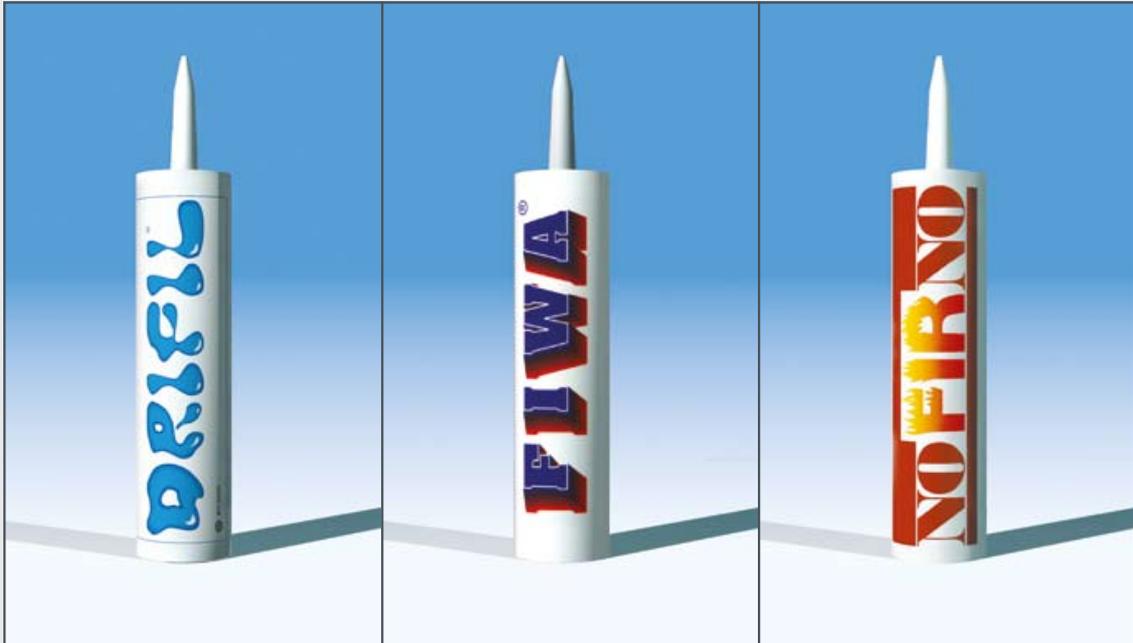
16) The cloth is then used to press down the sealant layer. People with sensitive skin should use gloves when working with the NOFIRNO<sup>®</sup>. Please refer to the Safety Data Sheet for more information.



*to obtain optimum adhesion during the curing process of the sealant, the cables should be tightly fixed immediately after finishing the transit.*



# RISE<sup>®</sup>/NOFIRNO<sup>®</sup> MULTI-ALL-MIX TRANSIT SEALING SYSTEM



DRIFIL<sup>®</sup> is a water-repellent sealant based on a single-component silicone compound. In developing DRIFIL<sup>®</sup> sealing compound, high priority was focused on its power of adhesion to subsurfaces as occurring in the construction sector, and to cable sheathing and metal and plastic pipes.

In addition, special attention was given to the permanent flexibility of the sealant in order to permit minor settlements and movements of the cable/pipe bunch after the sealant has set. The purpose of this is to ensure that the seal remains intact in the longer term even in spite of possible mechanical loading.

DRIFIL<sup>®</sup> sealant has a very short setting time. The top layer is rapidly tack-free.

FIWA<sup>®</sup> is a fire-resistant sealant based on a single component silicone compound. FIWA<sup>®</sup> is also water-repellent. The sealant adheres well to most subsurfaces occurring in the building industry, and is permanently elastic. In the event of fire or at temperatures in excess of 200 °C the sealant expands to about five to ten times its original volume. During this process a porous mass is formed which has excellent thermal insulation properties. In contrast to conventional materials that swell under severe heat exposure, the expansion of FIWA<sup>®</sup> is not caused by intumescence, but by a chemical process.

The advantage of this is that the expansion of FIWA<sup>®</sup> is not accompanied by the formation of fumes.

NOFIRNO<sup>®</sup> is a fire-resistant sealant based on a single component silicone compound.

The numerous fire tests we have carried out with NOFIRNO<sup>®</sup> sealant has shown that the sealant is able to withstand fire and thermal loads without showing any dramatic colour change or carbonization at the unexposed side. At the exposed side the sealant will NOT be consumed by the fire due to the protective layer and char formed. This means that the sealant stays in place there. NOFIRNO<sup>®</sup> sealant is halogen free, does not harden during service life, has outstanding weathering properties, does not shrink during fire exposure, has an oxygen index of 45% (>30% is flame retardant) and a low smoke index. Can be used in a very wide temperature range.



For ease of application of very high viscosity sealants, we have selected a powerful manual applicator with a 26 : 1 trigger leverage. This means much easier dispensing and reduced fatigue. The applicator is equipped with the so-called Wear Compensating Device, which automatically removes free-play in the trigger to provide instant rod drive immediately when the trigger is pulled. Less full trigger strokes required to empty a cartridge. Extended working life of the applicator.



We have also selected a powerful pneumatic applicator for highest productivity.

Quiet operation (less than 70 dB). Air supply to suit most standard systems. Fast, easy pressure regulation for accurate flow control. High volume trigger valve for immediate sealant flow. Ergonomic design: comfort, minimal operator fatigue. Short, well balanced design, combined with lightweight engineering plastic and aluminium components. Also available for 1 liter cartridges.



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES

## RISE<sup>®</sup>/NOFIRNO<sup>®</sup> MULTI-ALL-MIX TRANSIT SEALING SYSTEM

*ease of calculation with  
our cable and pipe penetrations*



### TRANSIT CALCULATOR

**Calculate  
your materials  
requirements for our  
fire safe and gas and  
smoke tight sealing  
systems**

**RISE  
RISE/NOFIRNO  
RISE/ULTRA  
RISWAT  
RIACNOF**

Free software. Can be downloaded from our website <http://www.rise-systems.com>.

After the entry of the dimensions of the conduit opening and the amount and outer diameters of the ducted cables or pipes, the software calculates the amount of RISE<sup>®</sup> or RIWAT<sup>®</sup> insert sleeves, the RISE<sup>®</sup>, RISWAT<sup>®</sup> or NOFIRNO<sup>®</sup> filler sleeves, the ACTIFOAM<sup>®</sup> spare filling sheets, the RISE<sup>®</sup> or RISE<sup>®</sup>/ULTRA crushers and the DRIFIL<sup>®</sup>, FIWA<sup>®</sup> or NOFIRNO<sup>®</sup> sealant.

It is easy to switch between the several systems and also between A-class, H-class, EMC and watertight penetrations.

After entry of the dimensions and amount and sizes of cables/pipes, a drawing appears on the screen showing also the remaining free space in the conduit opening. Furthermore the filling rate of the cable penetrations is shown.

Warnings appear for deviations of the certified configurations and for overfilling the transits or exceeding filling rates.

For a created project all calculated transits can be stored in a database. Order/calculation forms can be shown on screen for project totals and single transits. The material lists can be printed and/or exported to MS Word.

*we are there with full support for  
our cable and pipe penetrations*



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES

## ARTIST IMPRESSION OF THE FIRST PHASE OF THE NEW FACTORY NEXT TO OUR R&D CENTRE



- 1) machines specially developed for compounding and processing of rubbers under controlled conditions to obtain optimum quality
- 2) machines specially developed for compounding and manufacturing of all types of sealants under controlled processing
- 3) moisture treatment installation and processing equipment for manufacturing of electrically conductive sealants and rubbers
- 4) a complete line of injection moulding presses ranging from 40 tons up to 400 tons for manufacturing sealing plugs and other rubber components
- 5) a complete line of compression moulding presses up to 300 tons for manufacturing larger type sealing plugs and ULEPSI rubber plates
- 6) processing installation for after-curing of rubber products to obtain the required compression set (long term behaviour)
- 7) extruder line including cooling system and cutting and slitting installation for manufacturing insert and filler sleeves for the RISWAT system
- 8) fully automatic extruder lines with a length of 20 meters, including cooling system and automatic cutting, slitting and sorting installation for manufacturing rubber insert and filler sleeves and rubber strips of the RISE system
- 9) extruder line for manufacturing luminescent profiles and hoses
- 10) injection moulding machine for manufacturing thermoplastic YFESTOS products and other plastic parts
- 11) completely equipped die-making shop for the in-house production of all tooling for rubber and plastics manufacturing
- 12) modern laser equipment for engraving the type codes in the dies for rubber manufacturing and for marking products with bar and 2D-matrix codes
- 13) mixing and airless spraying facilities for the NOFIRNO boards

*Together with highly advanced systems and technologies  
we offer highest quality products.*



YOUR RELIABLE  
PARTNERS



[www.generalmarine.co.nz](http://www.generalmarine.co.nz)

65 & 90 Gaunt Street · Westhaven · Auckland 1010 // PO Box 90205 · Victoria Street West · Auckland 1142

Phone +64 9 309 6317 · [sales@generalmarine.co.nz](mailto:sales@generalmarine.co.nz)

GENERAL  
*Marine*  
SERVICES