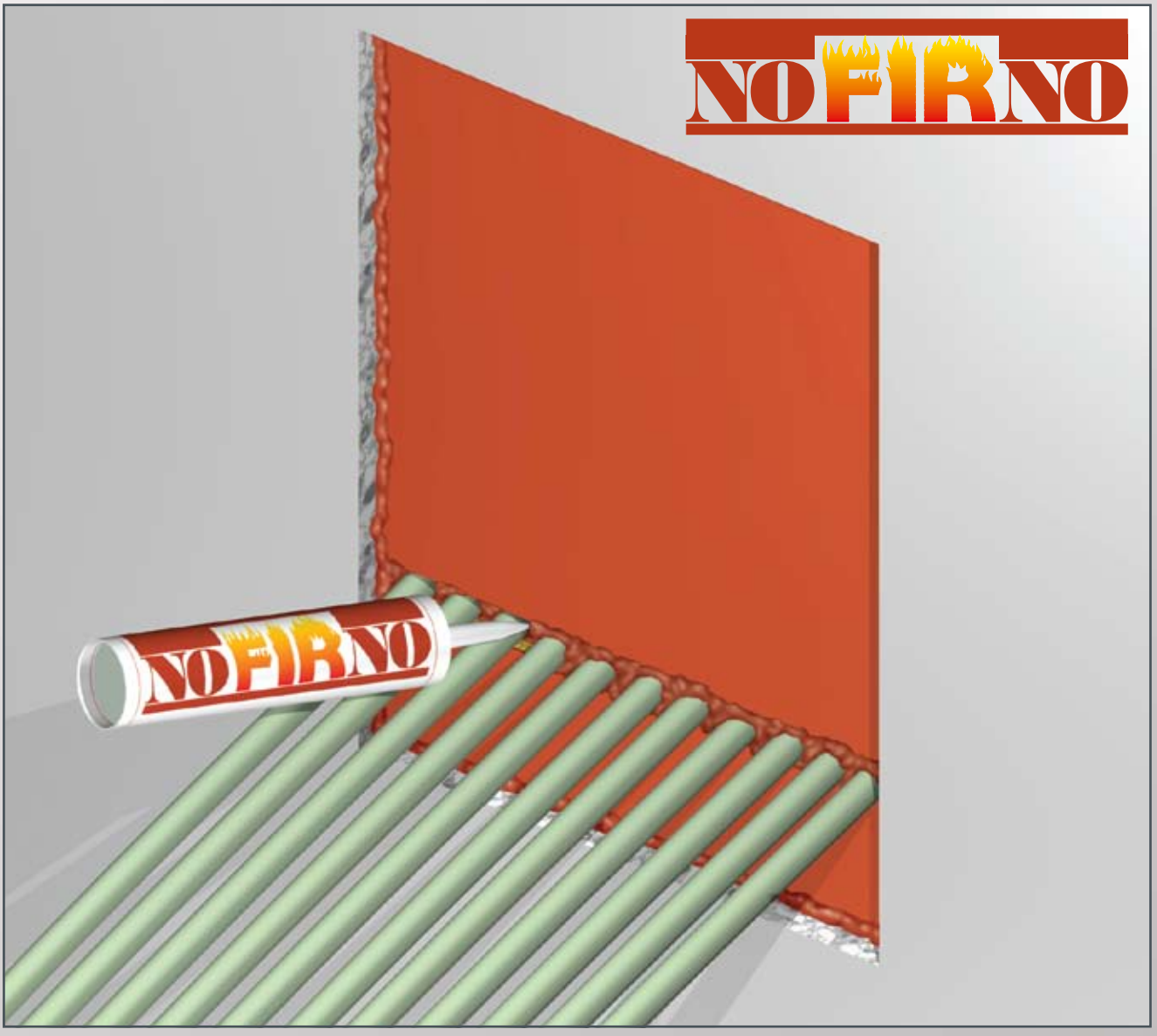
NOFIRNO® FIRESTOP SYSTEM FOR CABLES/CABLE WAYS IN BUILDING AND INDUSTRIAL PLANTS



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

NOFIRNO

INNOVATIVE TECHNOLOGY

MAXIMUM SIMPLICITY OF USE
OPTIMUM FLEXIBILITY
OUTSTANDING PERFORMANCE

Websites: http://www.actifoam.com, www.beele.com, www.firsto.com, www.nofirno.com, www.rise-systems.com, www.rise-nofirno.com, www.riswat.com and www.slipsil.com

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.

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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.

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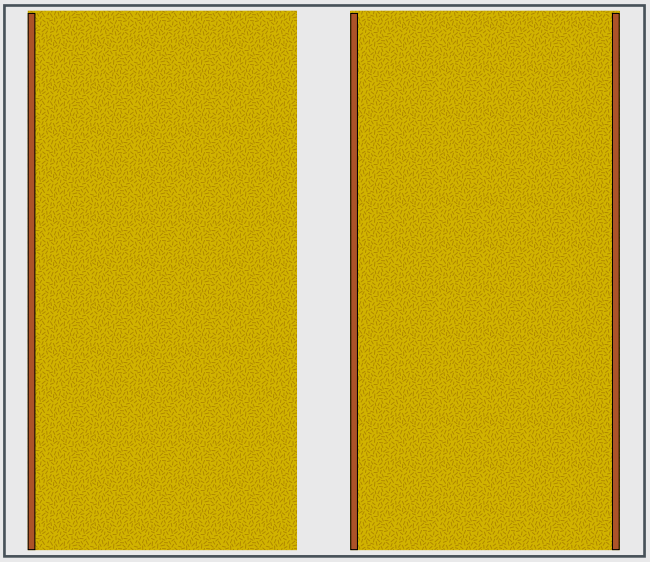
To obtain optimum fire safety in construction use is generally made of the ACTIFOAM® and/or FIRSTO® systems. However, sometimes wall and floor openings are oversized which means that expensive material has to be used to fill these oversized openings. To overcome this problem a system technology has been 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^3.
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.

Fire resistant board 12 mm thick.
Cut to size of the conduit opening.
Supplied in sizes 1000x1000 mm.

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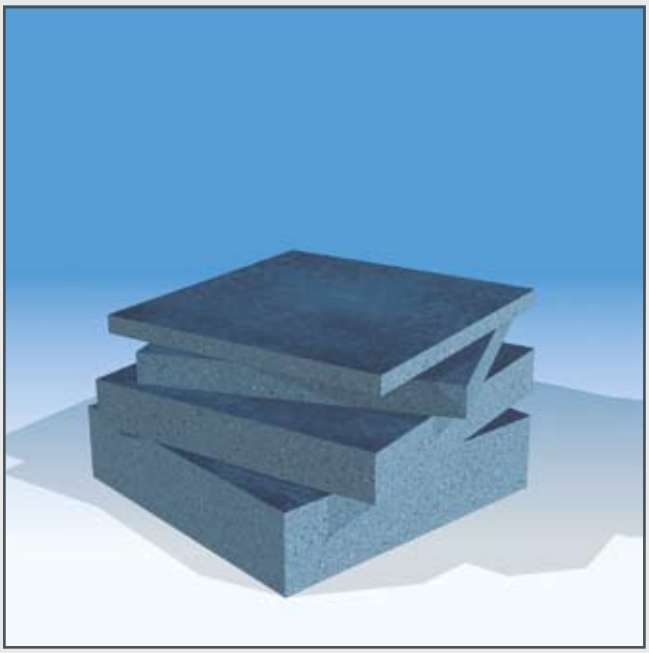
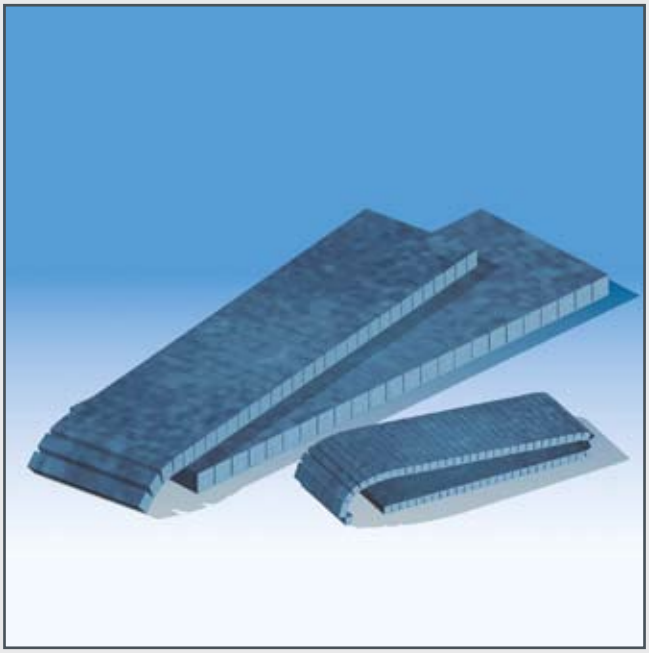
ACTIFOAM® is used to fill any cavities or gaps in constructions. In case of fire the cavity will be totally filled with the expanding rubber, offering a perfect fire seal for a very long duration. Oxygen index 40% (>30% is flame retardant). ACTIFOAM® can also be used for other sealing purposes. An advantage 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
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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.

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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

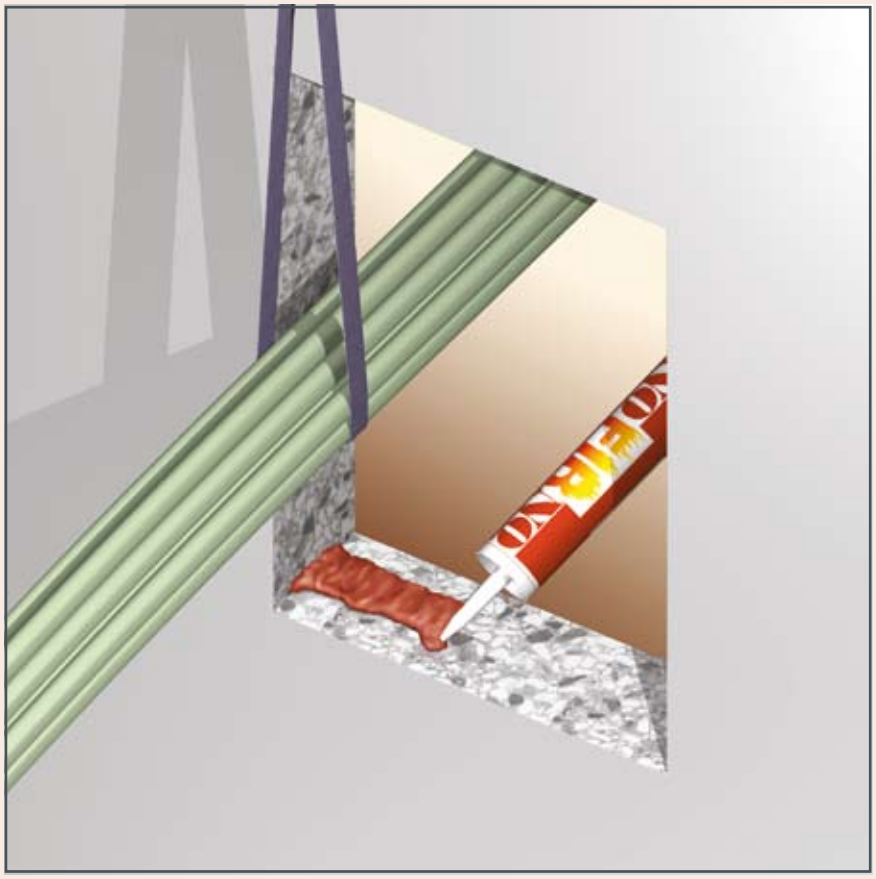
PRODUCT INFORMATION

01)	colour	red brown
02)	specific gravity	1.40 ± 0.03 g/cm^3
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.

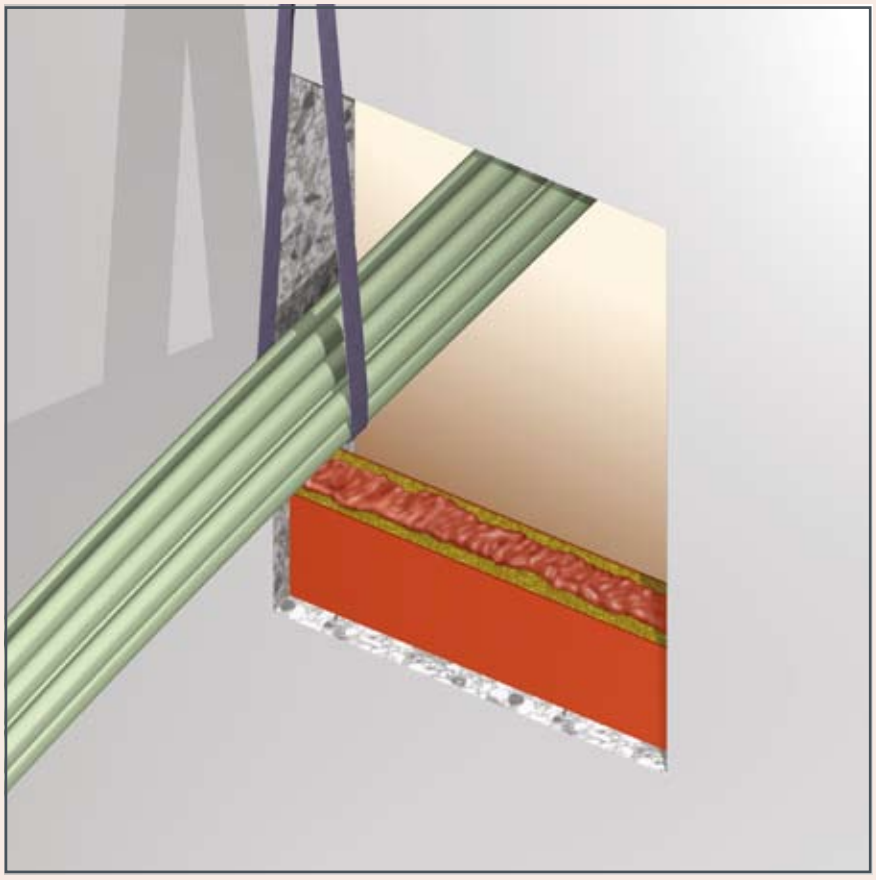
NOFIRNO® - SOLO BOARD INSTALLATATION INSTRUCTIONS

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.



NOFIRNO
INNOVATIVE TECHNOLOGY

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
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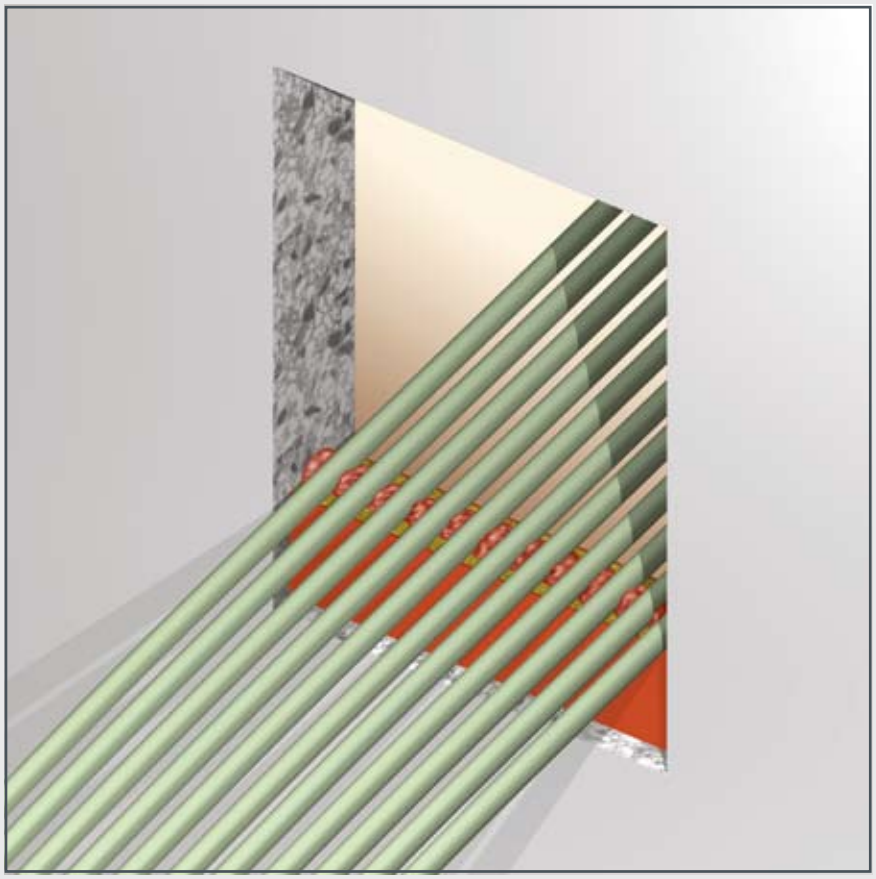
NOFIRNO® - SOLO BOARD INSTALLATATION INSTRUCTIONS

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.



NOFIRNO
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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.

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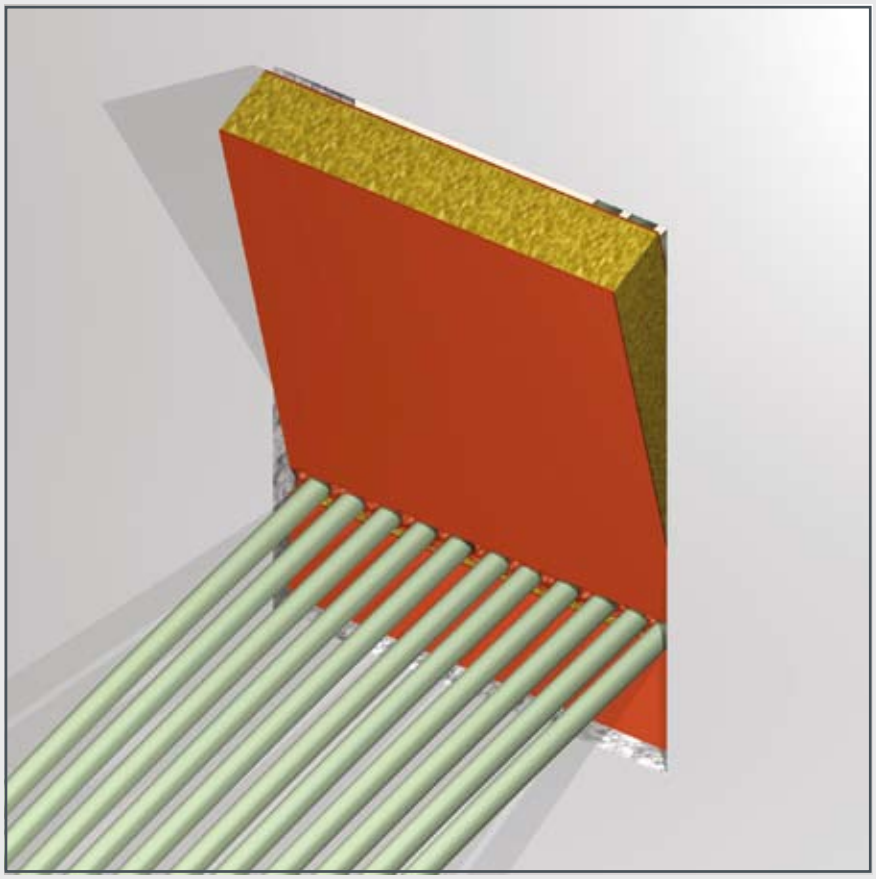
NOFIRNO® - SOLO BOARD INSTALLATATION INSTRUCTIONS

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.



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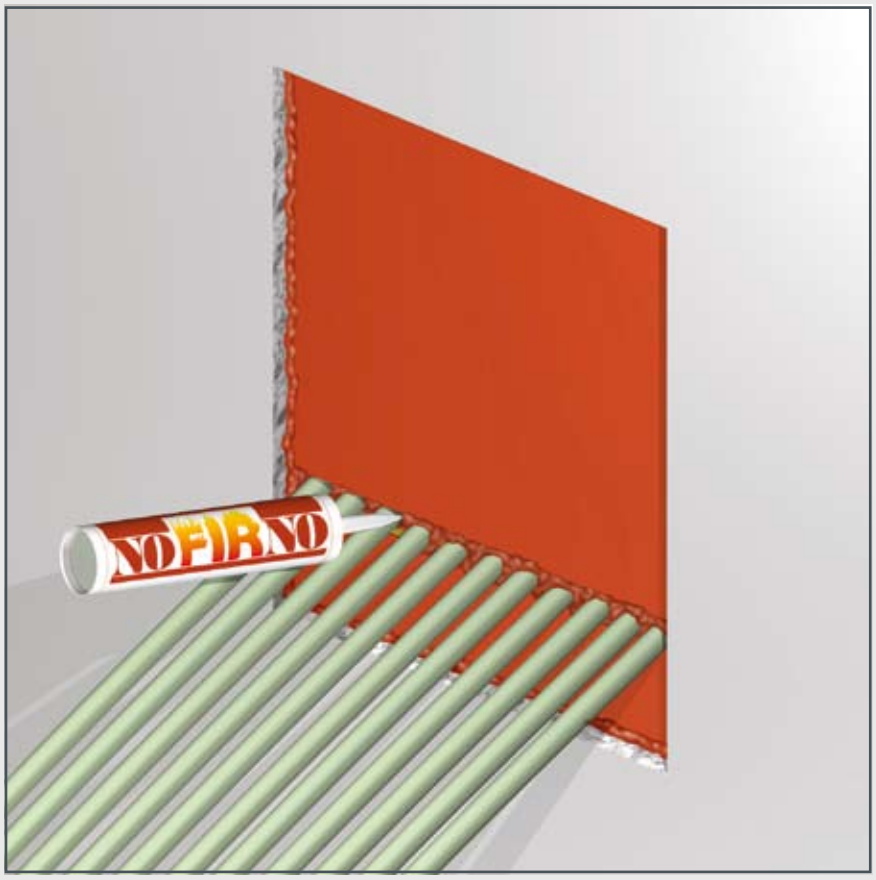
6) Finally all seams around the NOFIRNO® boards are sealed with NOFIRNO® sealant. The NOFIRNO® sealant can be smoothed by hand. Wet the hand with soap and water to avoid sealant sticking to the hand.



NOFIRNO
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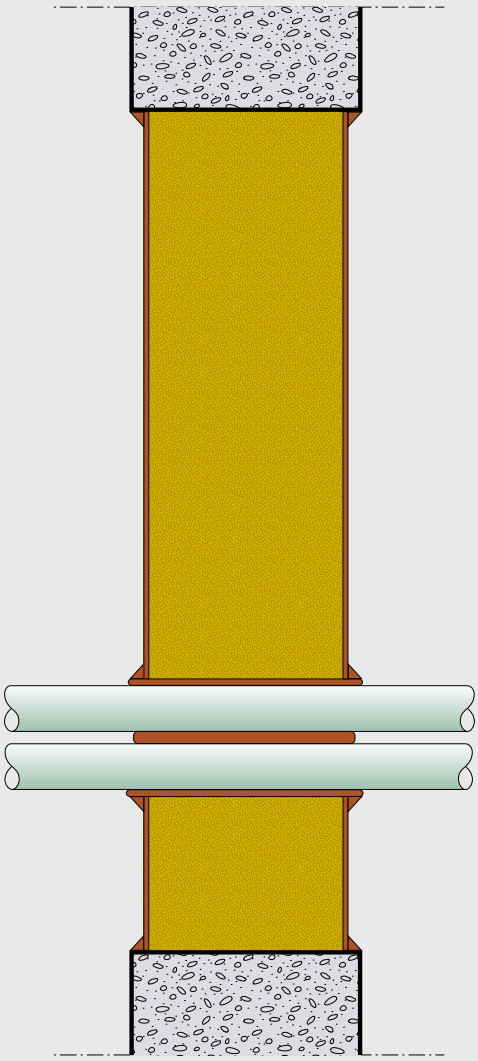
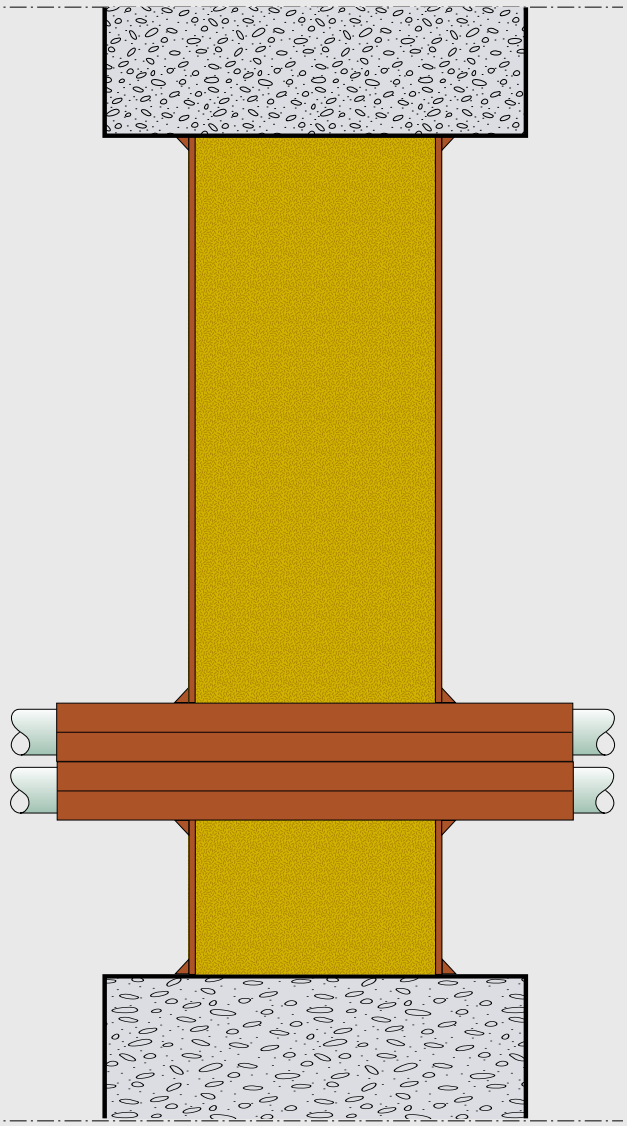
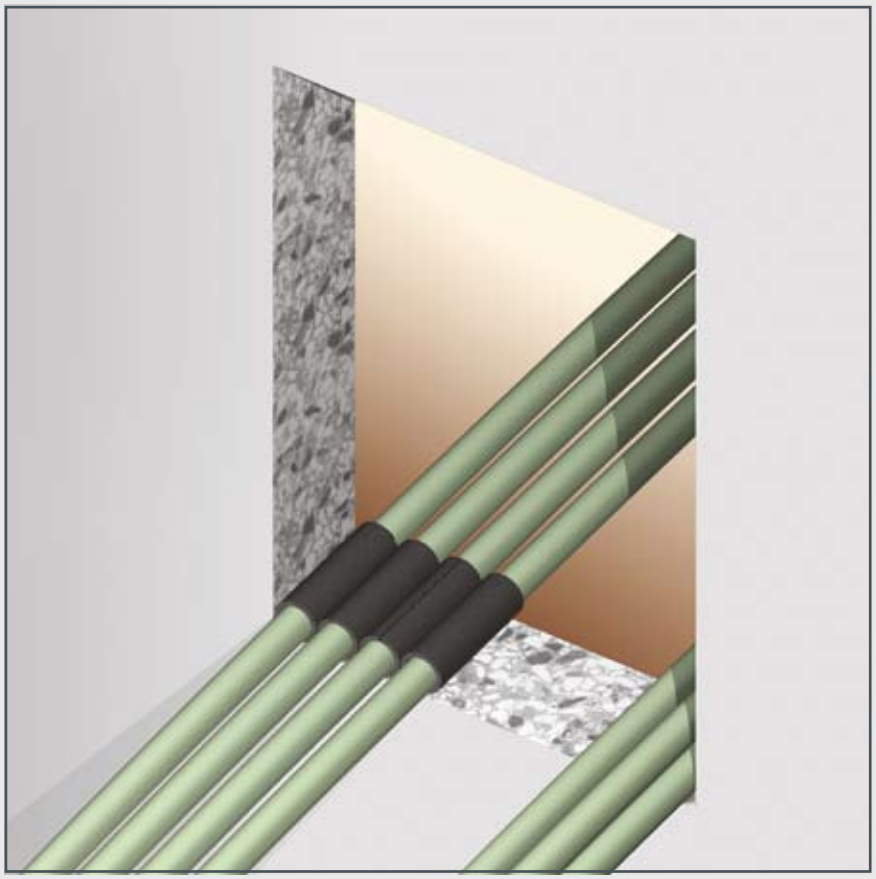
The biggest advantage of the NOFIRNO® boards is that they offer a very economic solution for the sealing of larger open spaces in conduit openings. Fire tests have shown that application of the superb NOFIRNO® coating on the boards offers a high degree of thermal insulation. A double sided coated board 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®
INSTALLATATION 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.



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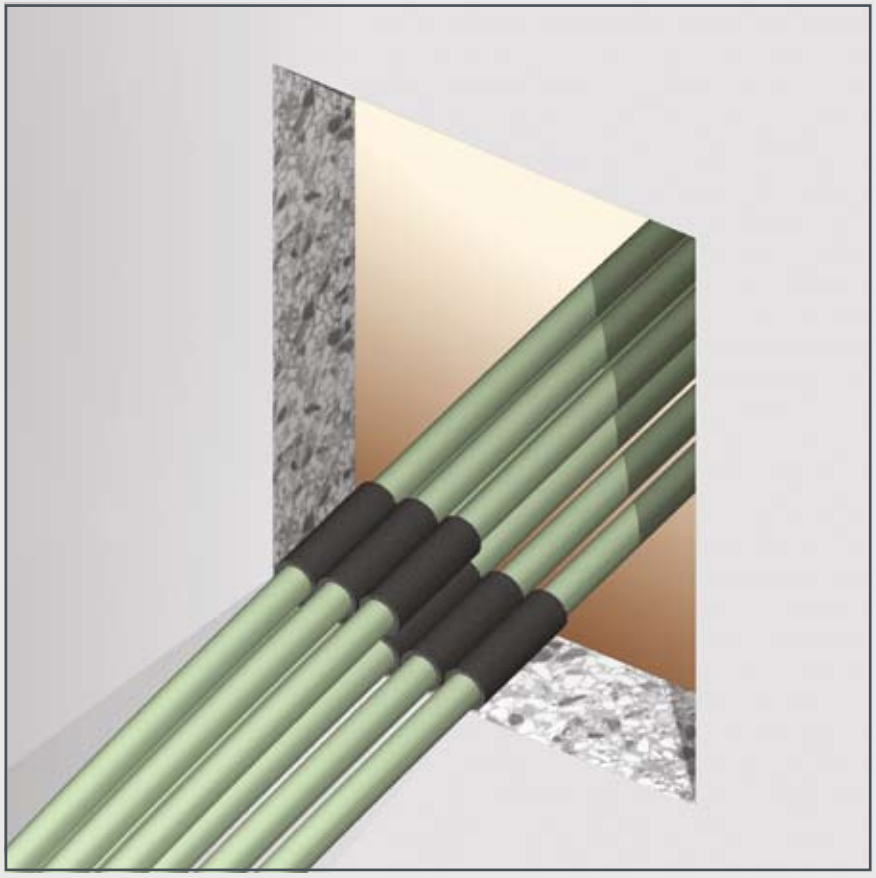
2) Depending on the required fire rating the RISE® insert sleeves should have an appropriate length. In case the depth of the penetration is too short, NOFIRNO® sleeves with a longer length can be placed around each of the cables.



NOFIRNO
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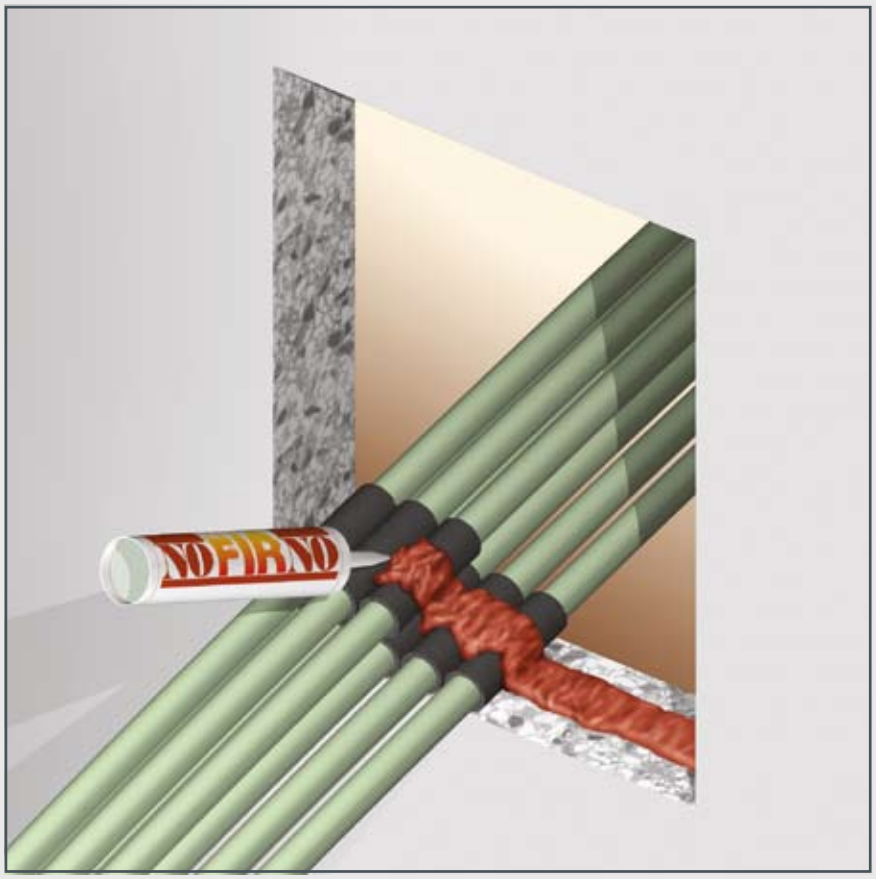
NOFIRNO® - RISE®
INSTALLATATION INSTRUCTIONS

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.



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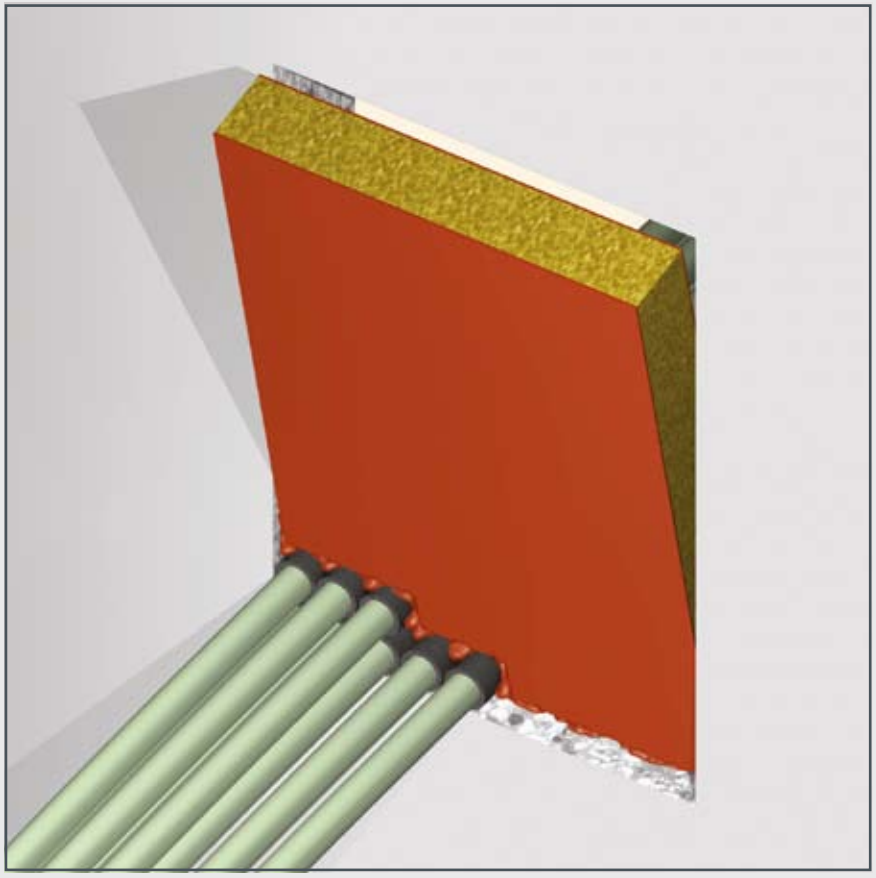
4) A NOFIRNO® board is cut to size and tightly inserted into the open space of the conduit opening.
The NOFIRNO® board should be a bit oversized and can be forced into the opening using a piece of wood and a hammer.



NOFIRNO
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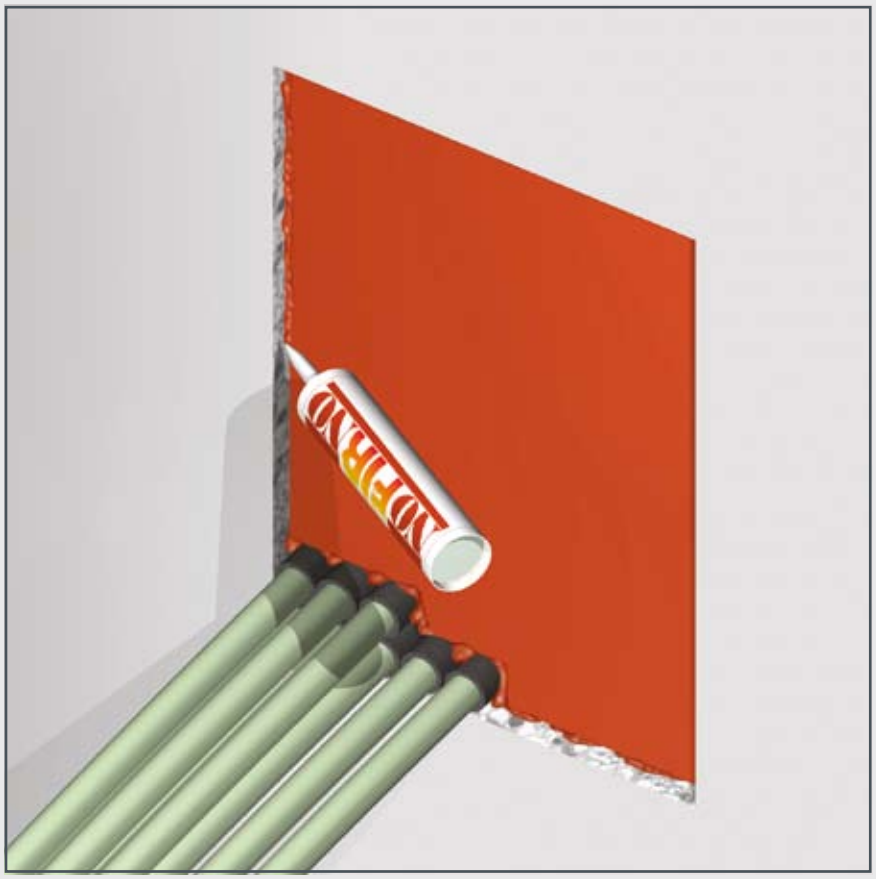
NOFIRNO® - RISE®
INSTALLATATION INSTRUCTIONS

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.



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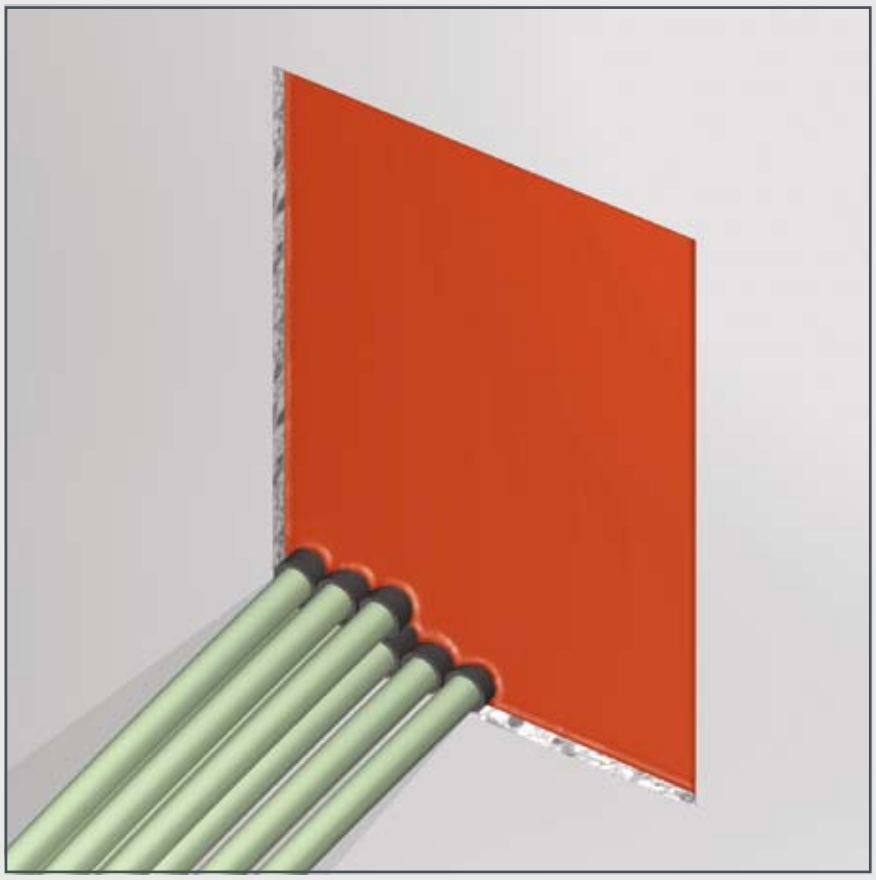
6) The finished NOFIRNO® - RISE® multi-cable penetration. The NOFIRNO® board can be removed for extra cables to be added.
For higher fire ratings single coated NOFIRNO® boards can be installed at both sides of the conduit opening.



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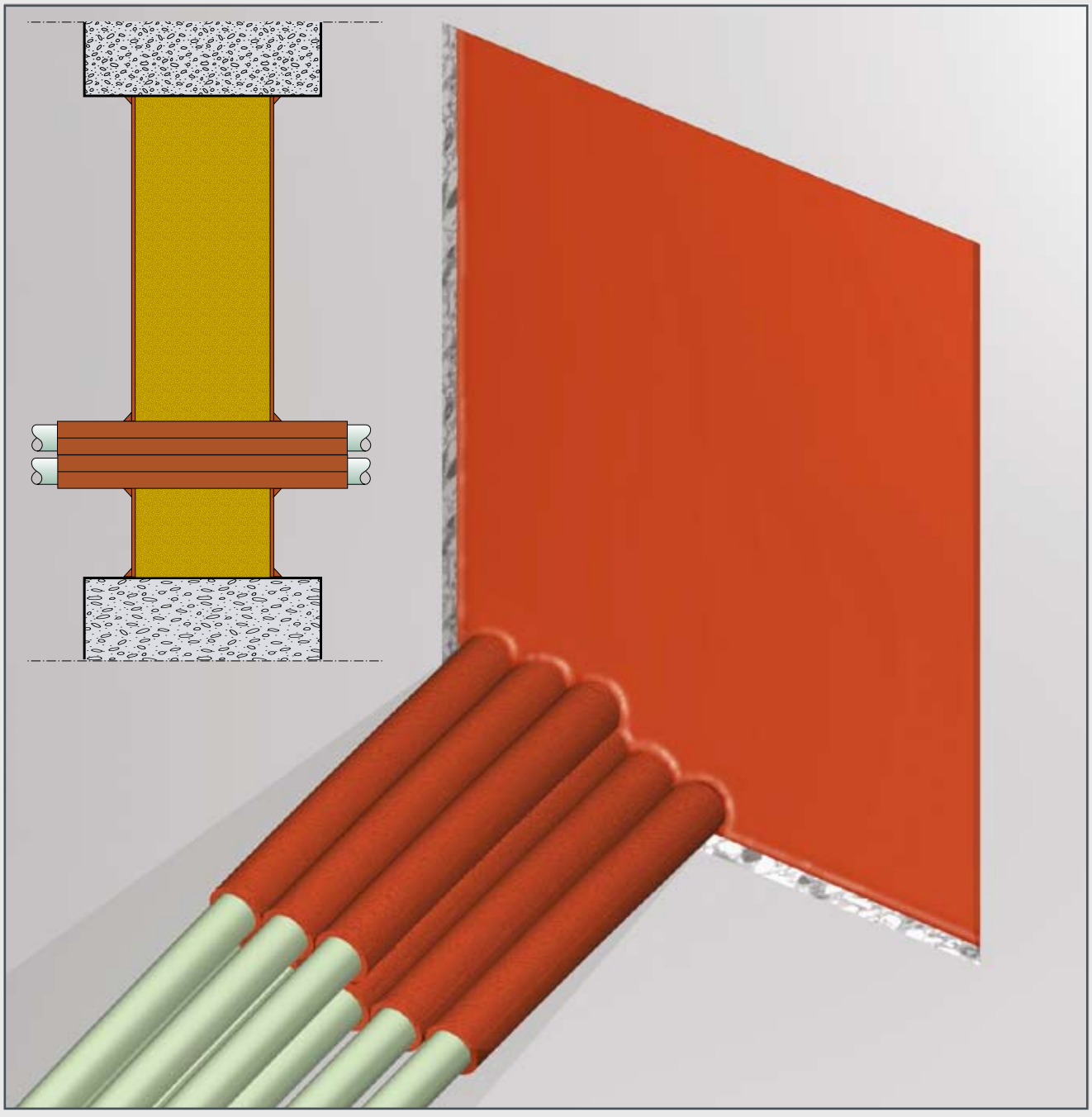
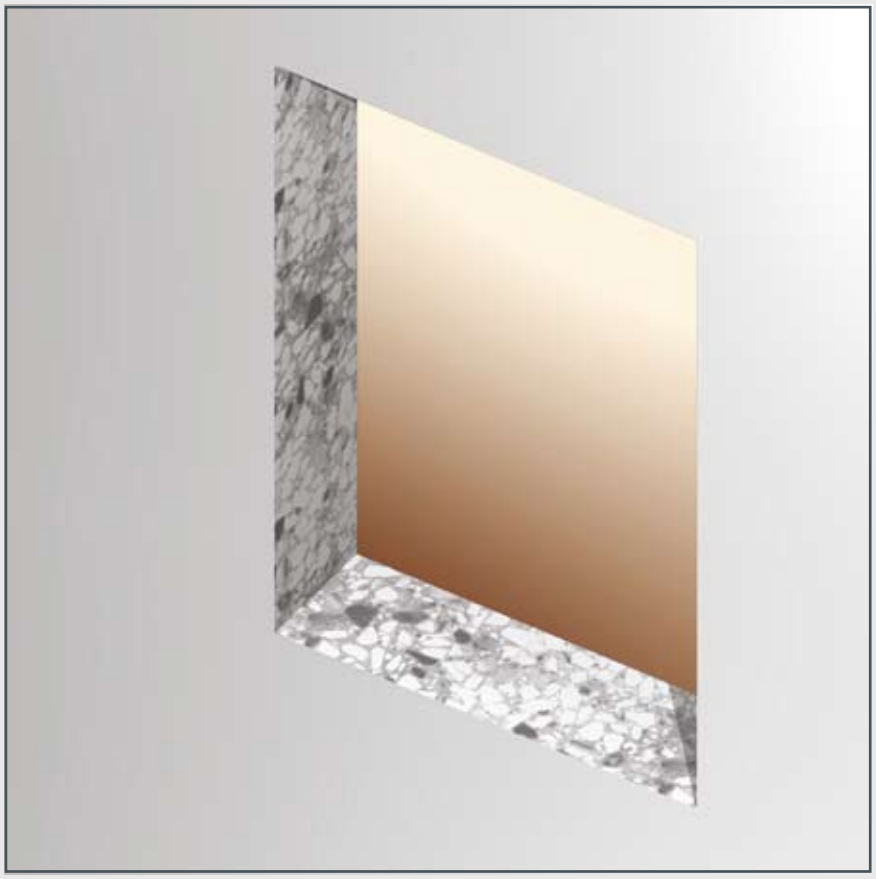
Two single sided coated boards, applied for the fire safe sealing of ducts for several cable runs, fulfil EI90/E120 classification, which stands for minimum two hours flame tight and 90 minutes thermal insulation. Large diameter cables with heavy copper conductors 4 x 185 mm² transmit substantial heat 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®
INSTALLATATION 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.



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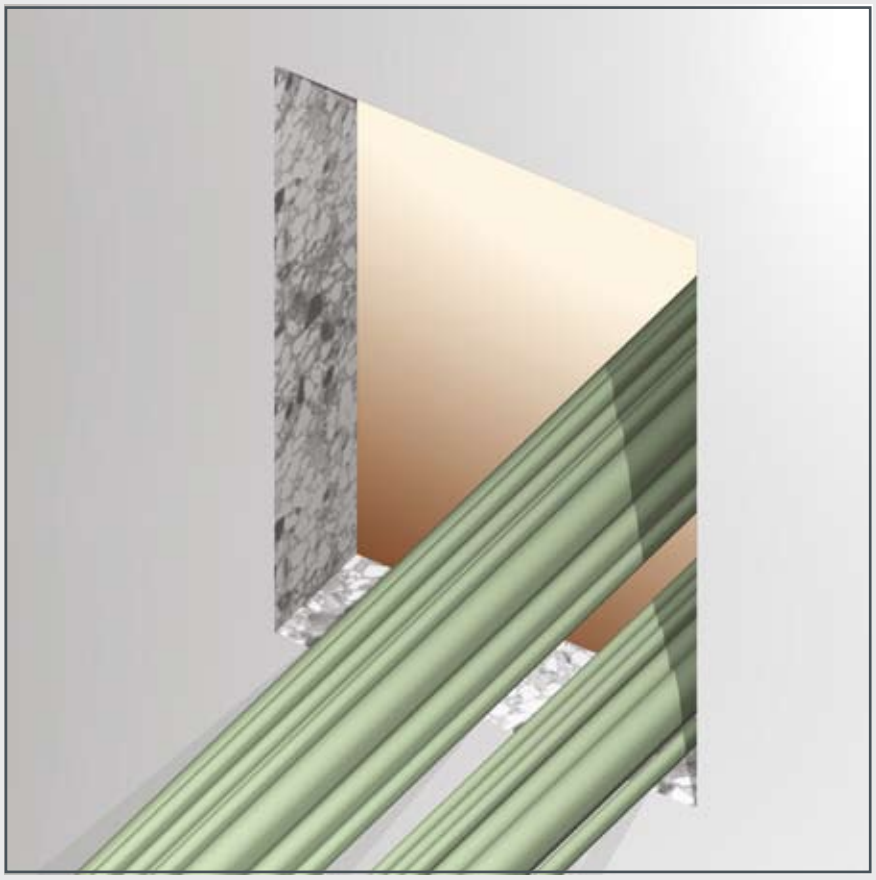
2) The cables can be ducted through the conduit opening in random order. It is most important that they are not pulled too tight in order not to hamper their separation at a later stage.



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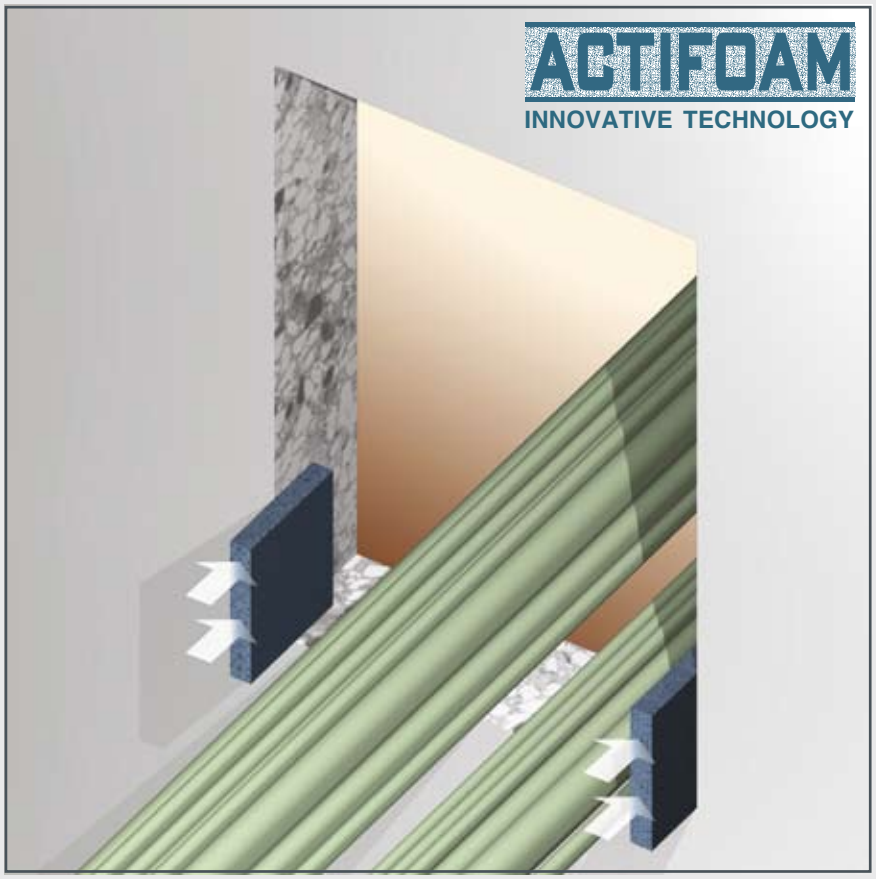
NOFIRNO® - ACTIFOAM® INSTALLATATION INSTRUCTIONS

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.



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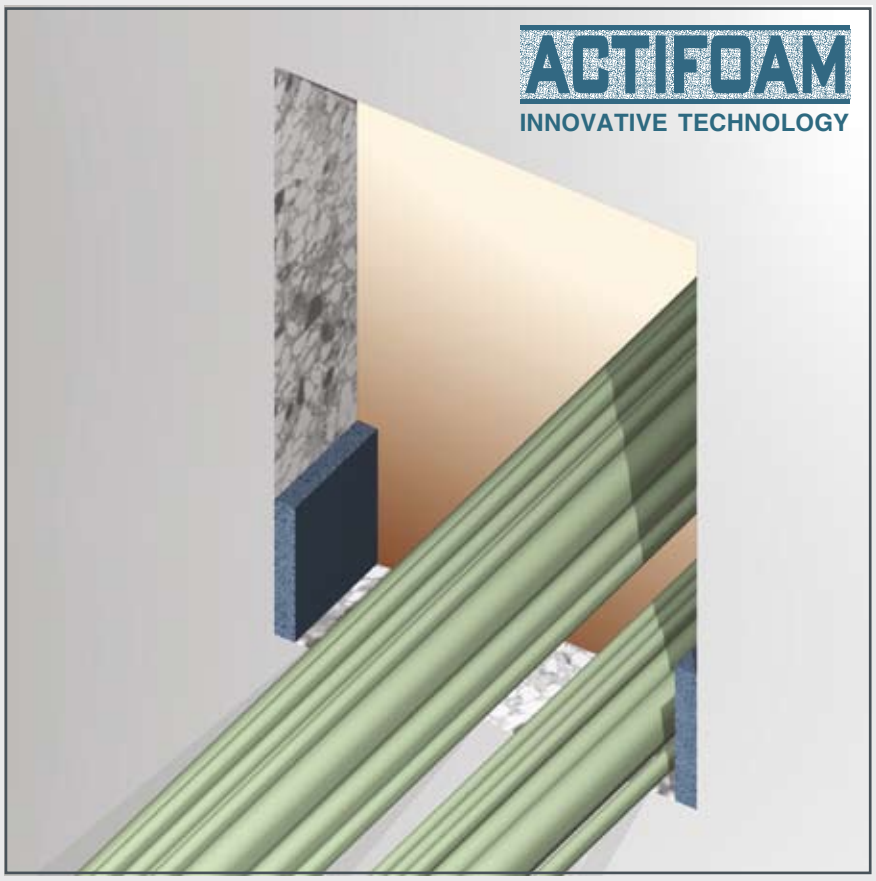
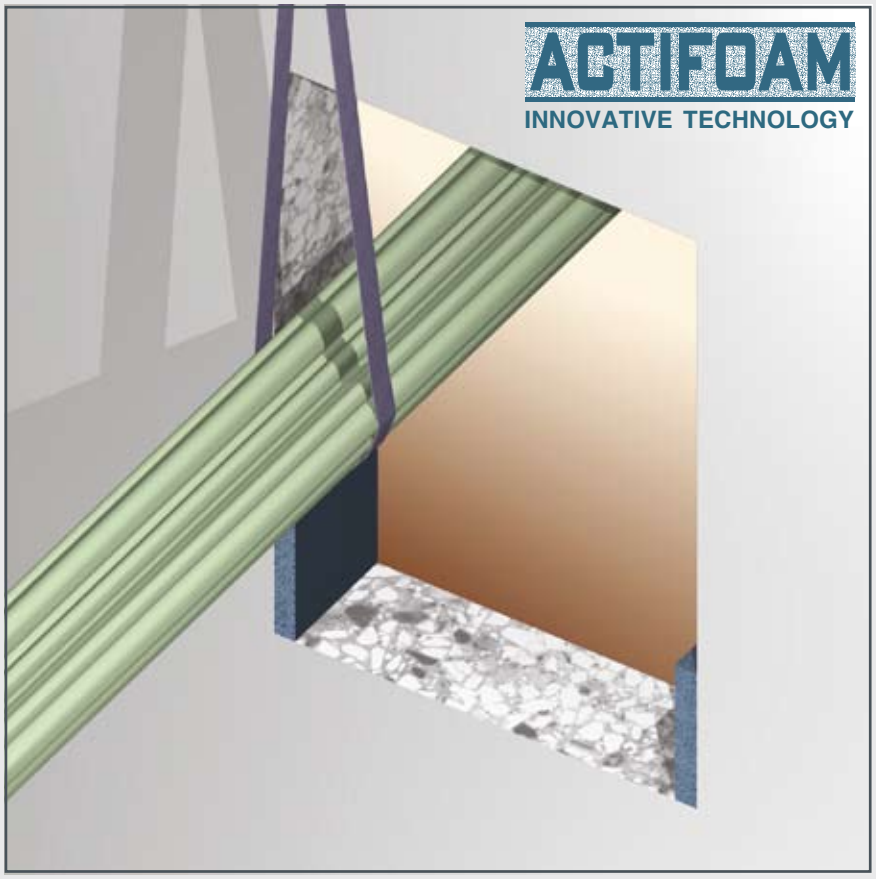
4) The ACTIFOAM® rubber sheets can easily be cut to size with a sharp knife. ACTIFOAM® rubber sheets are supplied in a variety of sizes, widths and thickness. See page 4 for more details.



NOFIRNO
INNOVATIVE TECHNOLOGY

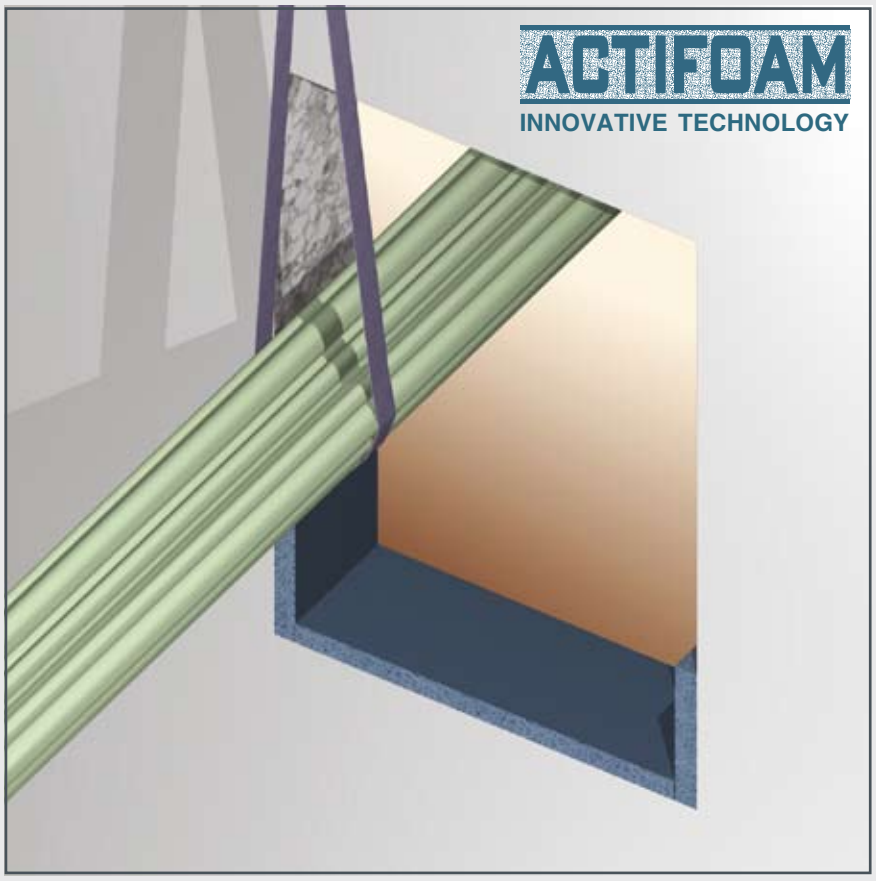
NOFIRNO® - ACTIFOAM® INSTALLATATION INSTRUCTIONS

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.



NOFIRNO
INNOVATIVE TECHNOLOGY

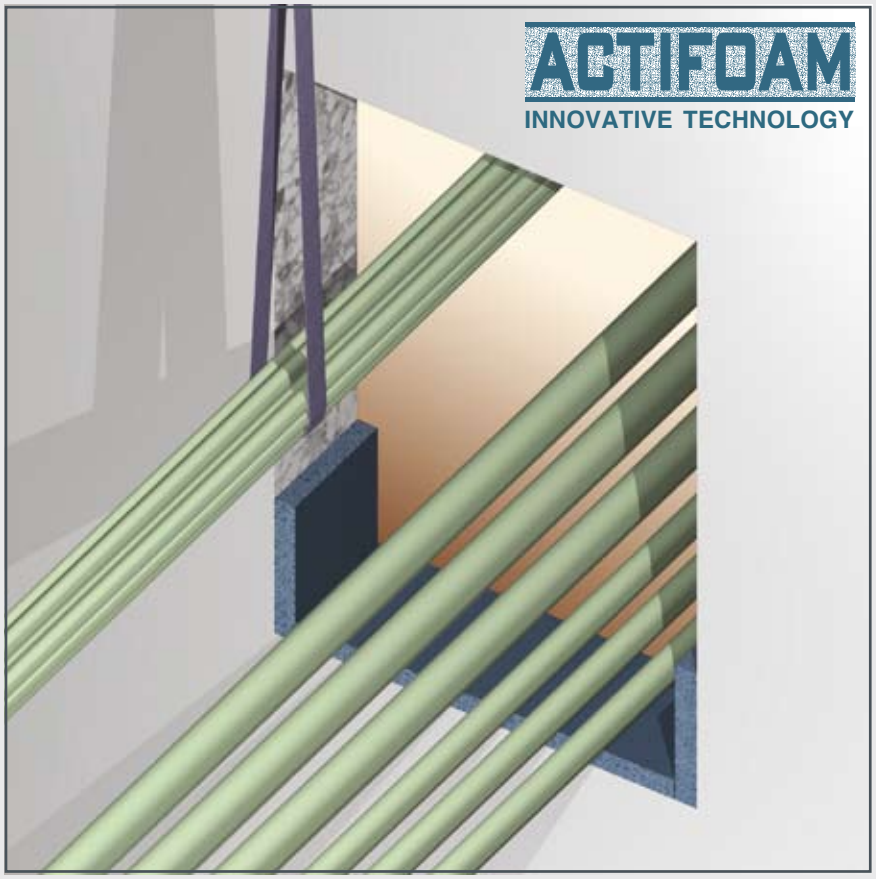
6) A slightly oversized strip of ACTIFOAM® rubber with a thickness of 25 mm is placed inside the conduit opening underneath the cables. The sheet should fit snugly between the sheets against the side walls.



NOFIRNO
INNOVATIVE TECHNOLOGY

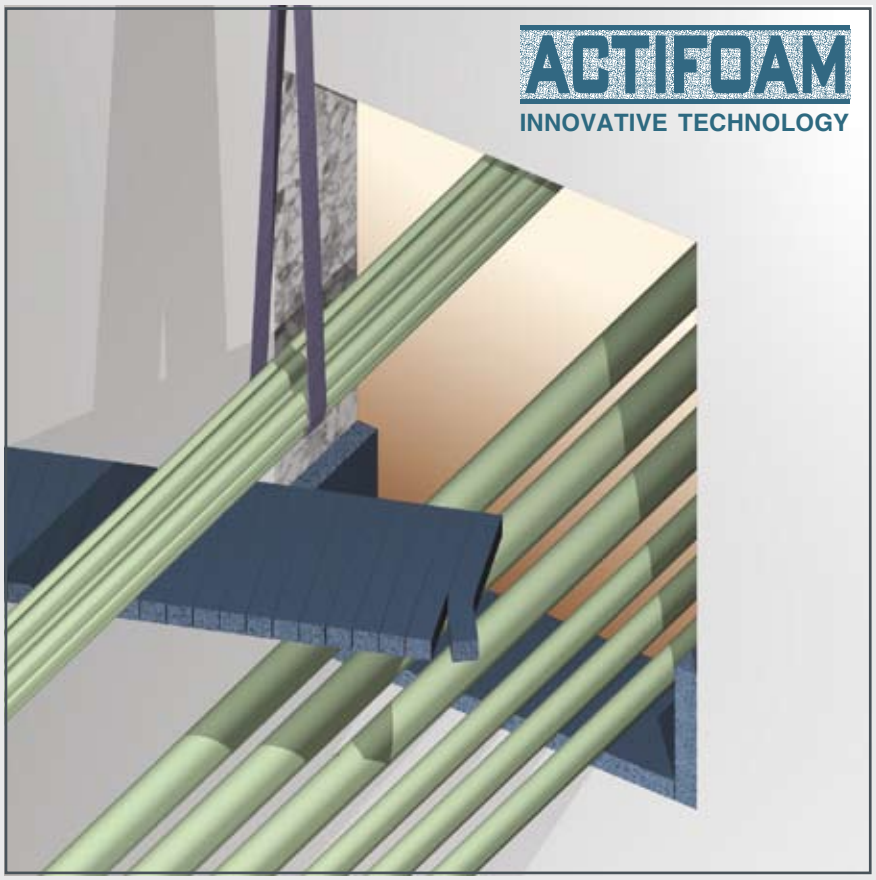
NOFIRNO® - ACTIFOAM®
INSTALLATATION INSTRUCTIONS

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.



NOFIRNO
INNOVATIVE TECHNOLOGY

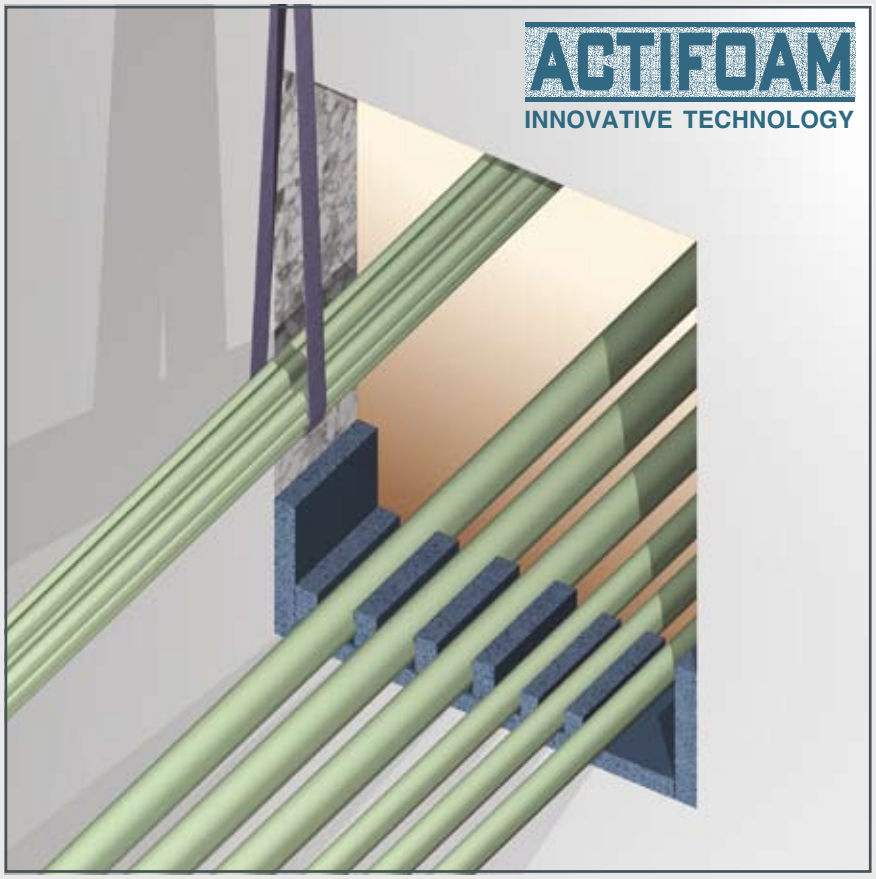
8) For proper cable separation, square profiles are torn off the pre-slit ACTIFOAM® rubber sheets.
The sizes of the profiles should be equivalent to the cable diameters.



NOFIRNO
INNOVATIVE TECHNOLOGY

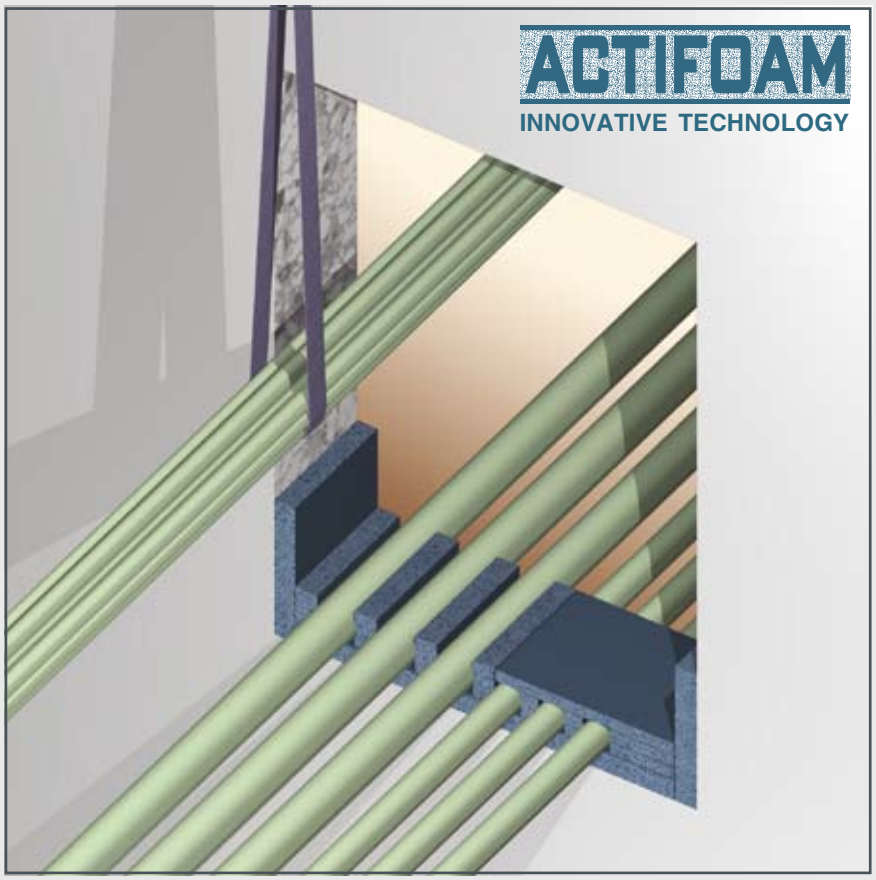
NOFIRNO® - ACTIFOAM® INSTALLATATION INSTRUCTIONS

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.



NOFIRNO
INNOVATIVE TECHNOLOGY

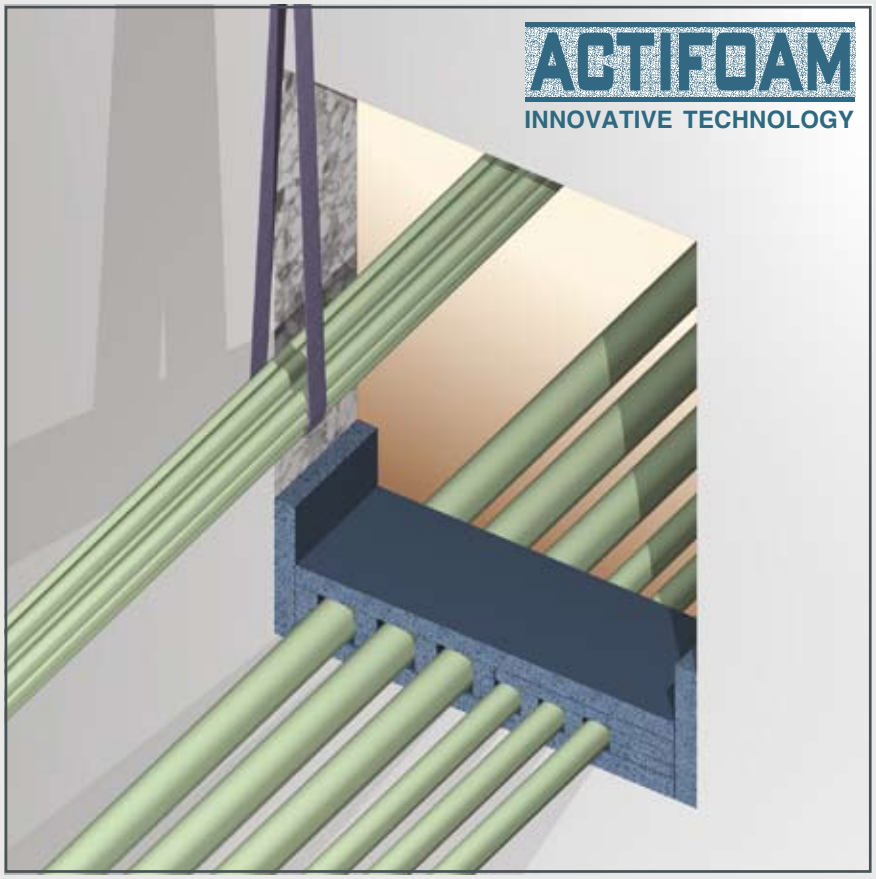
10) Adjacent to the first layer of cables and profiles, one or more extra sheets of ACTIFOAM® rubber are fitted to create a level layer for further filling the conduit opening.



NOFIRNO
INNOVATIVE TECHNOLOGY

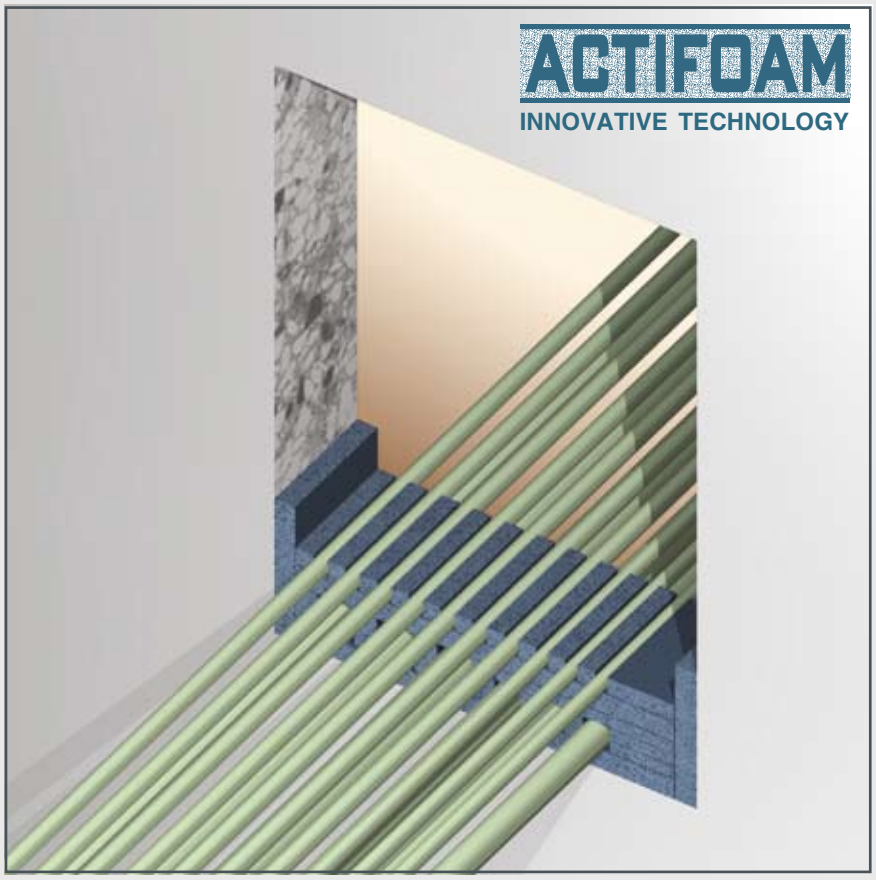
NOFIRNO® - ACTIFOAM®
INSTALLATATION INSTRUCTIONS

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.



NOFIRNO
INNOVATIVE TECHNOLOGY

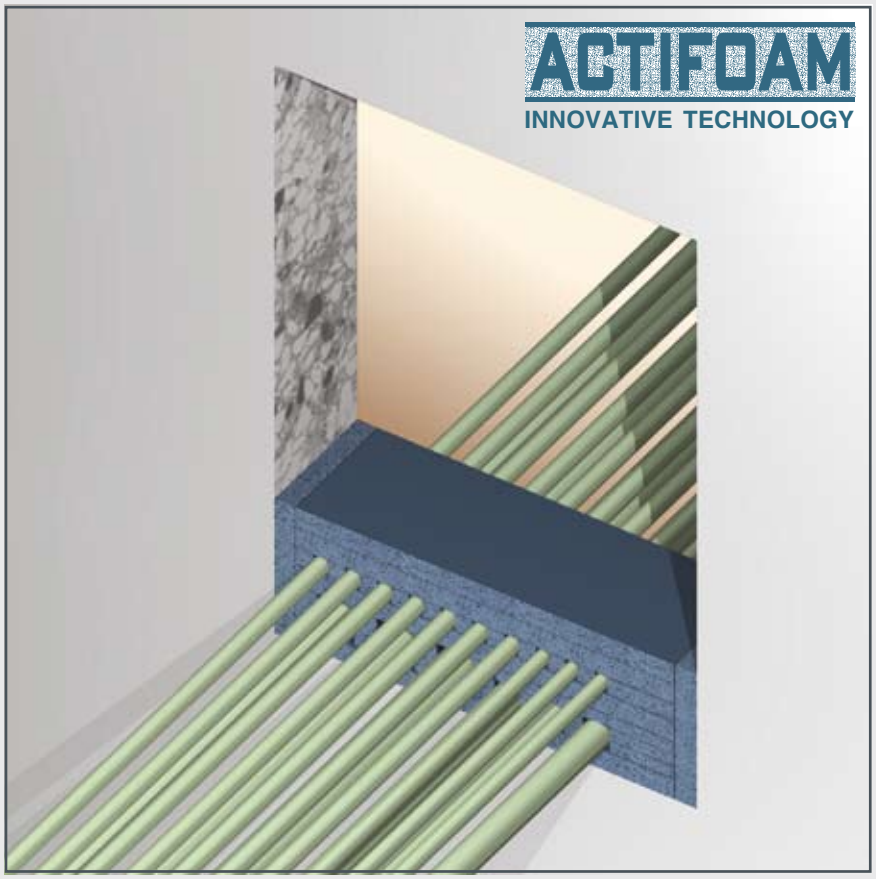
12) The next layer of cables is spread out and in the same way as with the first layer of cables, the cables are separated with the ACTIFOAM® pre-slit profiles and levelled with one or more ACTIFOAM® sheets.



NOFIRNO
INNOVATIVE TECHNOLOGY

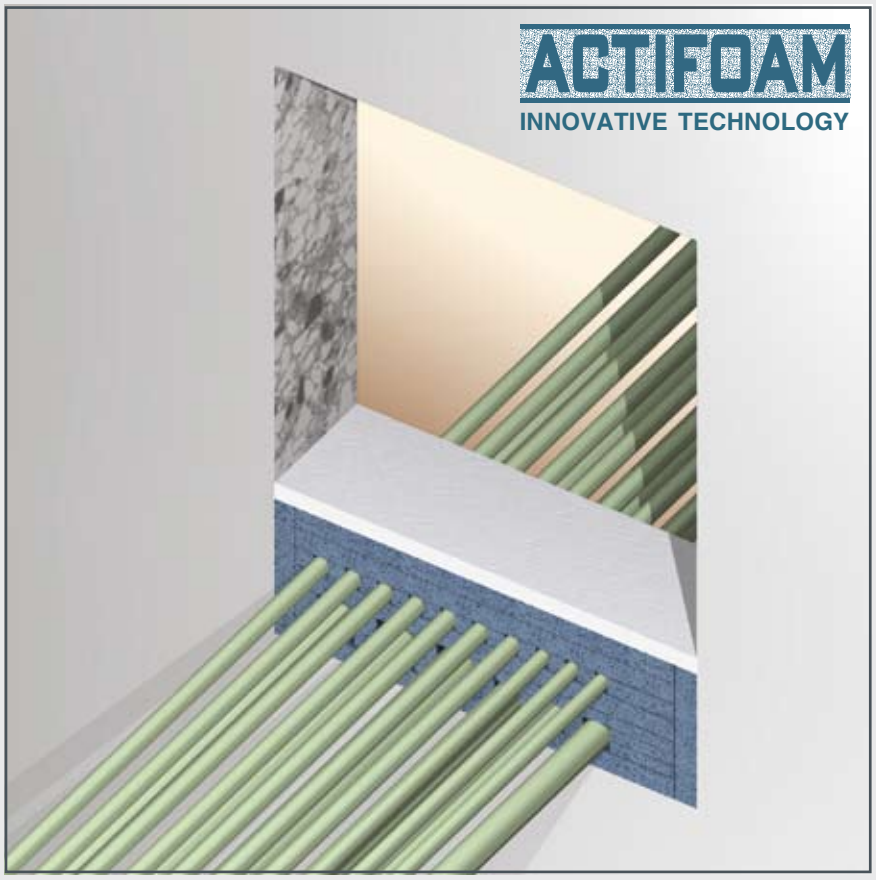
NOFIRNO® - ACTIFOAM®
INSTALLATATION INSTRUCTIONS

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.



NOFIRNO
INNOVATIVE TECHNOLOGY

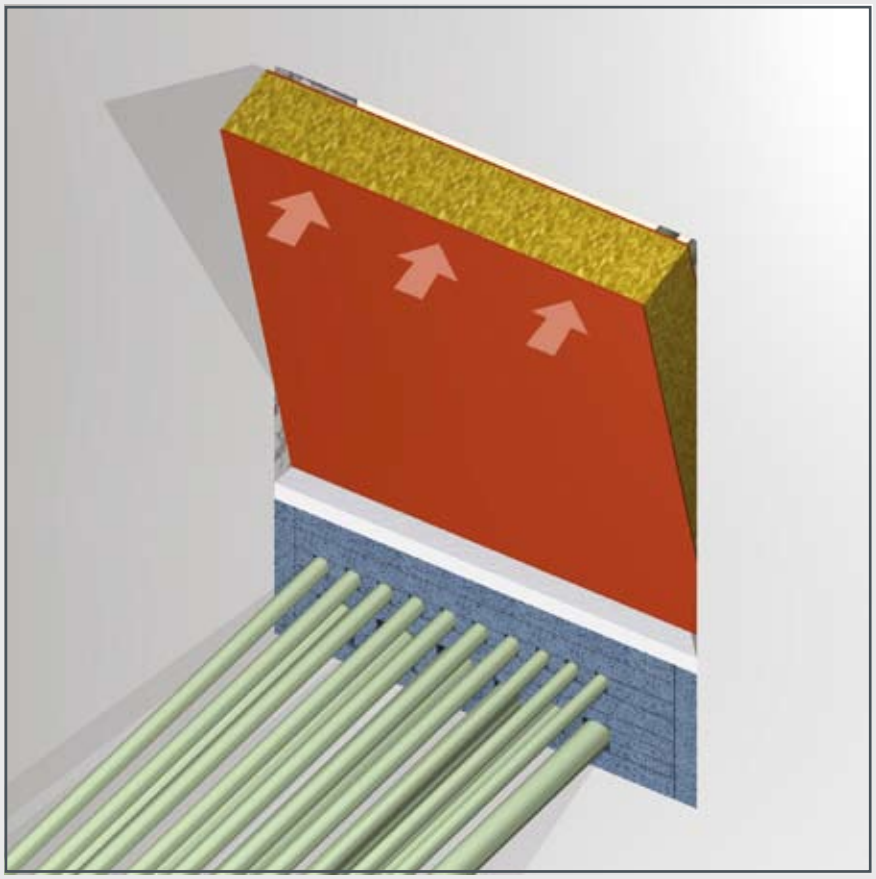
14) A fire safe compression plate is placed on top of the ACTIFOAM® filling to obtain controlled expansion during fire exposure.
The plate is also needed to compress the ACTIFOAM® filling in order to improve tightness.



NOFIRNO
INNOVATIVE TECHNOLOGY

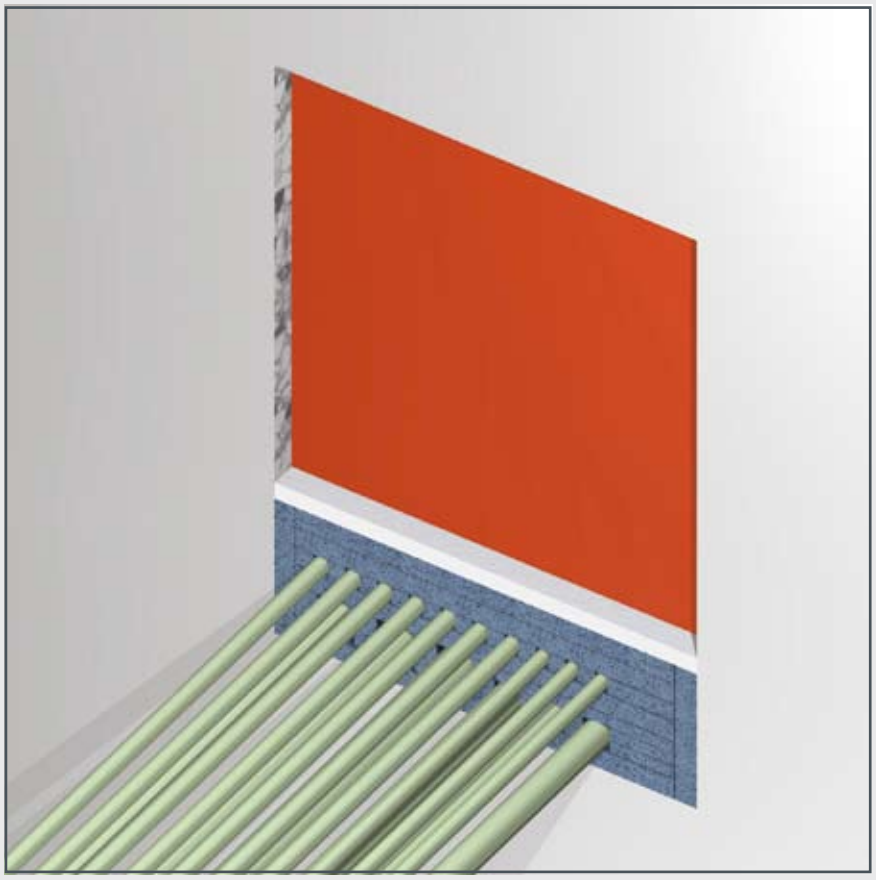
NOFIRNO® - ACTIFOAM®
INSTALLATATION INSTRUCTIONS

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.



NOFIRNO
INNOVATIVE TECHNOLOGY

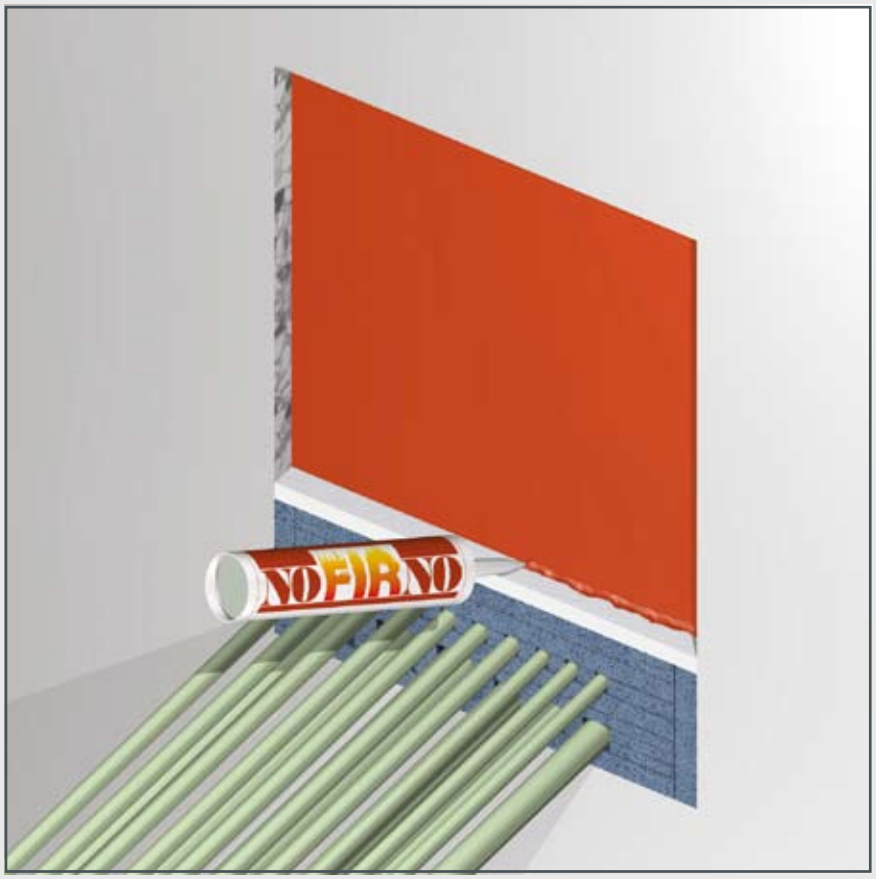
16) Depending on the required fire rating a single NOFIRNO® board coated on both sides can be inserted in the conduit opening.
For higher fire ratings two boards coated on one side only can be placed on top of the compression plate.



NOFIRNO
INNOVATIVE TECHNOLOGY

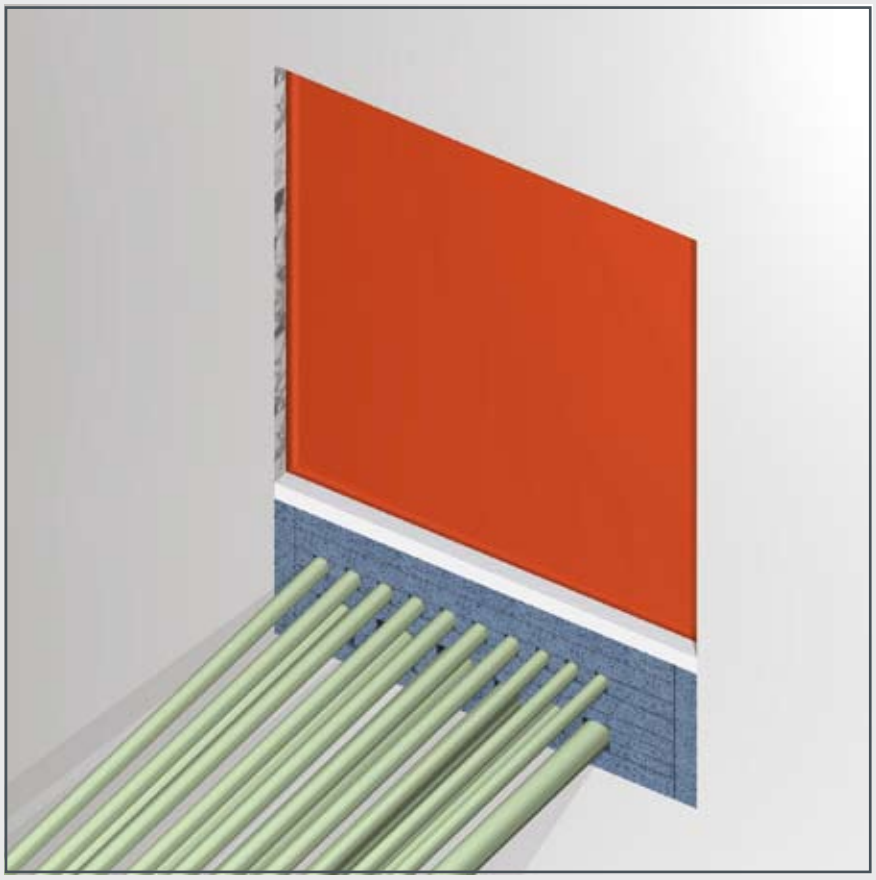
NOFIRNO® - ACTIFOAM® INSTALLATATION INSTRUCTIONS

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

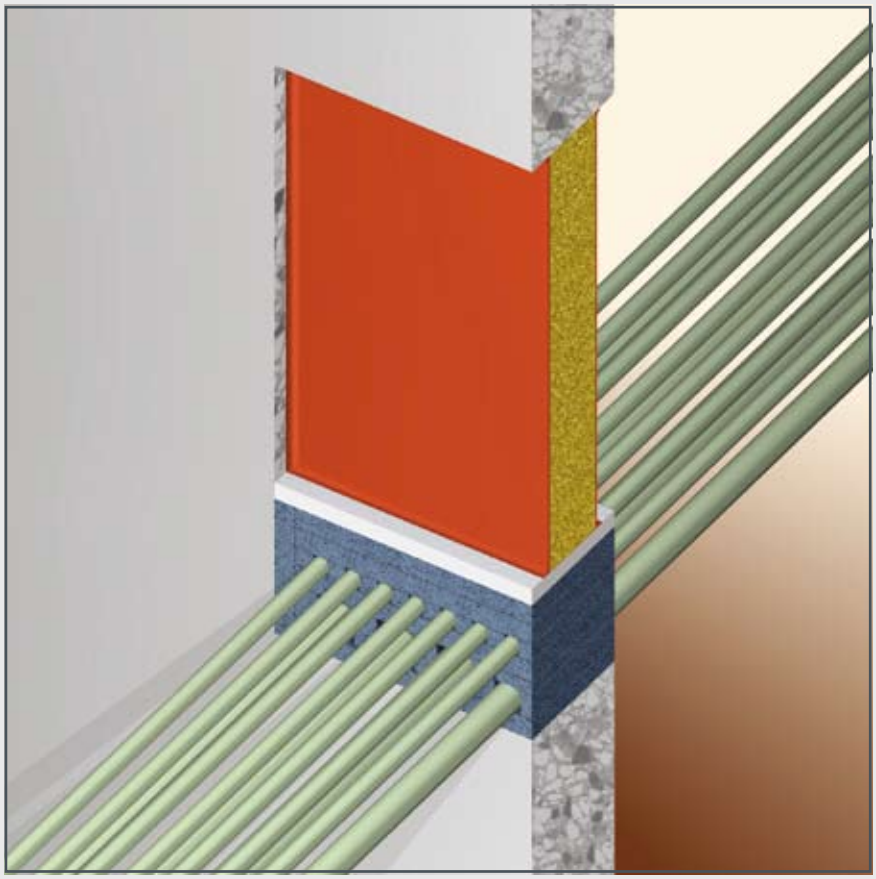
18) The finished NOFIRNO® - ACTIFOAM® multi-cable penetration.
For adding extra cables the NOFIRNO® board can be removed and the fire safe plate compression plate lifted. The ACTIFOAM® filling allows easy access for ducting more cables.



NOFIRNO
INNOVATIVE TECHNOLOGY

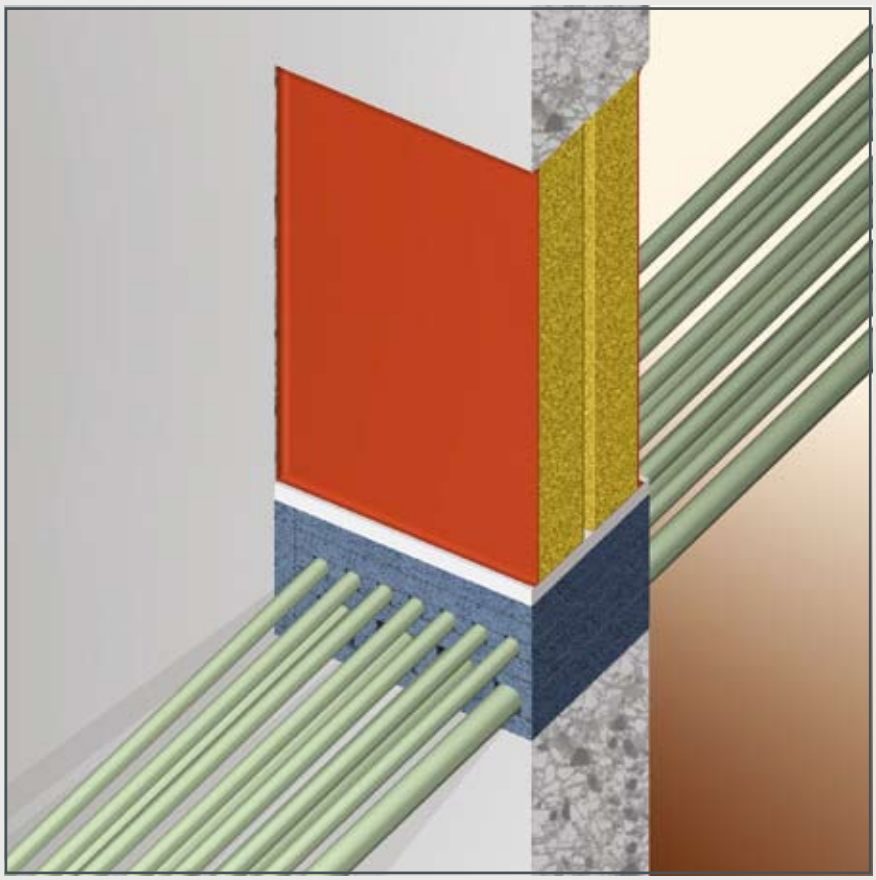
NOFIRNO® - ACTIFOAM®
INSTALLATATION INSTRUCTIONS

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.



NOFIRNO
INNOVATIVE TECHNOLOGY

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.

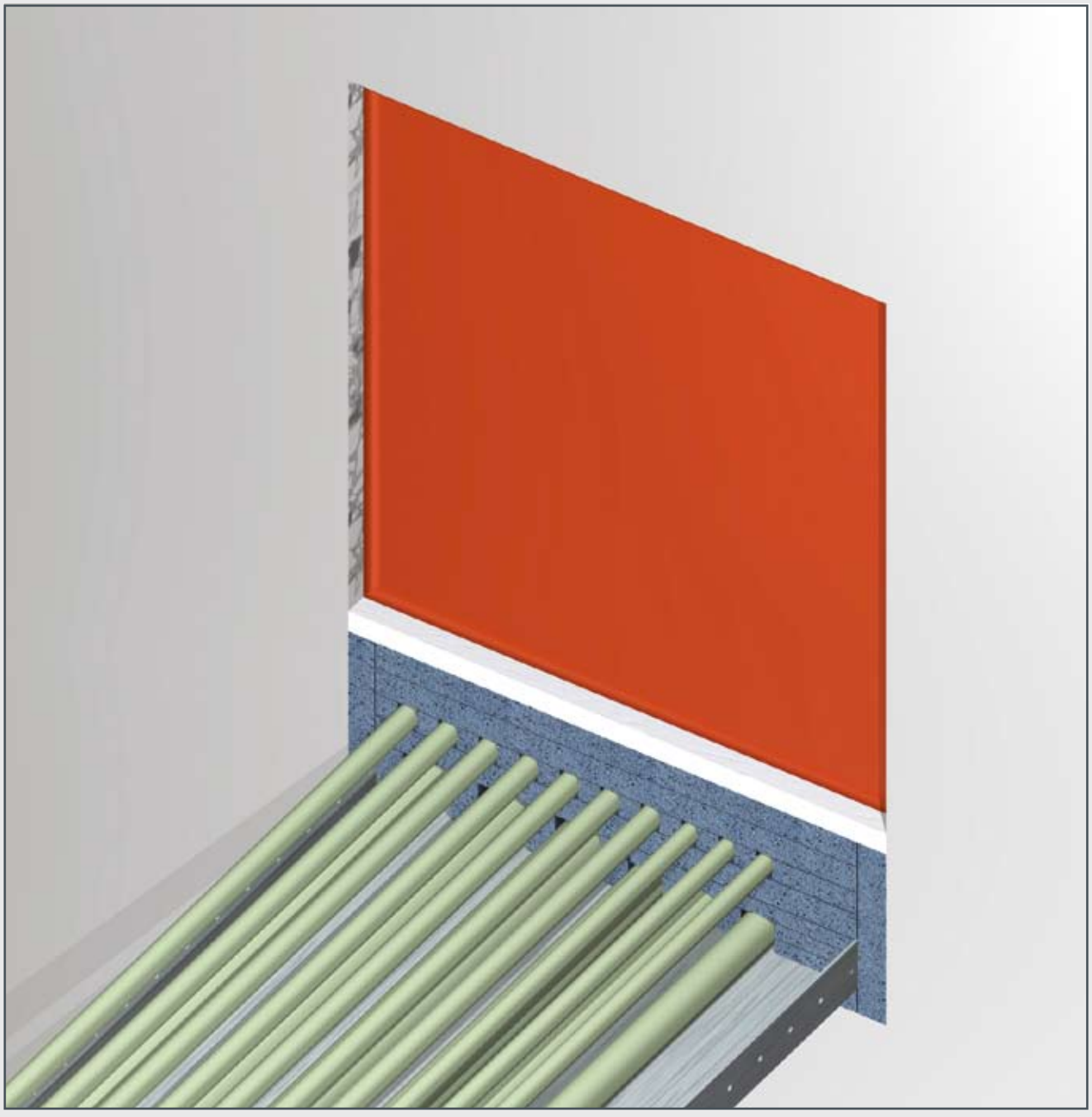


NOFIRNO
INNOVATIVE TECHNOLOGY

NOFIRNO

INNOVATIVE TECHNOLOGY

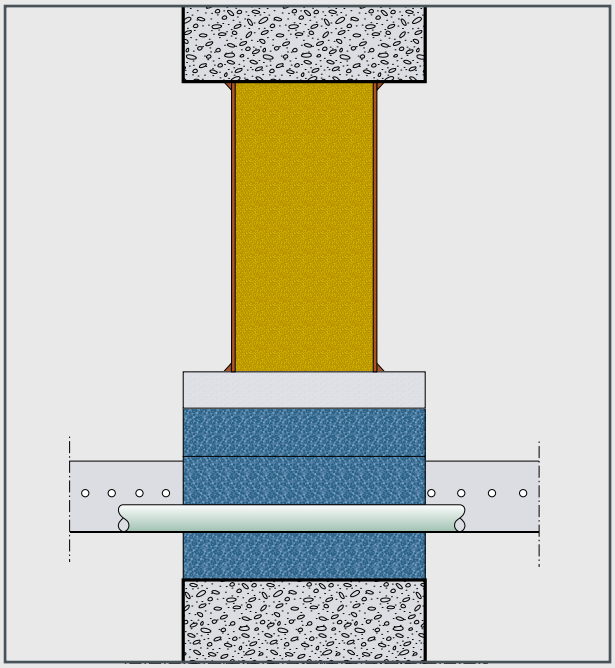
The advantage of the NOFIRNO® - ACTIFOAM® sealing system is to allow for a spare space in the conduit opening which is sealed in an very easy and economic way. ACTIFOAM® allows, if required, the tray to be passed through the conduit opening. Furthermore it is not necessary to coat the cables and/or cable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



NOFIRNO

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.

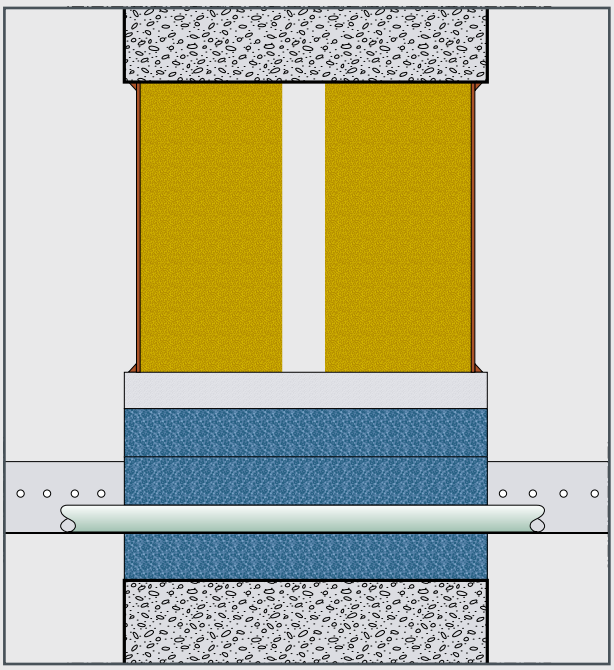


NOFIRNO® mineral wool board coated at each side with NOFIRNO® coating 1,2 - 1,5 mm thick; thickness of the mineral wool board 60 mm (without coating), mass of mineral wool about 152 kg/m³.

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/m³.

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.

NOFIRNO

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.

NOFIRNO

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.

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.

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Websites: http://www.actifoam.com, www.beele.com, www.firsto.com, www.nofirno.com, www.rise-systems.com, www.rise-nofirno.com, www.riswat.com and www.slipsil.com

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* RISWAT® GAS AND WATERTIGHT CABLE AND PIPE DUCTS
* SLIPSIL® SEALING PLUGS FOR PIPE ENTRIES
* SLIPSIL®-SQ MULTI-CABLE TRANSITS
* DYNATITE® DYNAMIC HIGH PRESSURE SEALS
* BEESEAL® MULTI-PIPE AND CABLE PENETRATIONS
* ACTIFOAM® TEMPORARY SEALS AND CAVITY SEALS
* FIRSTO® FIRESTOPS FOR CABLE TRAY PENETRATIONS
* NOFIRNO® CAVITY SEALS, COATINGS AND SEALANTS
* ULEPSI® TANK SUPPORTS FOR BITUMEN TANKERS

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