



**INSTALLATION INSTRUCTIONS
FYLLOFOAM[®]/ FYLLOFYS[®]
SEALING SYSTEM FOR
(MULTI-) CABLE TRANSITS**

FYLLOFOAM[®]

FYLLOFYS[®]

® registered trade marks of BEELE Engineering



**FIRE SAFE, GAS AND WATER
TIGHT SEALING SOLUTIONS FOR
INSTALLATIONS/CONSTRUCTIONS**

Beele campus 45.000 m²
building phase 1 started september 2017



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Research & Development

: BEELE Engineering BV, Aalten, the Netherlands.

Note

: The manufacturer reserves the right to make dimensional and design modifications without prior notification.

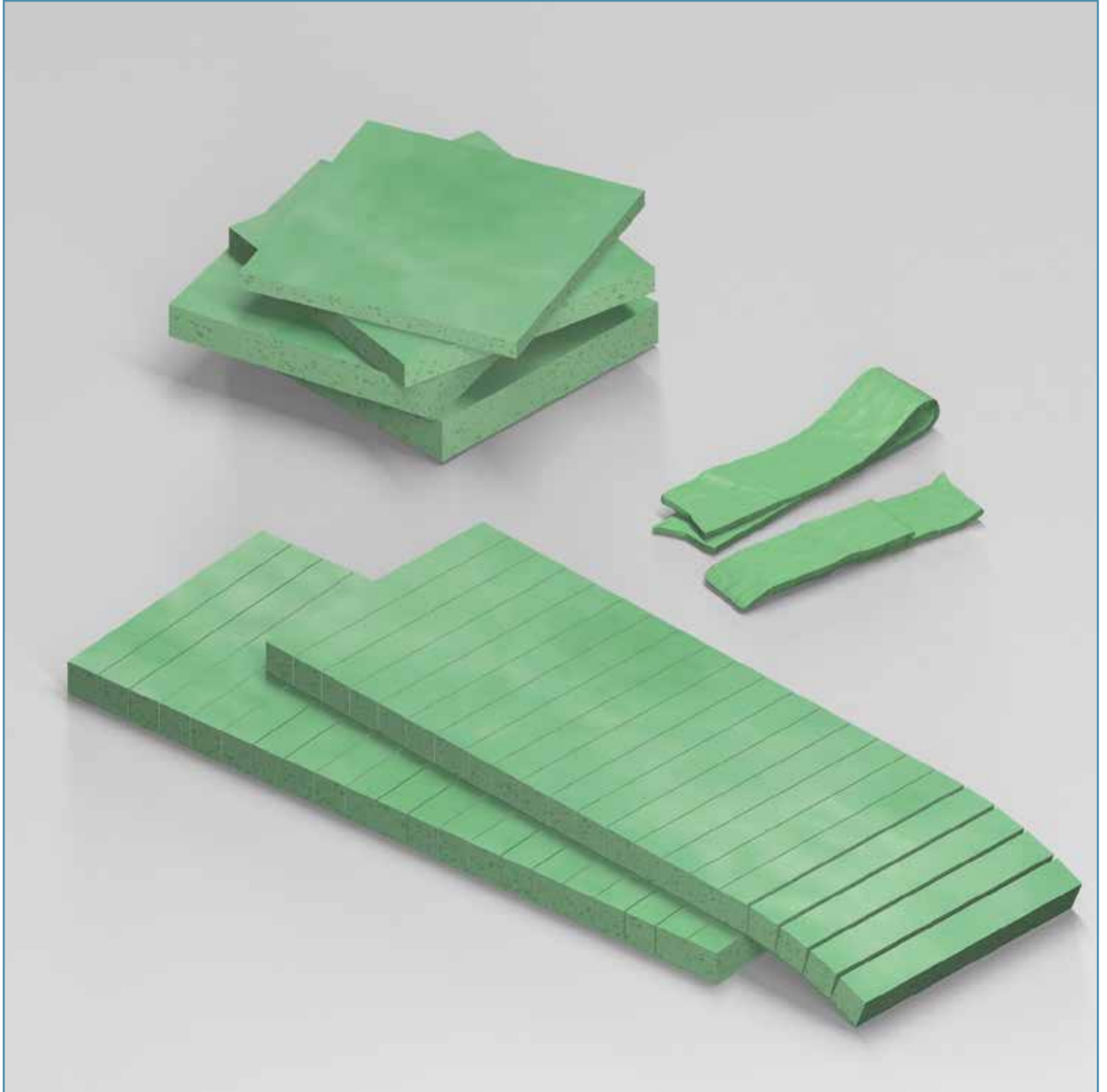
®

: ACTIFOAM, AQUASTOP, BEEBLOCK, BEEBOND, BEELE, BEELE WE CARE, BEESEAL, CONDUCTON, CONTITITE, CONTROFIL, CRUSHER, CRUSHNOF, CSD, CSD THE SIMPLE SEAL SYSTEM, DRIFIL, DYNATITE, FIRAQUA, FIREQUAKE, FIRSTO, FISSIC, FIWA, FYLLOFYS, GLANDMOD, LEAXEAL, MULTI-ALL-MIX, NOFIRNO, profiles NOFIRNO gaskets, RAPID TRANSIT SYSTEM, RIACNOF, RISE, RISWAT, SEALING VALLEY, \$, SLIPSIL, flanges SLIPSIL plugs, ULEPSI, XATTAX and YFESTOS are registered trade marks of BEELE Engineering.

brochure code

: installation FYLLOFOAM-FYLLOFYS cable

**INSTALLATION INSTRUCTIONS FOR FYLLOFOAM®-FYLLOFYS®
MULTI-CABLE TRANSIT SEALING SYSTEM**



FYLLOFOAM® rubber sheets/profiles are used to fill any cavities or gaps in constructions, offering a perfect fire seal for a very long duration.

INSTALLATION INSTRUCTIONS FOR FYLLOFOAM®-FYLLOFYS® MULTI-CABLE TRANSIT SEALING SYSTEM

PRODUCT INFORMATION SEALANT

01) colour	red brown, blue, black, white, grey
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	12 months when stored properly. Since we have no control on storage, we can only guarantee for 6 months. when applied later than 6 months after date of manufacturing, curing and adhesive properties have to be checked before application

NOFIRNO® is absolutely HALOGEN FREE with zero VOC (volatiles organic compounds) according to TÜV report 89206405-01. Furthermore NOFIRNO® has a low smoke index and a high oxygen index (ISO 4589-2: 1996), and low flame spread characteristics according to IMO Resolution A.653(16). NOFIRNO® is a paste-like compound which is simple to use. NOFIRNO® has a balanced viscosity and can be applied overhead.

article number 50.0102



black



article number 50.0104

white



article number 50.0105

blue grey



article number 50.0106

concrete grey



article number 50.0111

INSTALLATION INSTRUCTIONS FOR FYLLOFOAM®-FYLLOFYS® MULTI-CABLE TRANSIT SEALING SYSTEM

PRODUCT INFORMATION FYLLOFYS® THERMAL INSULATION

01) material base	hydrous phyllosilicate
02) finishing	FISSIC® non-combustible coating
02) specific gravity	500 ± 50 kg/m ³
03) application limit	1100 °C
04) cold compressive strength	1.5 N/mm ² (DIN-EN 1094-5)
05) thermal expansion (linear)	0.6% (750 °C)
06) permanent linear change	< 1% (1000 °C)
07) thermal conductivity	0.15 W/mK (200 °C) 0.17 W/mK (400 °C) 0.19 W/mK (600 °C) ASTM C 1113
08) non-combustible	test report Efectis No. EFR-17-OMI-003574 rev.1 according to FTP code 2010 - Part 1: non-combustibility test (ISO 1182)

PRODUCT INFORMATION FISSIC® PROTECTIVE COATING

- FISSIC®** is a fire retardant coating on the basis of an APEO-free water-based polymer emulsion without the addition of VOC containing solvents.
- FISSIC®** has been tested successfully on flame spread characteristics and toxicity and is classed as "not capable of producing excessive quantity of smoke or toxic product". MED certificate 39278/A0 EC issued by Bureau Veritas.
- FISSIC®** is fire proof and salt water resistance (even after fire). KIWA Netherlands report 20150421HN01.
- FISSIC®** is gas tight 30 mBar.
- FISSIC®** is water impermeable. KIWA Netherlands report 20160203TW01
- FISSIC®** resistance to diesel & petrol. KIWA Netherlands report 20160224TW01
- FISSIC®** prevents "CUI - corrosion underneath insulation"
- FISSIC®** successfully SBI tested according to EN 13823:2010 for B-1s-d0 class rating
- FISSIC®** successfully tested according to ISO 1716 for A2-1s-d0 non-combustible. Warrington report 18250B
- FISSIC®** adhesion 3.84 MPa according to ISO 4624:08-2003. KIWA report P 10498a
- FISSIC®** successfully tested on wear resistance according to EN 660-1:1999 - no mass reduction after 2000 double-strokes with a load of 17 kg. KIWA Polymer Institute report P 11035-E

PRODUCT INFORMATION FYLLOFYS®/FISSIC® THERMAL INSULATION PRODUCTS

01) temperature cycling	-50 °C to + 100 °C - no changes
02) QUV weathering	96 hours + 336 hours exposure acc. to ISO 11507 method A - no changes with a 0.5 mm thick FISSIC® coating
03) seawater resistance	96 hours + 336 hours exposure acc. to ISO 9227 - with 0.5 mm thick coating - limited water absorption
04) mechanical stability	FYLLOFYS® with FISSIC® coating - 3 point bending test - improvement of Fmax (N) and DLbreak (%) with coating thickness 0.5 - 1.5 mm

IN-HOUSE TESTING NO. BBV_0042 - MARCH-MAY 2018

INSTALLATION INSTRUCTIONS FOR FYLLOFOAM®-FYLLOFYS® MULTI-CABLE TRANSIT SEALING SYSTEM



The cable trays/ladders can be passed through the wall opening. Sealing of the wall opening starts when the cables are ducted. 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.

INSTALLATION INSTRUCTIONS FOR FYLLOFOAM®-FYLLOFYS® MULTI-CABLE TRANSIT SEALING SYSTEM



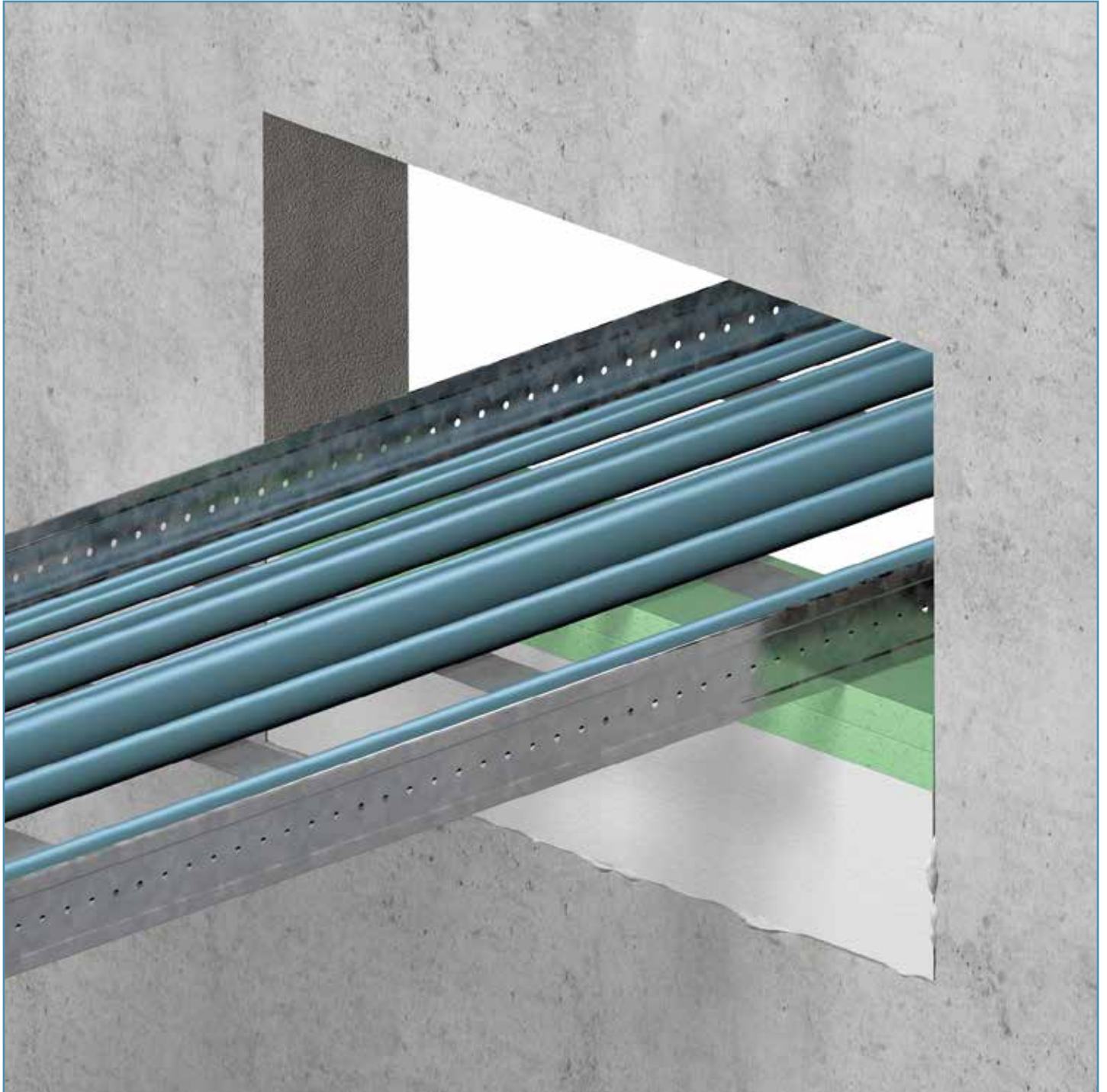
In case of oversized wall openings the FYLLOFOAM® rubber sheets/profiles will be installed only around and inside the ducted cable tray or ladder. The remaining open spaces are filled with FYLLOFYS® boards. The FYLLOFYS® boards are glued to the wall with NOFIRNO® sealant.

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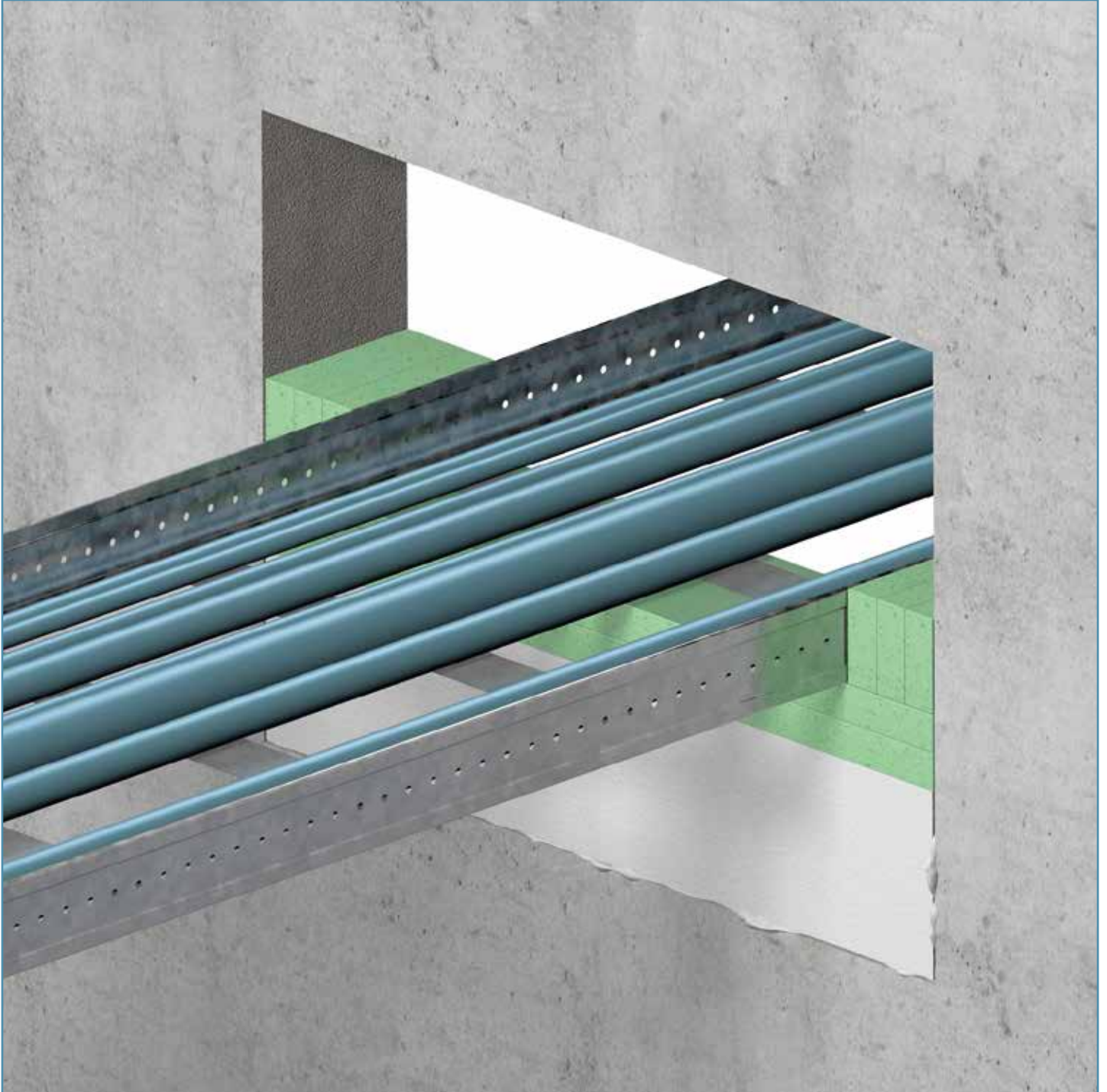
FYLLOFYS® boards are supplied with FISSIC® coating all around. The FISSIC® coating is water repellent and prevents water/moisture absorption. The FYLLOFYS® boards can cut to size on site. The cut surface should be treated with FISSIC® coating before installation in the wall opening.

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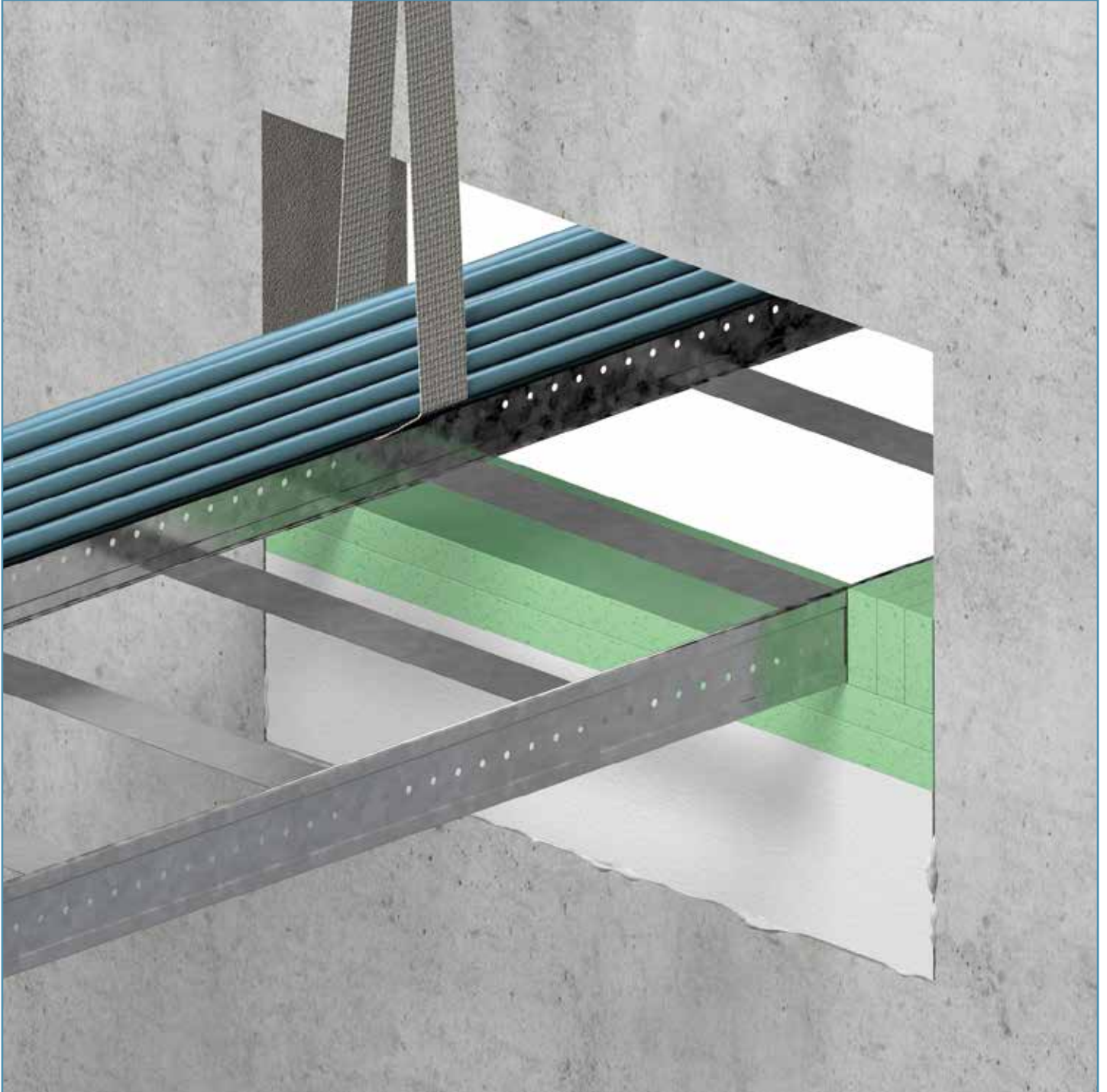
On top of the FYLLOFYS® boards the open space between the board and the cable tray/ladder is filled with sheets FYLLOFOAM® rubber.

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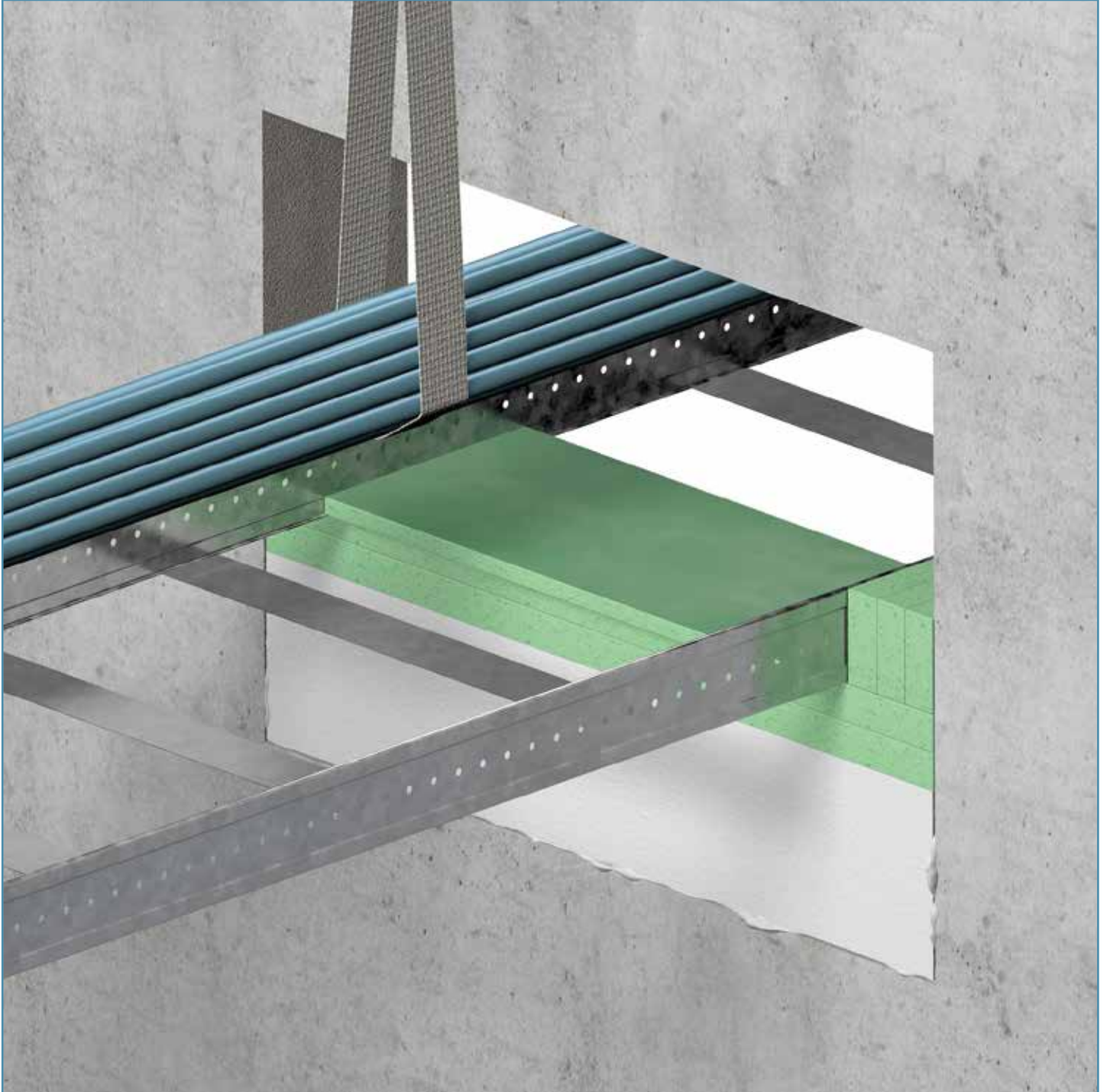
The open spaces at both sides of the cable tray/ladder and the wall is also filled with FYLLOFOAM® rubber cut to size. The FYLLOFOAM® rubber sheets should fit snugly in the conduit opening to ensure a tight fit against the wall and underneath the cable tray/ladder. This is important to obtain a smoke tight penetration.

INSTALLATION INSTRUCTIONS FOR FYLLOFOAM®-FYLLOFYS® MULTI-CABLE TRANSIT SEALING SYSTEM



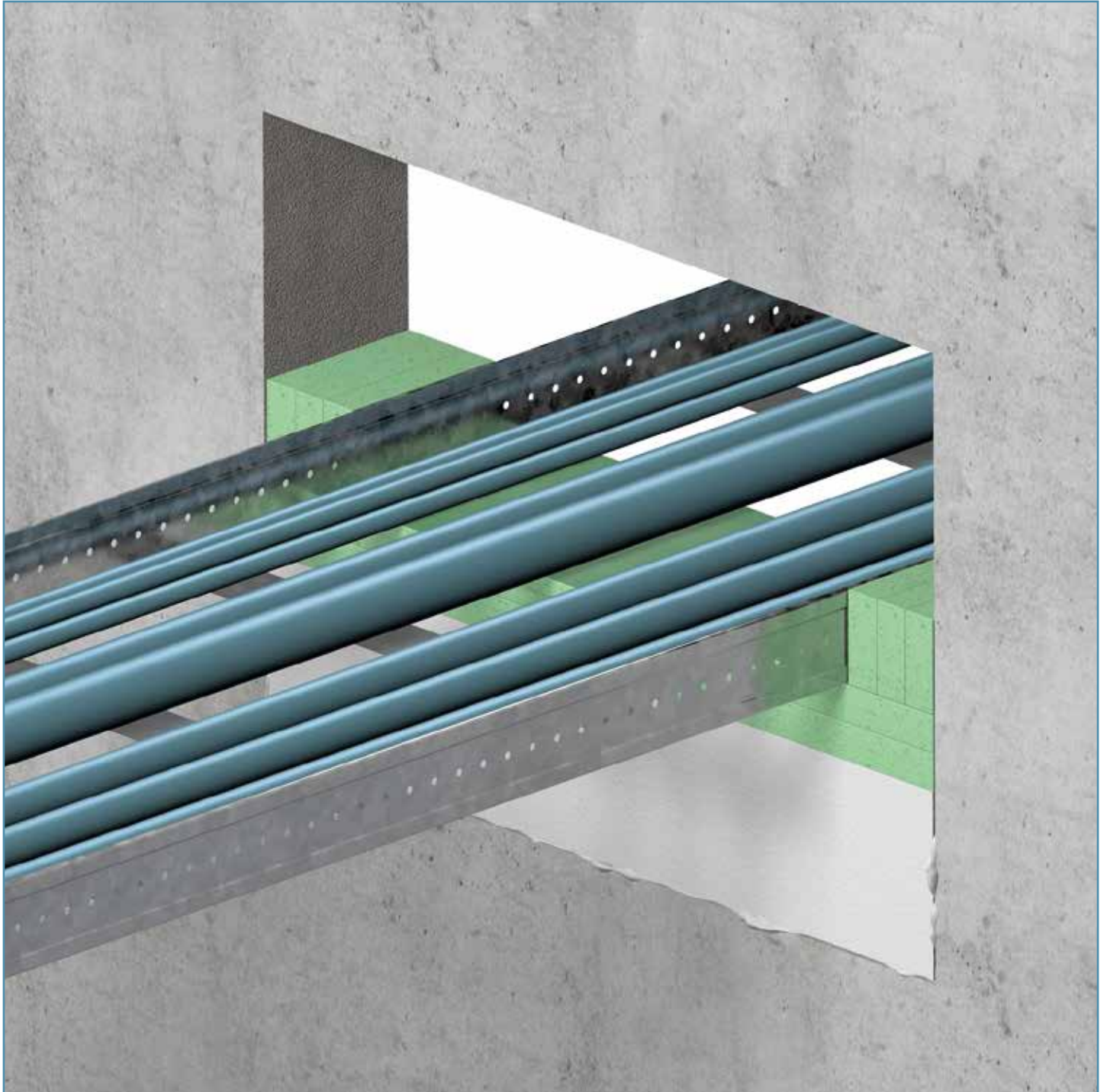
A FYLLOFOAM® rubber sheet must also be placed in the cable tray/ladder underneath the layer of cables. To make this job easy a band is placed around the cable bundle to lift the bundle of cables.

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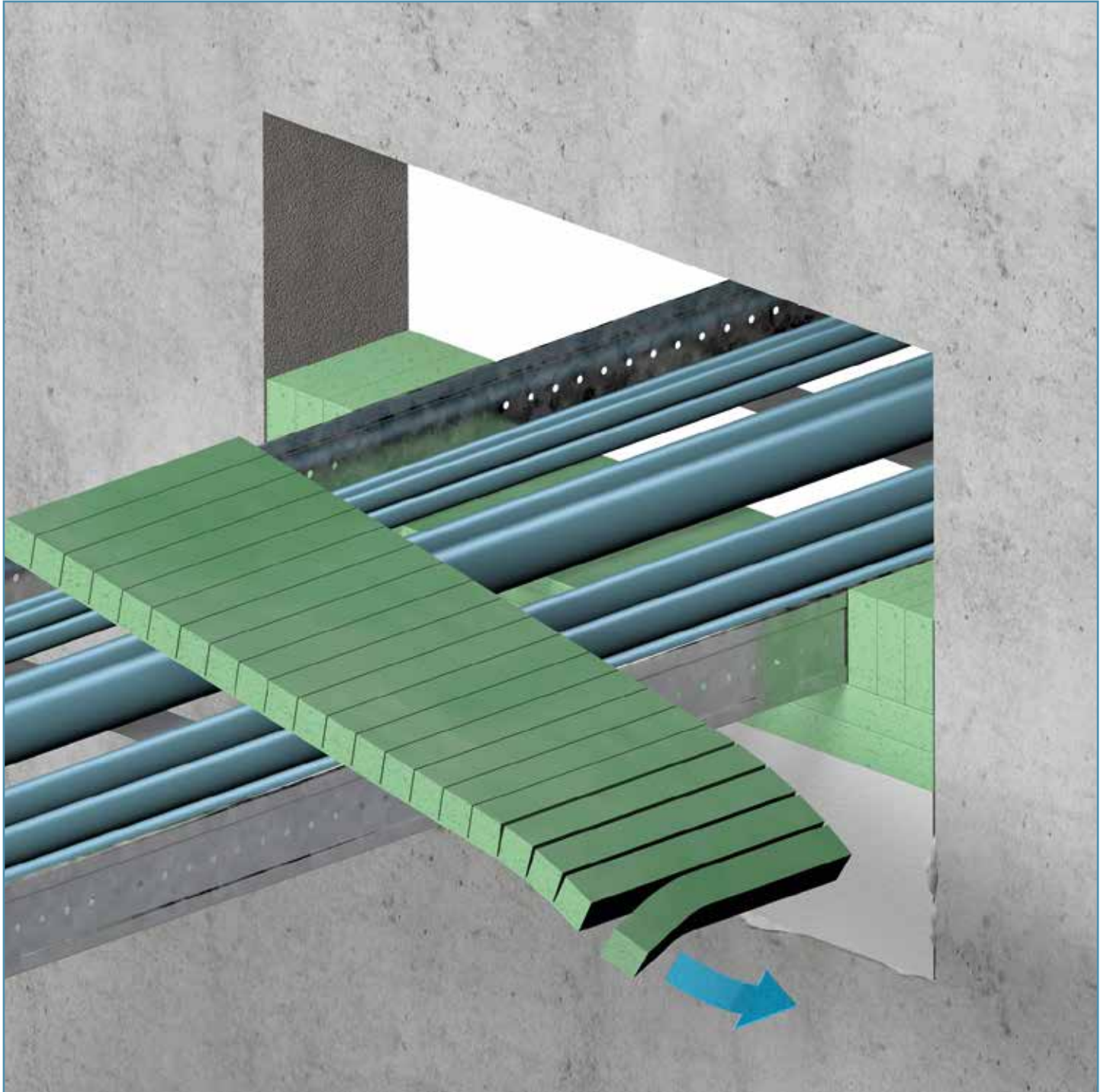
A slightly oversized strip of FYLLOFOAM® rubber with a thickness of 20-25 mm is placed inside the conduit opening underneath the cables. The sheet will be compressed by the weight of the cables.

INSTALLATION INSTRUCTIONS FOR FYLLOFOAM®-FYLLOFYS® MULTI-CABLE TRANSIT SEALING SYSTEM



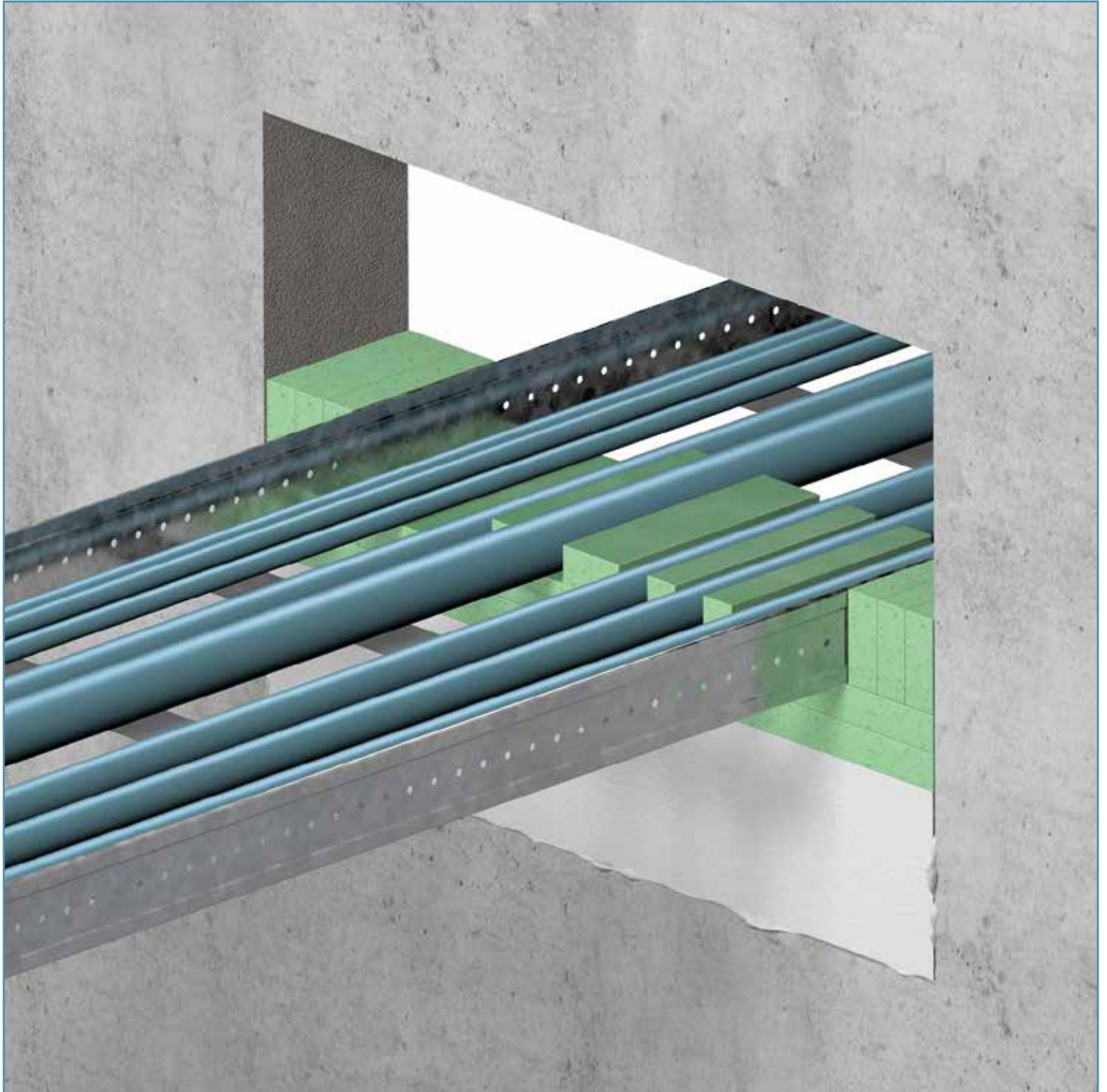
The cables are spread out on the ACTIFOAM® rubber sheet at the bottom of the conduit opening. It is recommended to leave some space between the cables to enable insertion of FYLLOFOAM® rubber strips for sufficient separation.

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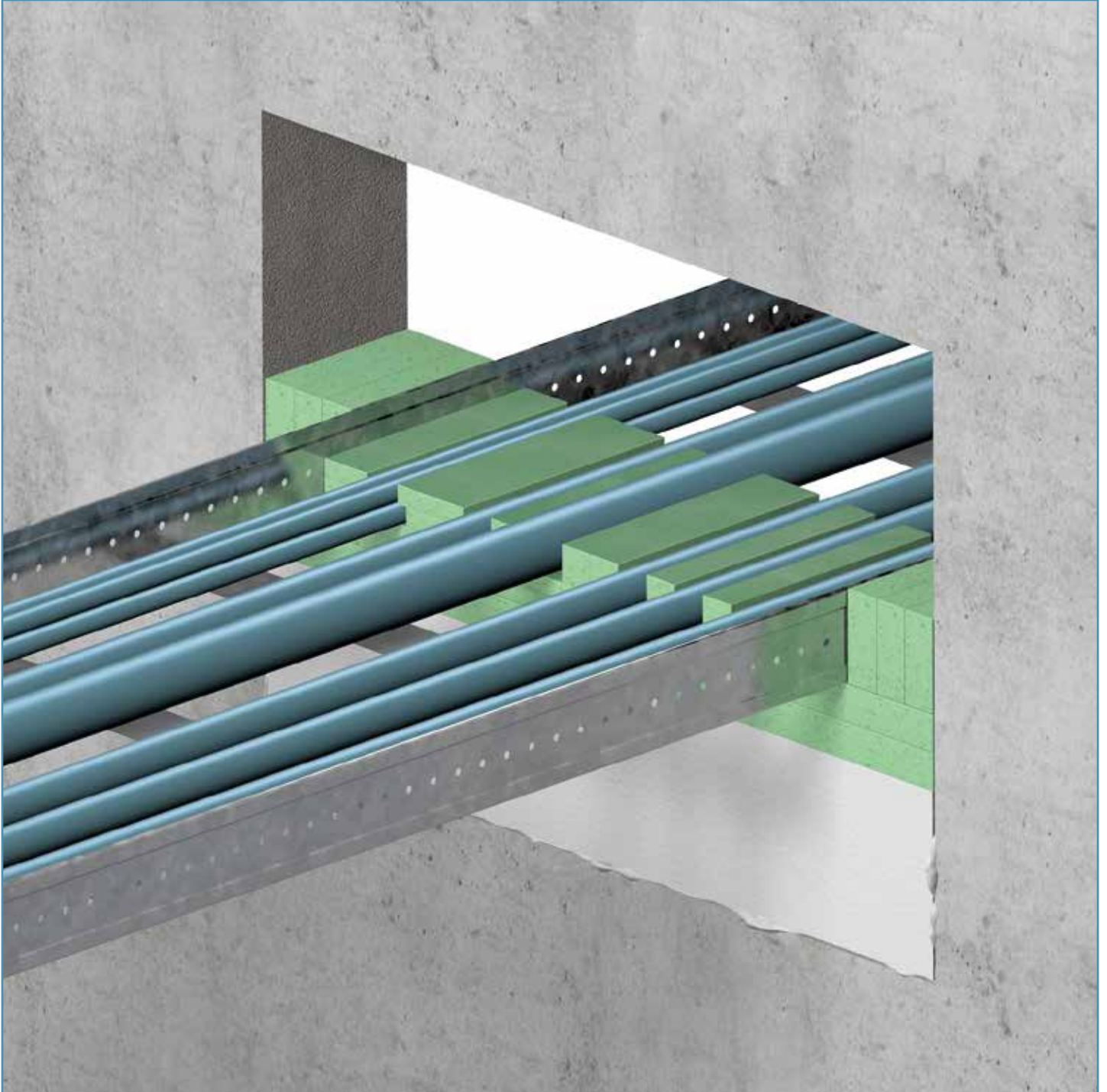
For proper cable separation, square profiles are torn off the pre-slit FYLLOFOAM® rubber sheets. The filling with FYLLOFOAM strips should extend 20-25 mm at both sides out of the wall opening for ease of removal for later extensions.

INSTALLATION INSTRUCTIONS FOR FYLLOFOAM®-FYLLOFYS® MULTI-CABLE TRANSIT SEALING SYSTEM



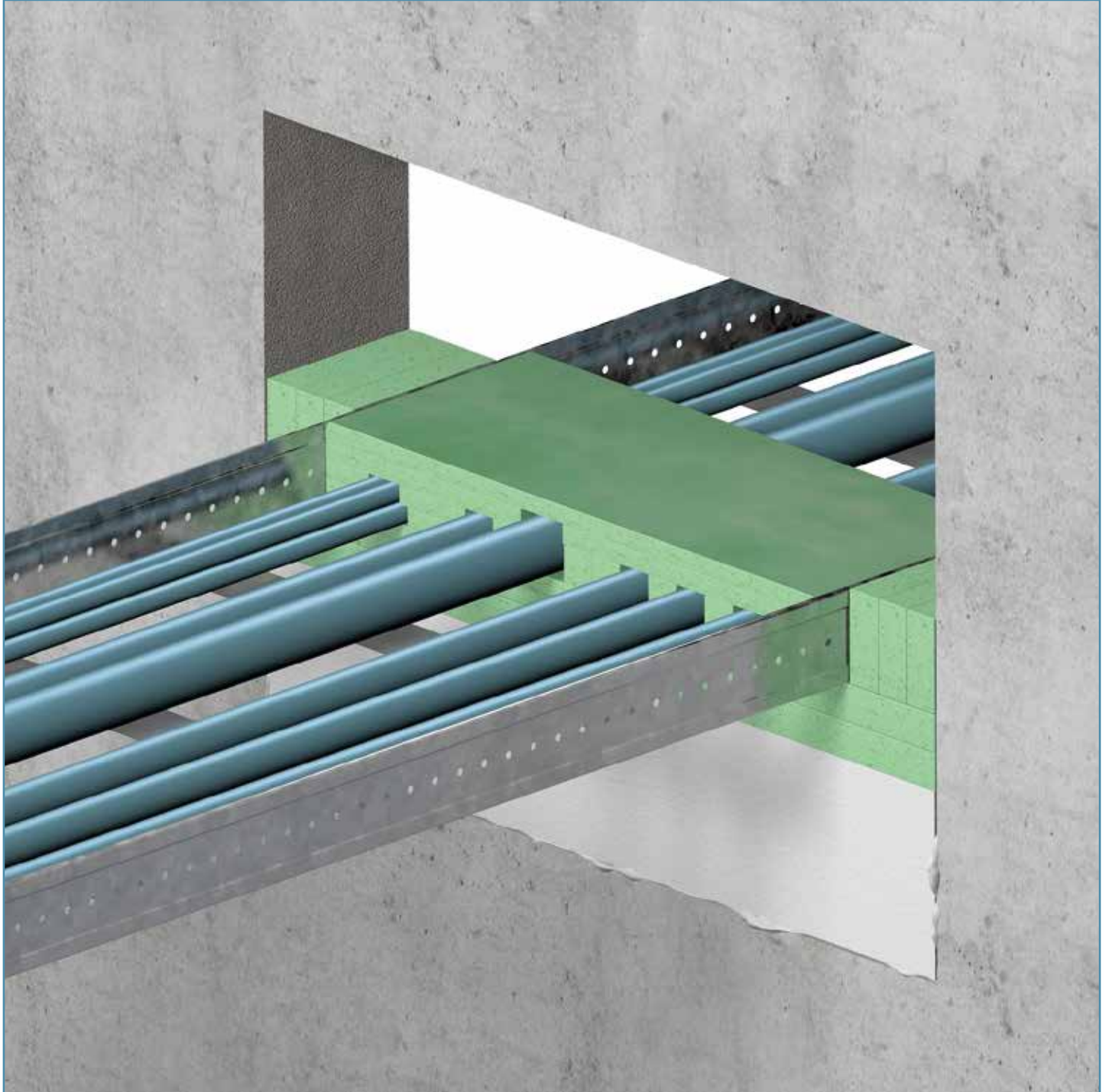
Profiles are slit in sizes of 10x10, 15x15, 20x20 and 25x25 mm. This enables an easy fit for a wide variety of cable sizes. Note the strips extending out of the wall sealing.

INSTALLATION INSTRUCTIONS FOR FYLLOFOAM®-FYLLOFYS® MULTI-CABLE TRANSIT SEALING SYSTEM



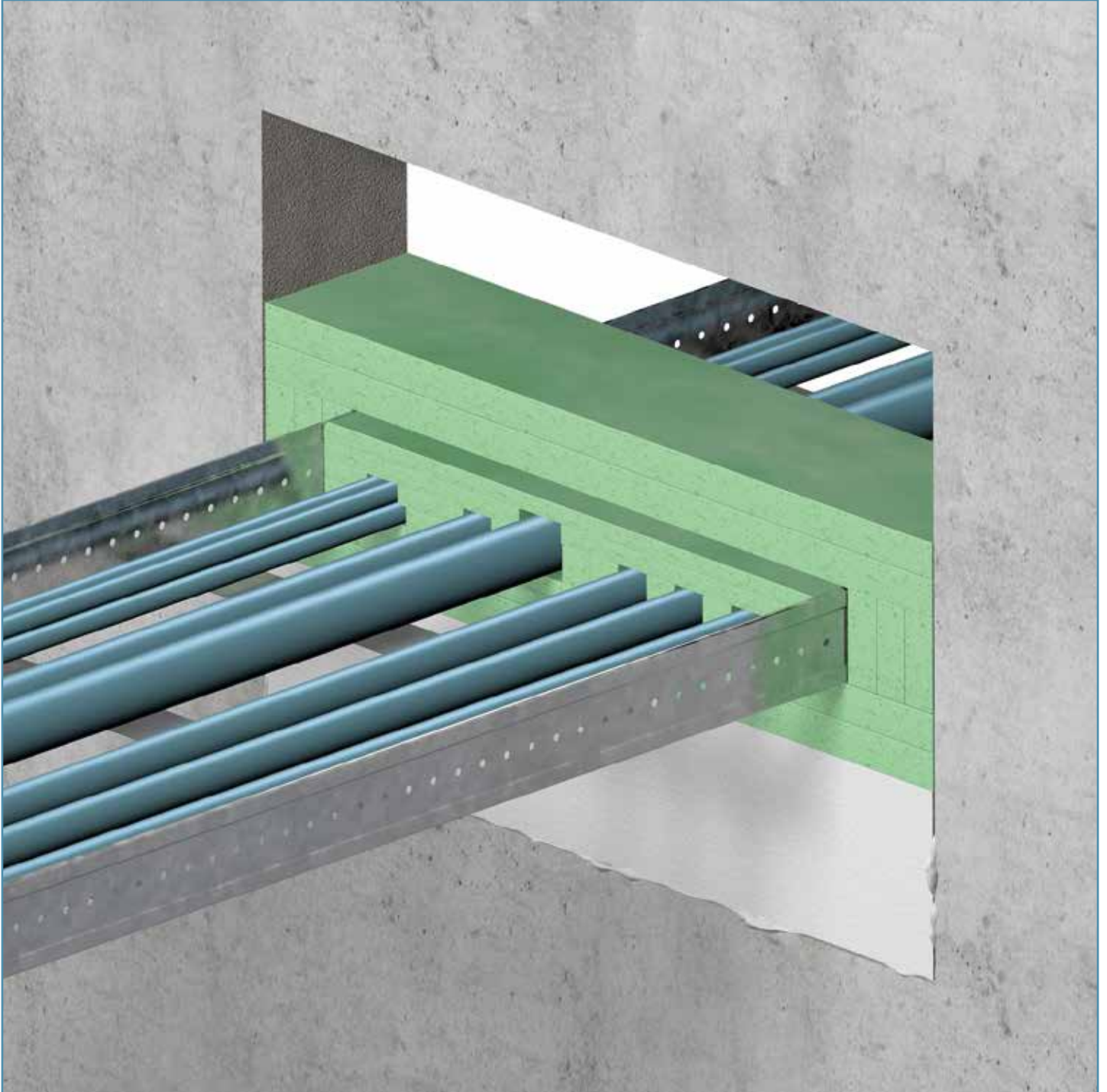
The FYLLOFOAM®/FYLLOFYS® systems allows ducting small bundles of cables.
Note: bundling saves space but for initial smoke tightness it is not recommended.

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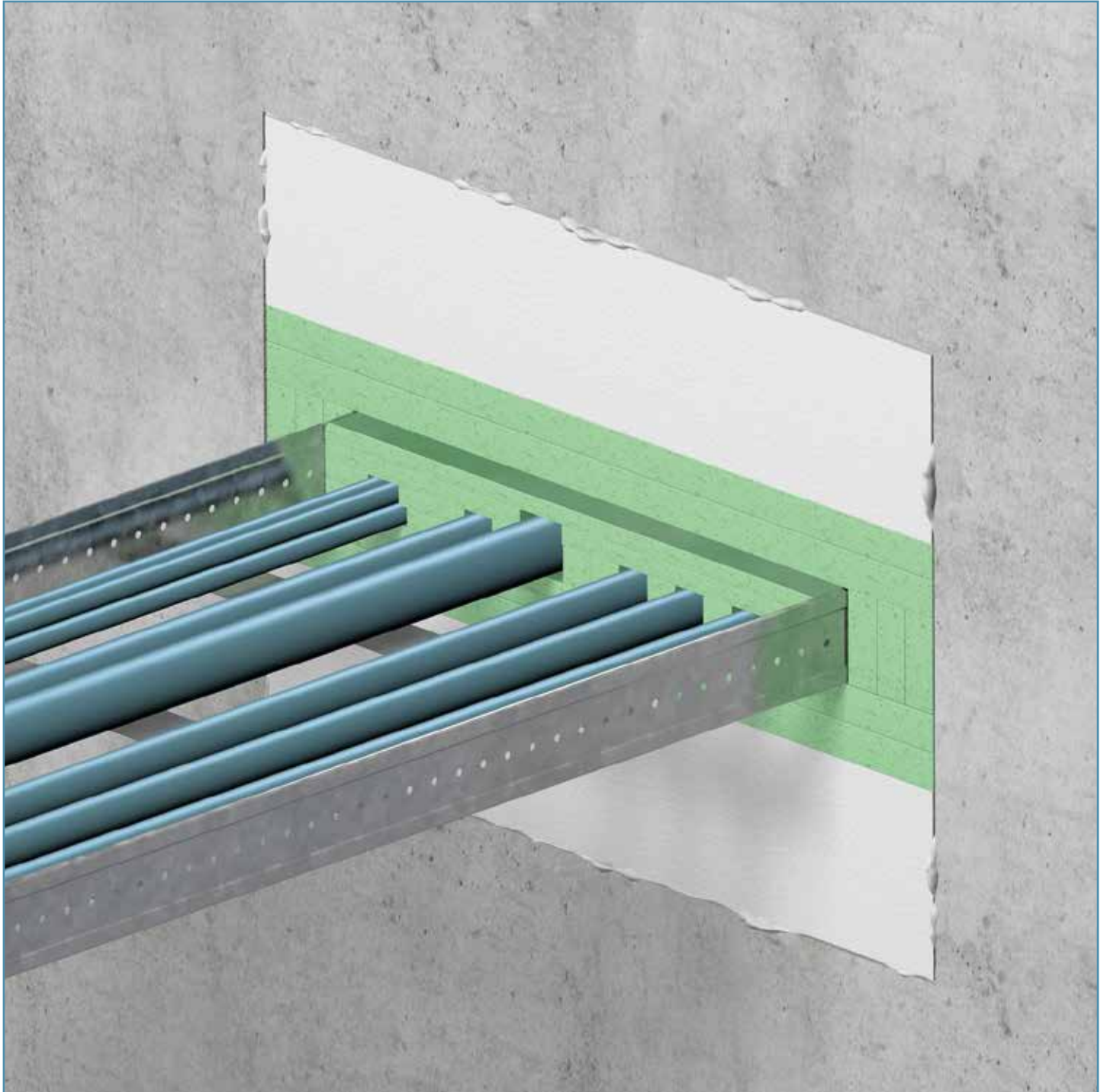
The filling in and around the cable tray/ladder is filled in a way to create a level layer for further filling the conduit opening.

INSTALLATION INSTRUCTIONS FOR FYLLOFOAM®-FYLLOFYS® MULTI-CABLE TRANSIT SEALING SYSTEM



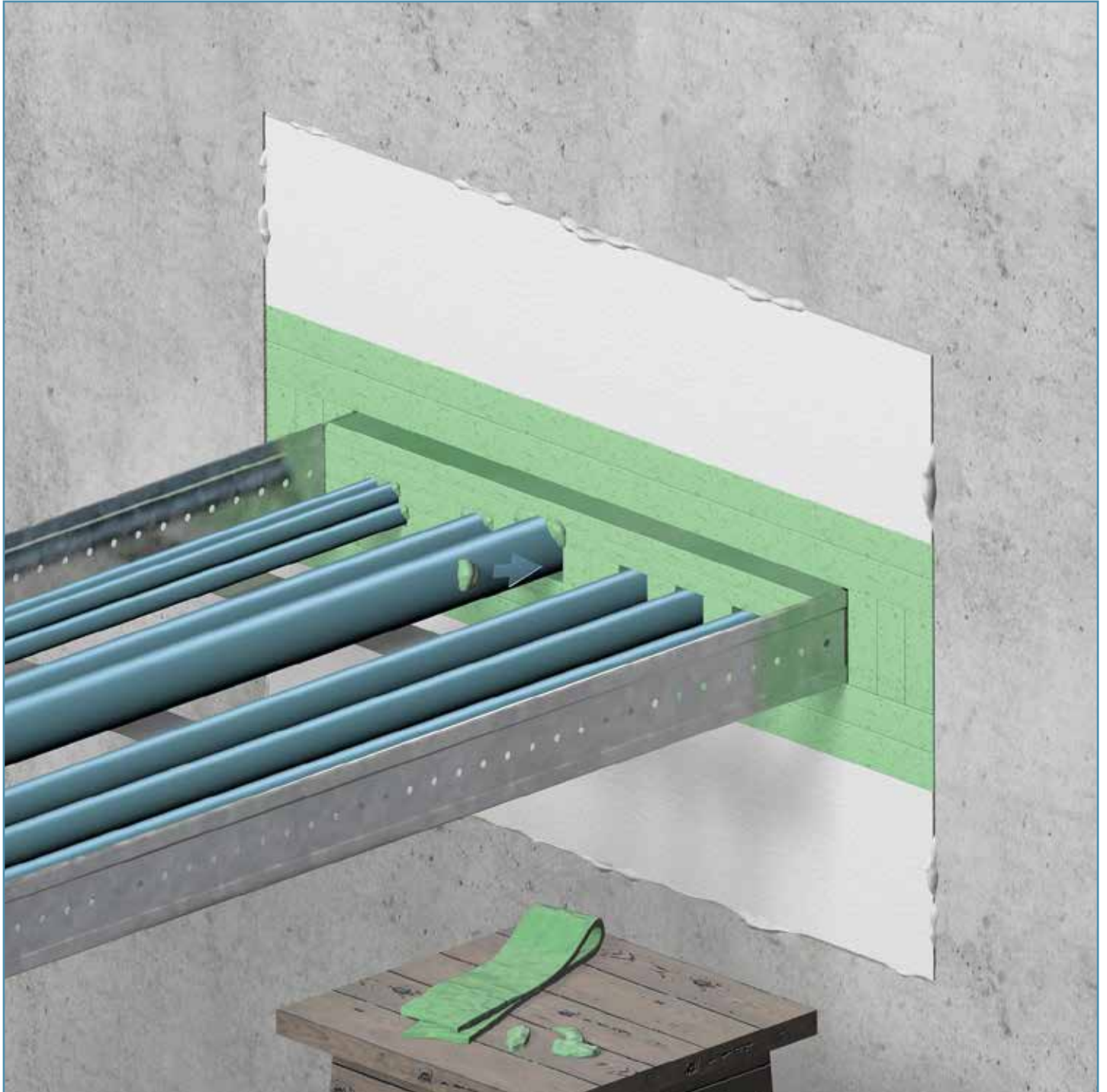
On top of the filling in and around the cable tray/ladder two FYLLOFOAM® sheets are placed with a view to create enough space for later extensions. All sheets should fit tightly in the conduit opening to obtain a fair degree of smoke tightness.

INSTALLATION INSTRUCTIONS FOR FYLLOFOAM®-FYLLOFYS® MULTI-CABLE TRANSIT SEALING SYSTEM



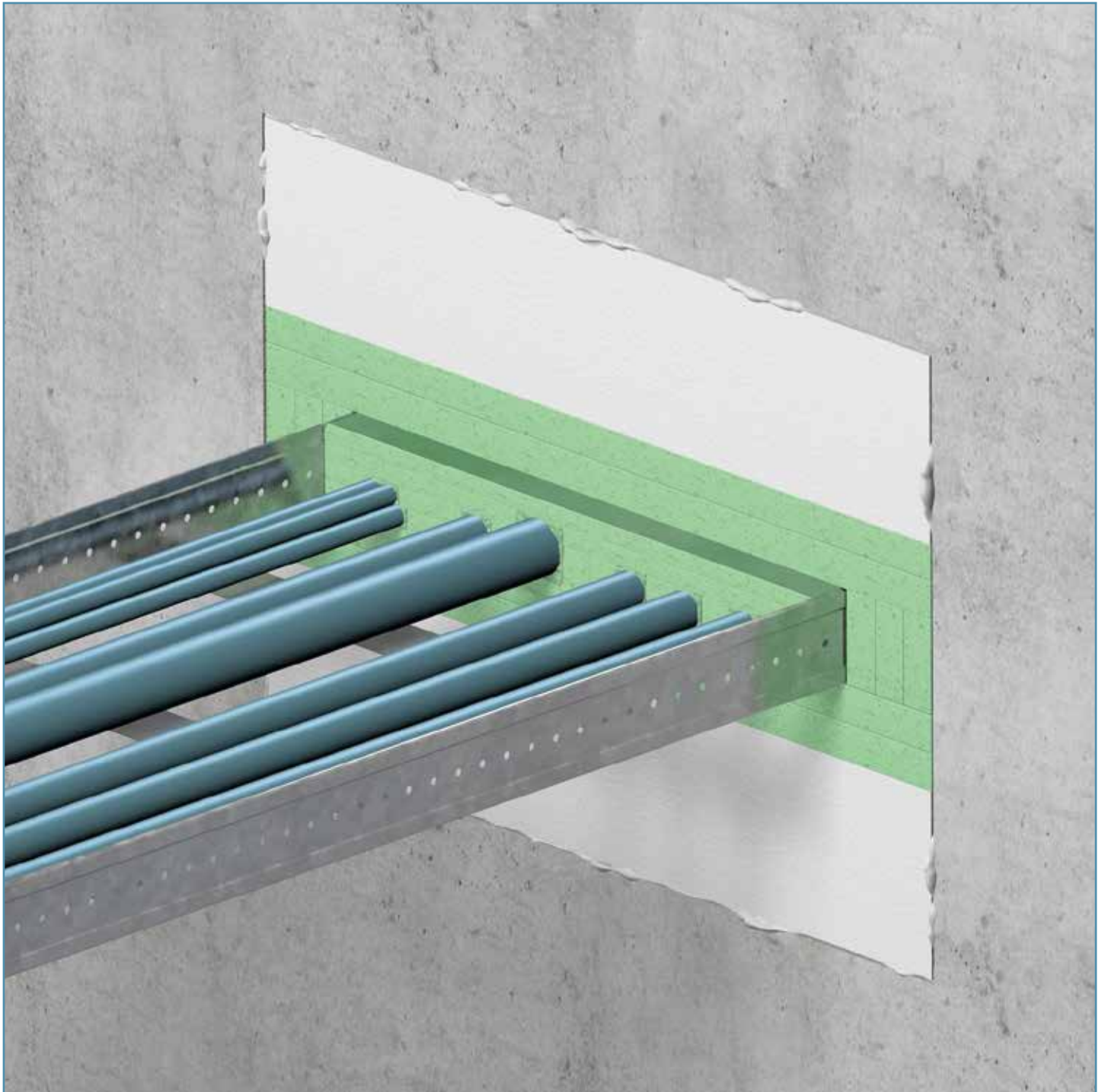
The remaining space of the wall opening is filled with a cut-to-size FYLLOFYS® board coated all around with FISSIC® coating on top of the FYLLOFOAM® filling. The FYLLOFYS® board should be a bit oversized to obtain sufficient mechanical stability of the sealing system. The board is glued to the wall with NOFIRNO® sealant.

INSTALLATION INSTRUCTIONS FOR FYLLOFOAM®-FYLLOFYS® MULTI-CABLE TRANSIT SEALING SYSTEM



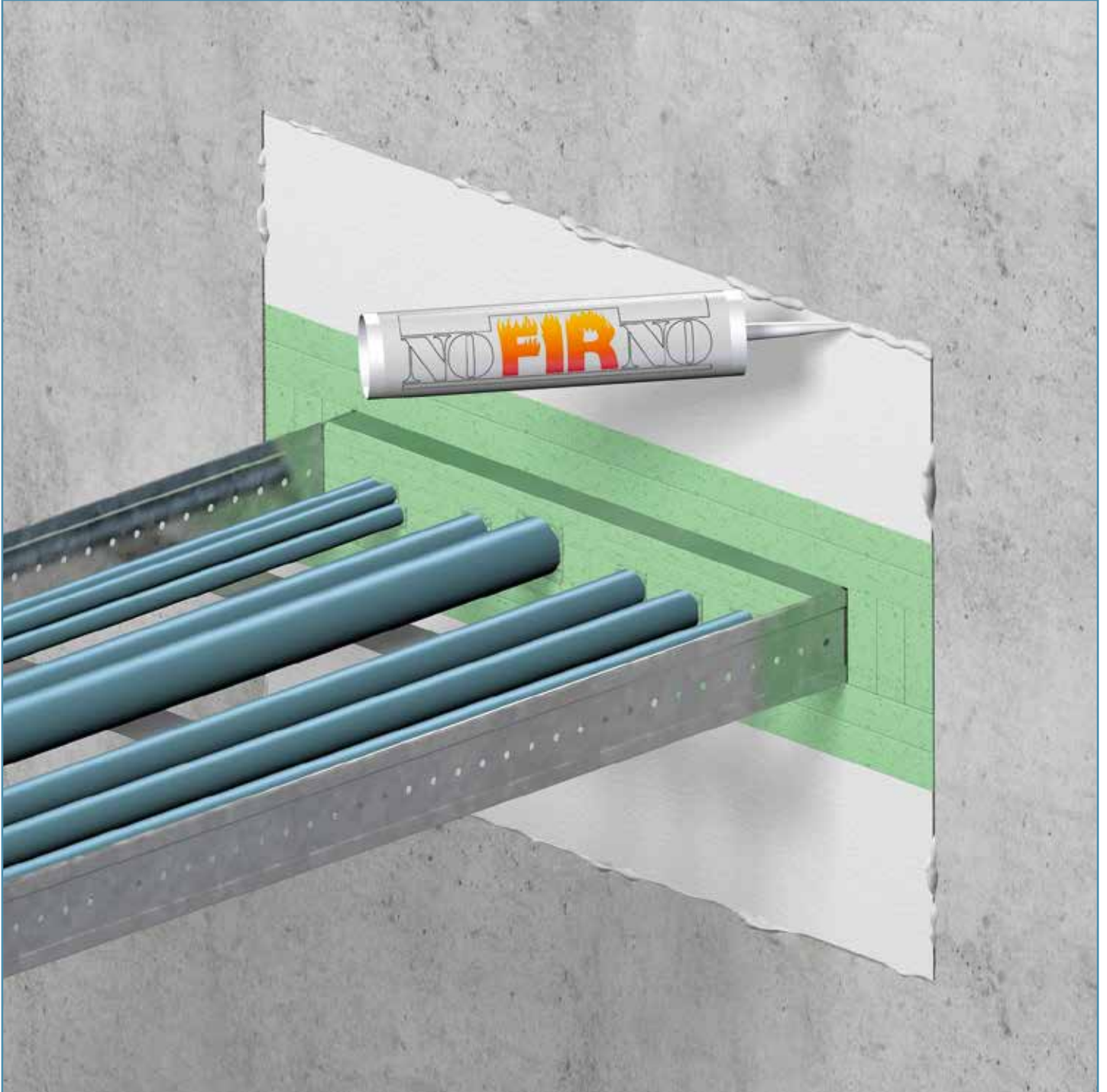
To obtain a fair degree of initial smoke tightness FIRAQUA® fire resistant, water repellent, kneadable rubber parts are pressed into the openings around the cables in between the FYLLOFOAM® filling.

**INSTALLATION INSTRUCTIONS FOR FYLLOFOAM®-FYLLOFYS®
MULTI-CABLE TRANSIT SEALING SYSTEM**



The finished FYLLOFOAM® filling.

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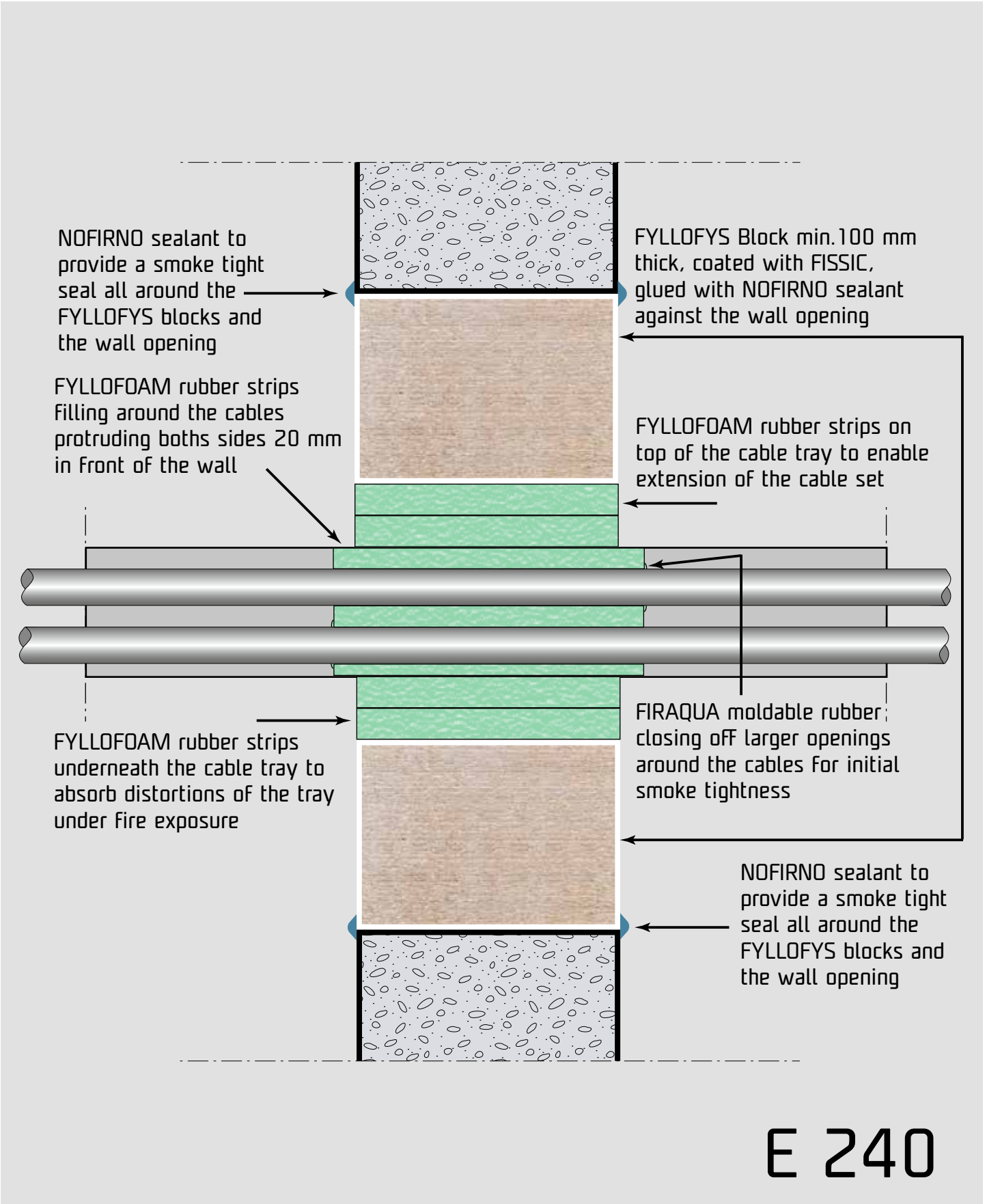
The FYLLOFOAM®/FYLLOFYS® sealing system is sealed all around the wall opening with NOFIRNO® sealant.

INSTALLATION INSTRUCTIONS FOR FYLLOFOAM®-FYLLOFYS® MULTI-CABLE TRANSIT SEALING SYSTEM



The finished FYLLOFOAM®/FYLLOFYS® sealing system.
The system is successfully tested according to EN 1366-3:2009 for a duration of 4 hours in walls 100 and 150 mm. Classification E240. Depending on the wall thickness classification EI 60 for 100 mm wall and EI 90 for 150 mm for cables up to 80 mm. Blind transits FYLLOFYS® and FYLLOFOAM® EI240/E240. European Technical Approval applied for.

**INSTALLATION INSTRUCTIONS FOR FYLLOFOAM®-FYLLOFYS®
MULTI-CABLE TRANSIT SEALING SYSTEM**



E 240

STATE-OF-THE ART MULTI-CABLE TRANSIT SEALING SYSTEMS

The logo for RISE, featuring the word "RISE" in a stylized, bold, red font with a white outline and a slight 3D effect. The letters are slightly slanted.The logo for RISE, featuring the word "RISE" in a stylized, bold, red font with a white outline and a slight 3D effect. The letters are slightly slanted.The logo for CONDUCTION, featuring the word "CONDUCTION" in a red, outlined font with a double-line border. The letters are slightly slanted.The logo for NOFIRNO, featuring the word "NOFIRNO" in a bold, orange font with a white outline. The letters are slightly slanted.The logo for CONTROFIL, featuring the word "CONTROFIL" in a bold, blue font with a white outline. Below it, the words "MULTI-CABLE TRANSITS" are written in a smaller, white font on a blue background.The logo for CET-A-SIL, featuring the words "CET-A-SIL" in a bold, blue font with a white outline. The letters are slightly slanted.

RISE®

- For fire, gas, smoke and watertight sealing of multi-cable penetrations.
- Compact system. No precise fitting parts.
- No metal parts, no corrosion.
- Most cost-effective way of installation.
- No pre-engineering or special conduit frames.
- No restrictions on cable types and sizes, no insulation in front of the penetration needed.
- Adding or removing cables an easy matter.
- RISE® EXTEND-A-FRAME for upgrading block systems - doubles the usable space!
- RISE® CONDUCTION® for EMC penetrations - high attenuation values - no galvanic corrosion - no aging.
- **Proven - for new and upgraded installations.**
- The system of choice in shipyards worldwide for more than 25 years!

NOFIRNO®

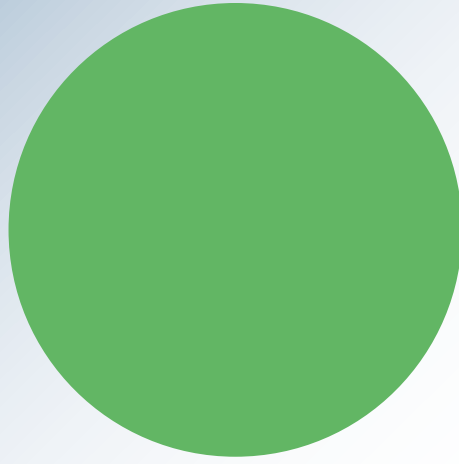
- System technology based on RISE®.
- Even easier installation.
- Even higher pressure ratings.
- Jet Fire tested for harshest applications.
- Bundled cable sets approved
- **Breakthrough - A-class with 15 mm both sides.**
- The system of choice for highest fire ratings and harshest environment!

CONTROFIL®

- Newest technology for cable ducting and sealing.
- Newest rubber technology - CRUSHNOF® rubber.
- Shorter conduit depths - flexible composition.
- Prevents overfilling of cable transits.
- Fire tight - watertight.
- **Breakthrough - controlled filling of transits.**
- The system of choice for neat cable routing in installations.

CET-A-SIL®

- Multi-gland system for electrical cabinets.
- Modular system - sealing plugs and modules.
- Suitable for IP 68 rated equipment.
- Watertight up to 4 meter water column.
- No compression on cable sheathings.
- No metal parts - no corrosion - no O-rings.
- **Breakthrough - no disassembling to add cables.**
- The alternative system for cable glands.



WE CARE

**BEELE ENGINEERING:
A COMPANY DEDICATED
TO SAFETY
FOR OVER 45 YEARS**



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