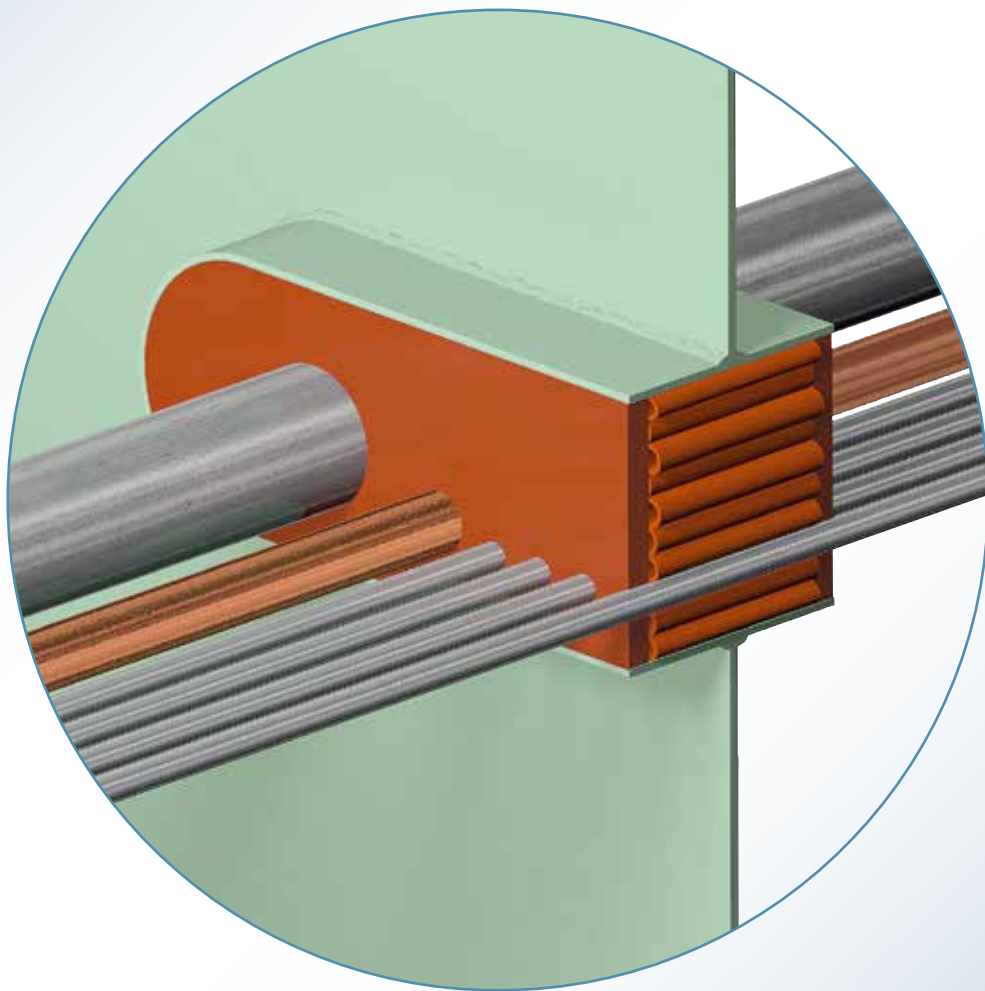




INSTALLATION INSTRUCTIONS NOFIRNO[®] SEALING SYSTEM (NOFIRNO[®] SLEEVES/SEALANT) FOR (MULTI-) PIPE TRANSITS



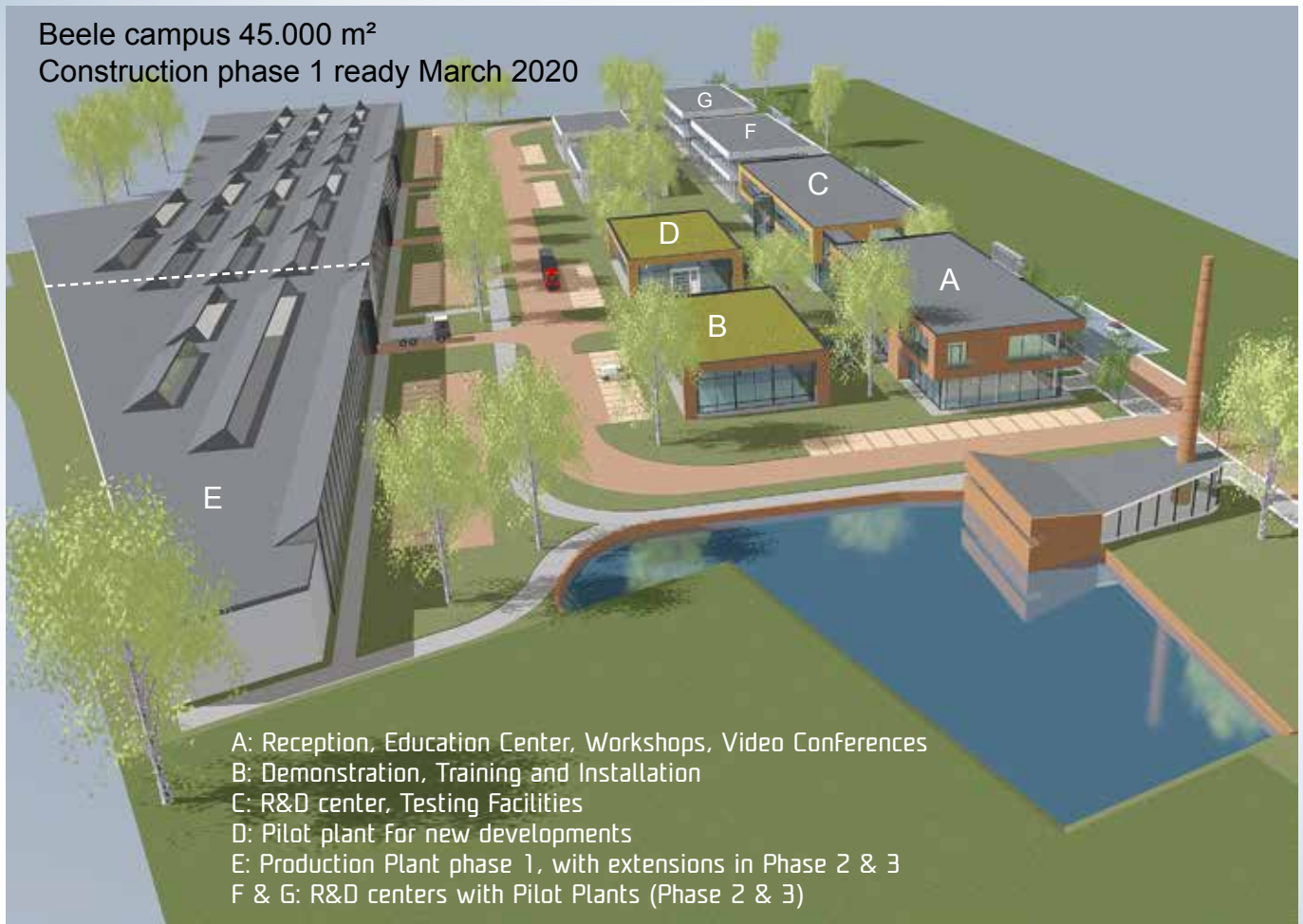
NO FIRNO[®]



SEALING VALLEY

KNOWLEDGE TRANSFER, EDUCATION AND TRAINING

Beele campus 45.000 m²
Construction phase 1 ready March 2020



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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.

®

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brochure code

: installation NOFIRNO pipe

INSTALLATION INSTRUCTIONS FOR NOFIRNO® (MULTI-) PIPE TRANSIT SEALING SYSTEM



The NOFIRNO® (multi-) pipe transit sealing system is composed of NOFIRNO® (multi-) filler sleeves type 22/15, or as an alternative, a combination of NOFIRNO® (multi-) filler sleeves type 18/12 and 27/19 and NOFIRNO® sealant.

The use of NOFIRNO® multi-filler sleeves type 22/15 contributes to ease of installation, due to the fact that there is no ratio to be regarded as is the case with the combination type 18/12 and 27/19. Furthermore, the use of filler sleeves 22/15 eliminates making mistakes in the ratio 1:2 to be applied for the combination 18/12 and 27/19 filler sleeves.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® (MULTI-) PIPE TRANSIT SEALING SYSTEM

PRODUCT INFORMATION SEALANT

01) colour	red brown
02) specific gravity	1.40 ± 0.03 g/cm³
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 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 50.0107



terracotta

article number 50.0108



black

article number 50.0109



white

article number 50.0110



blue grey

article number 50.0111



INSTALLATION INSTRUCTIONS FOR NOFIRNO® (MULTI-) PIPE TRANSIT SEALING SYSTEM

NOFIRNO® FILLER SLEEVES SINGLE & MULTI

NOFIRNO® filler sleeves



filler sleeves are supplied non-split

Operating temperatures:
-50 °C up to +180 °C

NOFIRNO® multi-filler sleeves



Operating temperatures:
-50 °C up to +180 °C

filler sleeves are supplied in
multi-sets of 10 sleeves

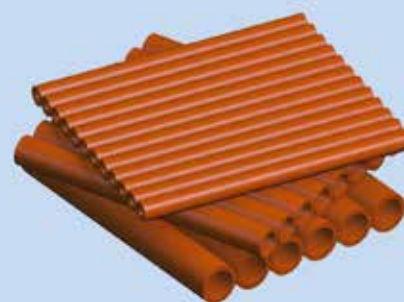
NOFIRNO® single filler sleeve	sleeve length		article number
18/12 single	140	all dimensions in mm	80.5002
18/12 single	160		80.5003
18/12 single	210		80.5004
27/19 single	140		80.5012
27/19 single	160	(only in combination with filler sleeves type 18/12)	80.5013
27/19 single	210		80.5014

NOFIRNO® multi-filler sleeve	sleeve length		article number
22/15 multi 10	140	all dimensions in mm	80.5072
22/15 multi 10	160		80.5073
22/15 multi 10	210		80.5074



NOFIRNO® multi-filler sleeve	sleeve length		article number
18/12 multi 10	140	all dimensions in mm	80.5052
18/12 multi 10	160		80.5053
18/12 multi 10	210		80.5054
27/19 multi 10	140		80.5062
27/19 multi 10	160	(only in combination with filler sleeves type 18/12)	80.5063
27/19 multi 10	210		80.5064

filler sleeves to be used for very small openings



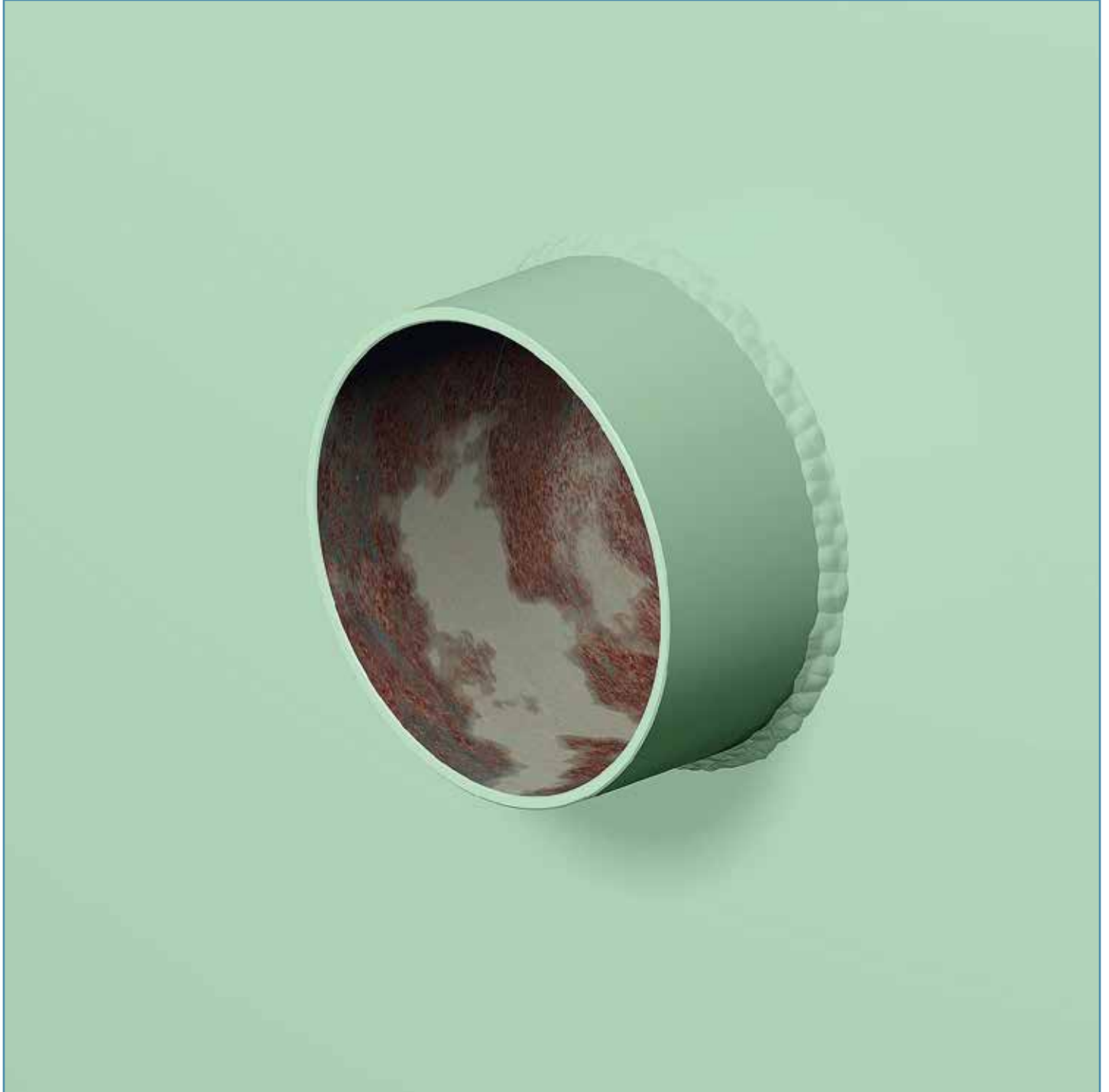
NOFIRNO® multi-filler sleeve	sleeve length		article number
MS 10/4 multi 12	140	all dimensions in mm	70.0321
MS 10/4 multi 12	160		70.0331
MS 10/4 multi 12	210		70.0341
MS 15/8 multi 8	140		70.0322
MS 15/8 multi 8	160		70.0332
MS 15/8 multi 8	210		70.0342
MS 20/12 multi 6	140		70.0323
MS 20/12 multi 6	160		70.0333
MS 20/12 multi 6	210		70.0343

INSTALLATION INSTRUCTIONS FOR NOFIRNO® (MULTI-) PIPE TRANSIT SEALING SYSTEM



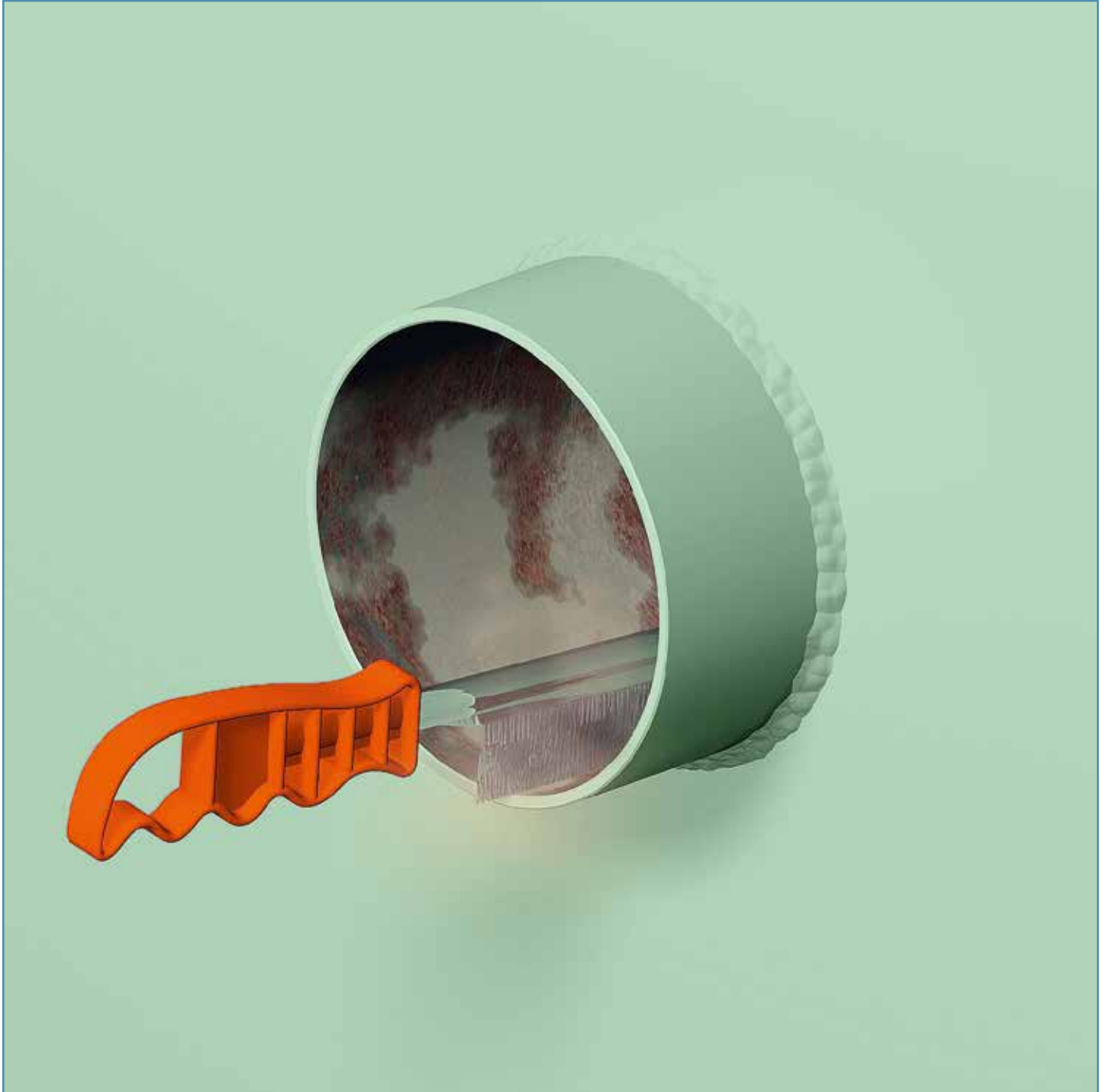
The tools needed for the installation are a steel brush, a tie-wrap cutter, a cutter for the nozzles of the sealant cartridges, flat nose pliers to adjust the set of fillers, a filler set adjuster, cloths for cleaning and compression of the sealant layer, a pipe cleaner, a bucket with water and a professional sealant dispenser.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM



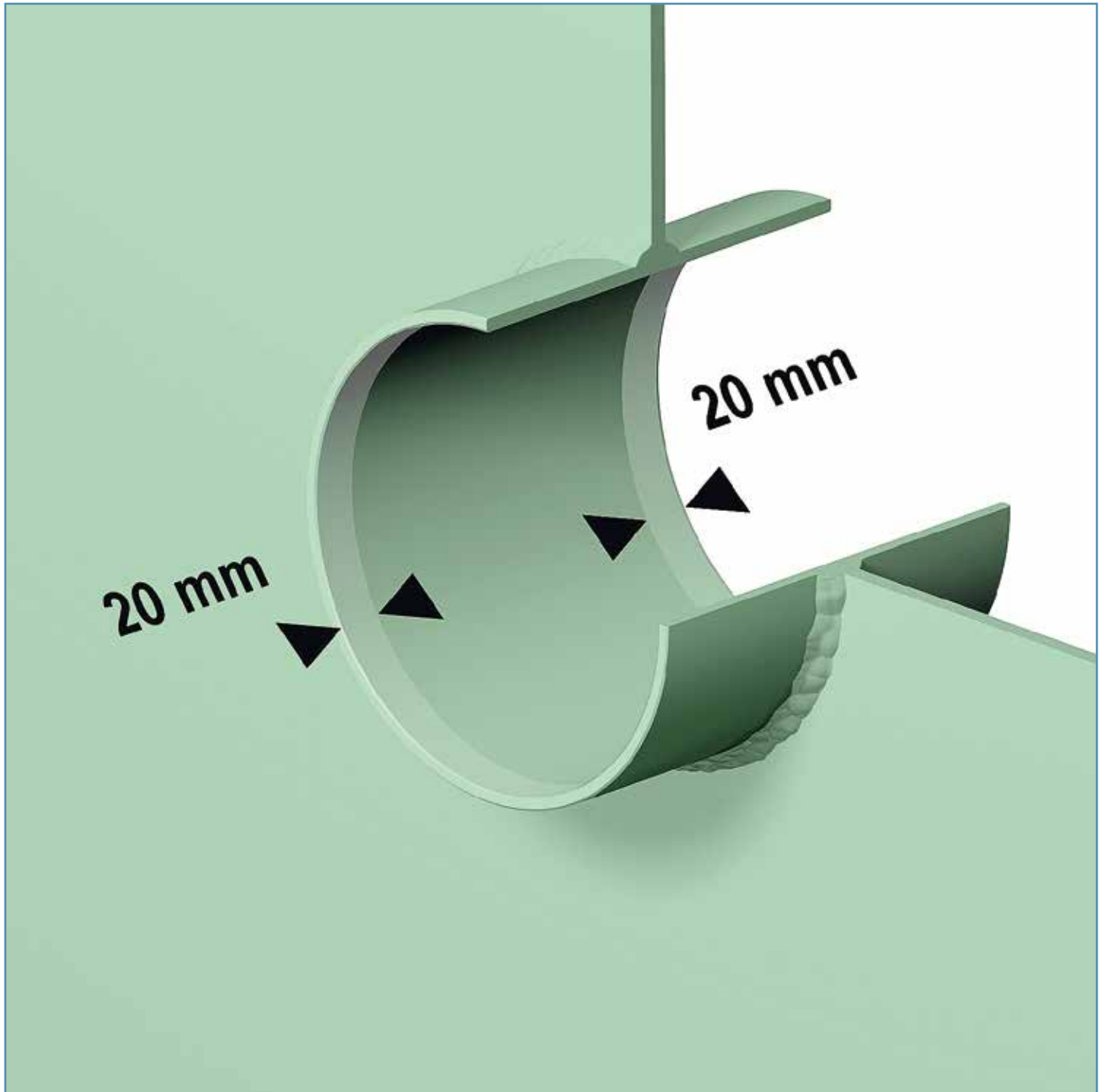
The conduit sleeves might be welded into the partition long before pipe installation will start. For this reason, the condition of the inside of the sleeve has to be checked when starting ducting pipes. Before insertion of the NOFIRNO® filler sleeves, the inside of the conduit sleeve has to be cleaned, and any dirt, oil, grease and other residues or corrosion should be removed from the inside of the conduit sleeve.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM



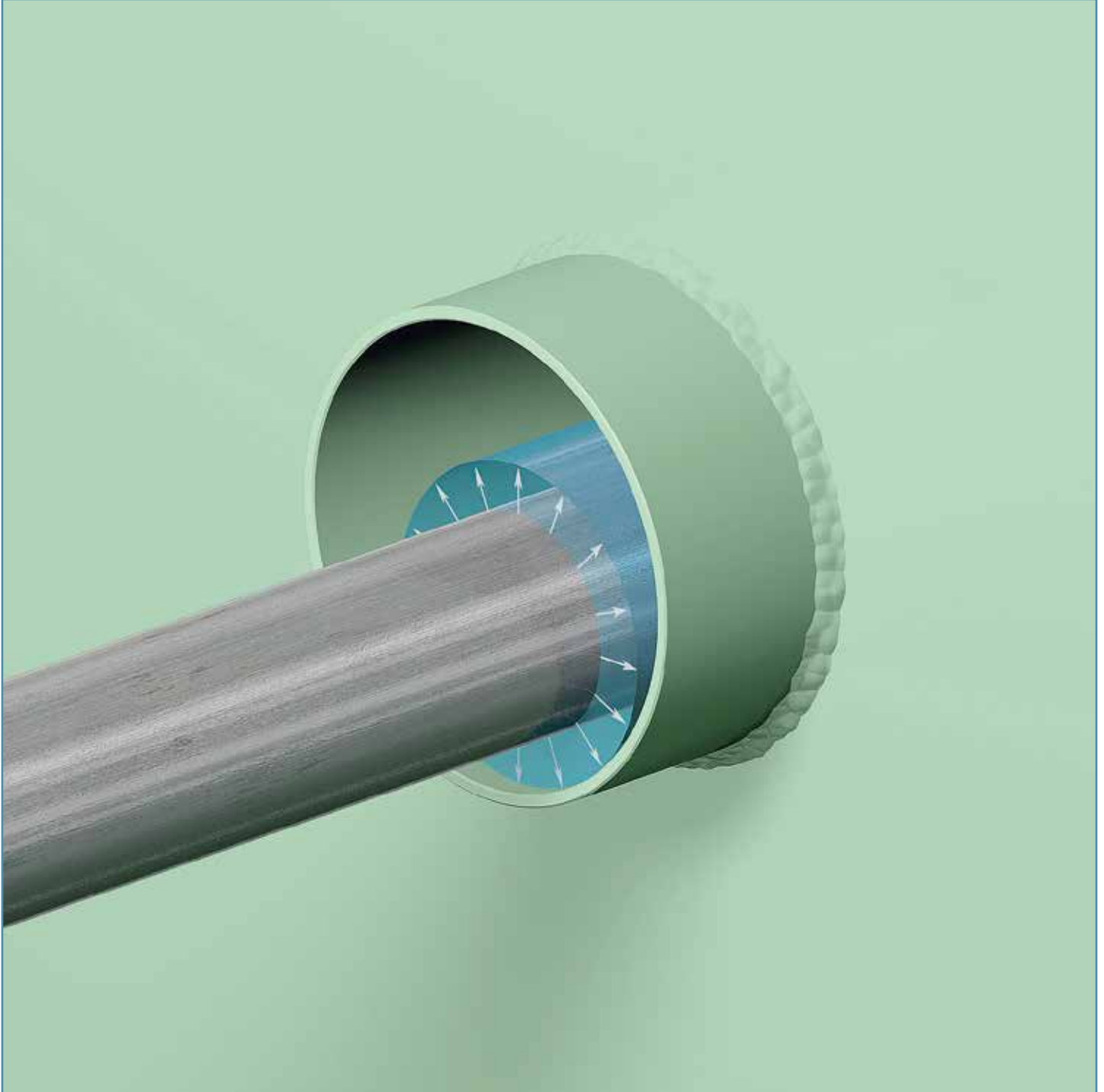
With a steel brush or by blasting, the corroded inner surface of the conduit sleeve should be treated to remove these corroded spots. The excellent adhesive properties of the sealing system will be diminished by corroded surfaces.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM



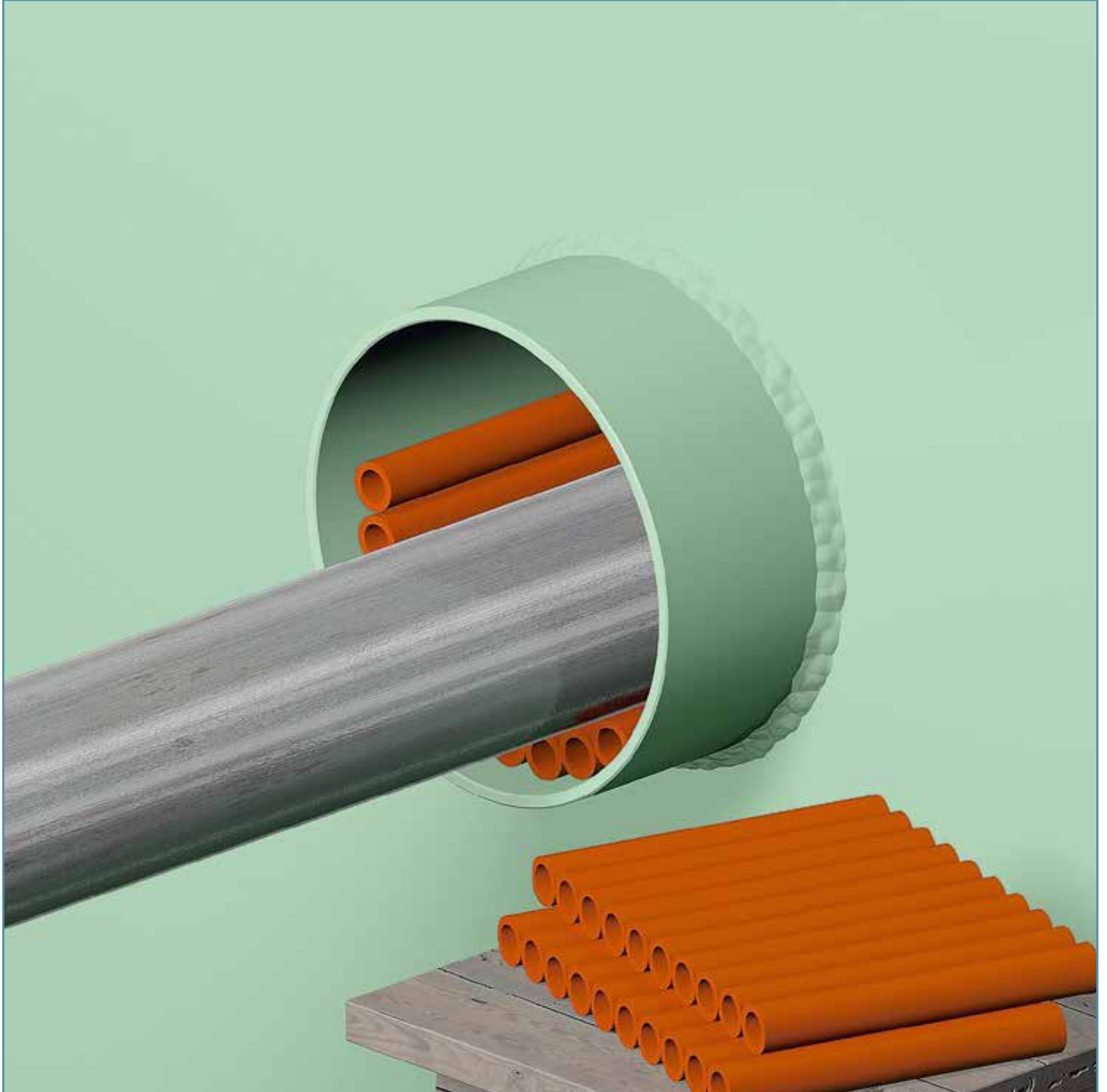
The NOFIRNO® sealing system is composed of filler sleeves, and layers of sealant. The filler sleeves are the backing on which the sealant is going to be applied. A 20 mm thick layer of sealant is applied at both sides of the penetration. Before welding the conduit sleeve into the partition, check if the conduit sleeve is deep enough to be in line with the certification of the sealing system. The NOFIRNO® filler sleeves are 40 mm shorter in length than the depth of the conduit sleeve.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM



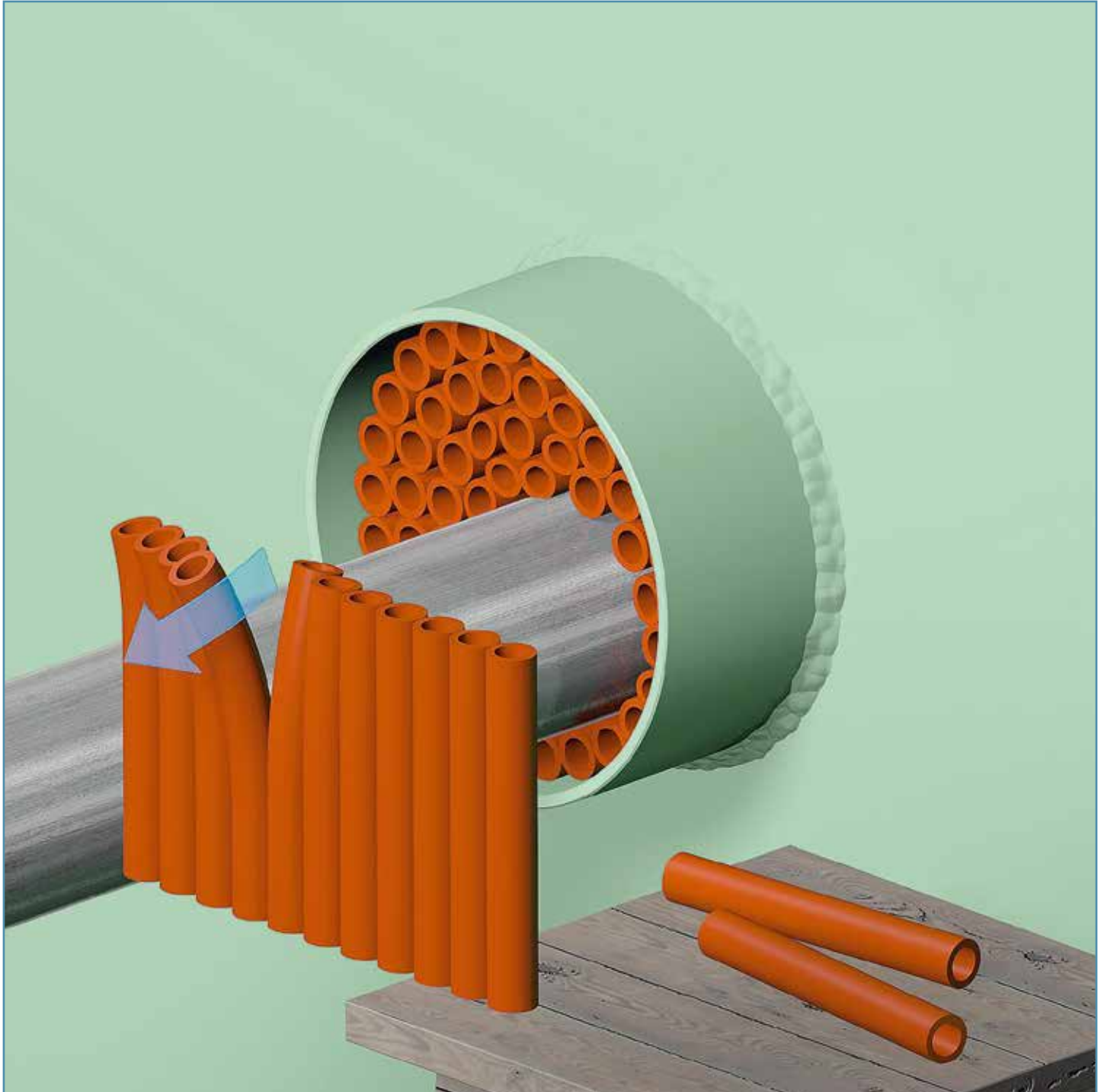
The metallic or GRE pipe can be passed through the conduit sleeve in an off centre position, provided there is enough space between the conduit sleeve and the ducted pipe. Make sure that the minimum space between the pipe and the wall of the conduit sleeve is in accordance with the minimum allowed distance as certified.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM



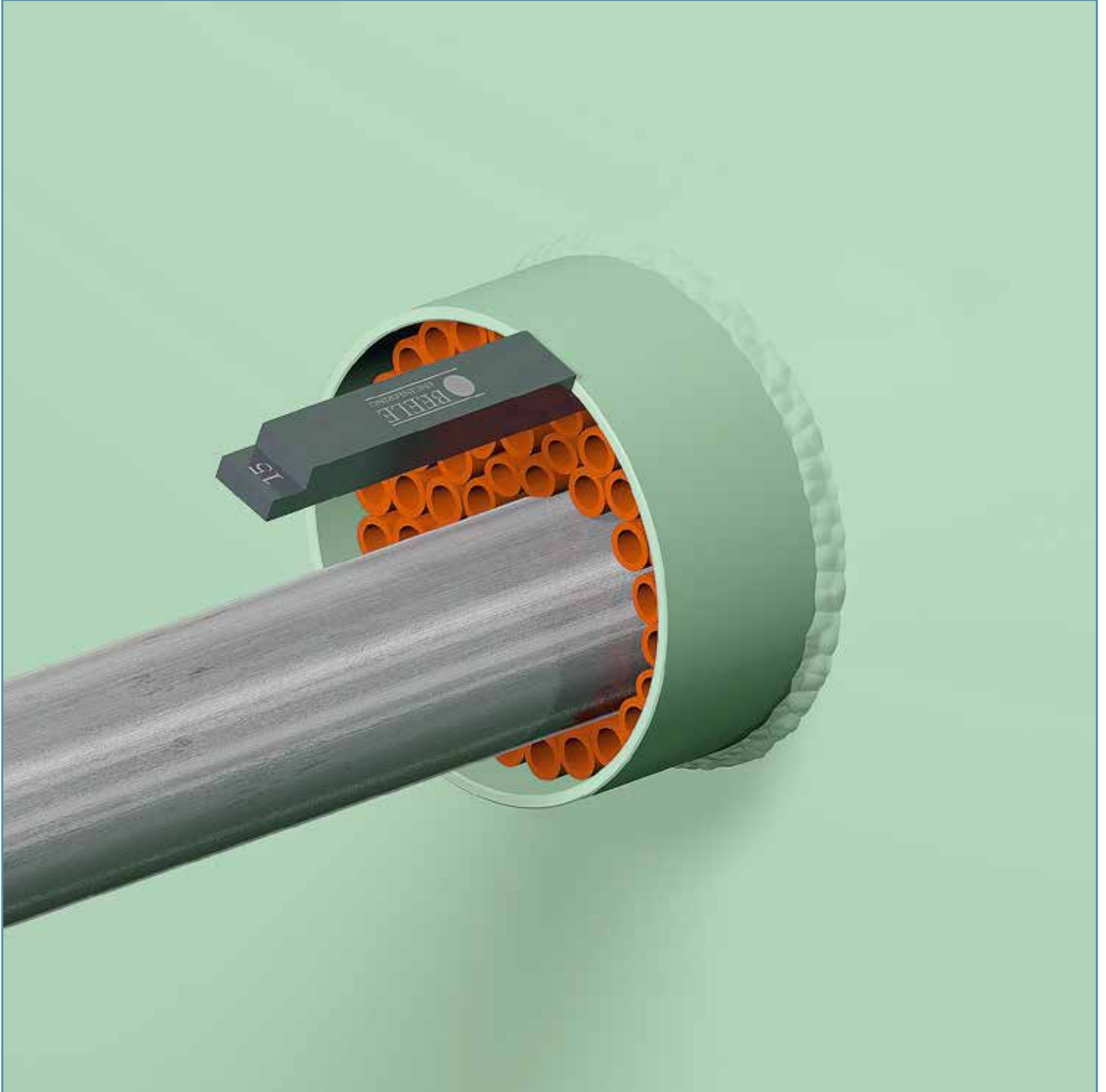
The open space between the conduit sleeve and the ducted pipe is filled with NOFIRNO® multi-filler sleeves type 22/15, or as an alternative, a combination of NOFIRNO® (multi-) filler sleeves type 18/12 and 27/19. For ease of filling, the NOFIRNO® filler sleeves are supplied non-split. The ratio 27/19 to 18/12 should be about 2:1. Alternative only filler sleeves type 22/15. The insertion does not have to be precise in this regard. Adjustment of the set of sleeves to the 20 mm recess can be carried out just before applying the sealant.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM



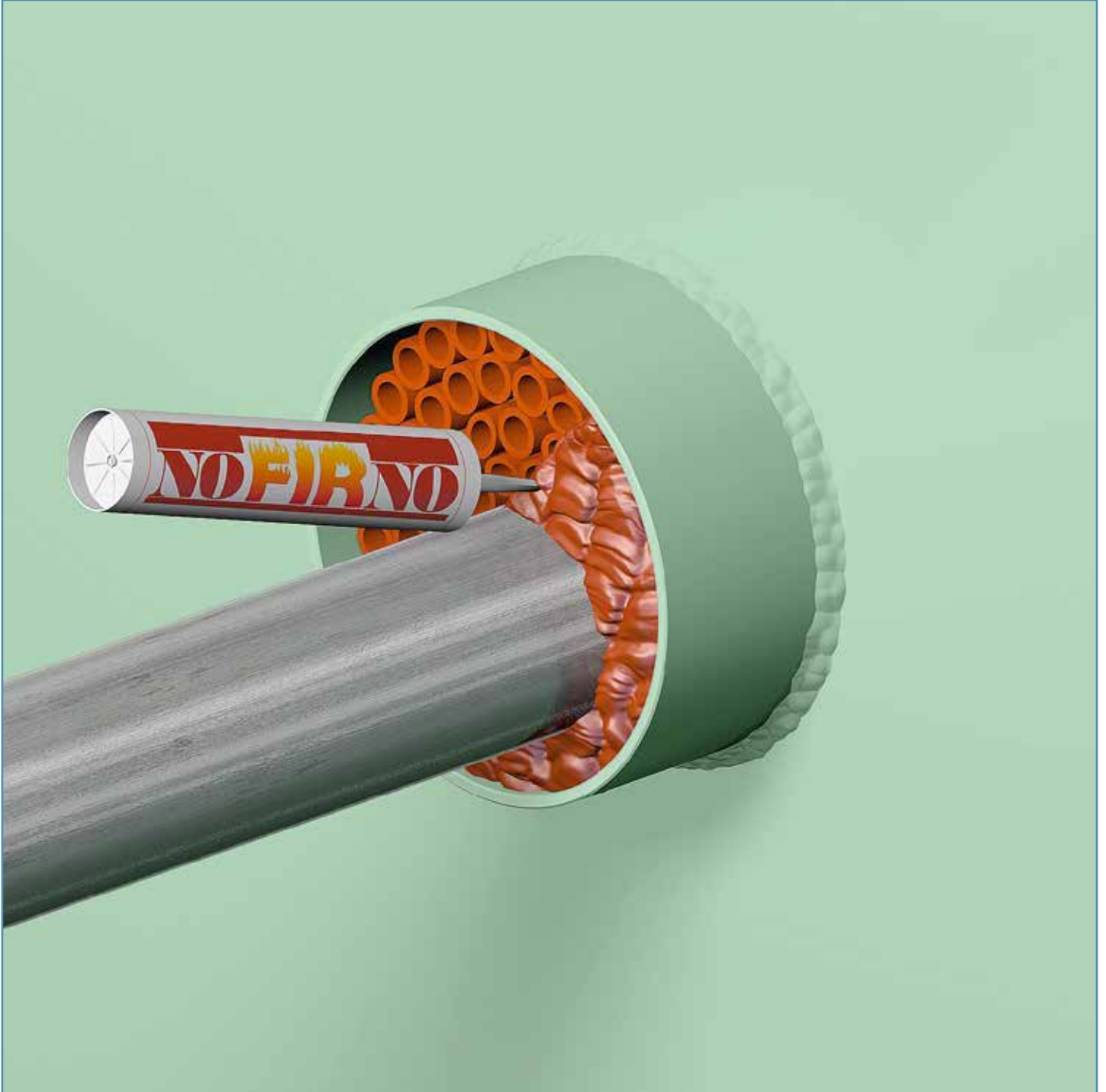
The smaller openings are now filled with parts of the sets of multi-filler sleeves. To tear off sleeves from the multi-set, the procedure is to do this backwards/forwards and not sideways. This is because of the strength of the intermediate rubber parts.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM



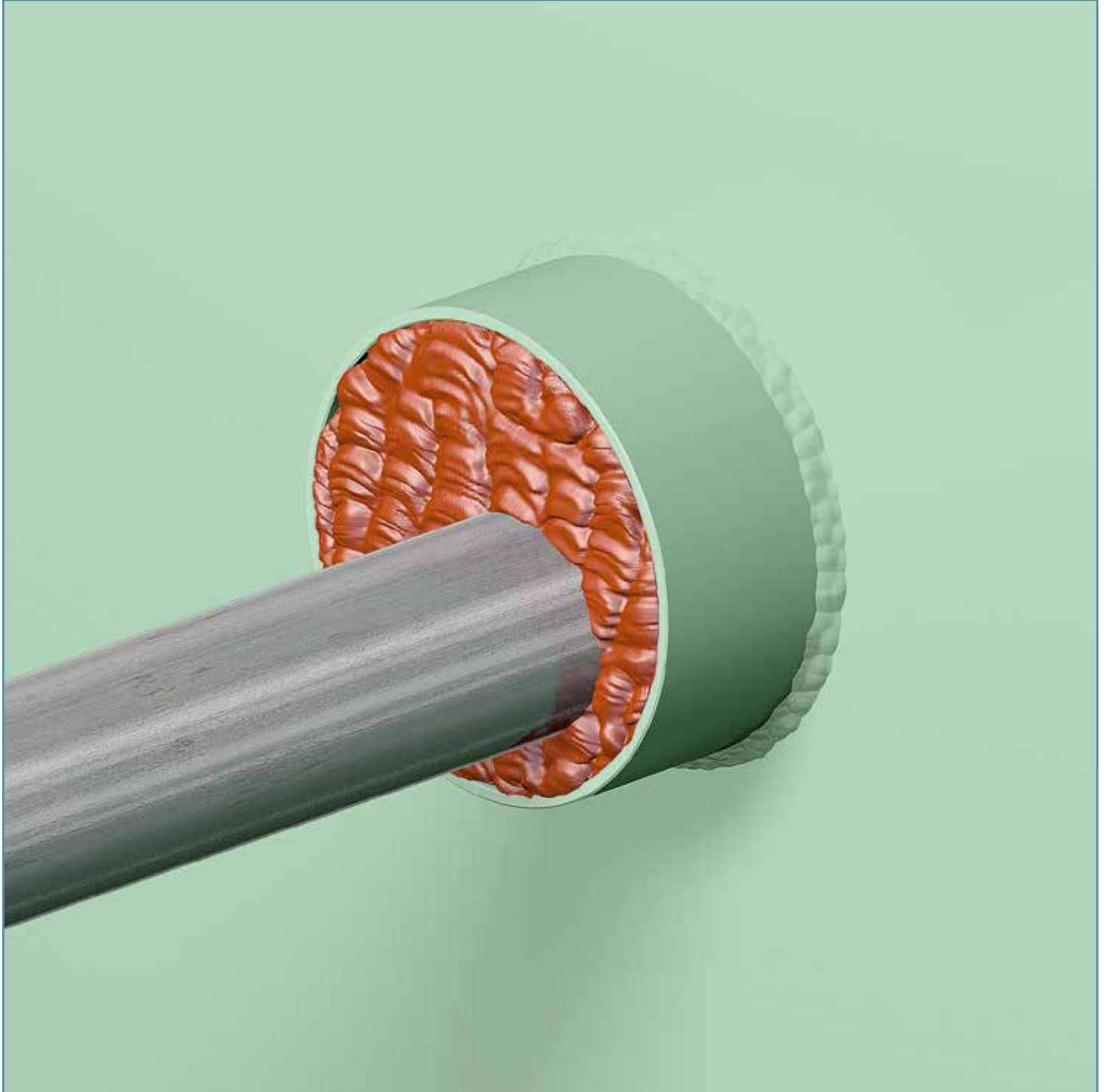
With a piece of wood marked with the required 20 mm depth, or with the aluminum adjuster developed by BEELE Engineering. Use a plastic hammer to adjust the set of filler sleeves with the NOFIRNO® adjuster.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM



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

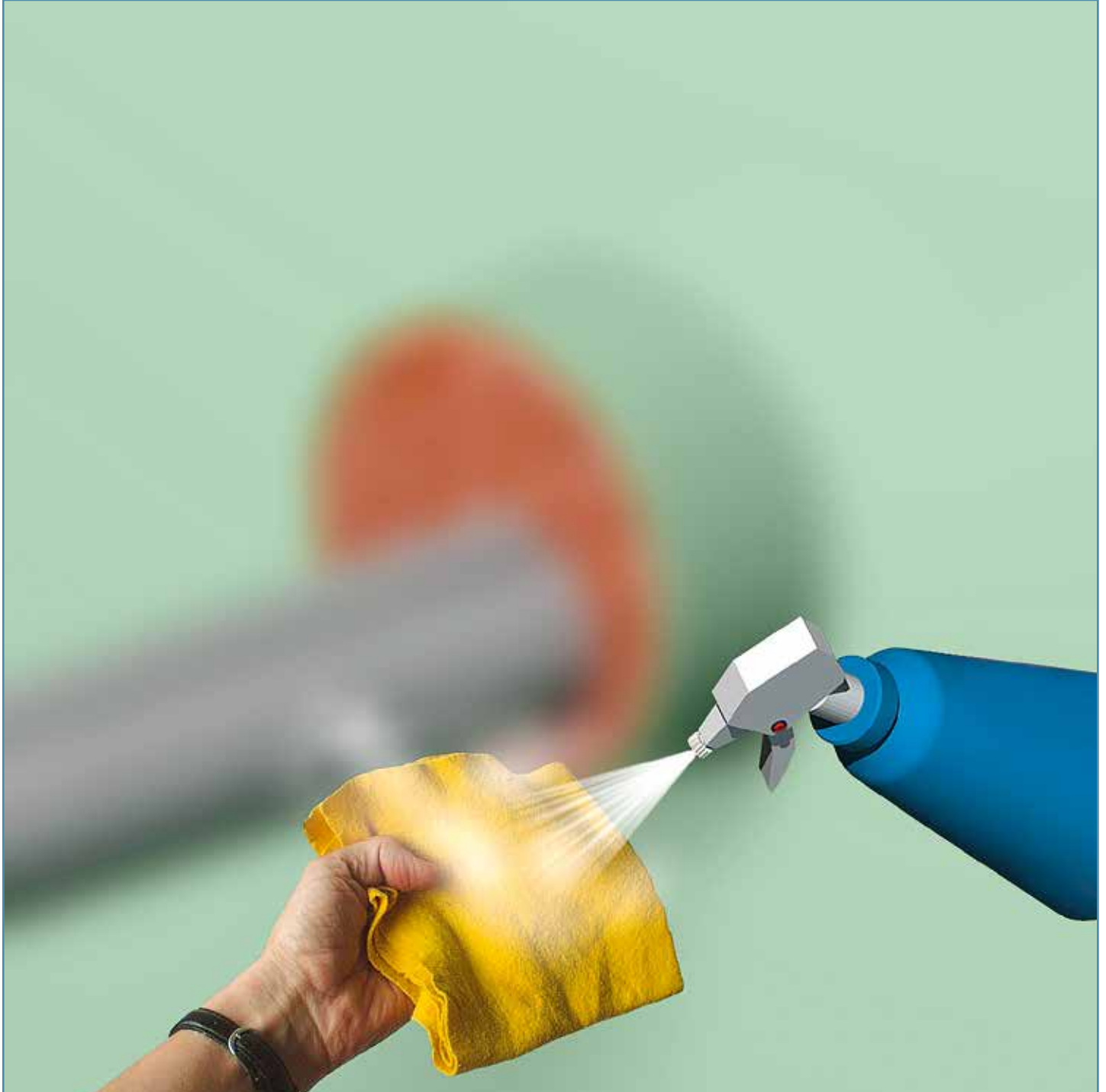
INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM



The pipe transit should be overfilled with NOFIRNO® sealant, because some sealant will be pushed into the empty spaces between and into the hollow NOFIRNO® (multi) filler sleeves during further finishing. This will contribute also to obtain higher tightness ratings.

Skin formation of the sealant takes place after ca. 10-15 minutes. In case of larger transits, do not apply more sealant than can be finished within this time-frame.

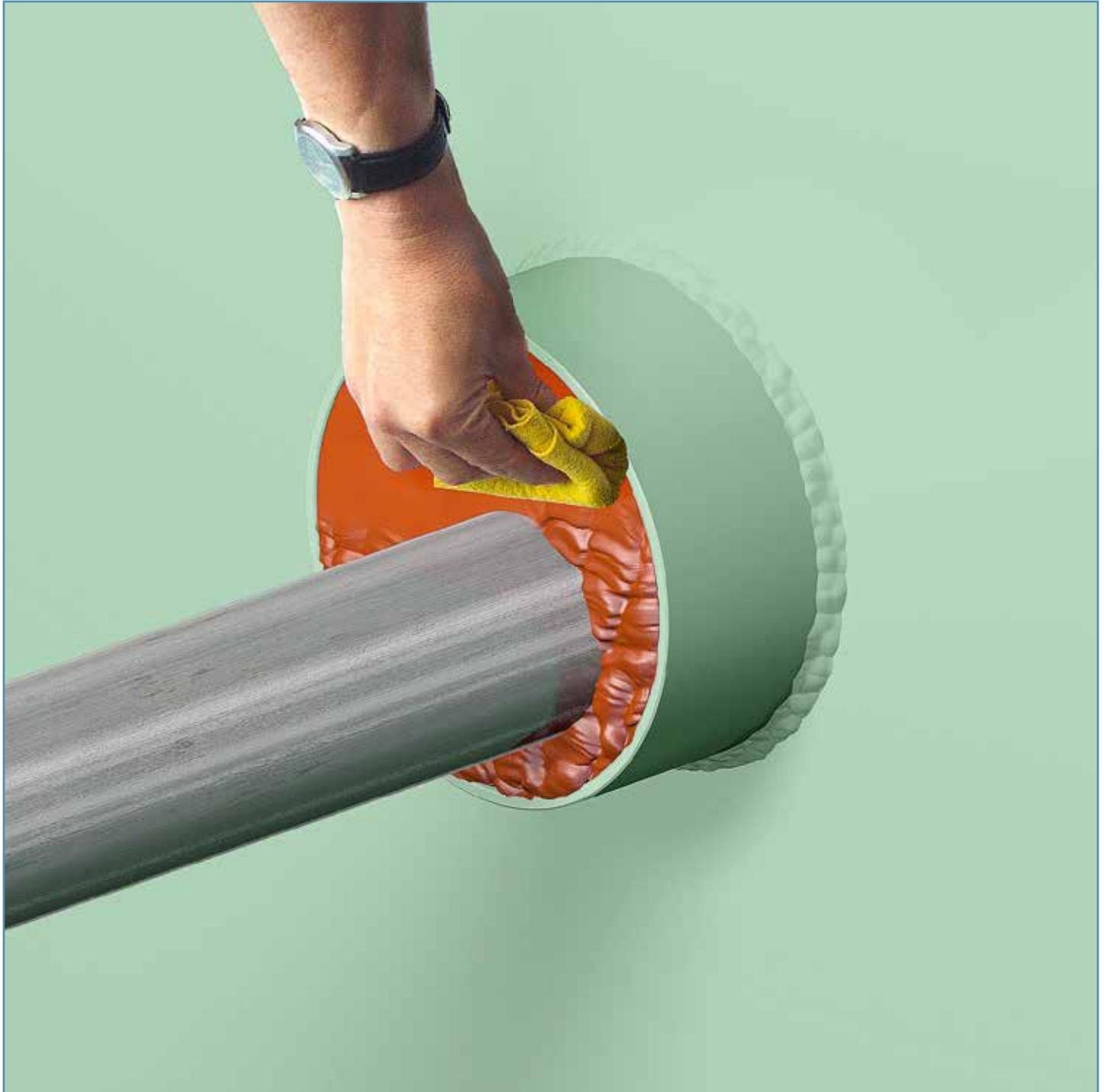
INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM



To smooth the surface of the NOFIRNO® sealant layer, a cloth is sprayed with water. This prevents the sealant from sticking to the cloth.

Please refer to the Safety Data Sheet for more information about the working environment.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM



The cloth is then used to press down the sealant layer flush with the end of the transit frame. It is of utmost importance to ensure that the sealant is pressed very tightly so that the sealant is compressed into all empty spaces of the NOFIRNO® sleeve set, including partially into the hollow filler sleeves. The larger the adhesive surfaces of the sealant, the higher the performance of the system.

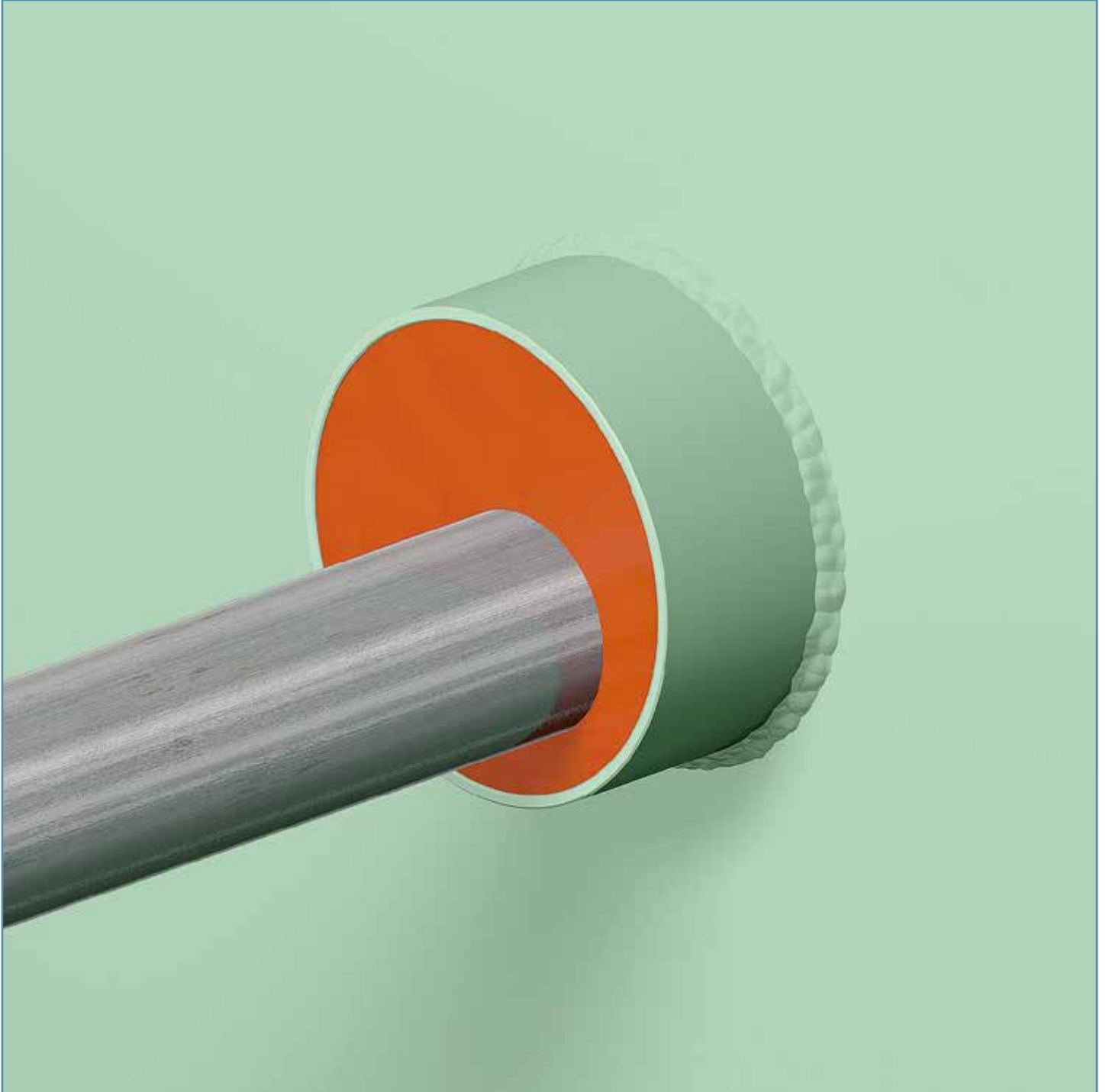
INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM



The surface can be smoothed by hand. Just wet the hands thoroughly with soap and water. No dirty hands when working with NOFIRNO® and a very neat surface is the result. Note: this should only be a smoothing procedure. Do not pack or compress the sealant further when using soap water.

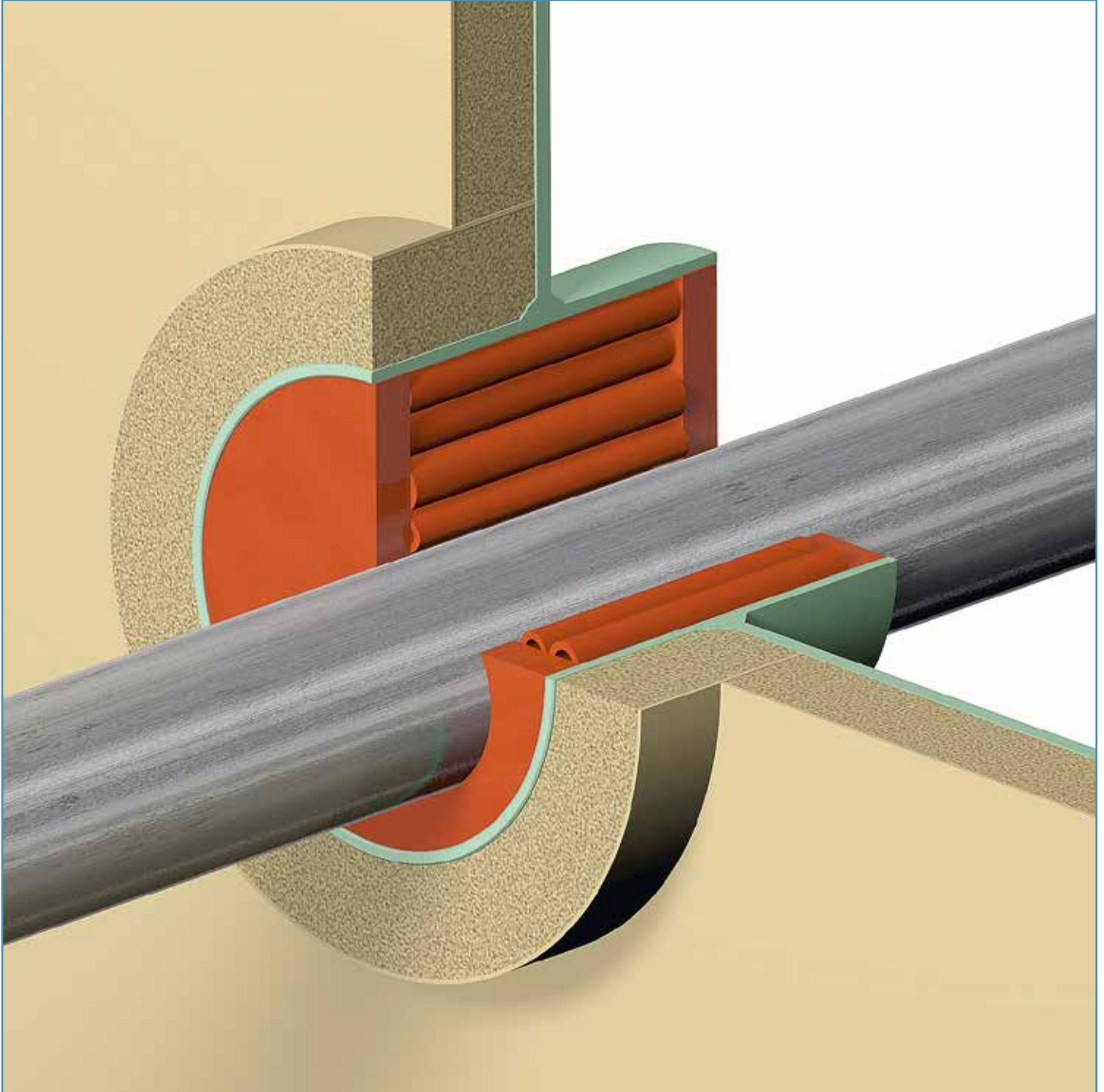
Wear protective gloves when working with NOFIRNO® sealant. Please refer to the Safety Data Sheet for more information.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM



To obtain optimum adhesion during the curing process of the sealant, the pipe should be tightly fixed at both sides of the transit, as close as possible to the transit, and immediately after finishing the transit. Movement of the pipe during the curing process will impair the adhesion process to the surface of the pipe. Note: time needed for curing of the sealant is dependent on air humidity in combination with the environmental temperature. It is advisable to place a sticker near the finished transit, stating that the transit has been recently installed, and should not be touched or damaged.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM



For A-class penetrations (which are insulated), the NOFIRNO® multi-pipe transit frame needs to be insulated only at the insulated side of the bulkhead or the lower side of the deck. Also approved for A-0 penetrations. Check the Type Approval Certificates for the insulation lengths to be applied around the ducted pipes to fulfil the criteria of the maximum temperature rise for A-class penetrations according to the FTP code. MED certificate 192130009AA00 issued by KIWA Netherlands.

No metal parts are incorporated in the sealing system. The conduit frames cannot corrode inside due to the tight sealant layers at both sides of the transit. No CUI (Corrosion Underneath Insulation).

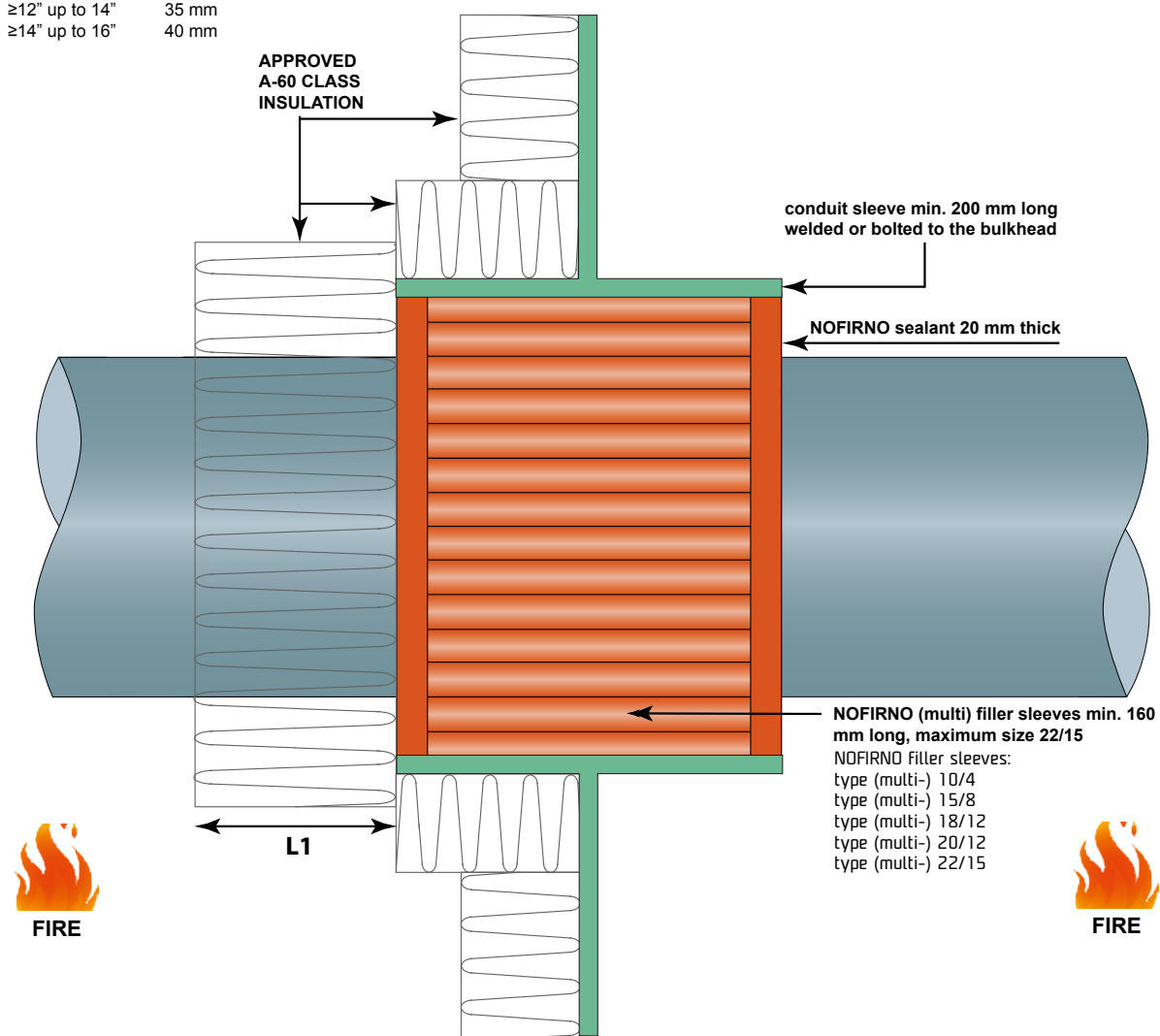
INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM

**direction of exposure:
fire from either side**

Minimum clearance between
conduit sleeve and ducted pipe:

OD pipe	
up to 3"	15 mm
≥3" up to 8"	20 mm
≥8" up to 12"	30 mm
≥12" up to 14"	35 mm
≥14" up to 16"	40 mm

NOFIRNO SEALING SYSTEM
for steel/ss/CuNi & GRE pipes
min. 1/16" - max. 16" NPS



L1 = length of Insulation around ducted pipe:

steel/ss/CuNi & GRE pipes	
up to 1"	200 mm
>1" up to 3"	350 mm
>3" up to 6"	500 mm
>6" up to 10"	700 mm
>10" up to 14"	900 mm
>14" up to 16"	1200 mm

conduit sleeve positioned:
- **symmetrically**
or
- **non-symmetrically with longest
length on unexposed side**



Description: NOFIRNO sealing system for A60 class bulkheads

Mat.: NOFIRNO sleeves/sealant

Ref.: JAB

Date:

14-10-2019

Scale:

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NFN 130E

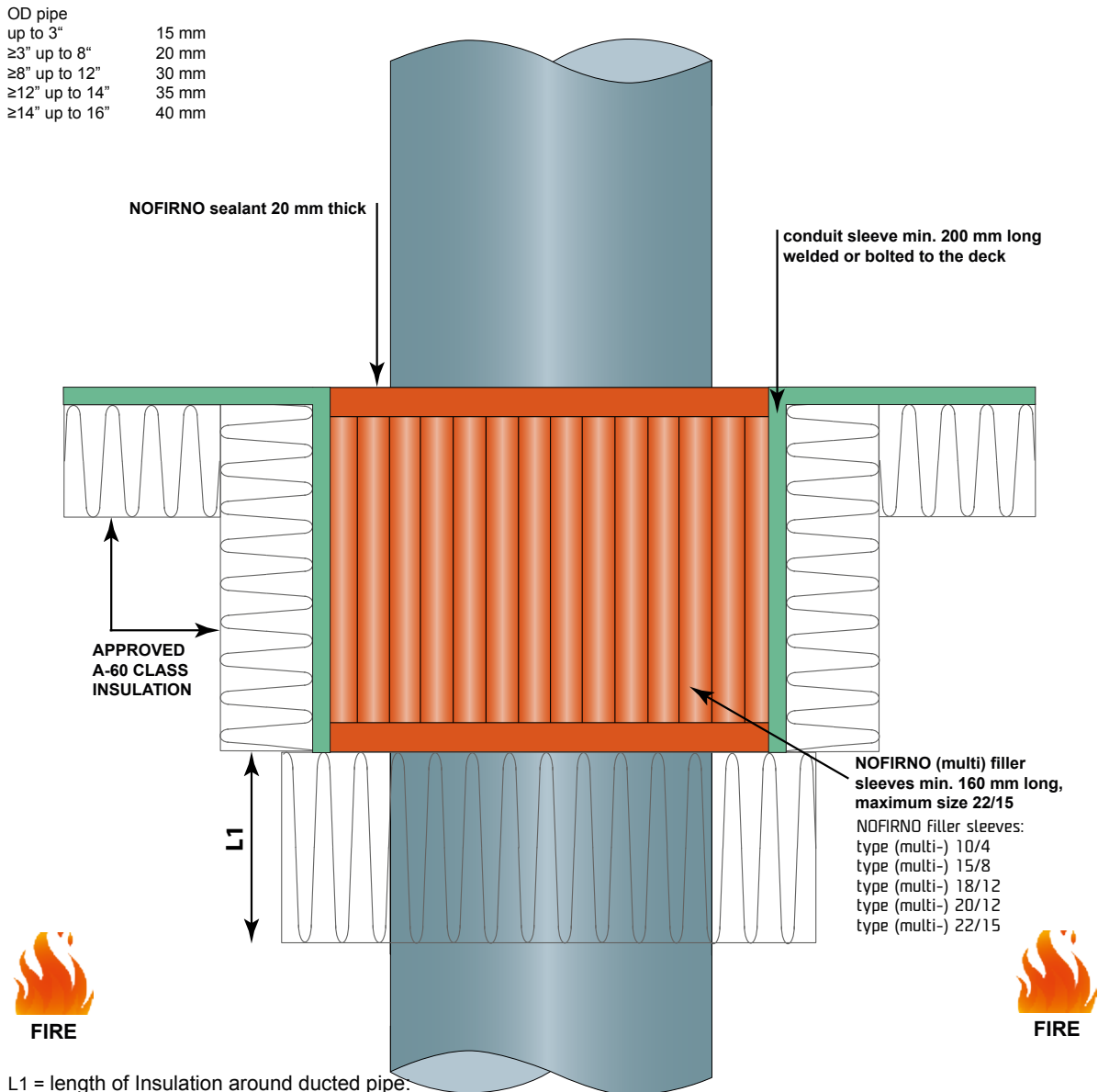
INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM

**direction of exposure:
fire from either side**

Minimum clearance between
conduit sleeve and ducted pipe:

OD pipe	
up to 3"	15 mm
≥3" up to 8"	20 mm
≥8" up to 12"	30 mm
≥12" up to 14"	35 mm
≥14" up to 16"	40 mm

NOFIRNO SEALING SYSTEM
for steel/ss/CuNi & GRE pipes
min. 1/16" - max. 16" NPS



L1 = length of Insulation around ducted pipe.

steel/ss/CuNi & GRE pipes

up to 1"	200 mm
>1" up to 3"	350 mm
>3" up to 6"	500 mm
>6" up to 10"	700 mm
>10" up to 14"	900 mm
>14" up to 16"	1200 mm

conduit sleeve positioned:
- totally below deck
up to
- fully above deck



Description: NOFIRNO sealing system for A60 class decks

Mat.: NOFIRNO sleeves/sealant

Ref.: JAB

Date:

14-10-2019

Scale:

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Rev. 1

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NFN 131E

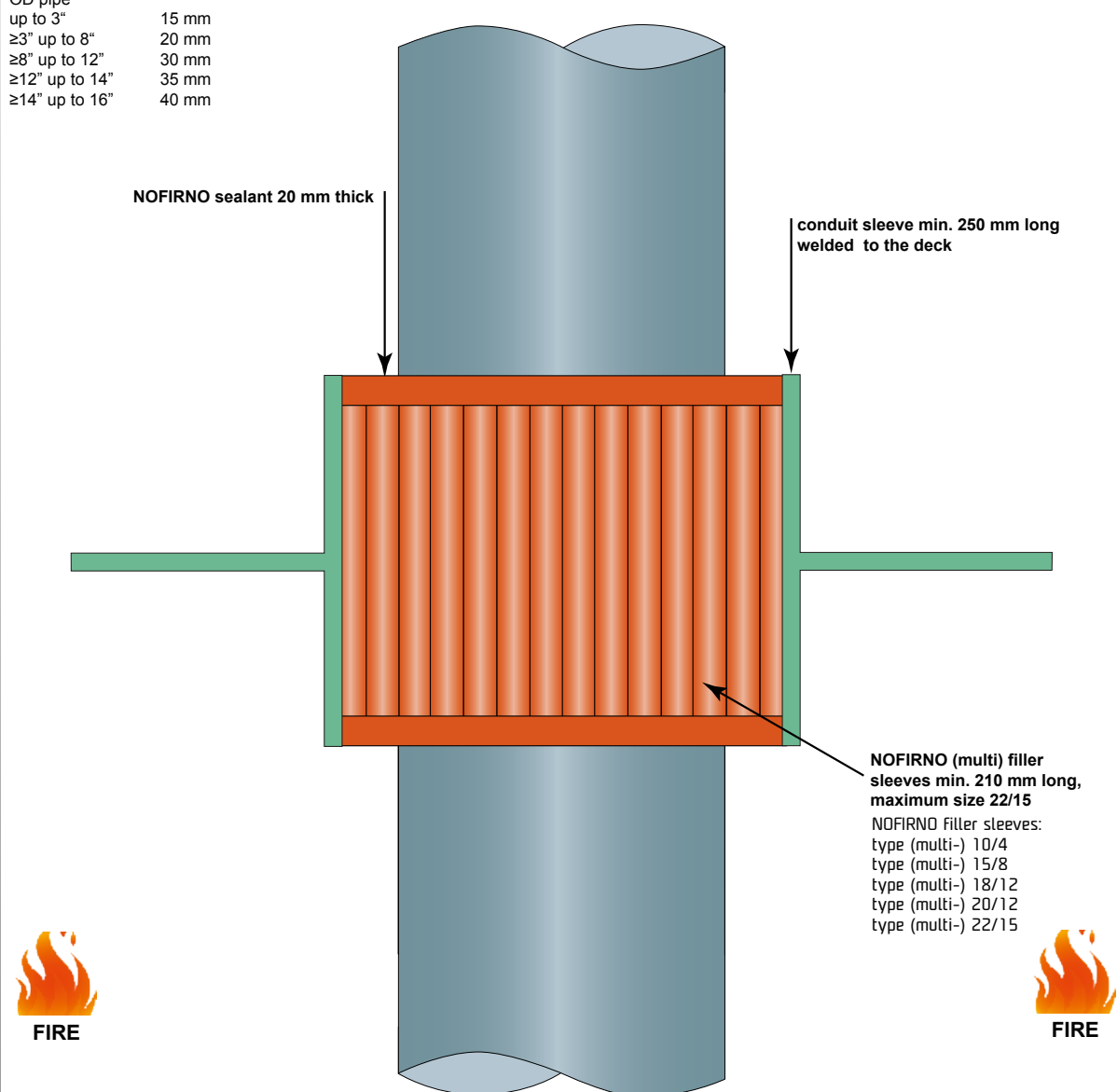
INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM

**direction of exposure:
fire from either side**

Minimum clearance between
conduit sleeve and ducted pipe:

OD pipe	
up to 3"	15 mm
≥3" up to 8"	20 mm
≥8" up to 12"	30 mm
≥12" up to 14"	35 mm
≥14" up to 16"	40 mm

NOFIRNO SEALING SYSTEM
for steel/ss/CuNi & GRE pipes
min. 1/16" - max. 16" NPS



conduit sleeve positioned:
- symmetrically
or
- non-symmetrically with longest
length on unexposed side

	Description: NOFIRNO sealing system for A0 class decks			
	Mat.: NOFIRNO sleeves/sealant			
	Ref.: JAB	Date:	14-10-2019	Scale:
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	Rev. 2			

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



NOFIRNO® is approved also for multi-pipe transits. The transit frames might be welded into the partition long before pipe ducting will start. For this reason, the condition of the inside of the frame/sleeve has to be checked when starting pipe ducting. Before insertion of the NOFIRNO® filler sleeves, the inside of the transit frames has to be cleaned, and any dirt, oil, grease and other residues or corrosion should be removed from the inside of the transit frame.

Note: for fire resistant penetrations the max. size of the transit frame is 600x300 mm or equivalent of 1800 cm².

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



With a steel brush or by blasting, the corroded inner surface of the transit frame should be treated to remove these corroded spots. The excellent adhesive properties of the sealing system will be diminished by corroded surfaces.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM

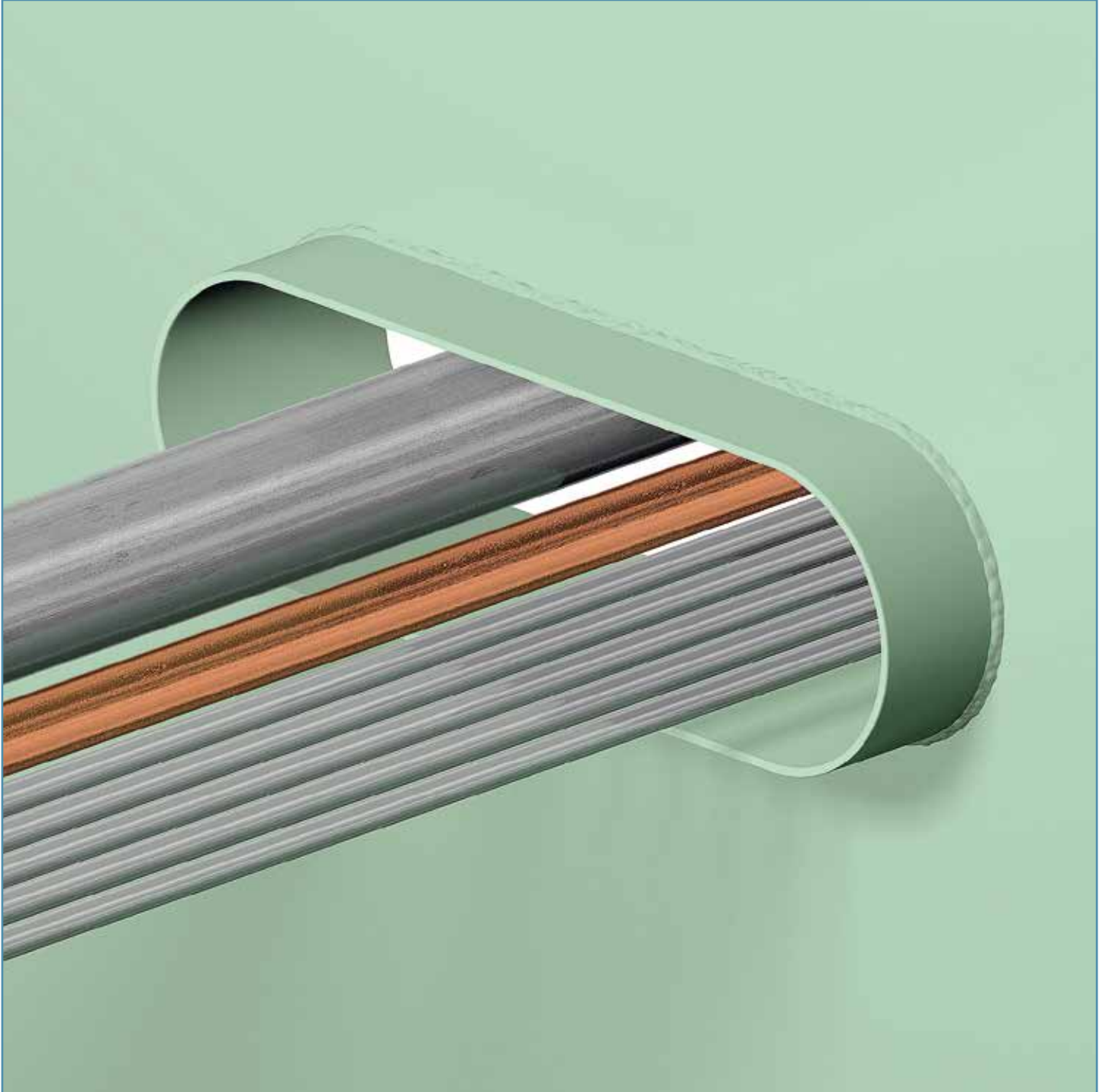


The NOFIRNO® sealing system is composed of (multi-) filler sleeves, and layers of sealant. The sleeves are the backing on which the sealant is going to be applied. A 20 mm thick layer of sealant is applied at both sides of the penetration. Before welding the transit frame into the partition, check if the transit frame is deep enough to be in line with the certification of the sealing system.

The NOFIRNO® filler sleeves are 40 mm shorter in length than the depth of the transit frame.

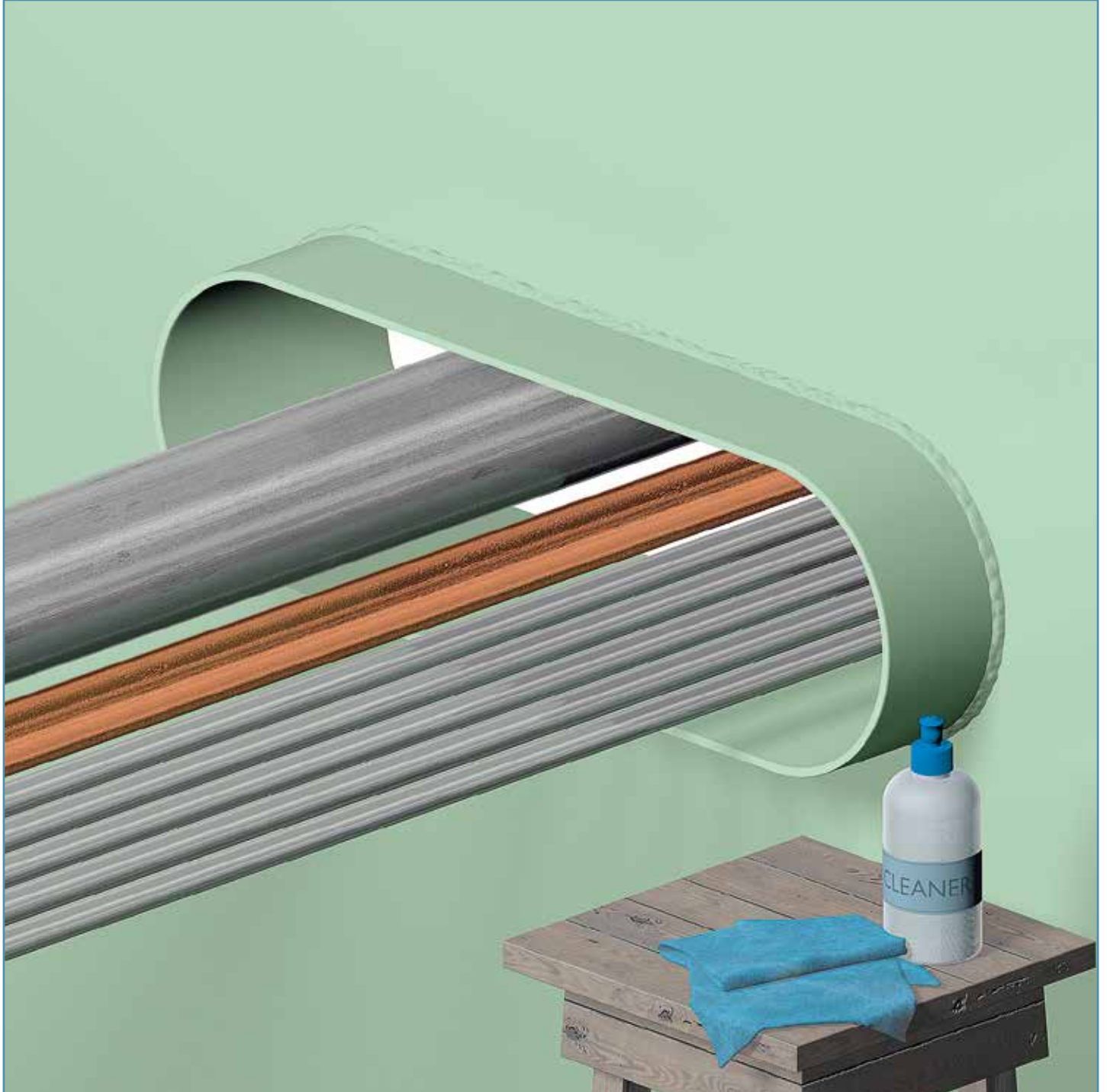
Note: for high rated watertight penetrations, the transit frame should be either of a limited size or partitions should be placed inside the larger transit frames to divide the frame in smaller sections.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



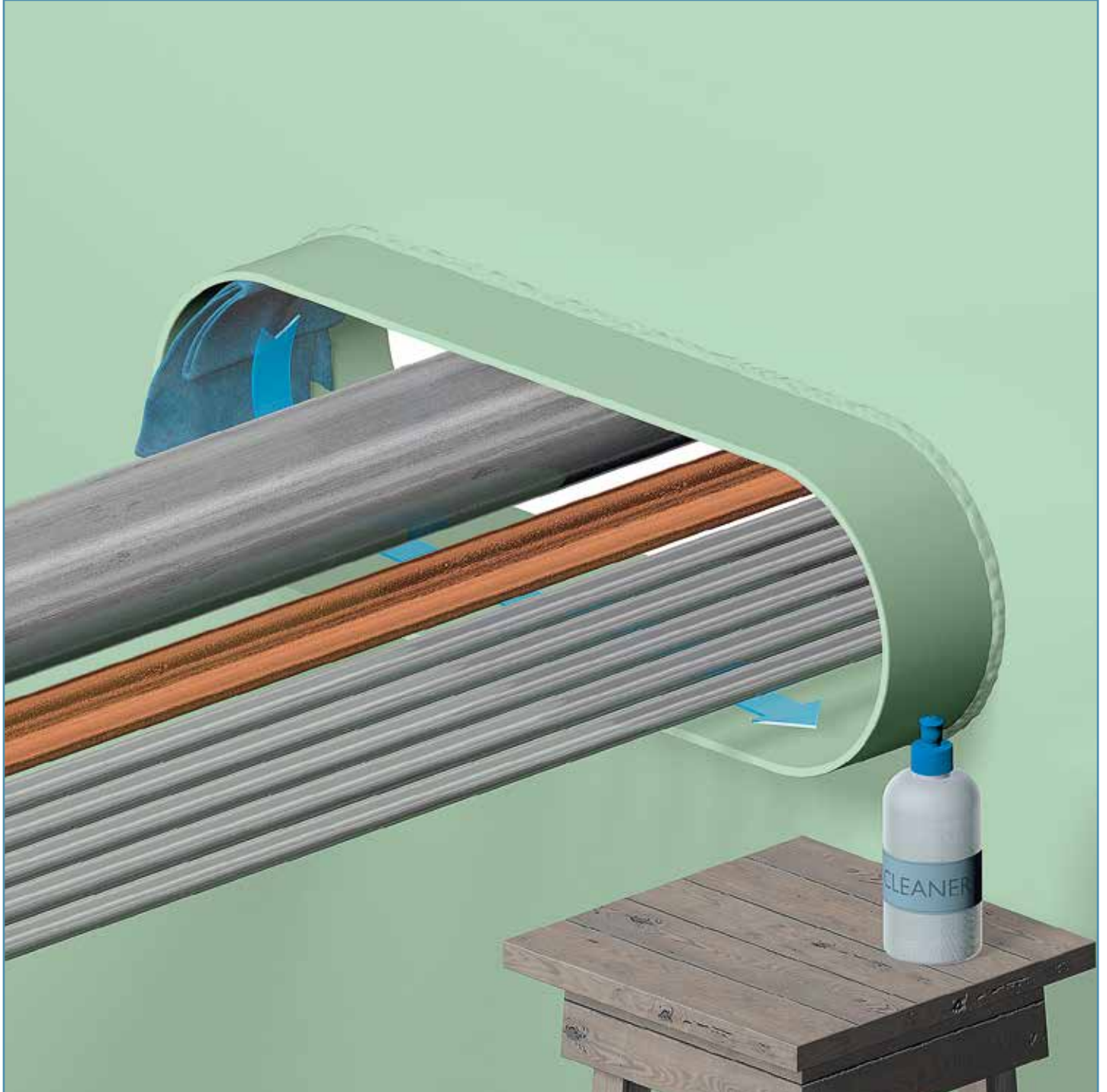
The pipes can be ducted through the transit frame in random order. It is most important that they are ducted with the required interspacing according to the certified drawings, and with not less than the minimum allowable distance to the wall of the conduit frame.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



For adequate cleaning purposes (which is an important step), sufficient separation of the ducted pipes and access to the wall of the conduit frame is of utmost importance.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



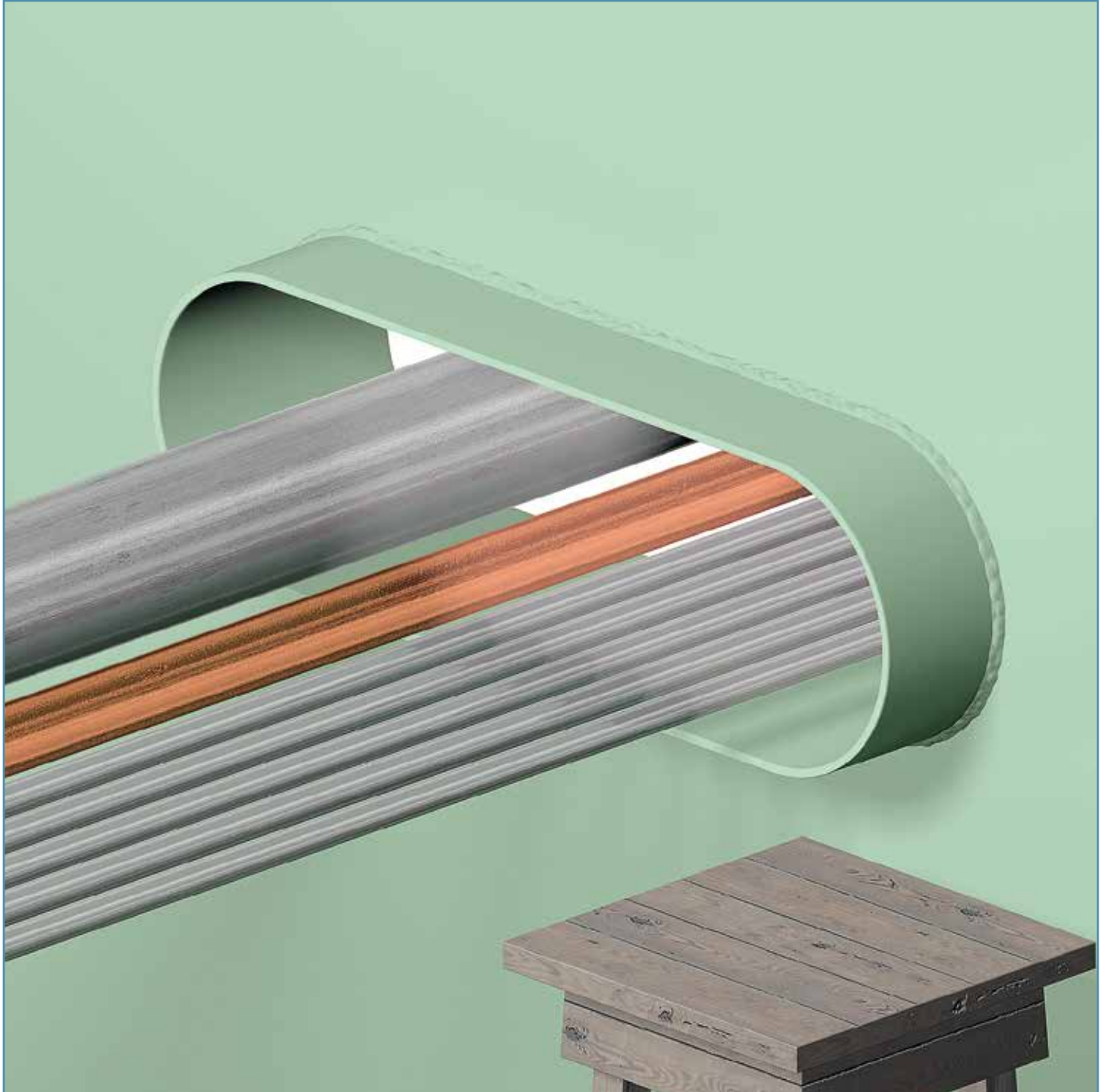
Final sealing of the pipe penetration may be quite some time after ducting the pipes. In such a situation, the status of the inside of the transits frames has to be checked again when starting with the installation of the sealing system. Clean the inside of the transit frames thoroughly and remove any dirt, oil, grease and other residues or corrosion from the inside of the transit frame.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



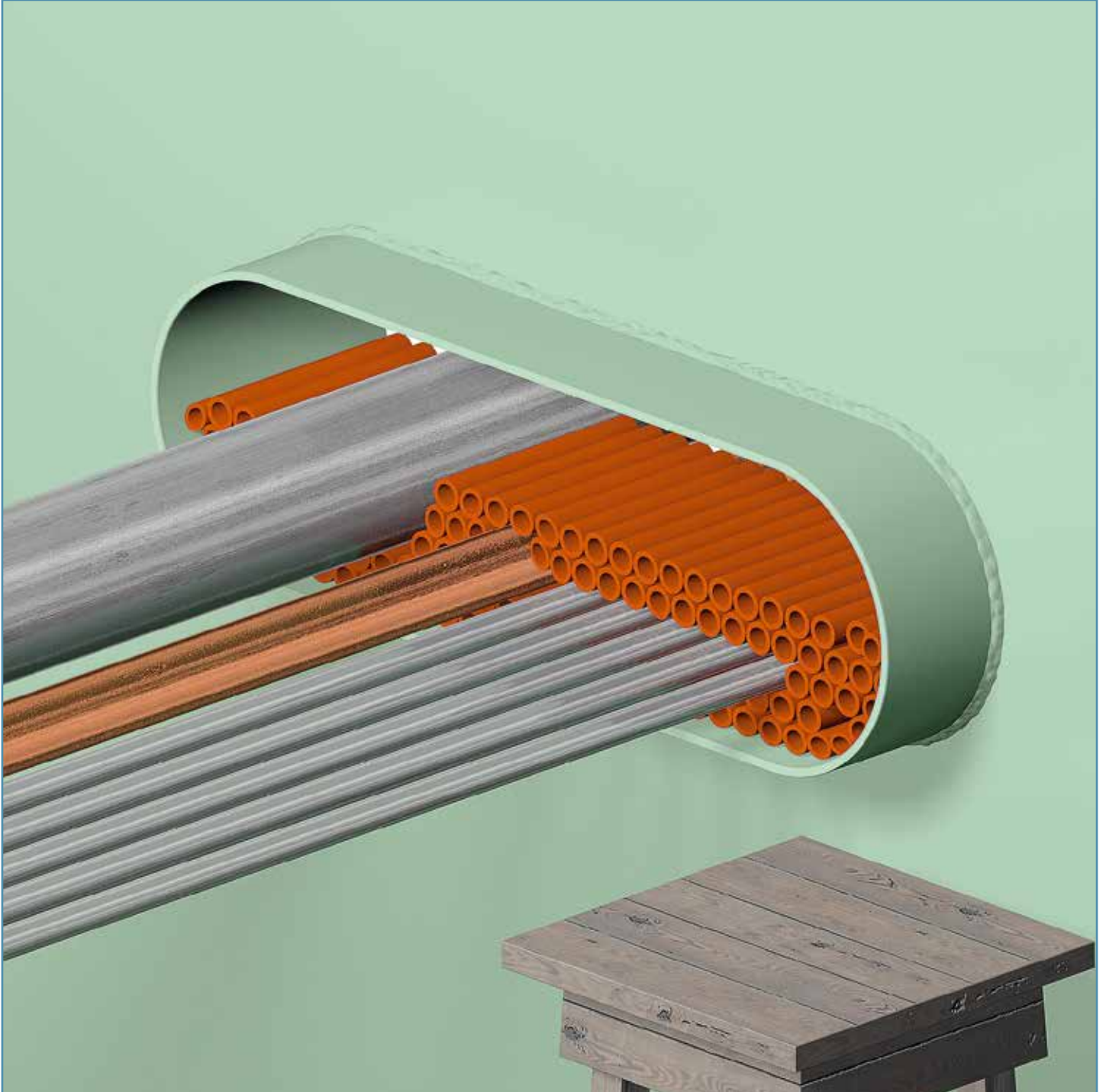
Clean and dry the pipes thoroughly in a similar way. Any moisture, dirt or oil residues will have a negative impact on the adhesive properties of the NOFIRNO® sealant to be applied after filling the transit frame.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



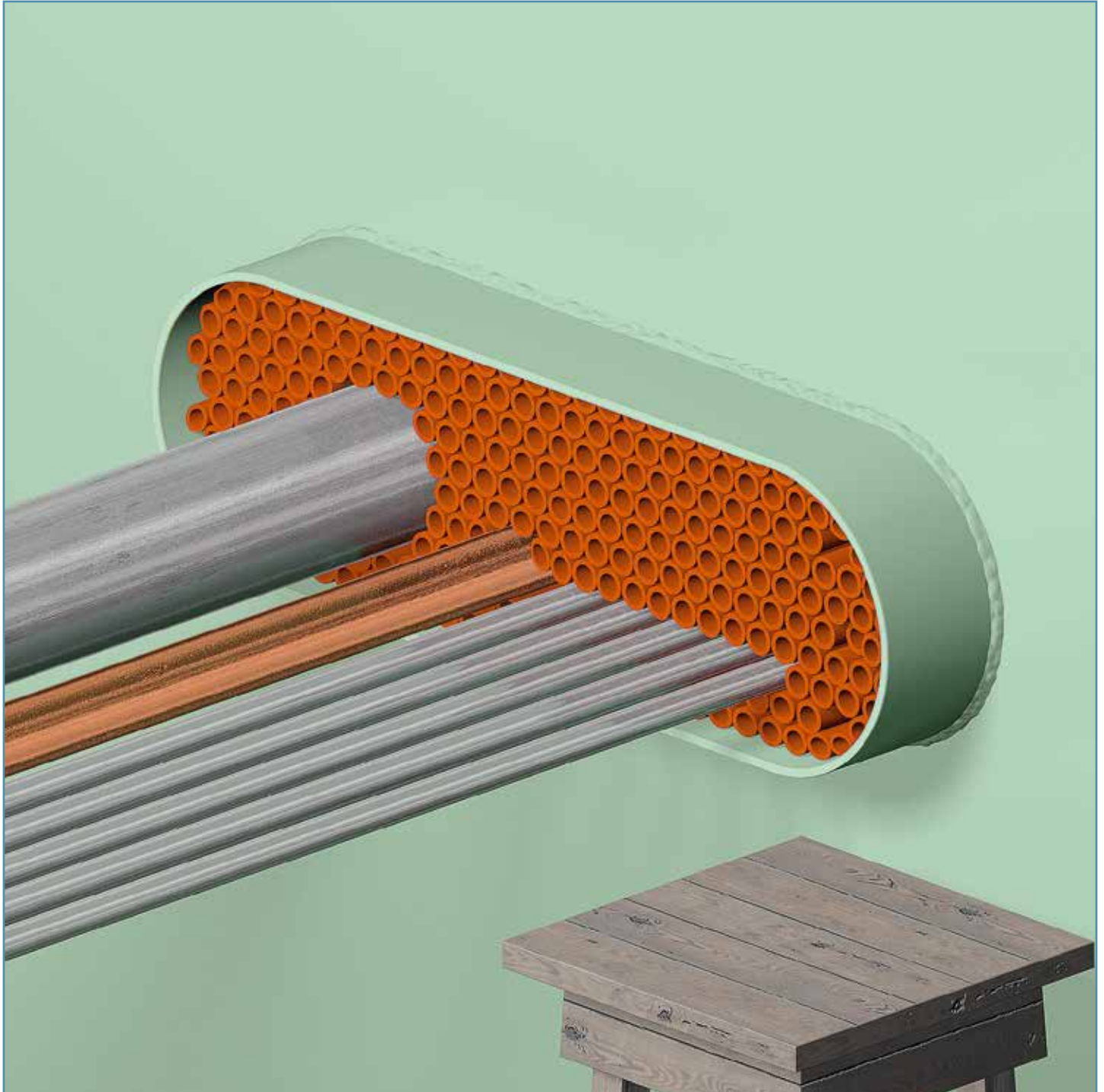
The pipes have to be cleaned at the spot where the sealant is applied in a later stage. This means 20 mm at both sides of the transit. If feasible, it is of course easier to clean the pipes over their full length inside the transit.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



For later extensions, it is advisable to use NOFIRNO® single filler sleeves, since they are easier to remove when a new pipe has to be ducted.

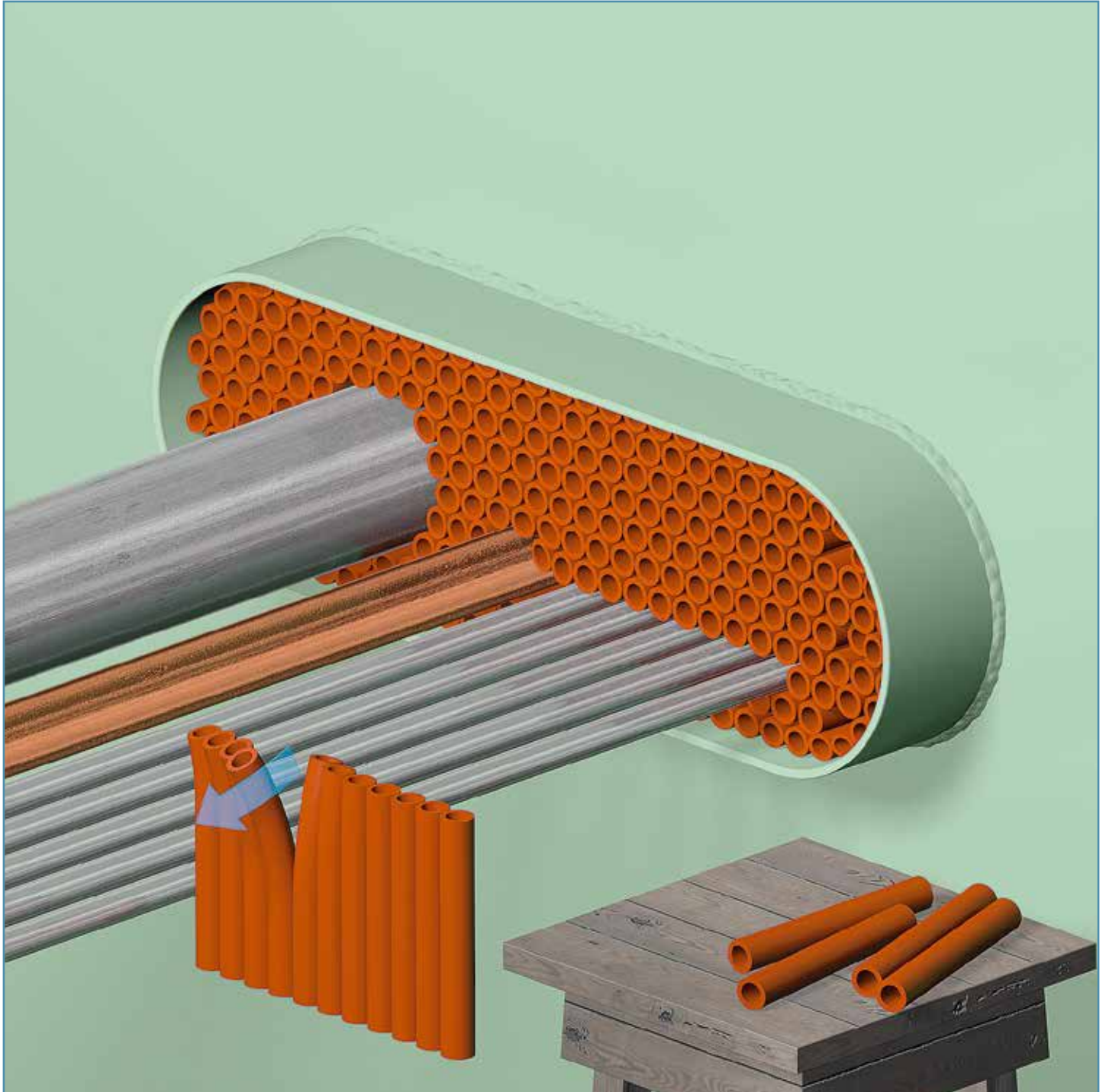
INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



By applying NOFIRNO multi-sleeves type 22/15 instead of the mix of type 18/12 and 27/19, mistakes with the filling ratio of the filler sleeves 18/12 and 27/19 are eliminated.

Although a ratio of the filler sleeves 27/19:18/12 of 2:1 has been tested officially, it is advisable to use a lower ratio, for instance 1:1, to improve overall mechanical stability. Especially in the case of watertight penetrations.

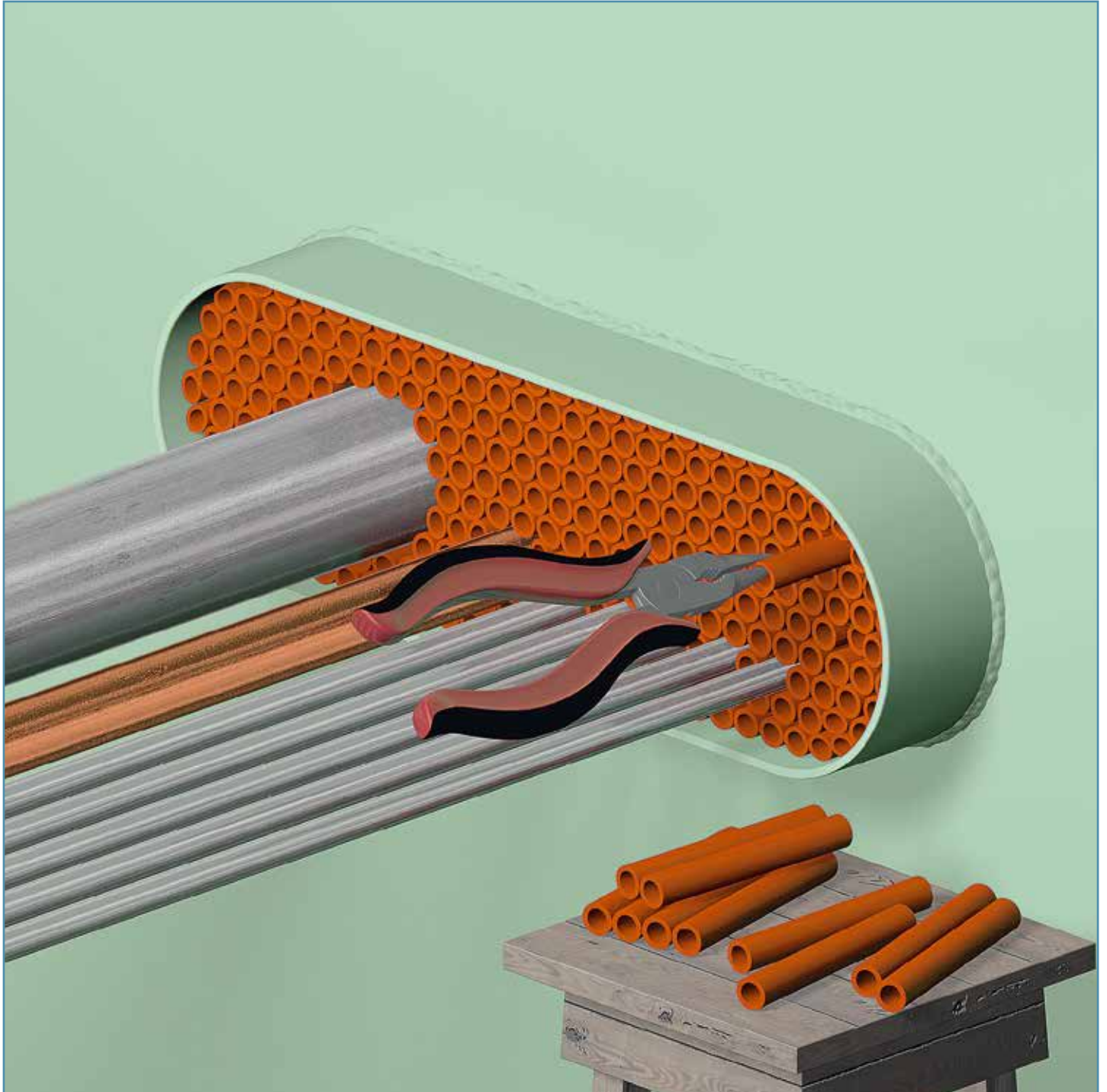
INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



The smaller openings are now filled with parts of the sets of multi-filler sleeves. To tear off sleeves from the multi-set, the procedure is to do this backwards/forwards and not sideways. This is because of the strength of the intermediate rubber parts.

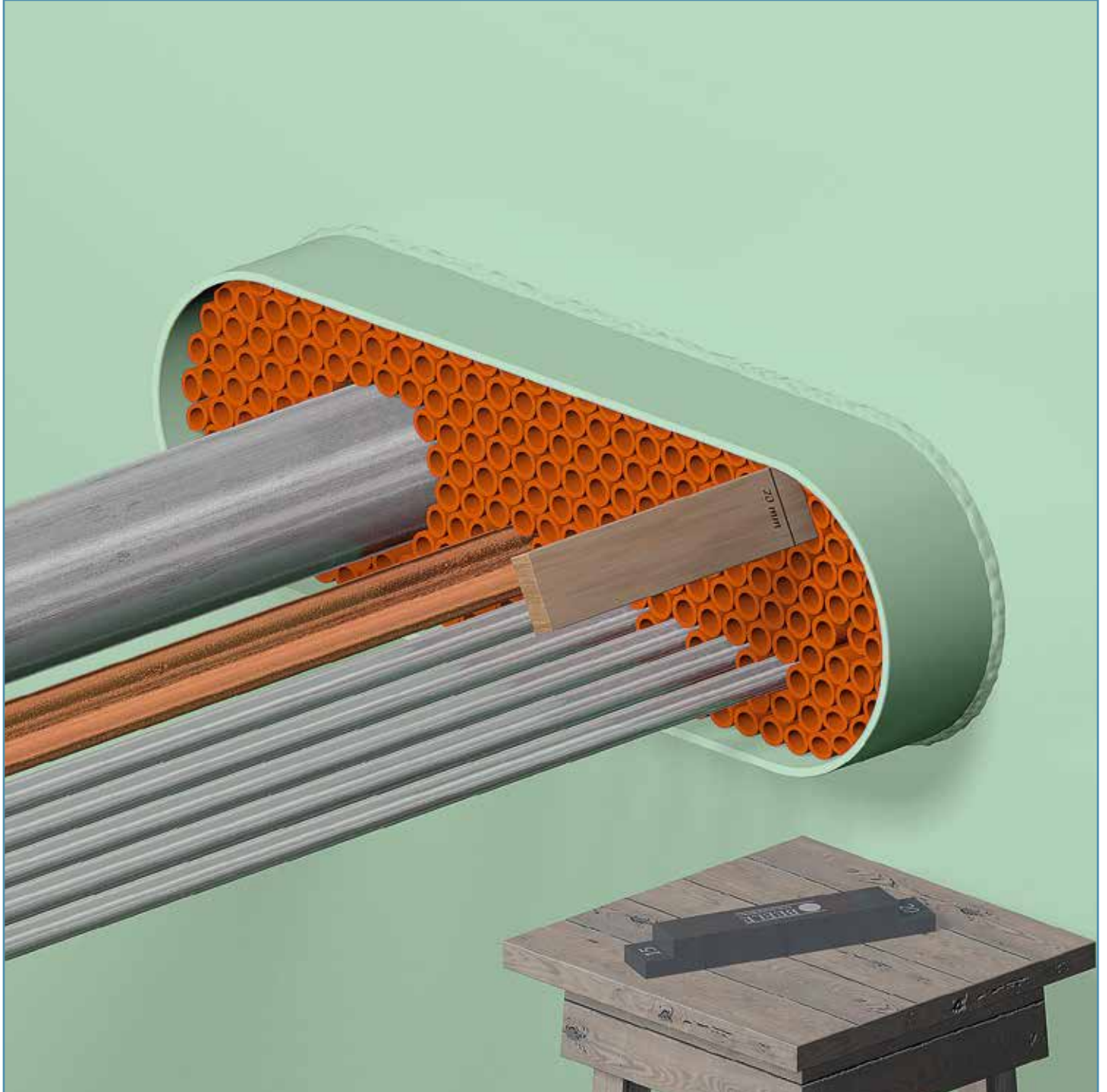
Push the filler sleeves into the transit frame in such a way as to leave about 20 mm free space at the front and the back. The insertion does not have to be precise in this regard. Adjustment of the set of sleeves to the 20 mm recess can be carried out just before applying the sealant.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



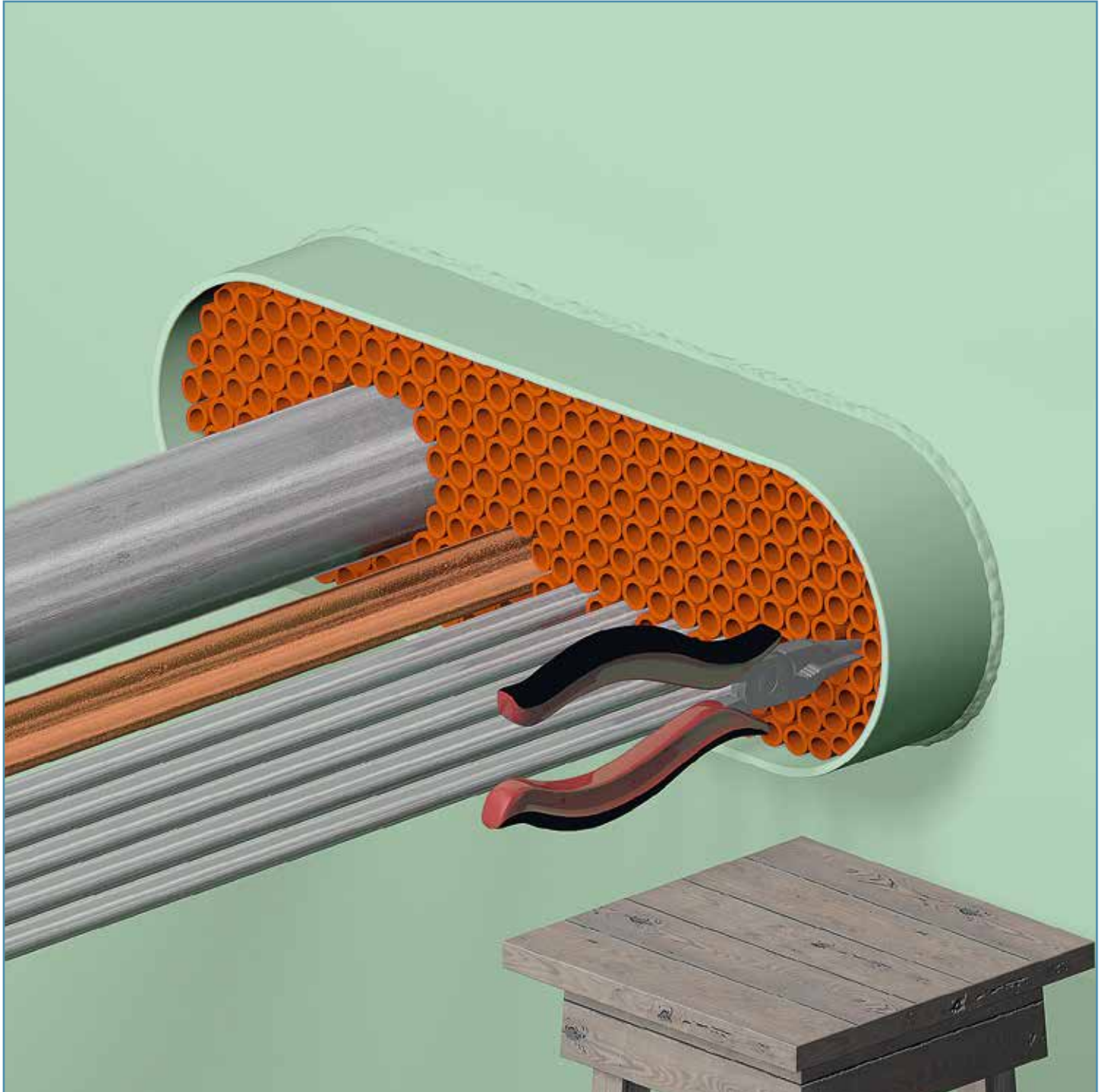
With a flat nose pliers, NOFIRNO® single filler sleeves are inserted in the remaining smaller open spaces in the set of fillers. A very tight fit of the filling is vital to the performance of the sealing system.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



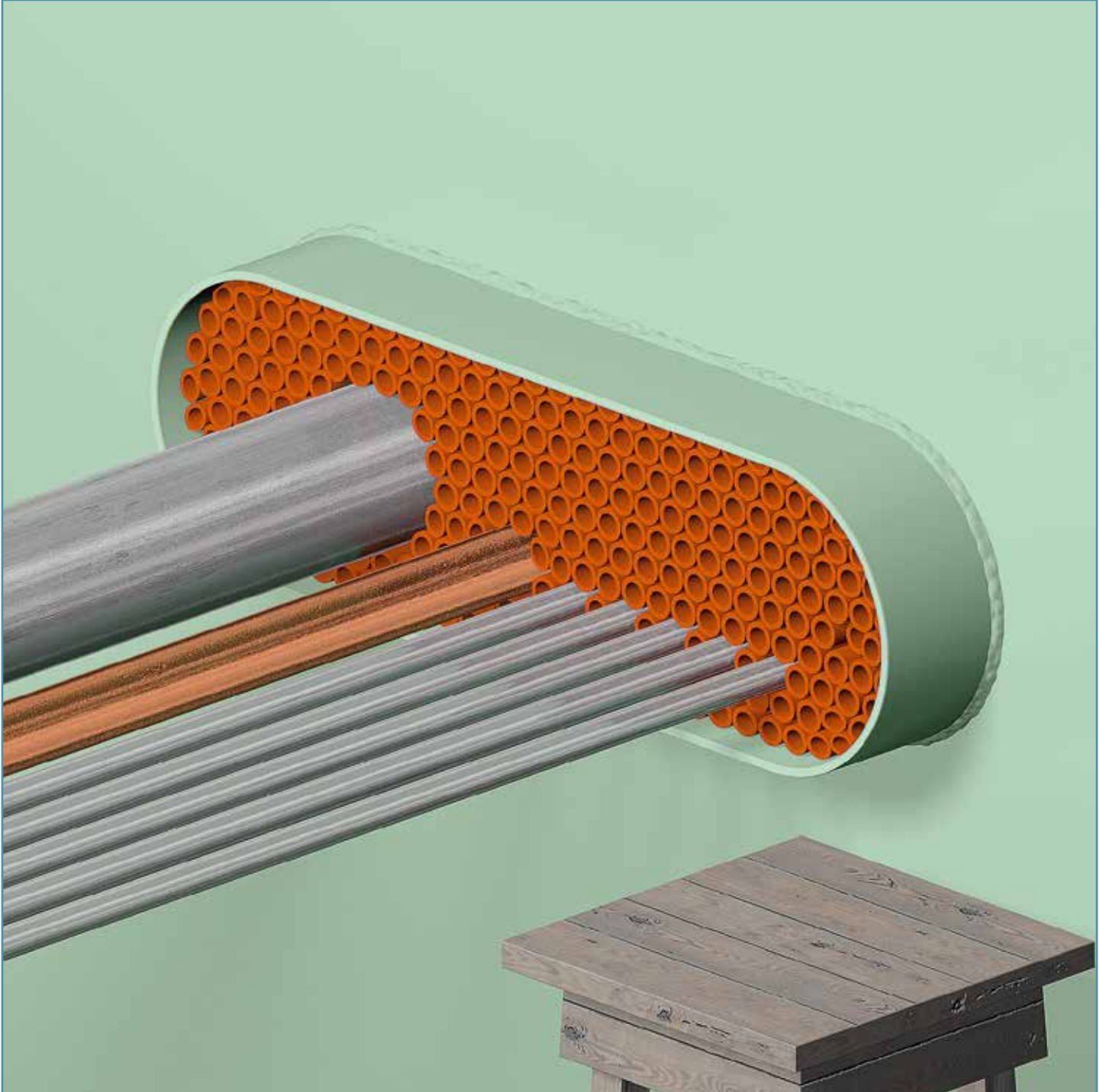
With a piece of wood marked with the required 20 mm depth, or with the aluminum adjuster developed by BEELE Engineering, the set of fillers can be adjusted to the required 20 mm recess inside the transit. Use a plastic hammer to adjust the set of filler sleeves with the NOFIRNO® adjuster.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



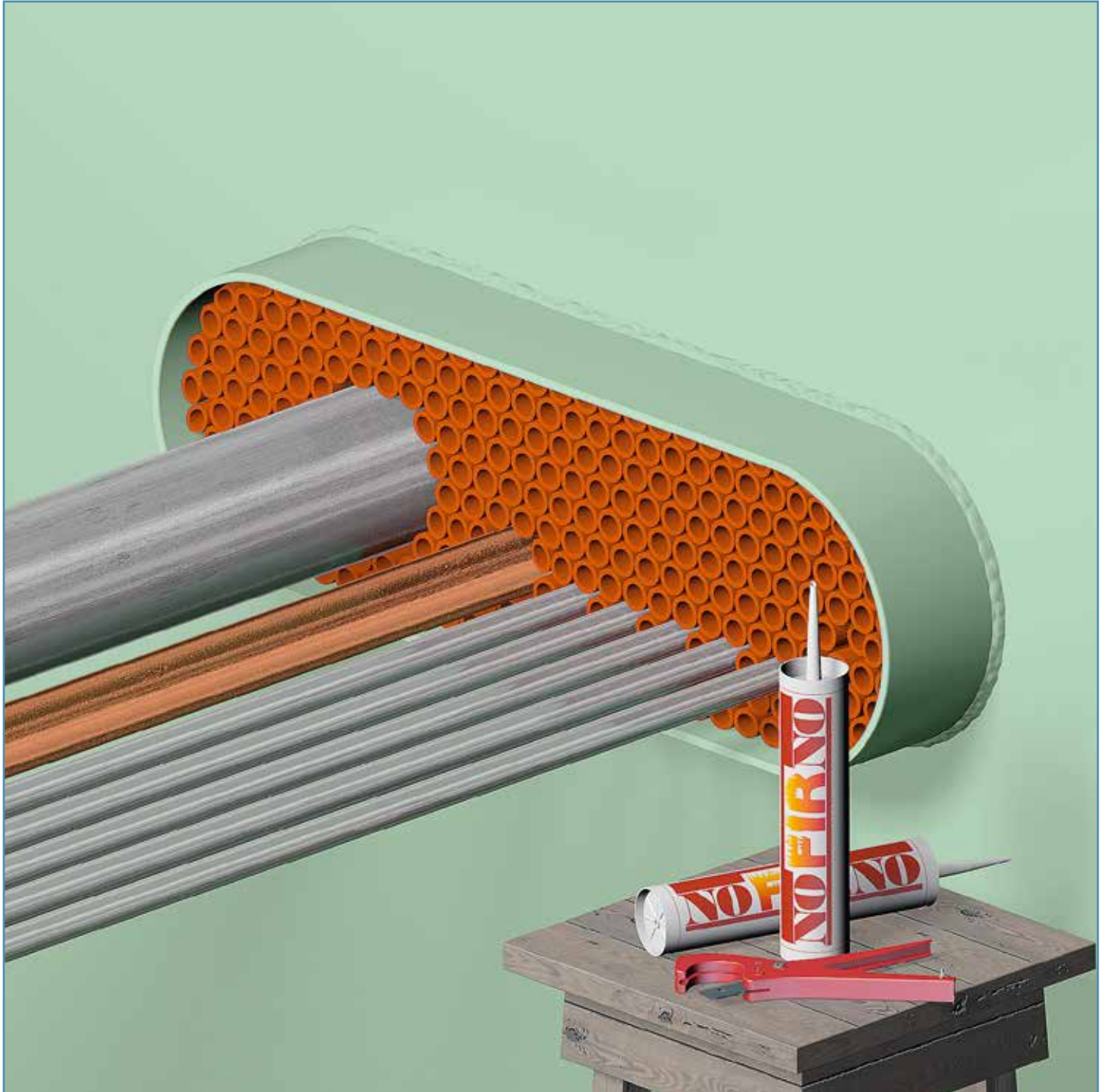
The filler set can be further adjusted with the aid of a flat nose pliers. Single filler sleeves sometimes might be inserted too deep. A ca. 20 mm free space at the front and back of the sealing system (+/- 2 mm tolerance is acceptable) is a must to obtain optimum sealing capacity of the sealing system.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



Before applying the NOFIRNO® sealant, it is advisable to perform a final check on the packing of insert and filler sleeves. A tight fit of the whole set of sleeves, in the required ratio, is not only vital for the mechanical stability of the sealing system, but also for the fire stopping properties. A final check should therefore be a part of quality control.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



Final smoke, gas and watertight sealing of the NOFIRNO® multi-pipe transits is achieved with the application of NOFIRNO® sealant. NOFIRNO® sealant has proven excellent performance with regard to mechanical and fire resistance requirements. The NOFIRNO® sealing system has been successfully exposed to severe pressure, shock and vibration tests.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



Cut the injection nozzles of the cartridges in an angled way to create a medium sized dispersing opening. This will improve the flow of the sealant in between the set of pipes. Furthermore, it is advisable to use professional sealant guns. Hand fatigue is prevented, and an optimum flow of the sealant is obtained. For larger penetrations, electric or pneumatic dispensers should be used.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



A 20 mm thick layer of NOFIRNO® sealant is applied at each side of the NOFIRNO® multi-pipe transit. NOFIRNO® sealant has an engineered viscosity, preventing the sealant from sagging and also allowing for a perfect flow of the sealant between the pipes during injection. For multi-pipe transits with a high filling rate, longer nozzles are available for the sealant cartridges.

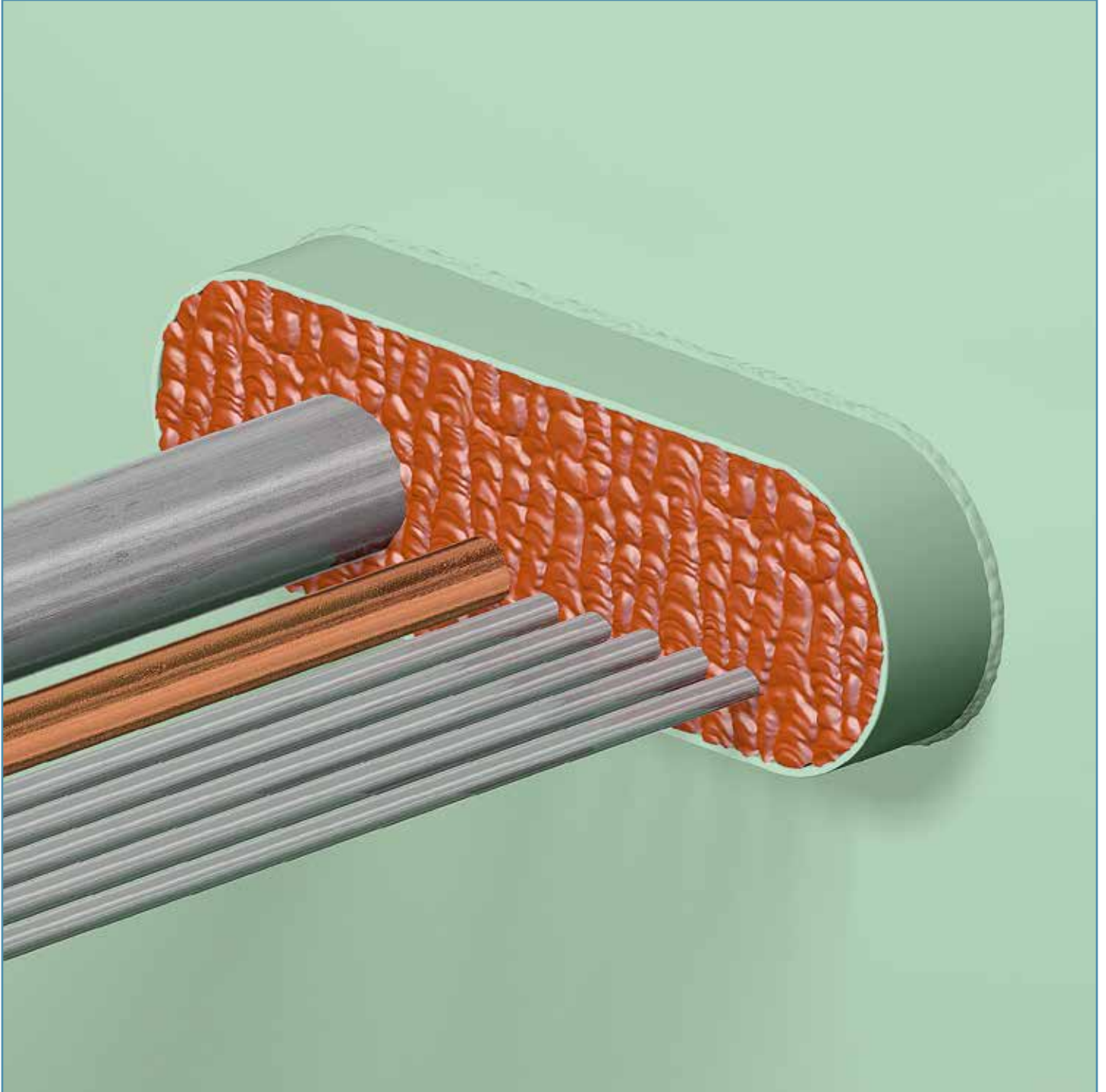
Please refer to the Safety Data Sheet for more information about the working environment.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



Skin formation of the sealant takes place after ca. 10-15 minutes. In case of larger transits with a low pipe filling rate, do not apply more sealant than can be finished within this time-frame.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



The multi-pipe transit should be overfilled with NOFIRNO® sealant, because some sealant will be pushed into the empty spaces between and into the hollow NOFIRNO® (multi) filler sleeves during further finishing. This will contribute also to obtain higher tightness ratings.

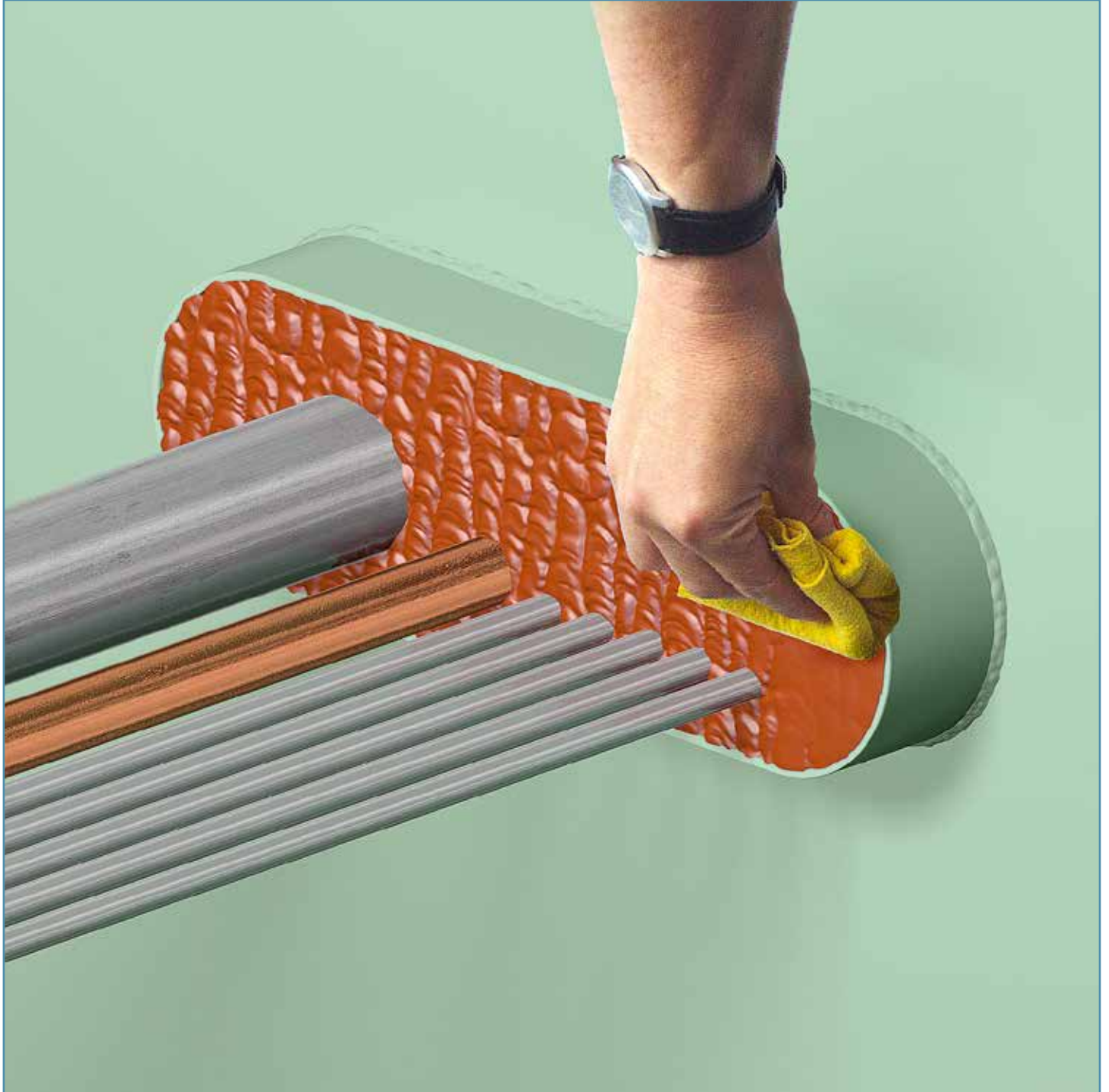
INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



To smooth the surface of the NOFIRNO® sealant layer, a cloth is sprayed with water. This prevents the sealant from sticking to the cloth.

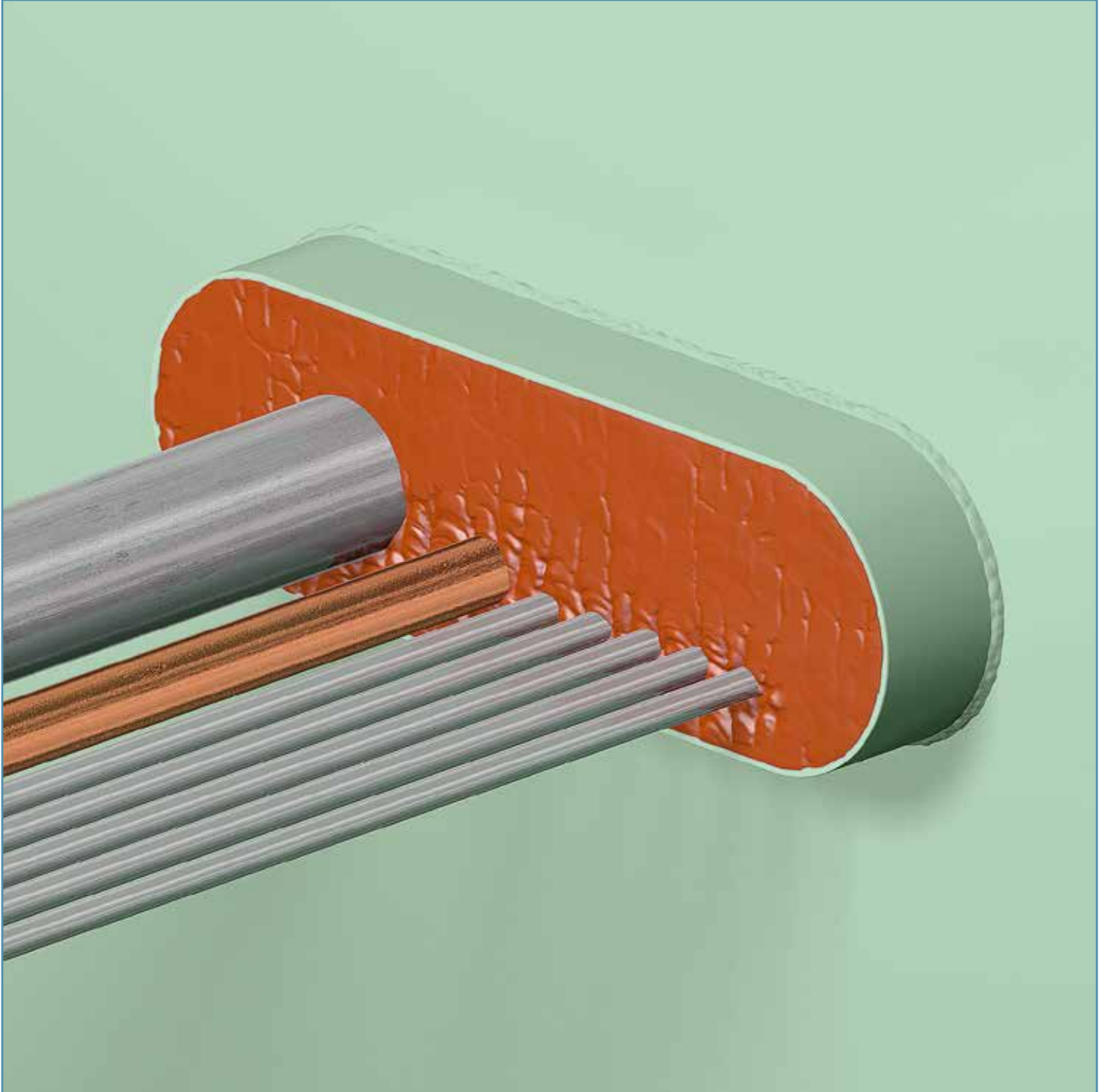
Please refer to the Safety Data Sheet for more information about the working environment.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



The cloth is then used to press down the sealant layer flush with the end of the transit frame. It is of utmost importance to ensure that the sealant is compressed very tightly so that the sealant is compressed into all empty spaces of the NOFIRNO® filler sleeve set, including partially into the hollow filler sleeves. The larger the adhesive surfaces of the sealant, the higher the performance of the system. The system can also be used for steam lines having temperatures up to +180° C.

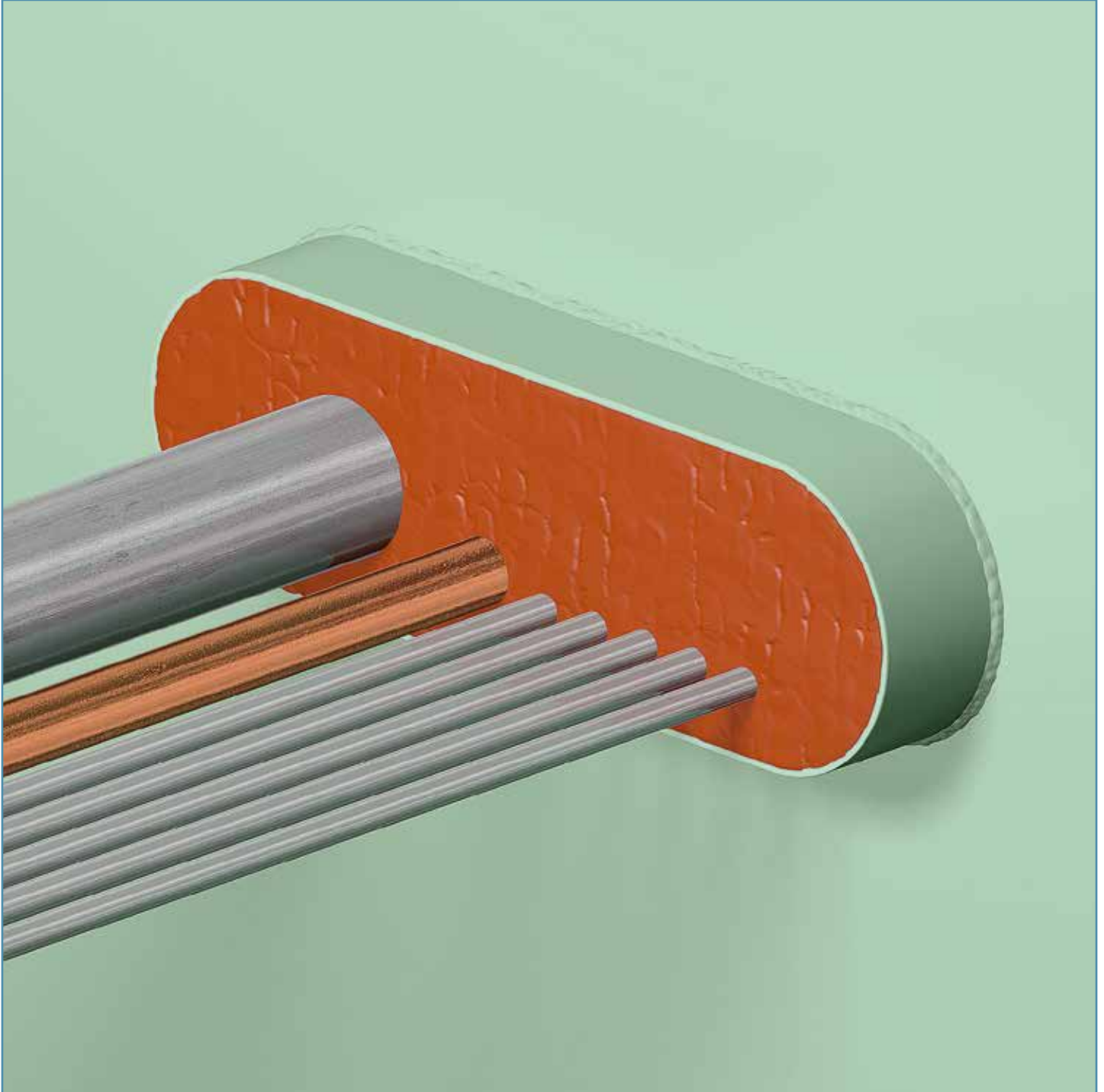
INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



Due to the rapid skin formation of the sealant, smoothing should take place directly after compression of the sealant layer. As soon as skin formation takes place, a very neat smoothing of the sealant layer is not possible anymore.

Note: the NOFIRNO® sealant is water repellent so that water will drip off. Neat smoothing is helpful in this respect. The NOFIRNO® sealant is also seawater, UV, ozone and weathering resistant and offers a durability of decades.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



A last check should be made to ensure that the sealant layer is pressed down tightly and that no larger open holes are visible. Air enclosure within the individual layer of sealant should be prevented during finishing, because this would have a negative impact on the performance of the sealant layer under fire exposure.

Please refer to the Safety Data Sheet for more information about the working environment.

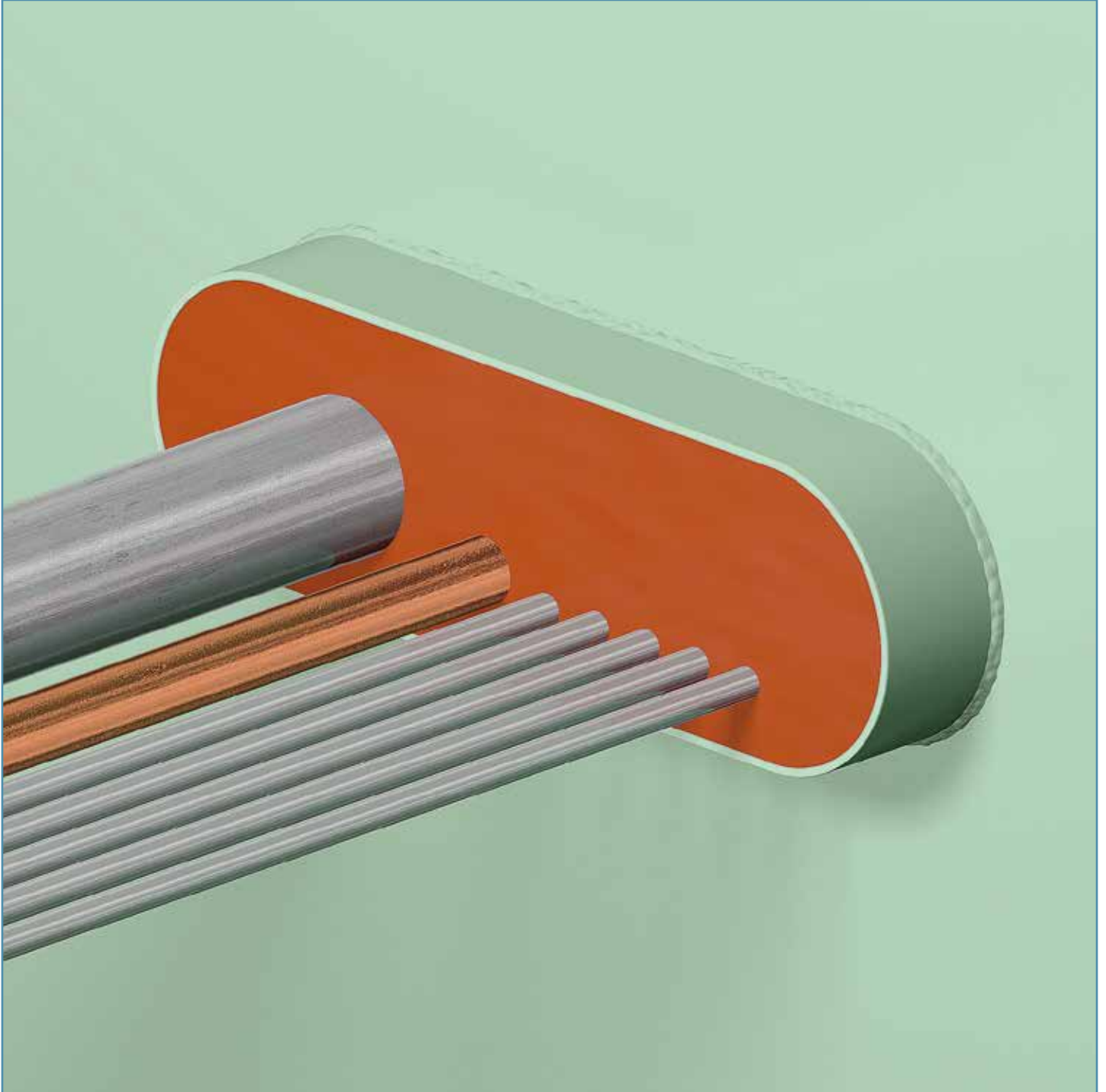
INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



The surface can be smoothed by hand. Just wet the hands thoroughly with water.
No dirty hands when working with NOFIRNO® and a very neat surface is the result.
Note: this should only be a smoothing procedure. Do not pack or compress the sealant further.

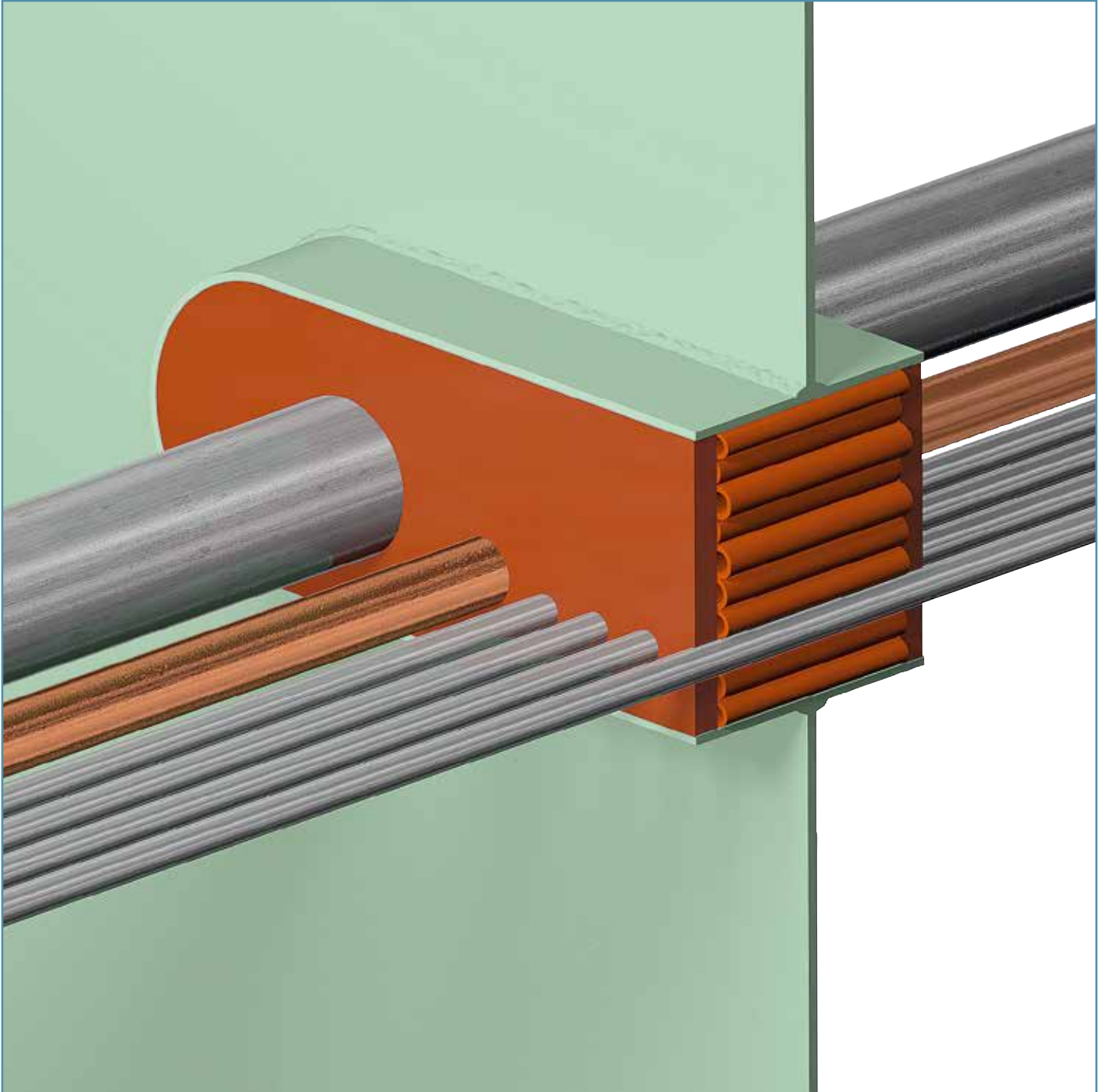
Wear protective gloves when working with NOFIRNO® sealant. Please refer to the Safety Data Sheet for more information.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



To obtain optimum adhesion during the curing process of the sealant, the pipes should be tightly fixed at both sides of the transit, as close as possible to the transit, and immediately after finishing the transit. Movement of the pipes during the curing process will impair the adhesion process to the surface of the pipe. Note: time needed for curing of the sealant is dependent on air humidity in combination with the environmental temperature. It is advisable to place a sticker near the finished transit, stating that the transit has been recently installed, and should not be touched or damaged.

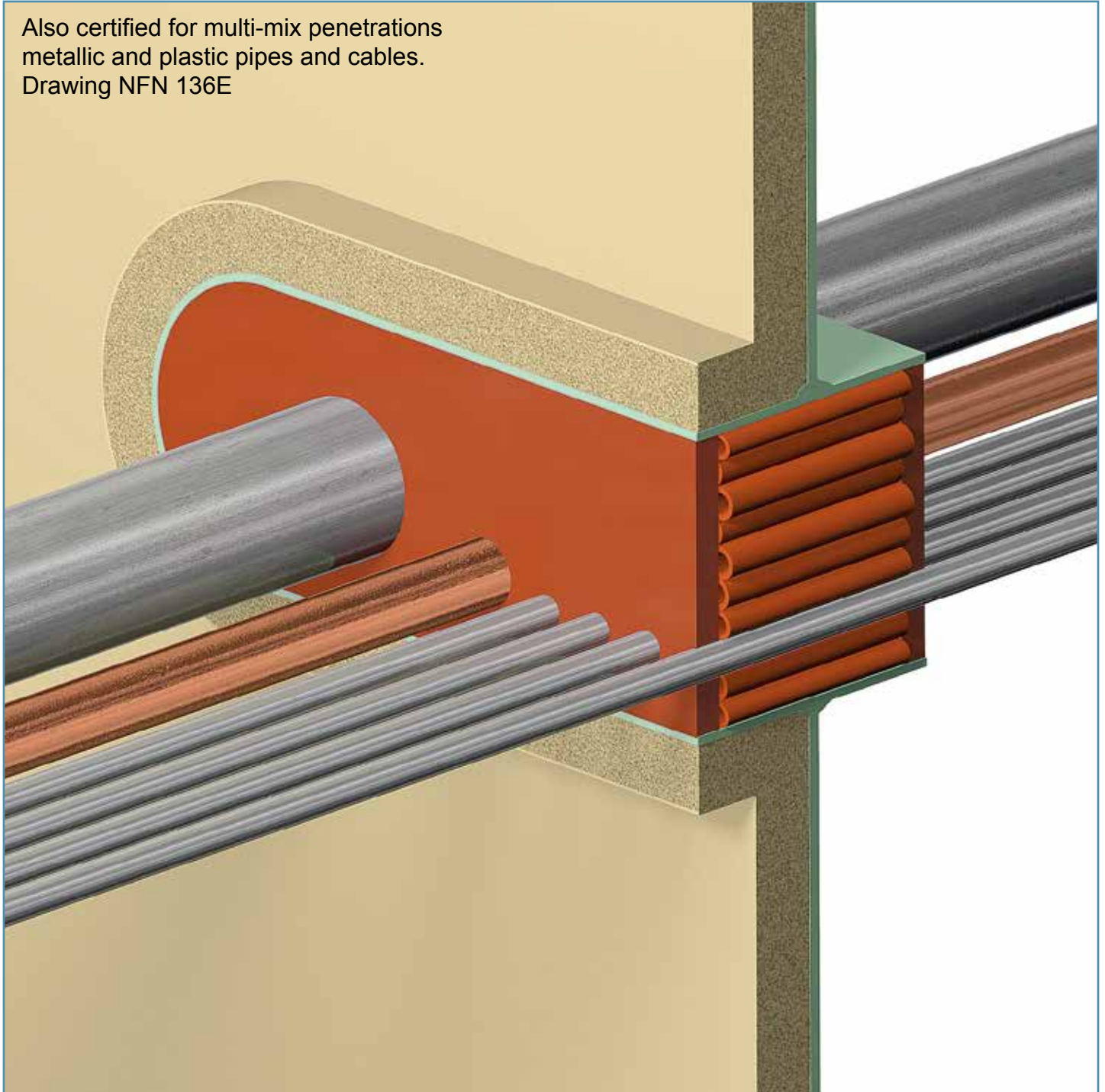
INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



The NOFIRNO rubber grades of the sleeves and the NOFIRNO® sealant, which are compounded under strict conditions in our factory, are suitable for gas and water tight ducting, and for fire rated applications as well. The NOFIRNO® rubber and sealant stay flexible at temperatures of -50 °C, allowing application in arctic environments. The NOFIRNO® system can also be used for steam lines with temperatures up to +180 °C. The NOFIRNO® (multi-) pipe transits have excellent resistance to seawater, UV, ozone and weather. Based on the use of the high tech silicone composition of the NOFIRNO® sealant and rubber, the system offers excellent durability.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM

Also certified for multi-mix penetrations
metallic and plastic pipes and cables.
Drawing NFN 136E



For A-class penetrations (which are insulated), the NOFIRNO® multi-pipe transit frame needs to be insulated only at the insulated side of the bulkhead .

Check the Type Approval Certificates for the insulation lengths to be applied around the ducted pipes to fulfil the criteria of the maximum temperature rise for A-class penetrations according to the FTP code.

MED certificate 192130009AA00 issued by KIWA Netherlands.

No metal parts are incorporated in the sealing system. The conduit frames cannot corrode inside due to the tight sealant layers at both sides of the transit. No CUI (Corrosion Underneath Insulation).

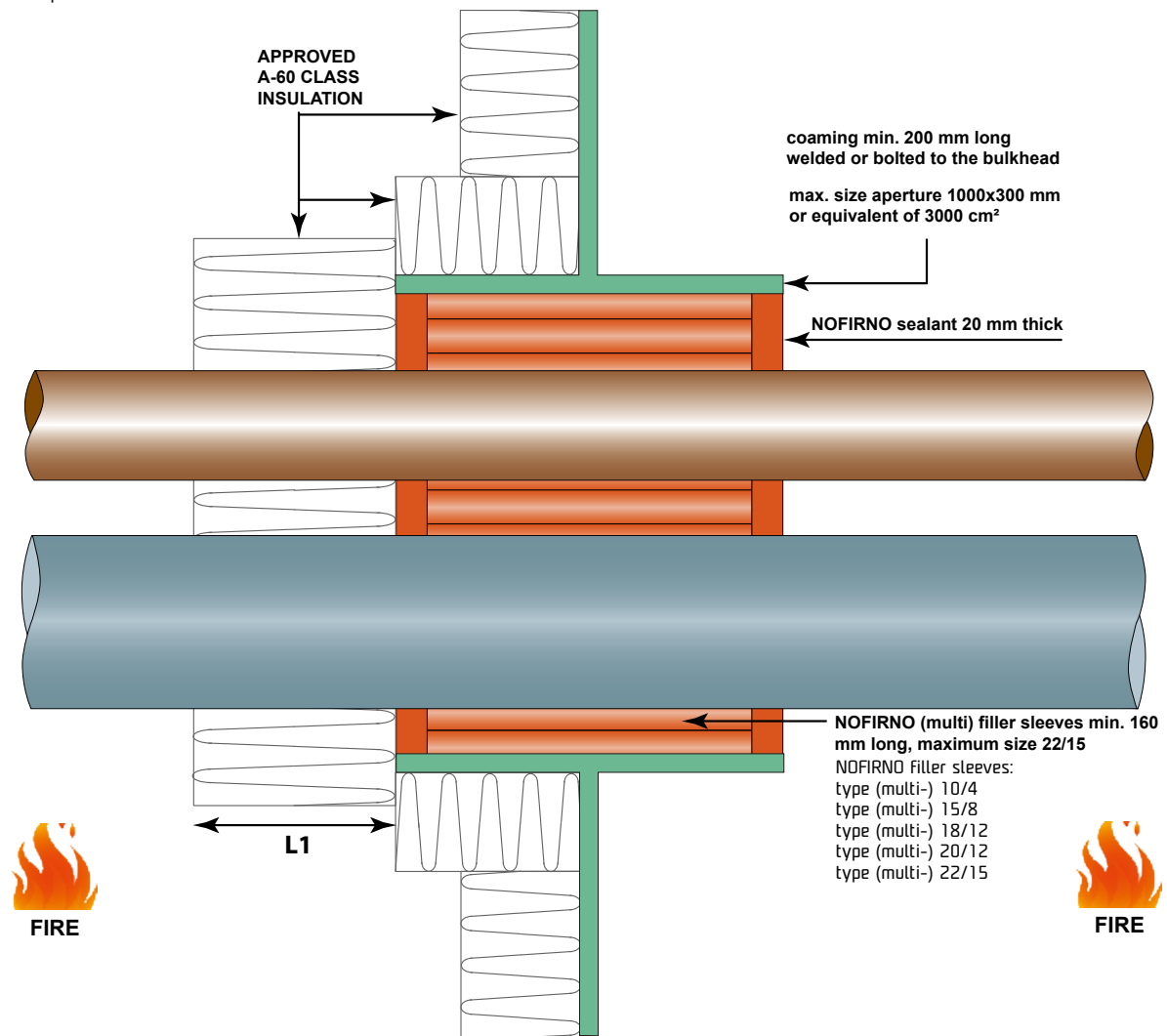
INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM

direction of exposure: fire from either side

Minimum clearance between the
conduit sleeve and the ducted pipes
and in between the ducted pipes:

OD pipe up to 3"	15 mm
≥3" up to 6"	20 mm

NOFIRNO MULTI-SEALING SYSTEM for steel/ss/CuNi min. 1/16" - max. 6" NPS, GRE pipes min. 1" - max. 6" and copper pipes min. 1/16" - max 4" NPS



L1 = length of Insulation around ducted pipe:

steel/ss/CuNi & GRE pipes		copper pipes	
up to 1"	200 mm	up to 1"	200 mm
>1" up to 3"	350 mm	>1" up to 2"	500 mm
>3" up to 6"	500 mm	>2" up to 4"	800 mm
		4"	1000 mm

conduit sleeve positioned:

- symmetrically
- or
- non-symmetrically with longest
length on unexposed side



Description: NOFIRNO sealing system for A60 class bulkheads

Mat.: NOFIRNO sleeves/sealant

Ref.: JAB

Date:

14-10-2019

Scale:

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Rev. 1

Rev. 2

NFN 134E

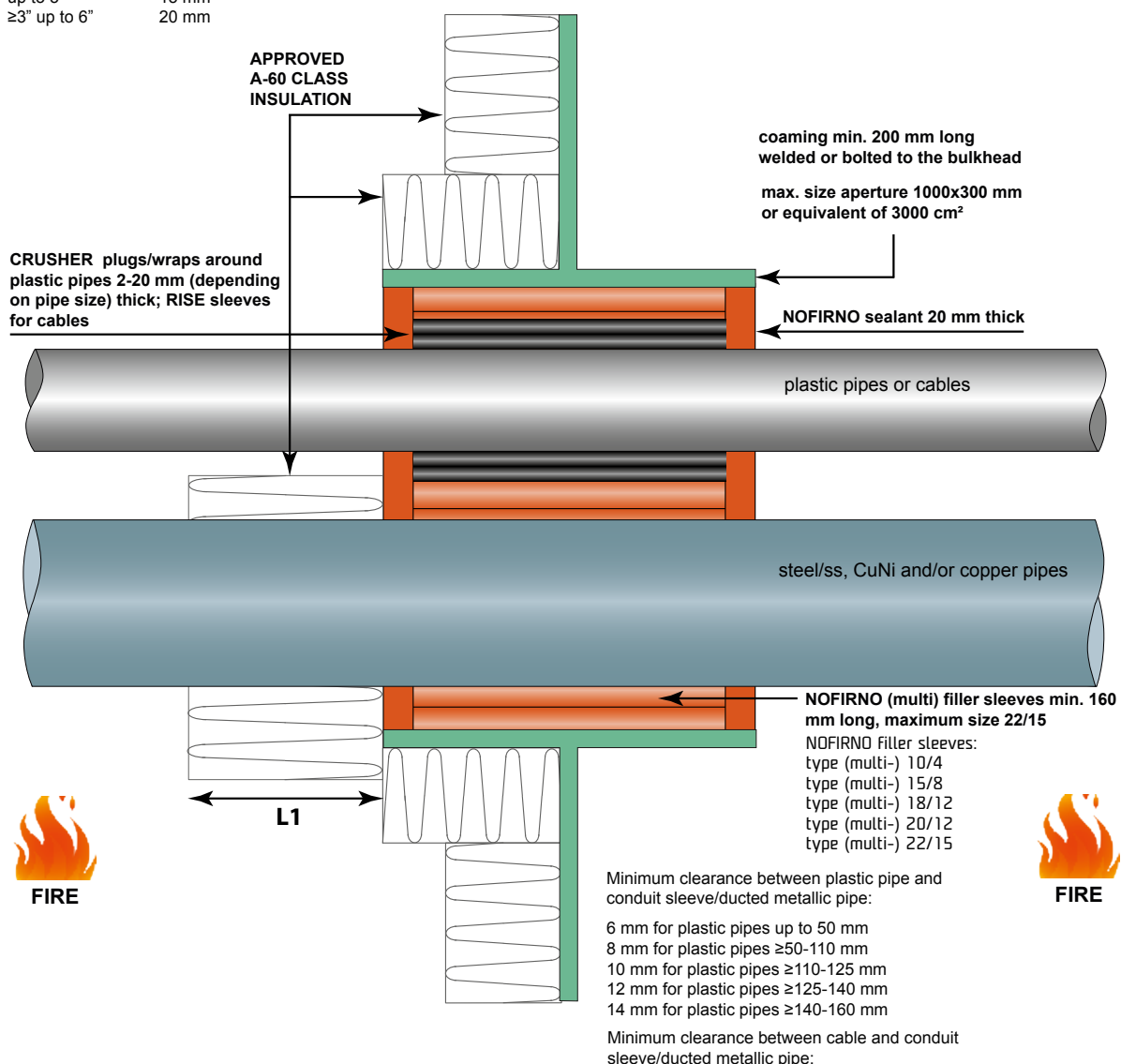
INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM

**direction of exposure:
fire from either side**

Minimum clearance between
conduit sleeve and ducted metallic pipe:

OD pipe	
up to 3"	15 mm
≥3" up to 6"	20 mm

NOFIRNO MULTI-MIX SEALING SYSTEM
for steel/ss/CuNi min. 1/16" - max. 6" NPS,
copper pipes min. 1/16" - max 4" NPS, GRE
pipes min. 1" - max. 6", plastic pipes max
160 mm and cables max. 105 mm



L1 = length of Insulation around ducted pipe:

steel/ss/CuNi & GRE pipes		copper pipes	
up to 1"	200 mm	up to 1"	200 mm
>1" up to 3"	350 mm	>1" up to 2"	500 mm
>3" up to 6"	500 mm	>2" up to 4"	800 mm
		4"	1000 mm

Minimum clearance between plastic pipe and
conduit sleeve/ducted metallic pipe:

6 mm for plastic pipes up to 50 mm
8 mm for plastic pipes ≥50-110 mm
10 mm for plastic pipes ≥110-125 mm
12 mm for plastic pipes ≥125-140 mm
14 mm for plastic pipes ≥140-160 mm

Minimum clearance between cable and conduit
sleeve/ducted metallic pipe:

15 mm for pipes up to 100 mm
30 mm for pipes up to 168 mm

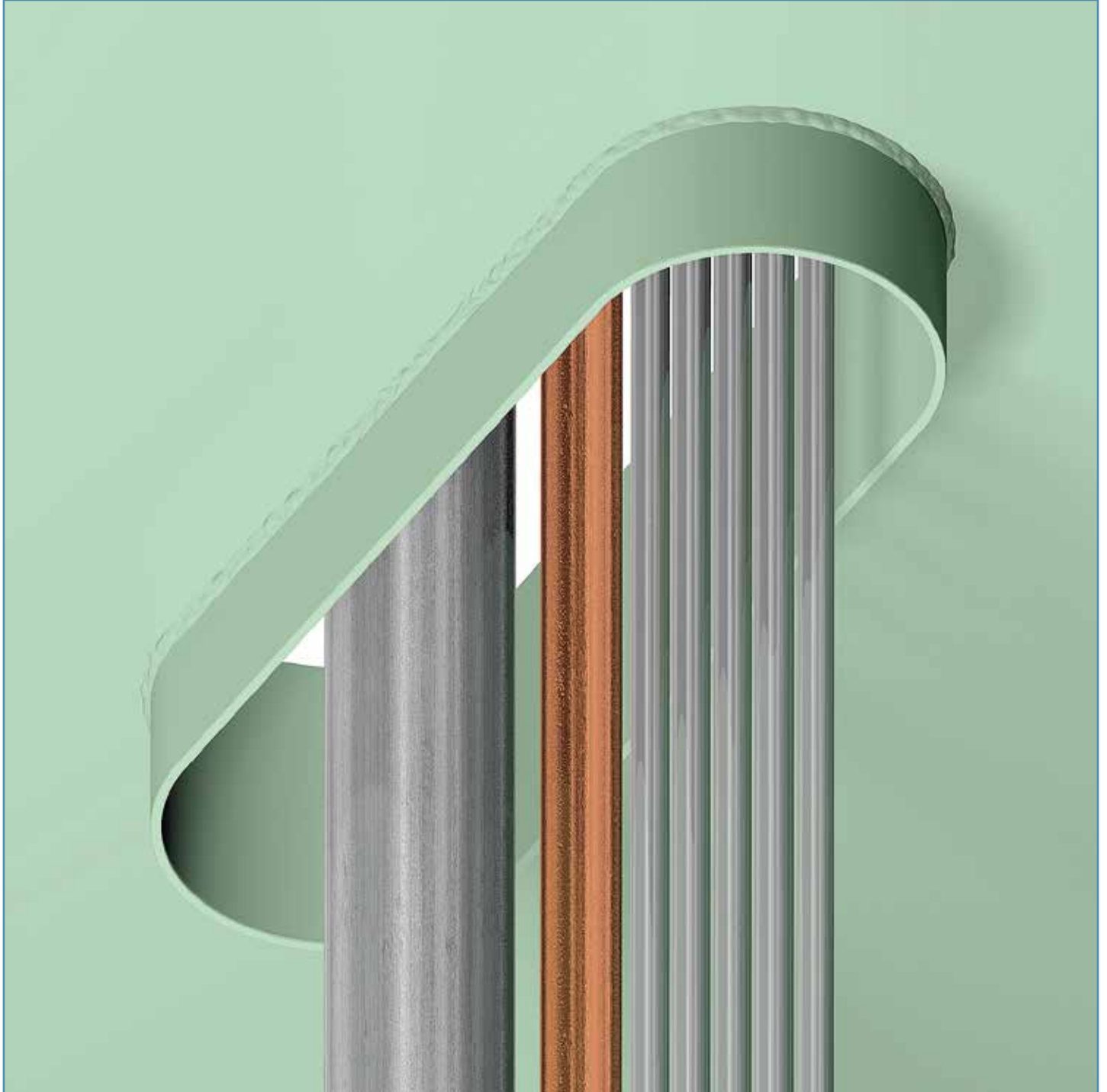
conduit sleeve positioned:

- **symmetrically**

or

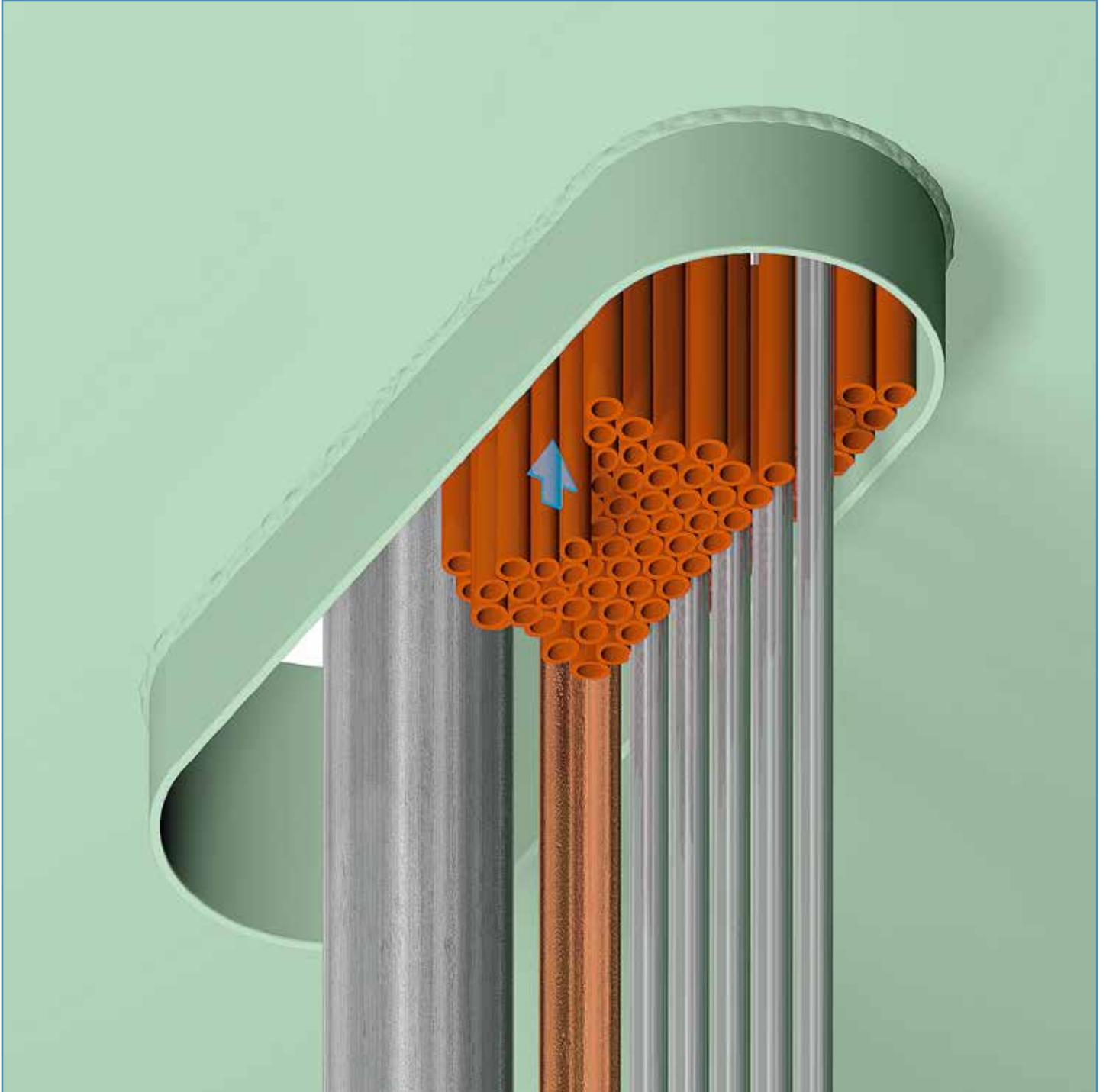
- **non-symmetrically with longest
length on unexposed side**

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



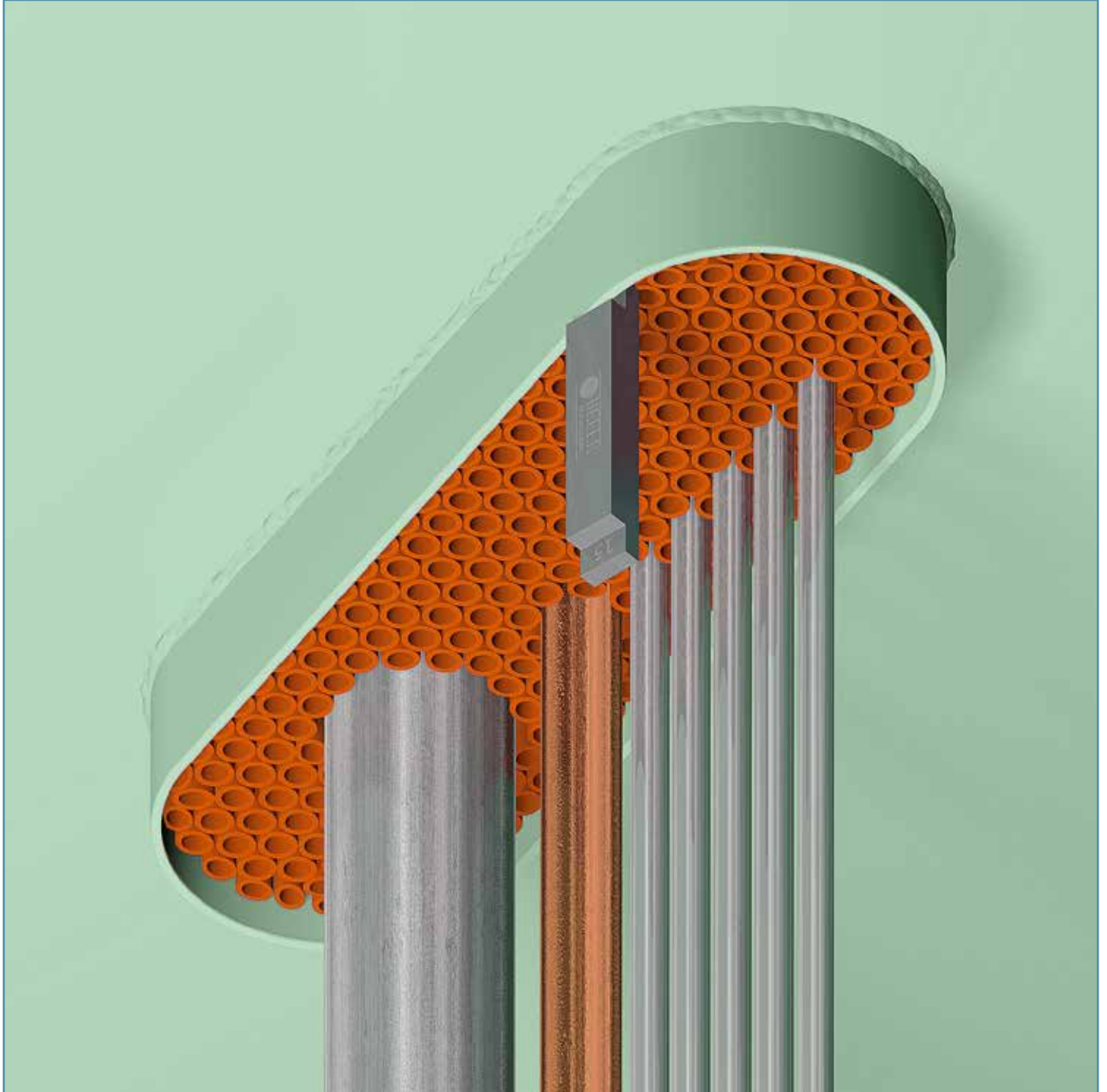
Deck penetrations are also easy to install with the NOFIRNO® system.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



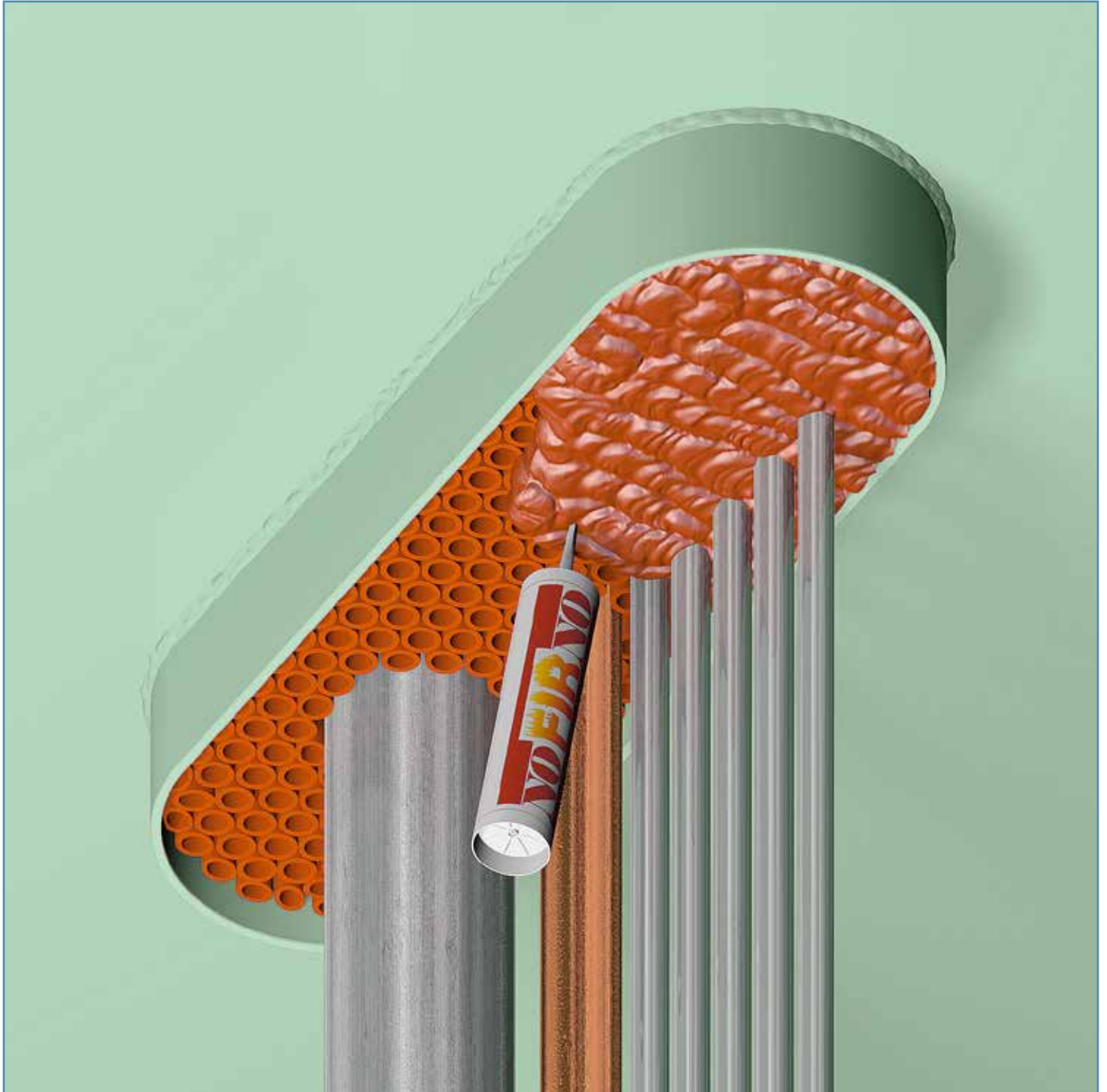
The multi-filler sleeves are very useful, especially for sealing deck penetrations. By making use of the NOFIRNO® multi-filler sleeves, sets and bundles can be made to ensure tight fitting inside the transit. Inserting fitting sets or bundles of multi-sleeves will ensure that sleeves won't fall out of the conduit frame. With NOFIRNO® single filler sleeves, the filling of larger vertical transits will be more difficult.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



With the Beele® adjuster or a marked piece of wood, the set of fillers is adjusted inside the transit. The NOFIRNO® rubber grade and the NOFIRNO® sealant, which are compounded under strict conditions in our factory, are suitable for gas and water tight ducting, and for highest fire rated applications as well.

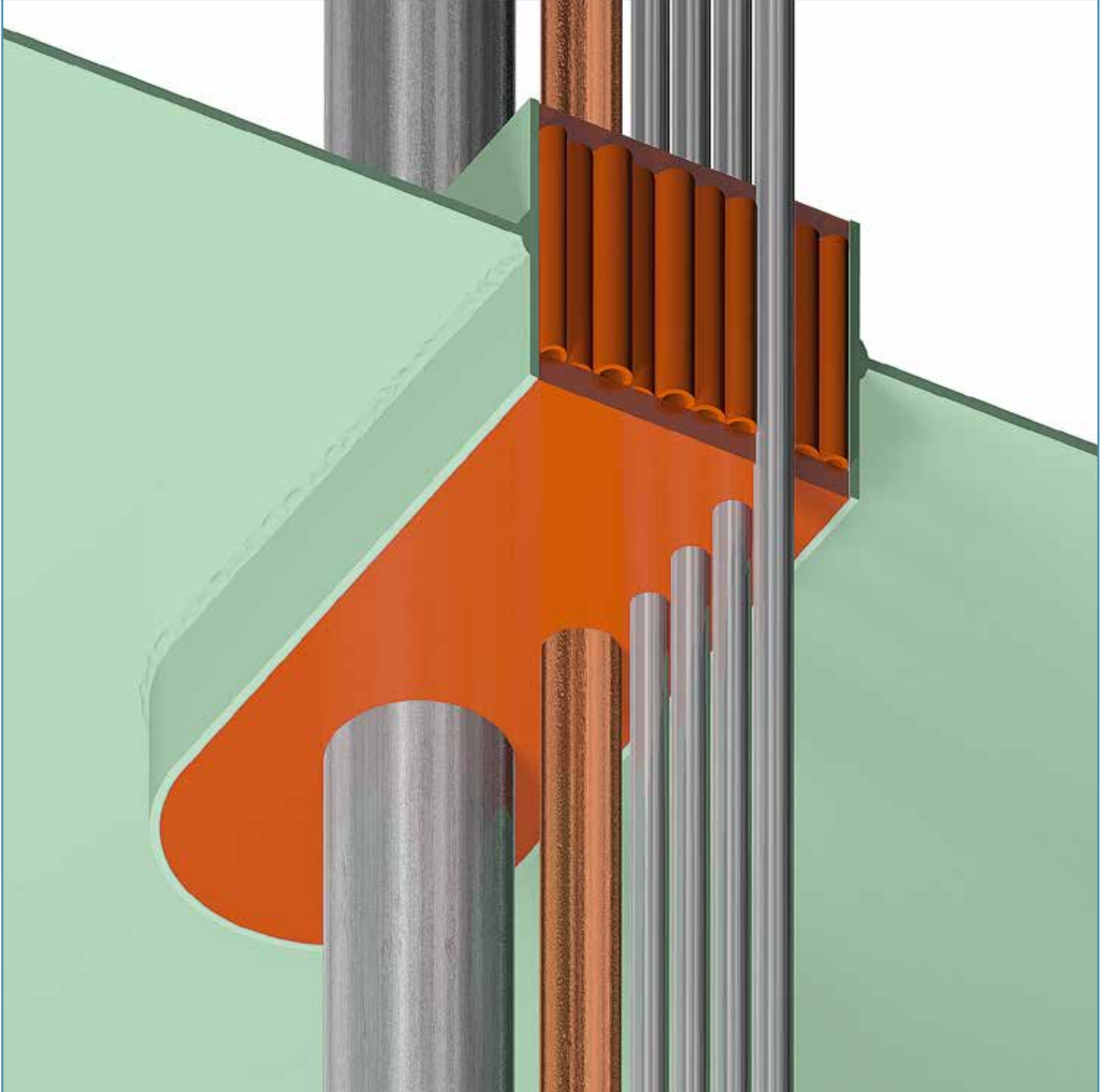
INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



The NOFIRNO® sealant can be applied overhead for deck/floor transits without dripping or sagging. After application of the sealant, the NOFIRNO® sealant is pressed tightly with a cloth sprayed with water. This prevents the sealant from sticking to the cloth.

Please refer to the Safety Data Sheet for more information about the working environment.

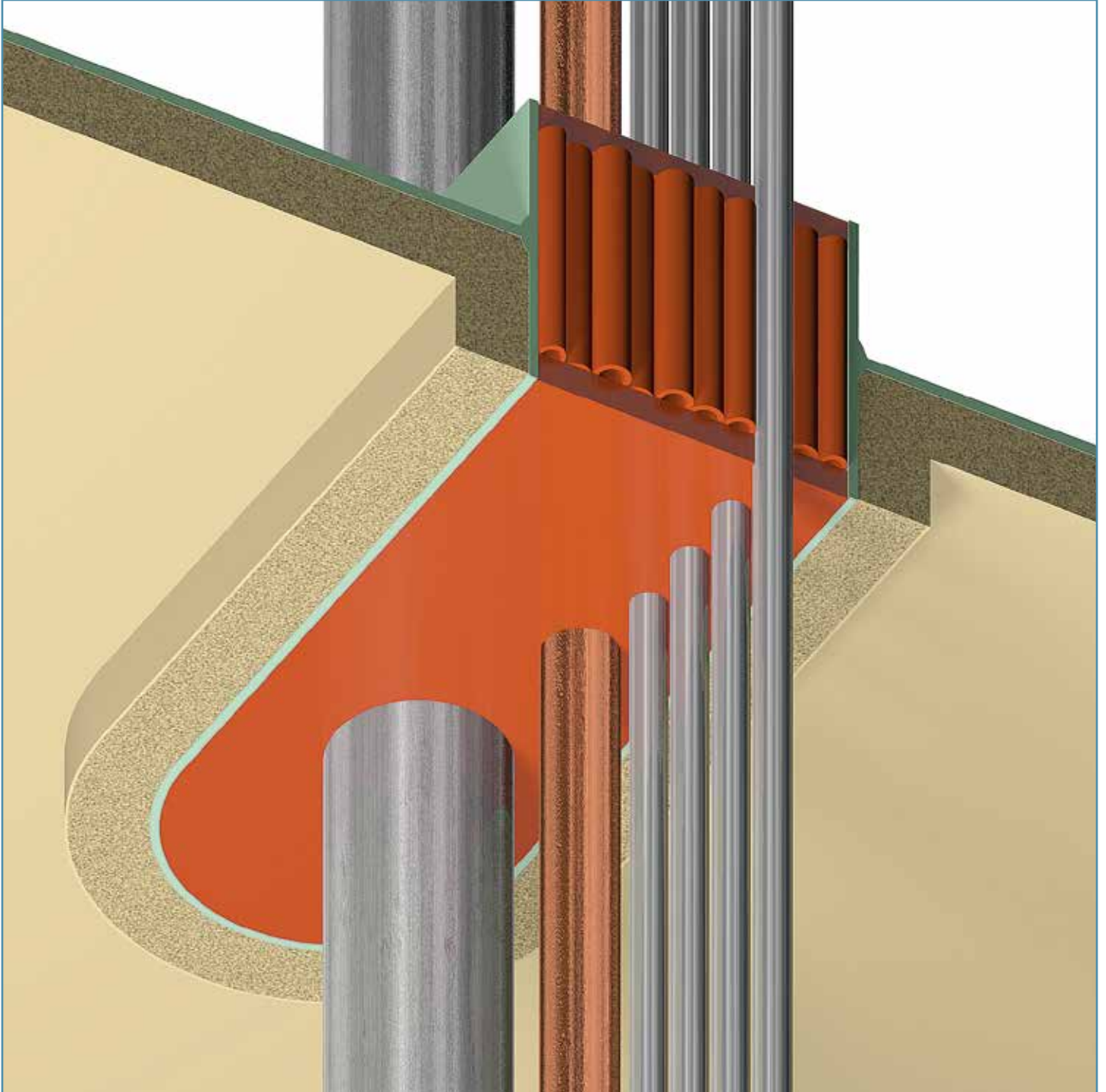
INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



The surface can be smoothed by hand. Just wet the hands thoroughly with water.
No dirty hands when working with NOFIRNO® and a very neat surface is the result.
Note: this should only be a smoothing procedure. Do not pack or compress the sealant further.

Wear protective gloves when working with NOFIRNO® sealant. Please refer to the Safety Data Sheet for more information.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM



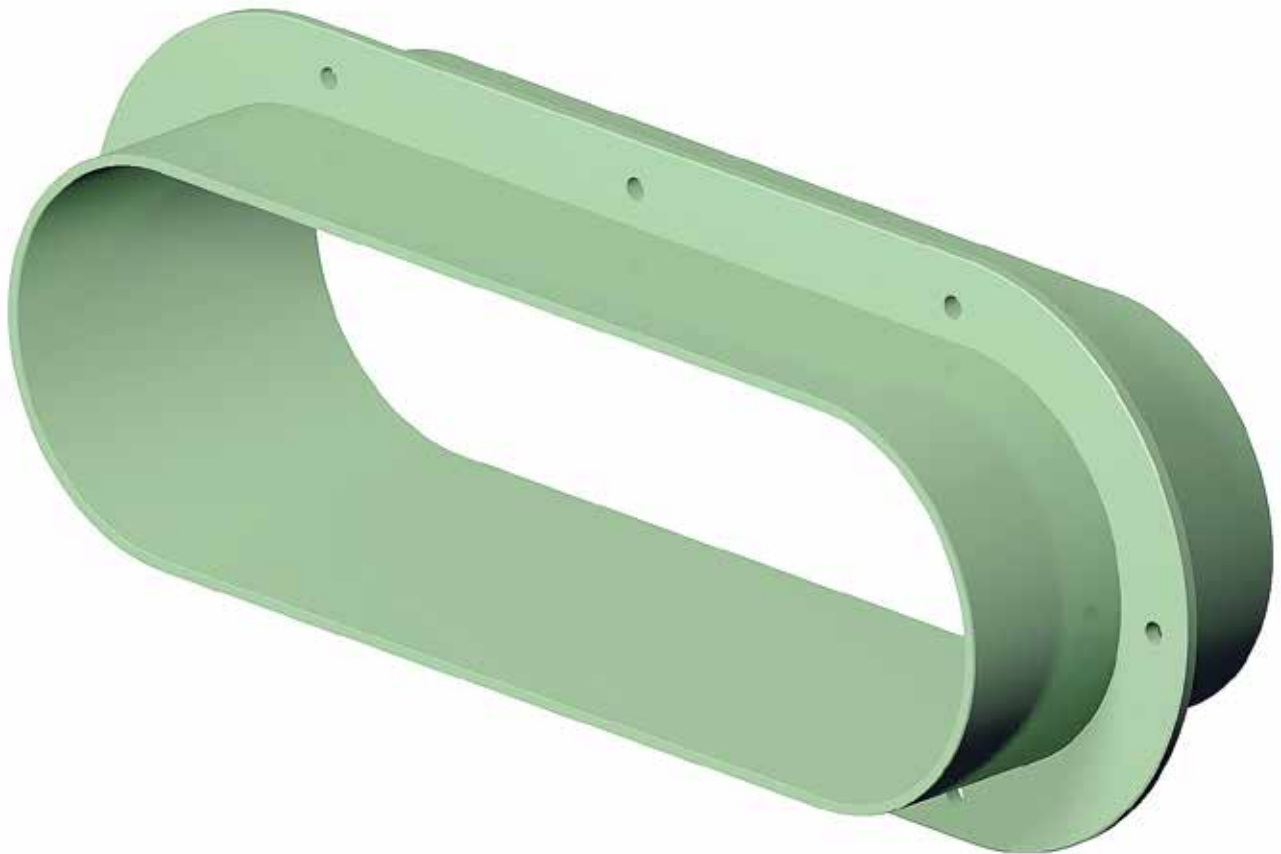
For A-class penetrations (which are insulated), the NOFIRNO® multi-pipe transit frame needs to be insulated only at the insulated side of the deck.

Check the Type Approval Certificates for the insulation lengths to be applied around the ducted pipes to fulfil the criteria of the maximum temperature rise for A-class penetrations according to the FTP code.

MED certificate 192130009AA00 issued by KIWA Netherlands.

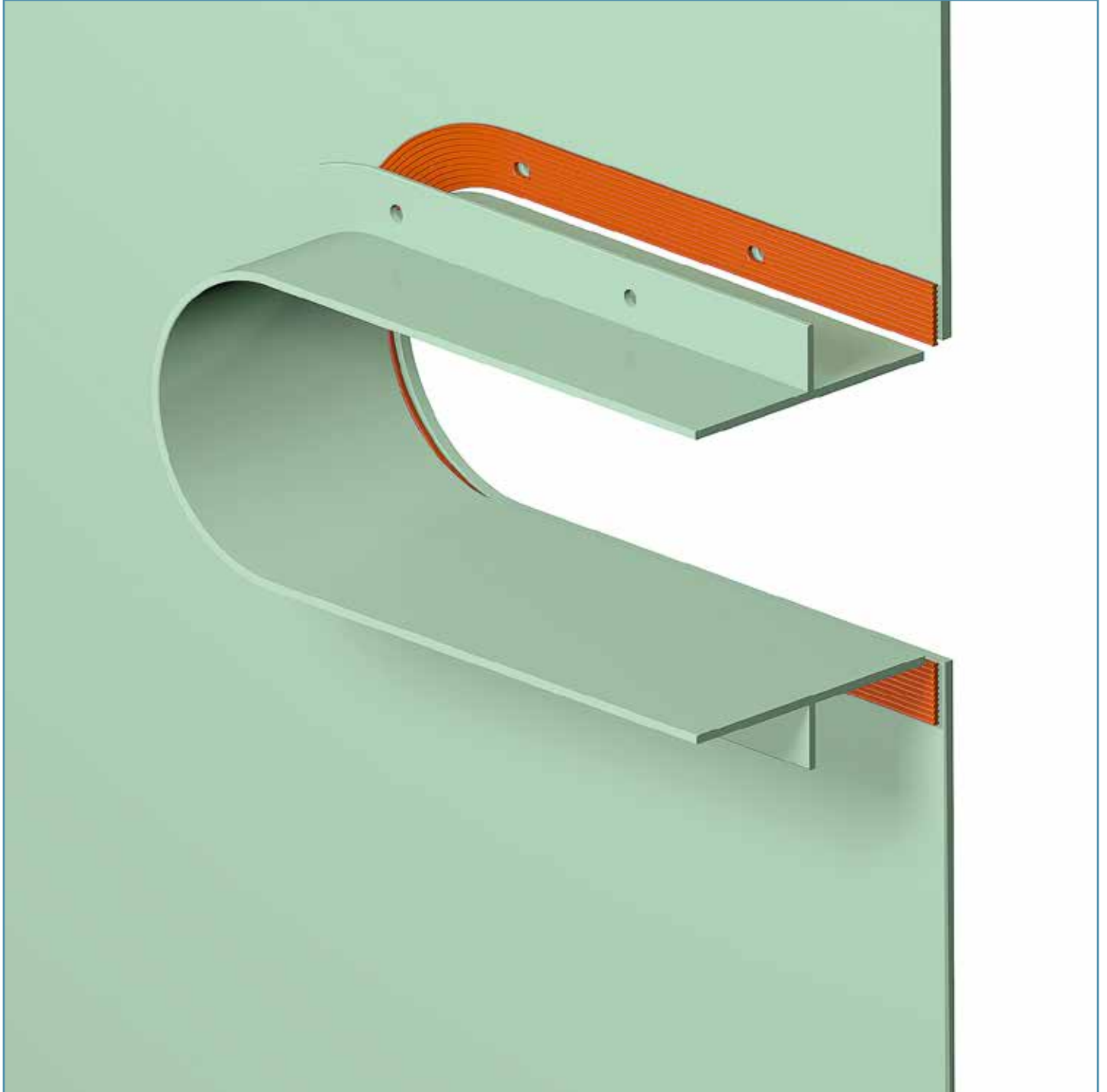
No metal parts are incorporated in the sealing system. The conduit frames cannot corrode inside due to the tight sealant layers at both sides of the transit. No CUI (Corrosion Underneath Insulation).

INSTALLATION INSTRUCTIONS FOR NOFIRNO® (MULTI-) PIPE TRANSIT SEALING SYSTEM



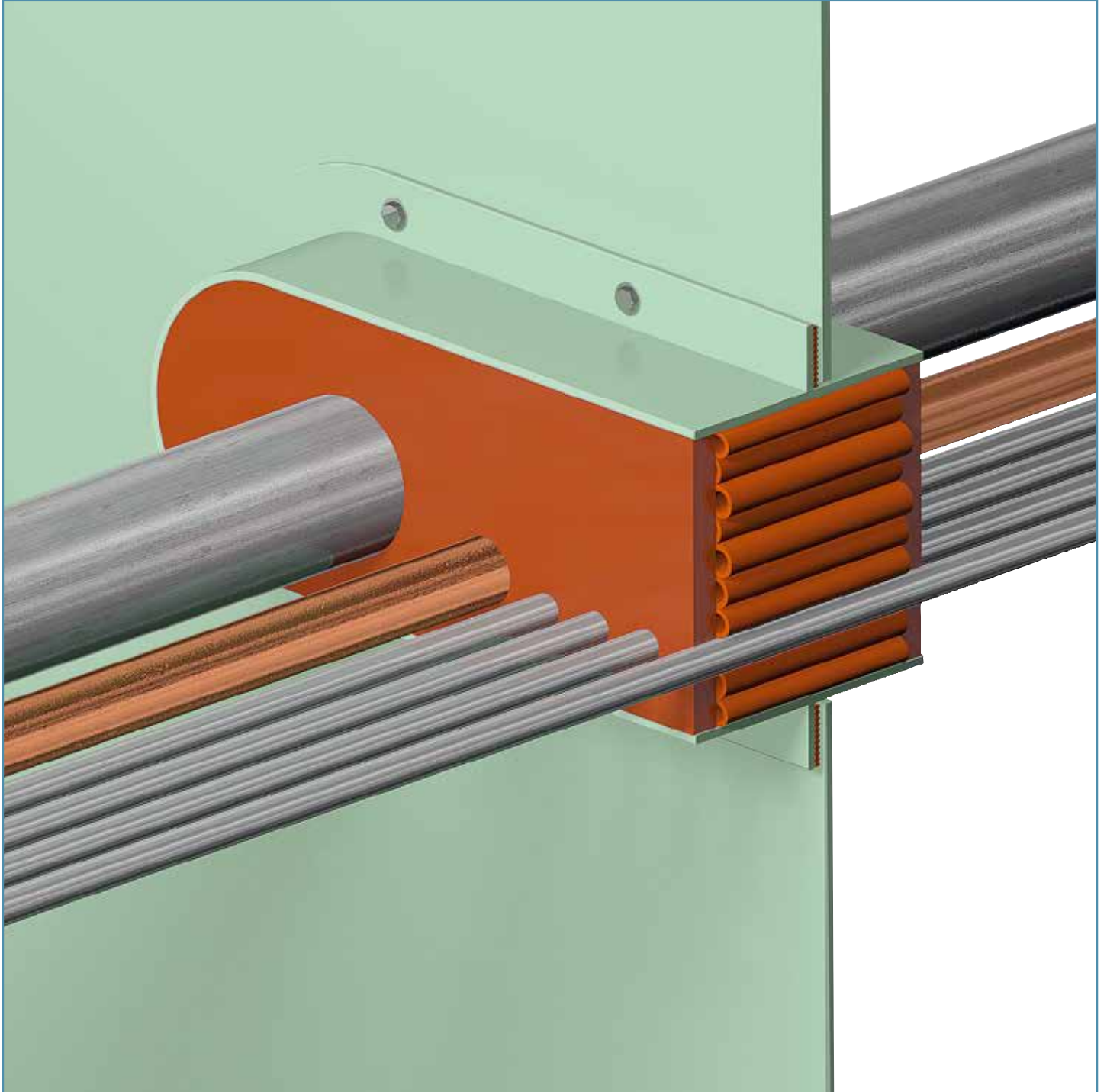
Flanged frames with a flange for bolting (60 mm wide and 6 mm thick) with a hole configuration for fixation, can be used also for the NOFIRNO® multi-pipe sealing system.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® (MULTI-) PIPE TRANSIT SEALING SYSTEM



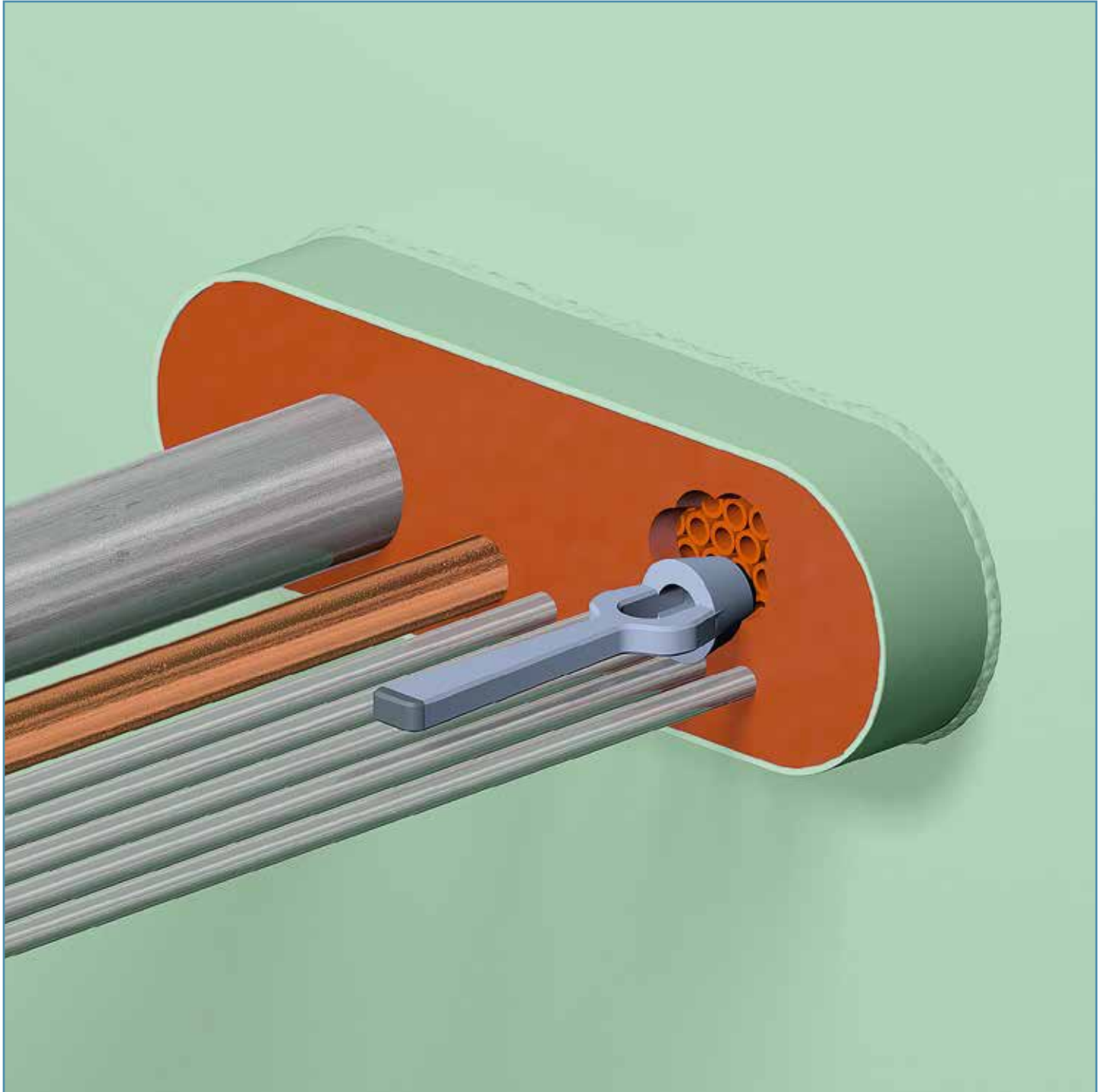
The flanged transit frames are bolted against the partition. A firesafe NOFIRNO® gasket has to be applied between the flange of the transit frame and the partition. The gaskets have a designed profiling to exclude the need for excessive compression (6-10 Nm is sufficient). The reduced forces on the profiled rubber make the usual need for retightening from time to time a thing of the past.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® (MULTI-) PIPE TRANSIT SEALING SYSTEM



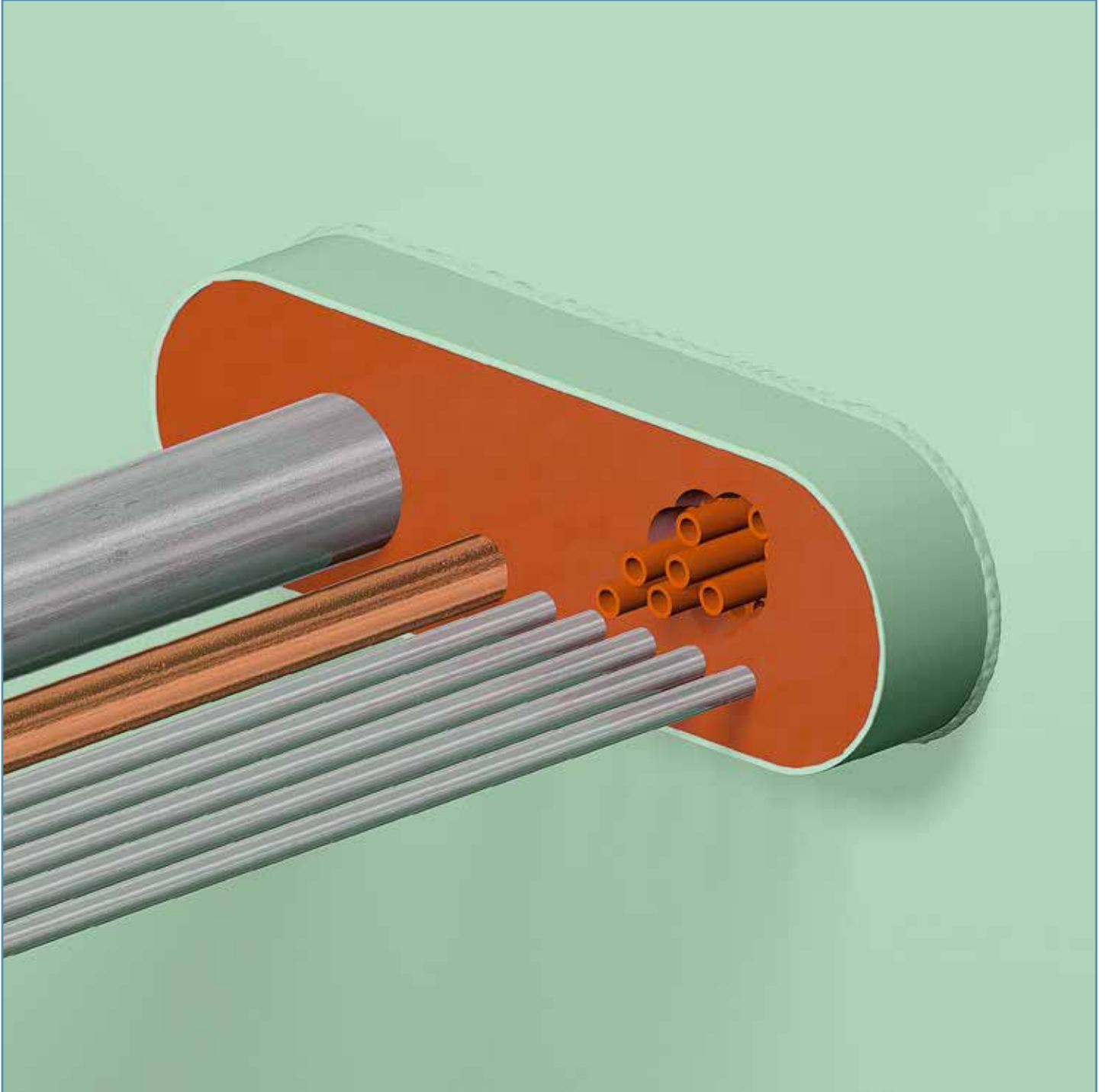
For A-class penetrations (which are insulated), the NOFIRNO® (multi-) pipe transit frame needs to be insulated only at the insulated side of the bulkhead or at the lower side of the deck. Check the Type Approval Certificates for the insulation lengths to be applied around the ducted pipes to fulfil the criteria of the maximum temperature rise for A-class penetrations according to the FTP code.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® (MULTI-) PIPE TRANSIT SEALING SYSTEM



Adding an extra pipe through a finished NOFIRNO® multi-pipe transit is an easy job. With the use of NOFIRNO® filler sleeves as separators, no permanent deformation of the rubber parts will occur, and the pipes are ducted individually. This means there is no need to disassemble the whole transit. Cut away the sealant layer at both sides of the penetration with a plastic knife or a hollow punch in a tapering shape, at a spot where there is sufficient spare space visible on the surface of the sealant layer.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® (MULTI-) PIPE TRANSIT SEALING SYSTEM



Remove enough NOFIRNO® filler sleeves to create an appropriate opening for the pipe to be ducted.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® (MULTI-) PIPE TRANSIT SEALING SYSTEM



A pipe is ducted through the free passage opening in the NOFIRNO® multi-pipe transit. For adding a pipe, there is in fact no more disassembling needed than removing some filler sleeves. No extra costs for the extension of the pipe set other than some new sealant to be applied.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® (MULTI-) PIPE TRANSIT SEALING SYSTEM



Refill the open spaces around the ducted pipe with NOFIRNO® filler sleeves. Ensure a tight fit of the filler sleeves around the ducted pipe to obtain mechanical stability of the sealing system, and to prevent the ducted pipe from movement inside the pipe transit.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® (MULTI-) PIPE TRANSIT SEALING SYSTEM

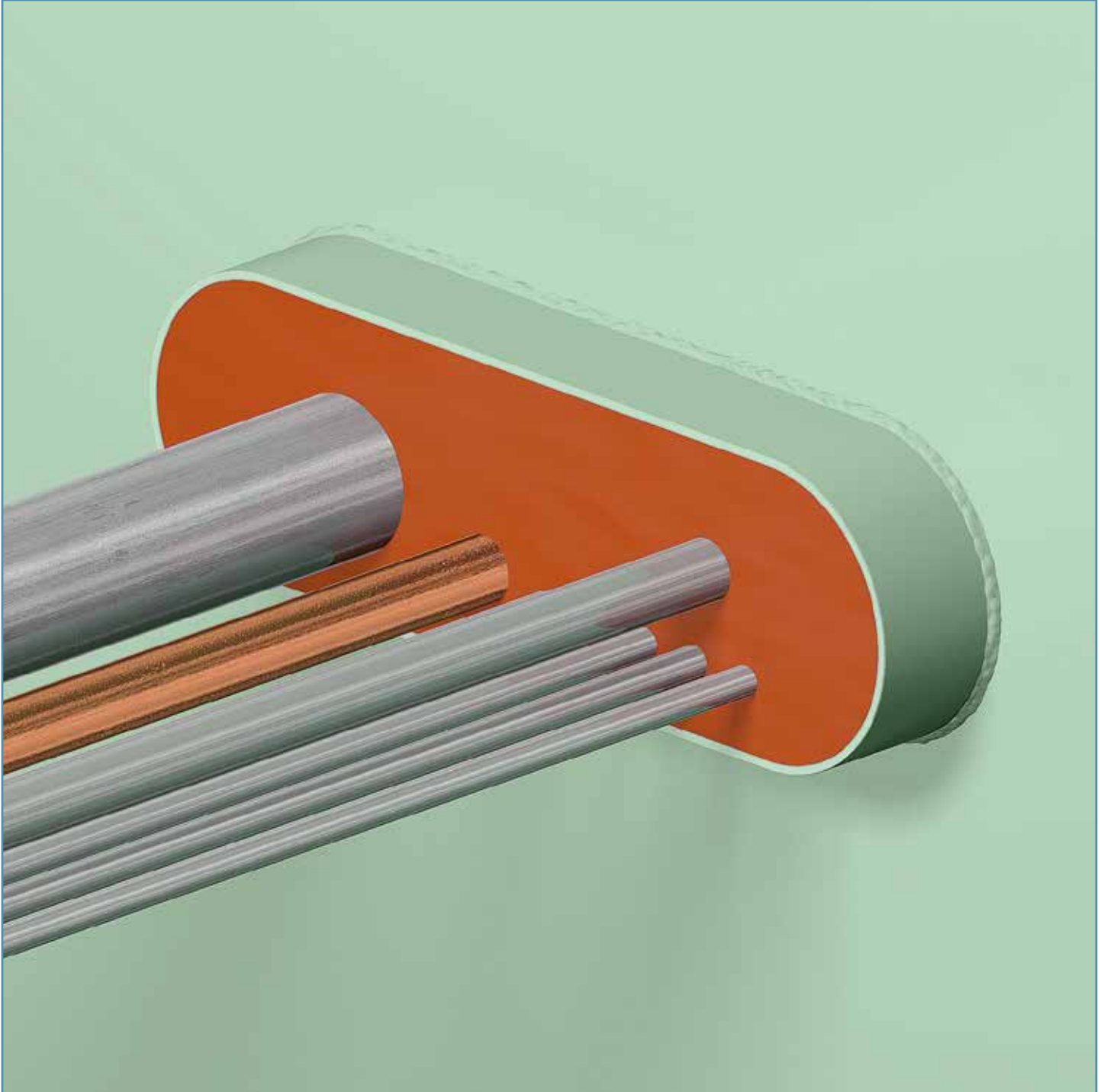


Clean and dry the newly ducted pipe thoroughly and refill the opening in the sealant layer at both sides of the transit with NOFIRNO® sealant.

The fresh sealant adheres very well to the already cured sealant. Finish the new sealant layer in the same way as done for the initial sealant layer.

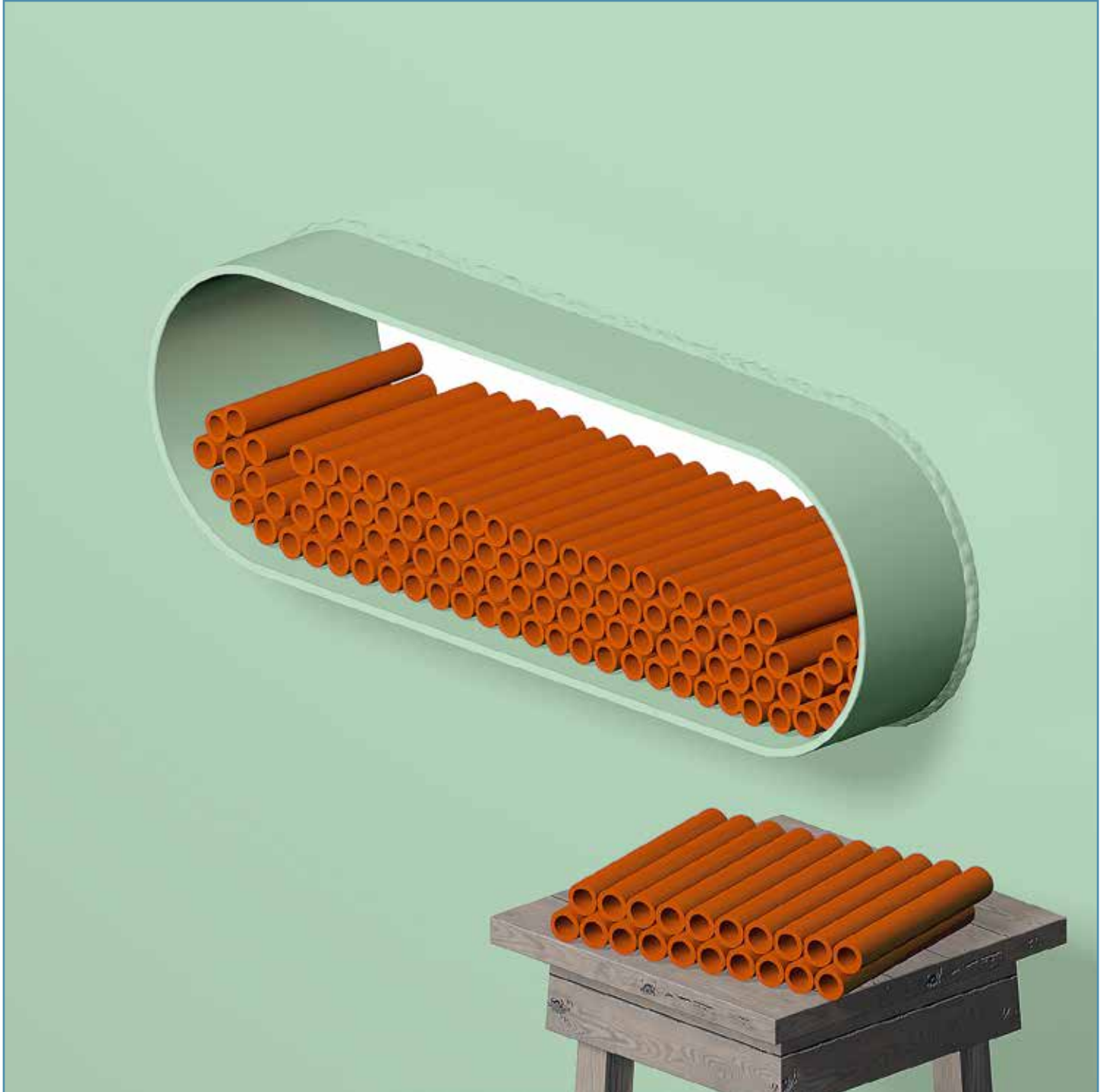
Please refer to the Safety Data Sheet for more information about the working environment.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® (MULTI-) PIPE TRANSIT SEALING SYSTEM



Note: time needed for curing of the sealant is dependent on air humidity in combination with the environmental temperature.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® BLIND TRANSIT SEALING SYSTEM



The NOFIRNO® system has been tested also for blind penetrations. The space inside the transit frame is filled with NOFIRNO® filler sleeves type 22/15. For ease of filling, the NOFIRNO® filler sleeves are supplied non-split. Multi-filler sleeves (set of 10) are preferred for filling larger spaces.

Filling the conduit frame with NOFIRNO® multi-filler sleeves starts with stacking the multi-set on top of each other and to place rolled-up sets of multi-sleeves in the corners.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® BLIND TRANSIT SEALING SYSTEM



Before applying the NOFIRNO® sealant, it is advisable to perform a final check on the packing of the filler sleeves. A tight fit of the whole set of sleeves in the required ratio is not only vital for the mechanical stability of the sealing system, but also for the fire stopping properties. A final check should therefore be a part of quality control.

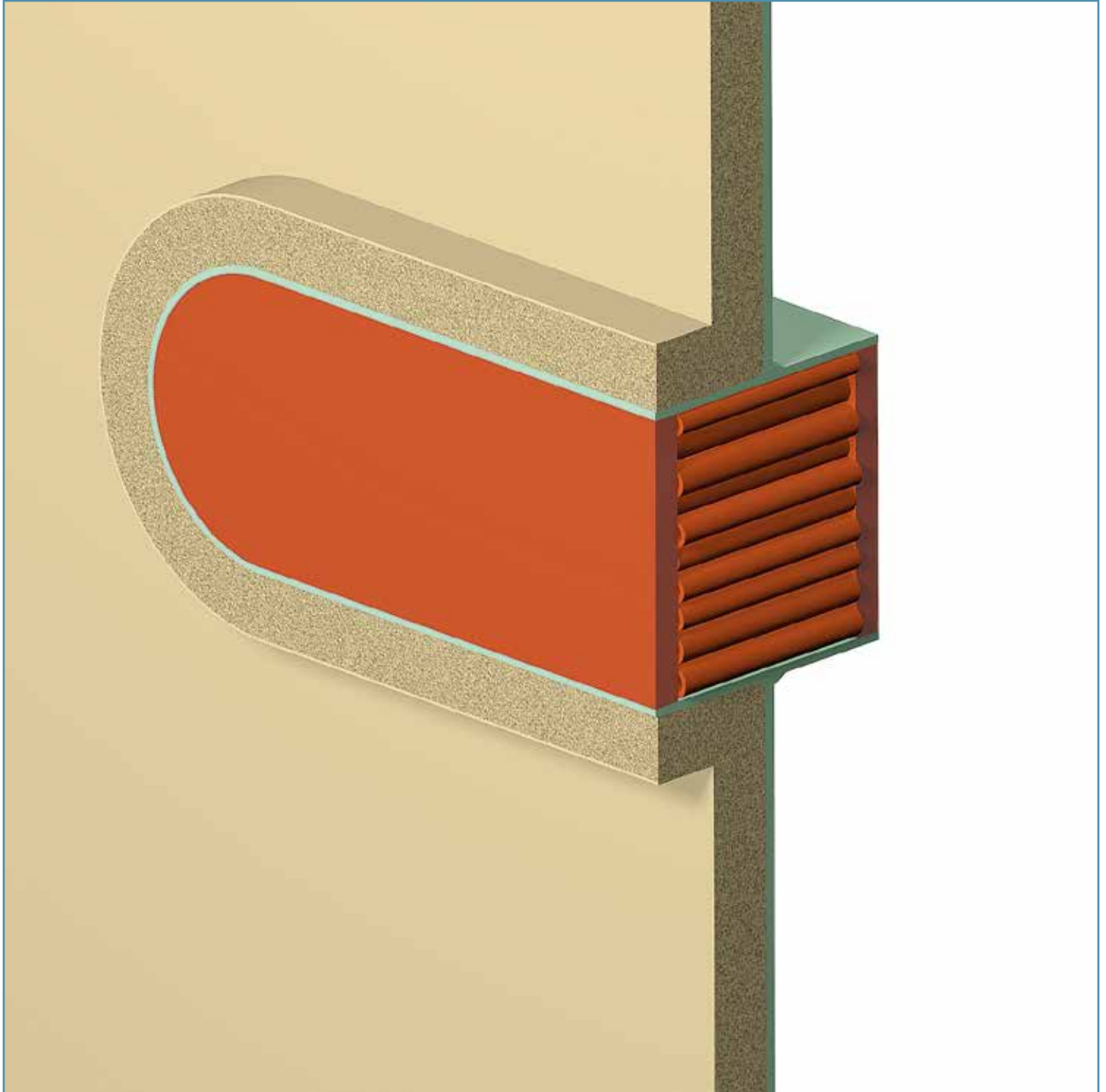
INSTALLATION INSTRUCTIONS FOR NOFIRNO® BLIND TRANSIT SEALING SYSTEM



The NOFIRNO rubber grade of the sleeves and the NOFIRNO® sealant, which are compounded under strict conditions in our factory, are suitable for gas and water tight ducting, and for fire rated applications as well. The NOFIRNO® sealant stays flexible at temperatures of -50 °C, allowing application in arctic environments.

The NOFIRNO® blind transits have excellent resistance to seawater, UV, ozone and weather. Based on the use of the high tech silicone composition of the NOFIRNO® sealant and rubber, the system offers excellent durability.

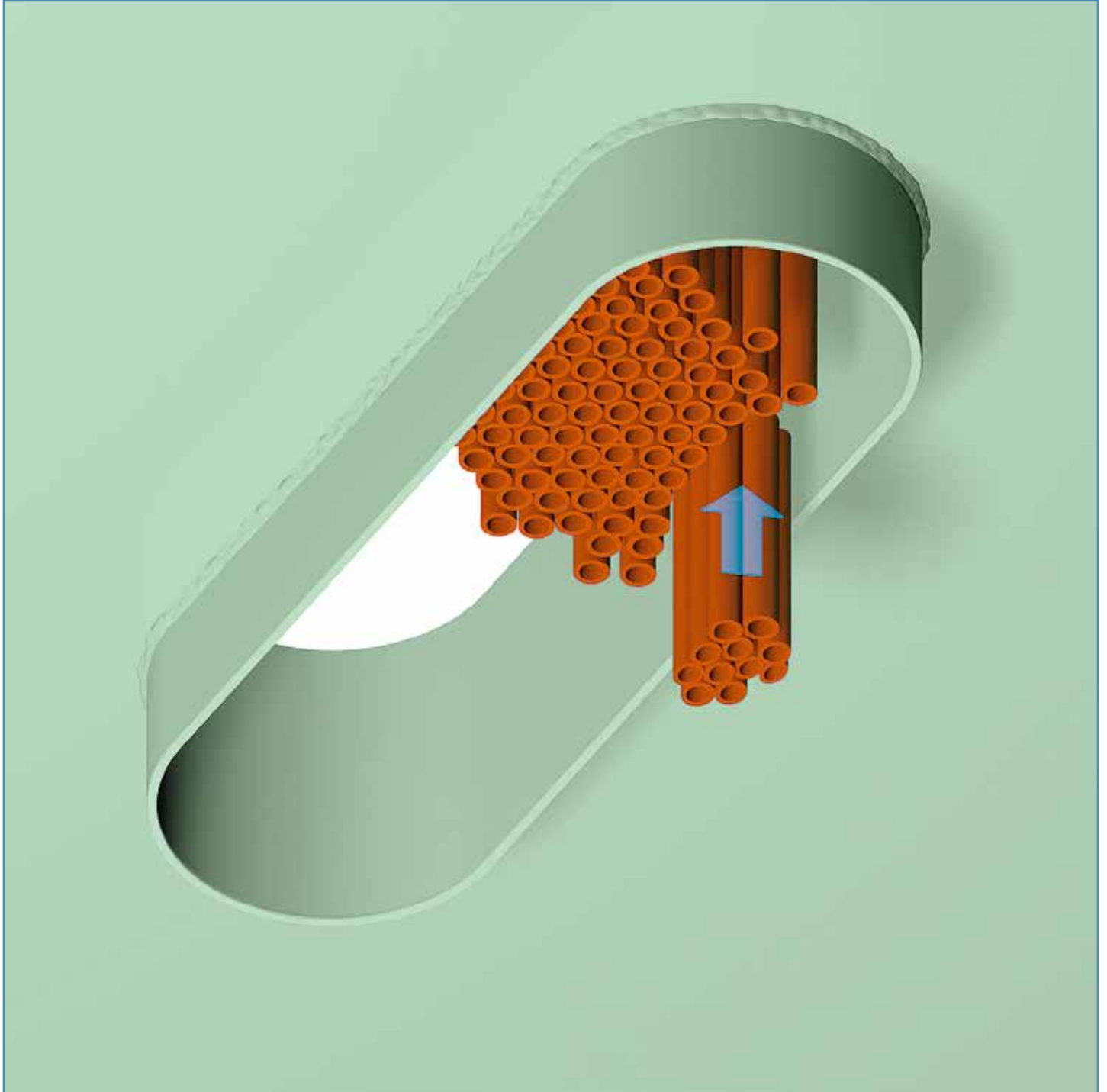
INSTALLATION INSTRUCTIONS FOR NOFIRNO® BLIND TRANSIT SEALING SYSTEM



For A-class penetrations (which are insulated), the NOFIRNO® blind transit frame needs to be insulated only at the insulated side of the bulkhead or the lower side of the deck. No extra insulation needed in front of the transit. Max. size of the coaming 600x300 mm.

For transits larger than 300x150 mm partitions have to be provided dividing the transit in sections. See drawings NFN 138E and NFN 139E.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® BLIND TRANSIT SEALING SYSTEM IN DECKS



The multi-filler sleeves are very useful, especially for sealing deck penetrations. By making use of the NOFIRNO® multi-filler sleeves, sets and bundles can be made to ensure tight fitting inside the transit. Inserting fitting sets or bundles of multi-sleeves will ensure that sleeves won't fall out of the conduit frame.

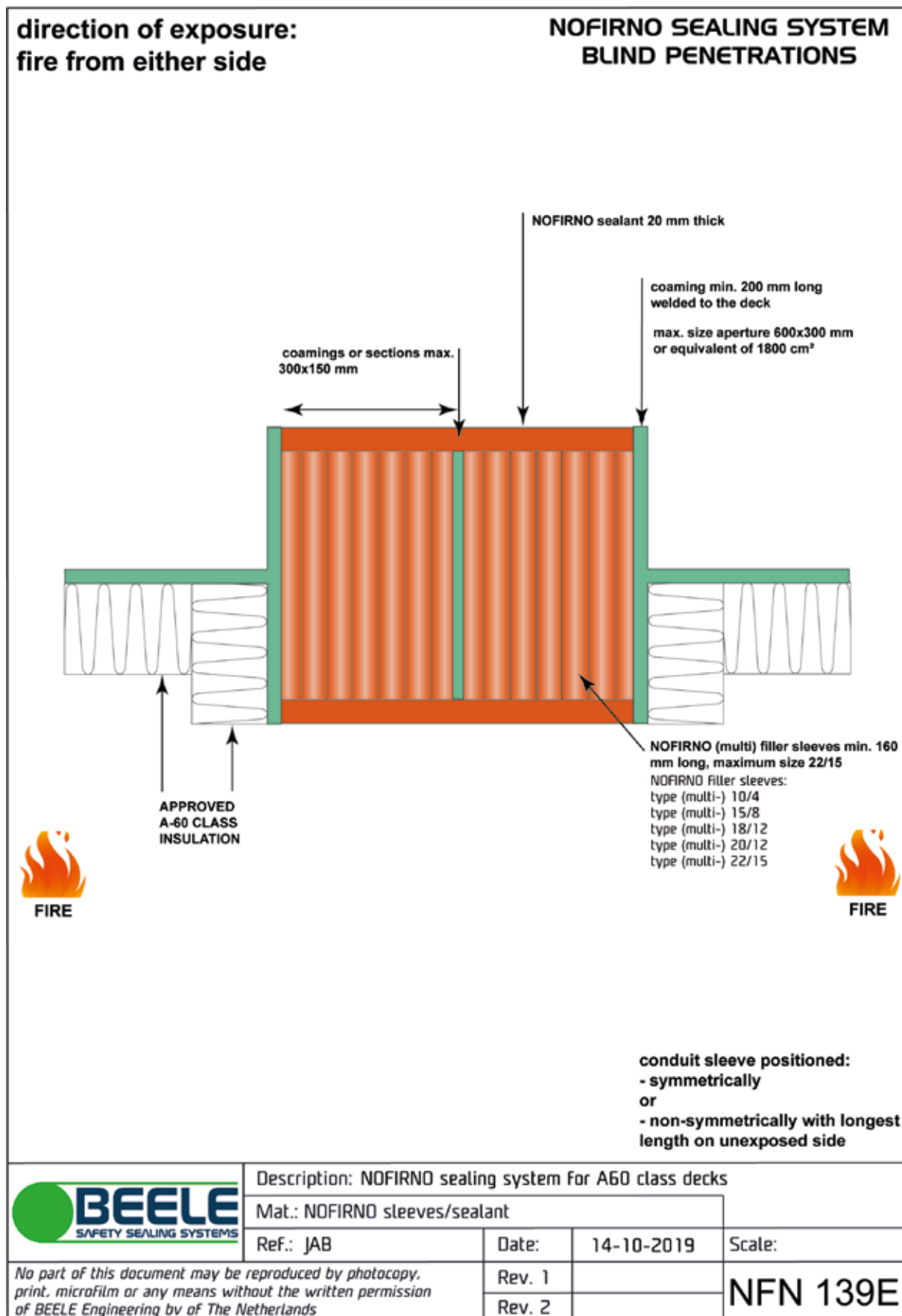
INSTALLATION INSTRUCTIONS FOR NOFIRNO® BLIND TRANSIT SEALING SYSTEM IN DECKS



The NOFIRNO® sealant can be applied overhead for deck/floor transits without dripping or sagging. After application of the sealant, the NOFIRNO® sealant is pressed tightly with a cloth sprayed with water. This prevents the sealant from sticking to the cloth. The surface can be smoothed by hand. Just wet the hands thoroughly with water. No dirty hands when working with NOFIRNO® and a very neat surface is the result.

Use protective gloves when working with NOFIRNO® sealant. Please refer to the Safety Data Sheet for more information.

INSTALLATION INSTRUCTIONS FOR NOFIRNO® SINGLE PIPE TRANSIT SEALING SYSTEM



INSTALLATION INSTRUCTIONS SLIPSIL® XL-I20 SEALING PLUGS - MED CERTIFICATE



CERTIFICATE

Certificate of
EC Type-examination (Module B)
192130009/AA/00
Product Category: MED/3.26b
USCG Approval No: 164.138/EC0560



Issued	27 November 2019	Date of expiration of validity	31 October 2024
Page	1 of 28 Certificate has four Annexes	Last date of placement	31 October 2024

With respect to Marine Equipment Directive 2014/90/EU and the implementing Regulation (EU) 2019/1397, Kiwa Telefication Notified Body 0560 declares that the equipment:

Product description:	NOFIRNO sealing system
Trademark:	NOFIRNO
Type designation:	NOFIRNO
Variants:	See Annex 3

Manufacturer:	BEELE ENGINEERING
Address:	Beunkdijk 11
City:	7122 NZ AALTEN
Country:	Netherlands

Complies with the international instruments and test standards as listed in the Annex.
This certificate is granted to:

Name:	BEELE ENGINEERING
Address:	Beunkdijk 11
City:	7122 NZ AALTEN
Country:	Netherlands



Gözde Tuzcu
Assessor



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Fax: +31 316 583 189
www.telefication.com

Chamber of commerce:
51565536

STATE-OF-THE ART METALLIC & PLASTIC PIPE SEALING SYSTEMS

NOFIRNO

slipsil
slipsil
XL-120

DYNATITE

CRUSHER

NOFIRNO®

- Approved for harshest fire ratings for pipe transits (A, H and Jet Fire class).
- Allows axial and radial movement of the ducted pipe. High pressure ratings - designed for gas and/or watertight penetrations.
- Prevents corrosion inside the penetration.
- NOFIRNO® rubber sleeves and sealant will remain stable and not be consumed by fire.
- **Breakthrough - MULTI-ALL-MIX® SYSTEM**
- Approved for any combination of cable and/or metallic, GRP or plastic pipes!

SLIPSIL®

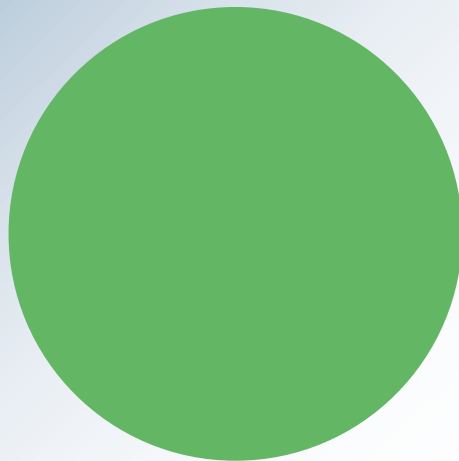
- Designed to provide fire safe, gas and watertight seals for pipe penetrations.
- For transits carrying single or multiple metal pipes with the same diameter (hydraulic and pneumatic lines).
- Installs in a couple of minutes. Lubricate and push - that is it!
- No bolting or other mechanical devices.
- Absorbs mechanical stresses, vibration and prevents galvanic corrosion problems.
- Wide temperature range: -60 °C up to +180 °C.
- **Proven - simple, shortest conduit length**
- The system of choice in shipyards worldwide for more than 30 years!

DYNATITE®

- For applications where a high degree of (instantaneous) tightness is required.
- Dynamic sealing when a disaster occurs.
- Plugs are compressible and will return to their original shape after shock pressure.
- Easily withstands shock pressure loads of up to 15 bar (220 psi).
- Ideal solution for the columns of offshore rigs and collision bulkheads.
- **Breakthrough - dynamic compression**
- Based on high-tech rubber grade and engineered profiling, the DYNATITE® plugs can be substantially compressed and get tighter with excessive pressure.

CRUSHER®

- Simple and effective system for all plastic pipe transits.
- RISE®/ULTRA C-FIT crushers squeeze and seal.
- RISE®/ULTRA wraps to be used for non-SLIPSIL® and oversized conduit sleeves.
- RISE®/ULTRA C-FIT crushers and wraps integrated in the NOFIRNO® sealing system.
- NOFIRNO® sealant adheres well to plastics: high degree of water tightness feasible.
- **Breakthrough - adhesion under fire load**
- RISE®/ULTRA compound forms an adhesive mass during fire exposure!
- Approved for a multiple mixture of all kinds of plastic pipes.



WE CARE

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



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