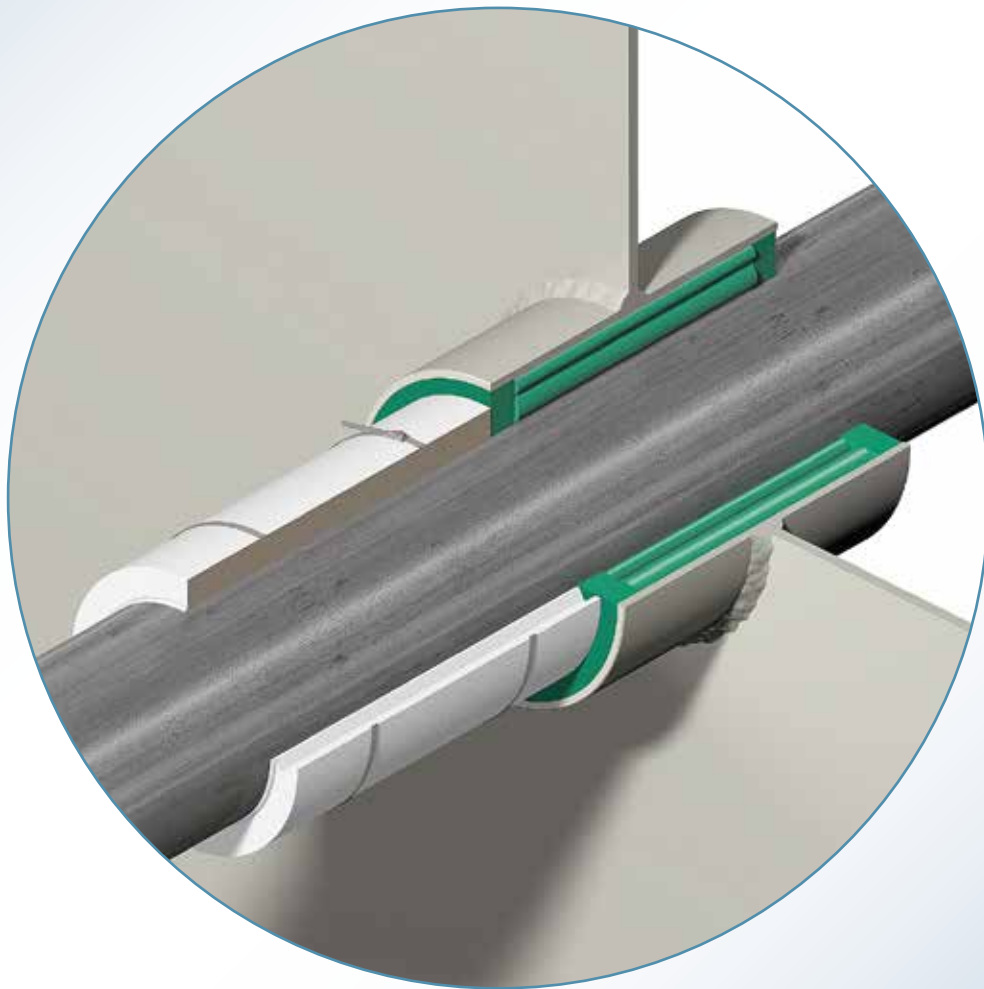




INSTALLATION INSTRUCTIONS NOFIRNO[®]/Cer SEALING SYSTEM (NOFIRNO[®]/Cer SLEEVES/SEALANT) FOR H- and J-class PIPE TRANSITS



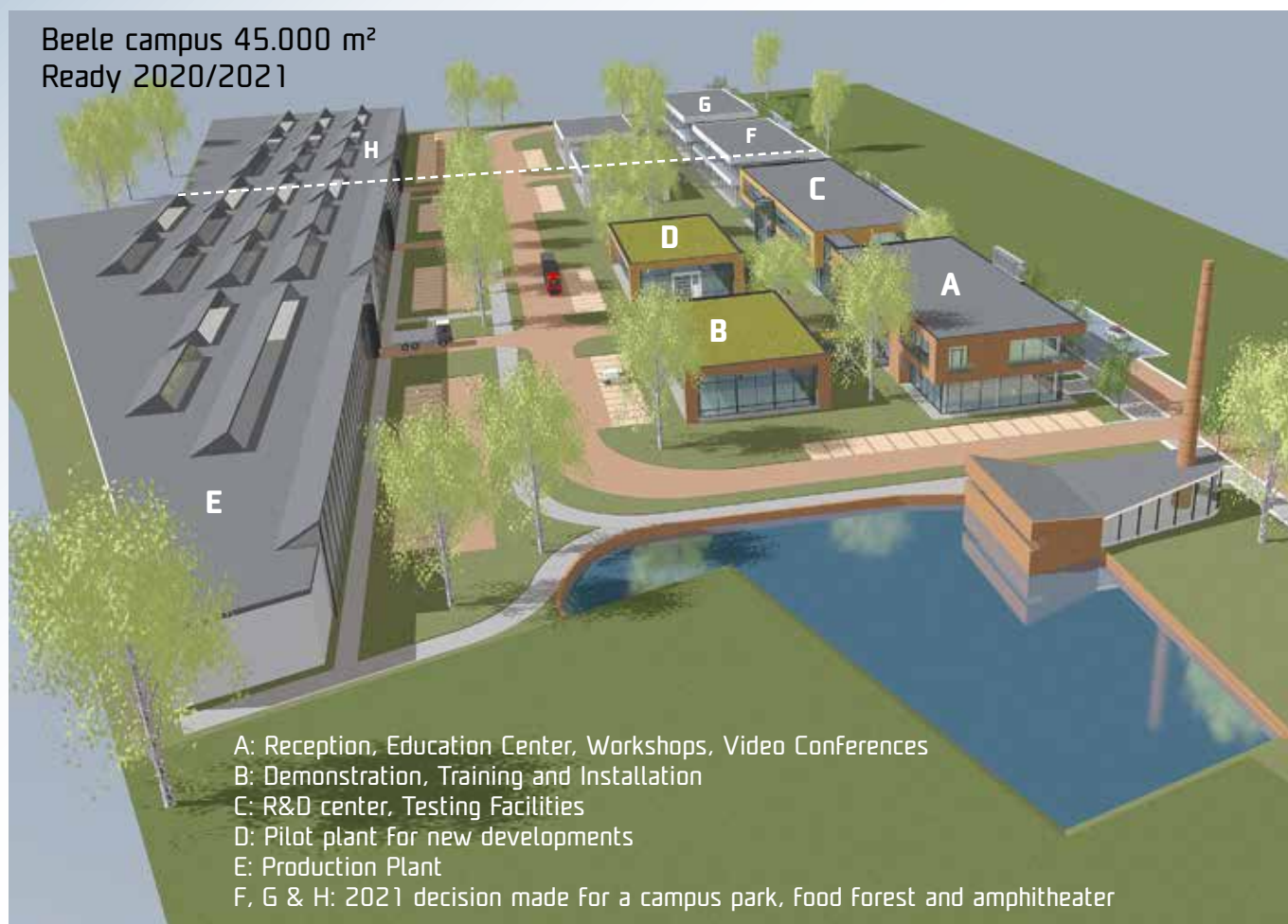
NO FIRNO[®]



SEALING VALLEY

KNOWLEDGE TRANSFER, EDUCATION AND TRAINING

Beele campus 45.000 m²
Ready 2020/2021



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Edition

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Research & Development

: BEELE Engineering BV, Aalten, the Netherlands.

Note

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brochure code

: installation NOFIRNO/Cer pipe

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



The NOFIRNO®/Cer (multi-) pipe transit sealing system is composed of NOFIRNO®/Cer (multi-) filler sleeves type 22/15, or as an alternative, a combination of NOFIRNO®/Cer (multi-) filler sleeves type 10/4, 15/8, 18/12, 20/12 and 22/15, and NOFIRNO®/Cer® sealant.

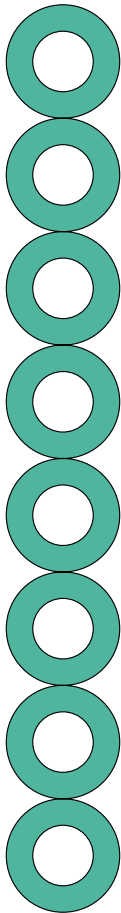
INSTALLATION INSTRUCTIONS FOR NOFIRNO® MULTI-PIPE TRANSIT SEALING SYSTEM

NOFIRNO®/Ce_r MULTI-FILLER SLEEVES

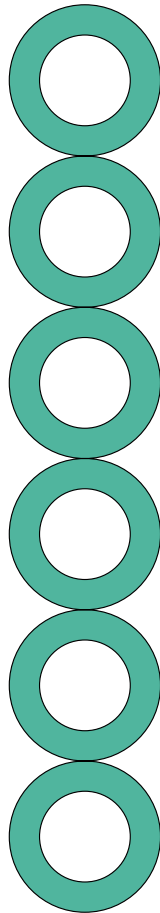


NOFIRNO® filler sleeve 10/4 multi 12
art. no. 50.2341 for 210 mm length

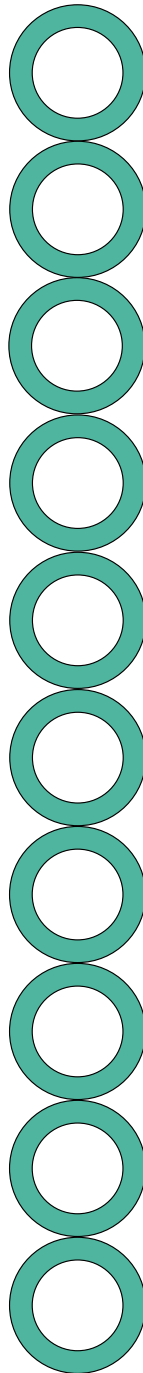
to be used for smaller conduit openings



NOFIRNO® filler sleeve 15/8 multi 8
art. no. 50.2342 for 210 mm length

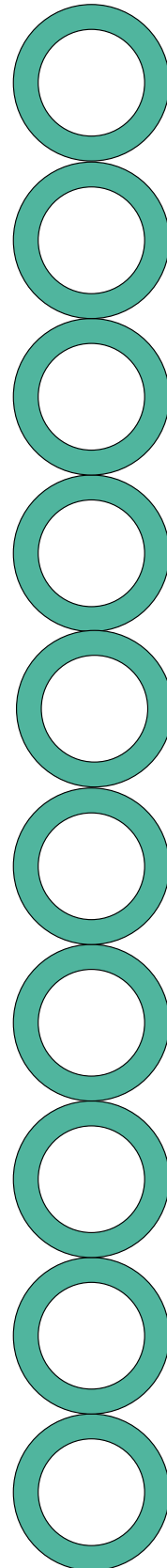


NOFIRNO® filler sleeve 20/12 multi 6
art. no. 50.2343 for 210 mm length



NOFIRNO® filler sleeve 18/12 multi 10
art. no. 50.5154 for 210 mm length

to be used for larger conduit openings



NOFIRNO® filler sleeve 22/15 multi 10
art. no. 51.5074 for 210 mm length

to be used for larger conduit openings

filler sleeves are supplied non-split

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

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM

PRODUCT INFORMATION SEALANT

01) colour	green
02) density	1.44 ± 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®/Cer is a new development based on the regular NOFIRNO® sealant polymer. The main improvement is the formation of a hard ceramic char when exposed to fire. NOFIRNO®/Cer is absolutely HALOGEN FREE with zero VOC (volatiles organic compounds) according to TÜV report 89206405-01. Furthermore NOFIRNO®/Cer 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®/Cer is a paste-like compound which is simple to use. NOFIRNO®/Cer has a balanced viscosity and can be applied overhead.

article number 50.0112



PRODUCT INFORMATION NOFIRNO®/Cer RUBBER

01) colour	green
02) specific gravity	1.40 ± 0.03 g/cm ³
04) service temperature	-50 °C up to +180 °C
05) tensile strength	1.5 MPa
06) elongation at break	200%
07) hardness	74 Shore A
08) elastic deformation	approx. 50%
09) resistance	UV, Ozone, arctic conditions
10) ageing	more than 20 years

NOFIRNO®/Cer rubber is highly endothermic and transfers under heat/fire temperatures above 350 °C in non-combustible hard ceramic. In this way offering highest fire ratings.

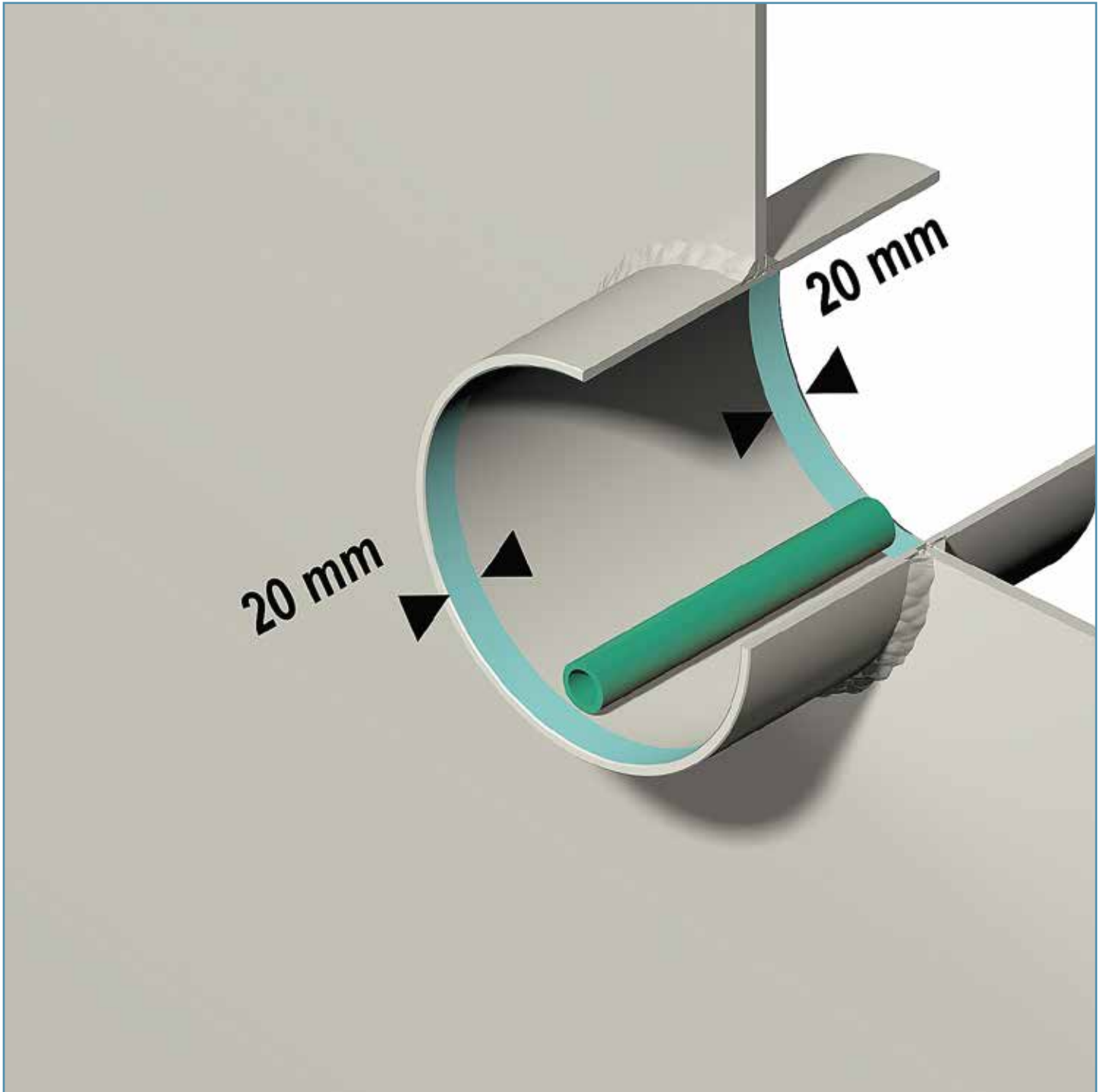


INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



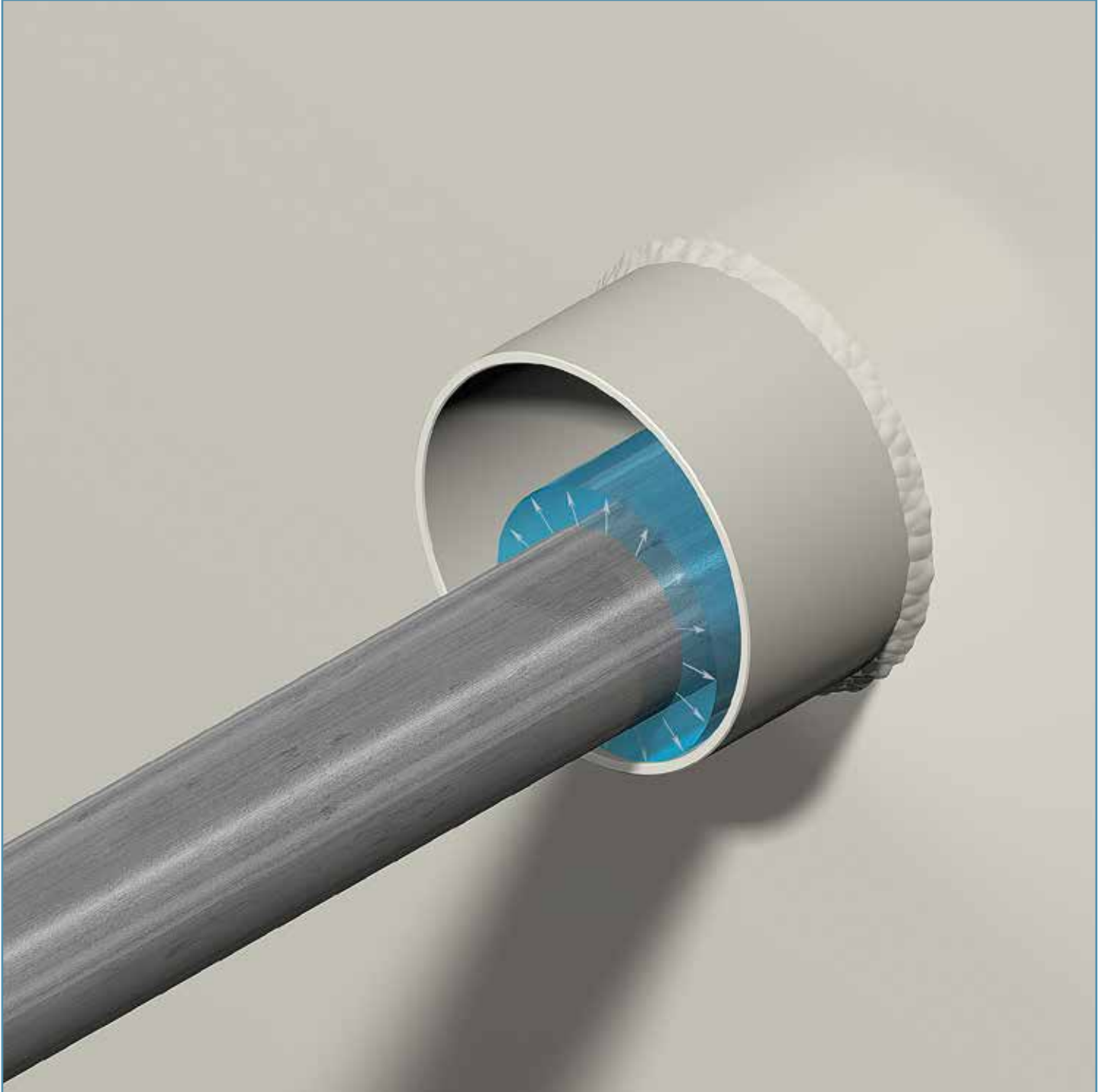
The tools needed for the installation are a steel brush, a tie-wrap cutter, a cutter for the nozzles of the sealant cartridges, flat nose pliers to adjust the set of fillers, a filler set adjuster, cloths for cleaning and compression of the sealant layer, a pipe cleaner, a bucket with water and a professional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

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



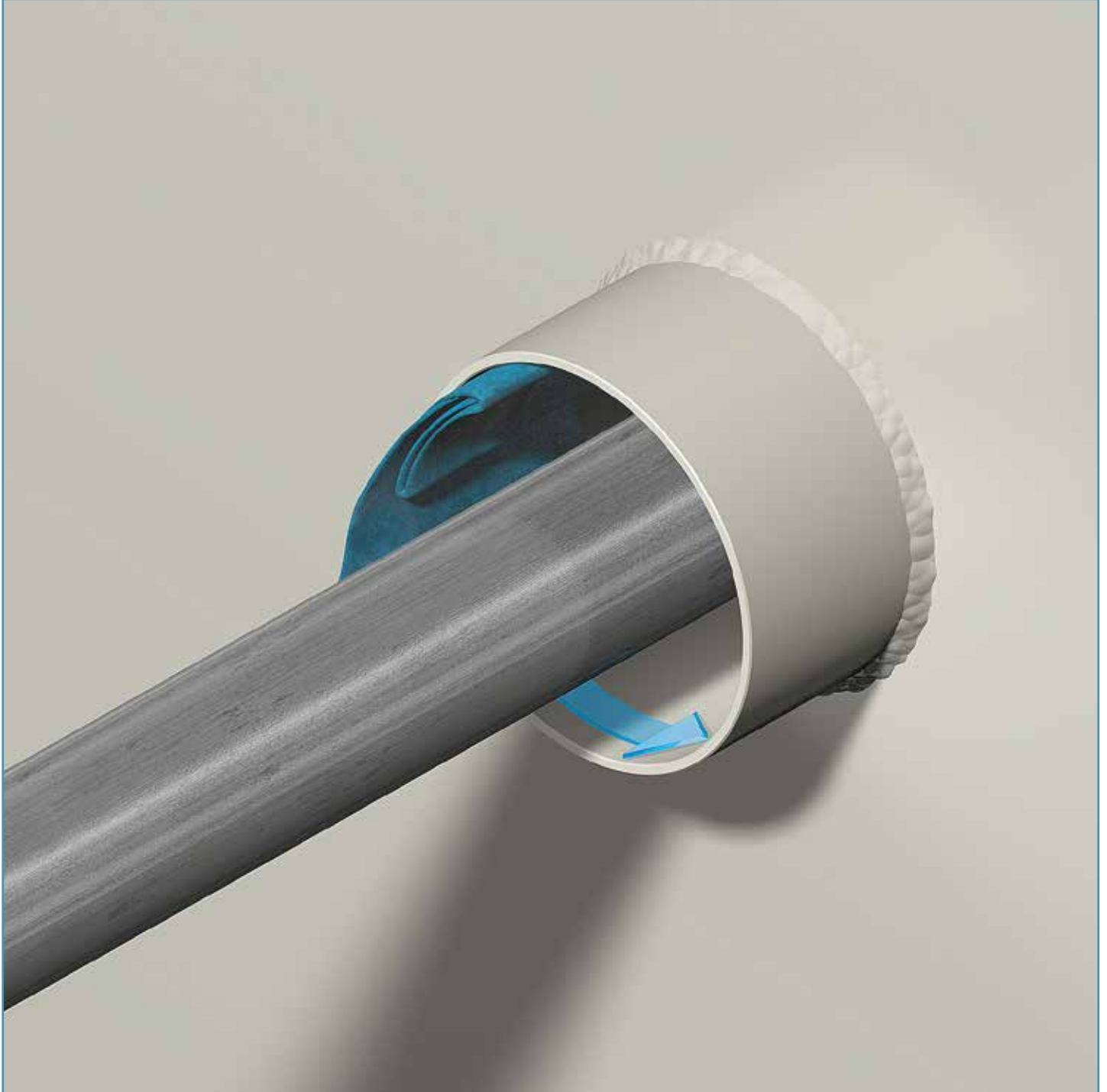
The NOFIRNO®/Cer sealing system is composed of filler sleeves, and layers of sealant. The filler sleeves are the backing on which the sealant is going to be applied. A 20 mm thick layer of sealant is applied at both sides of the penetration. Before welding the conduit sleeve into the partition, check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

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



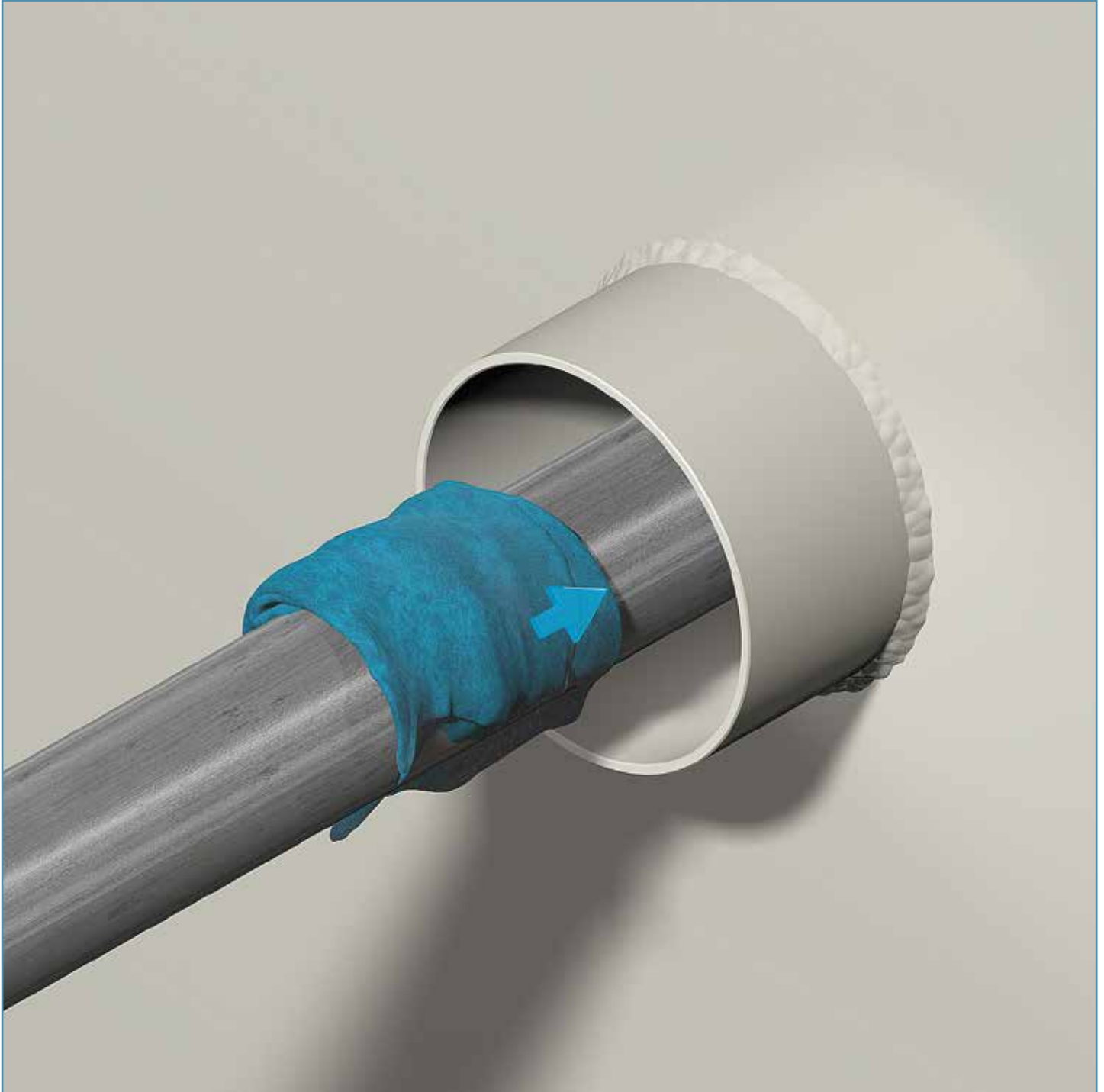
The pipe can be passed through the conduit sleeve in an off center position, provided there is enough space between the conduit sleeve and the ducted pipe. Make sure that the minimum space between the pipe and the wall of the conduit sleeve is in accordance with the minimum allowed distance as certified.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



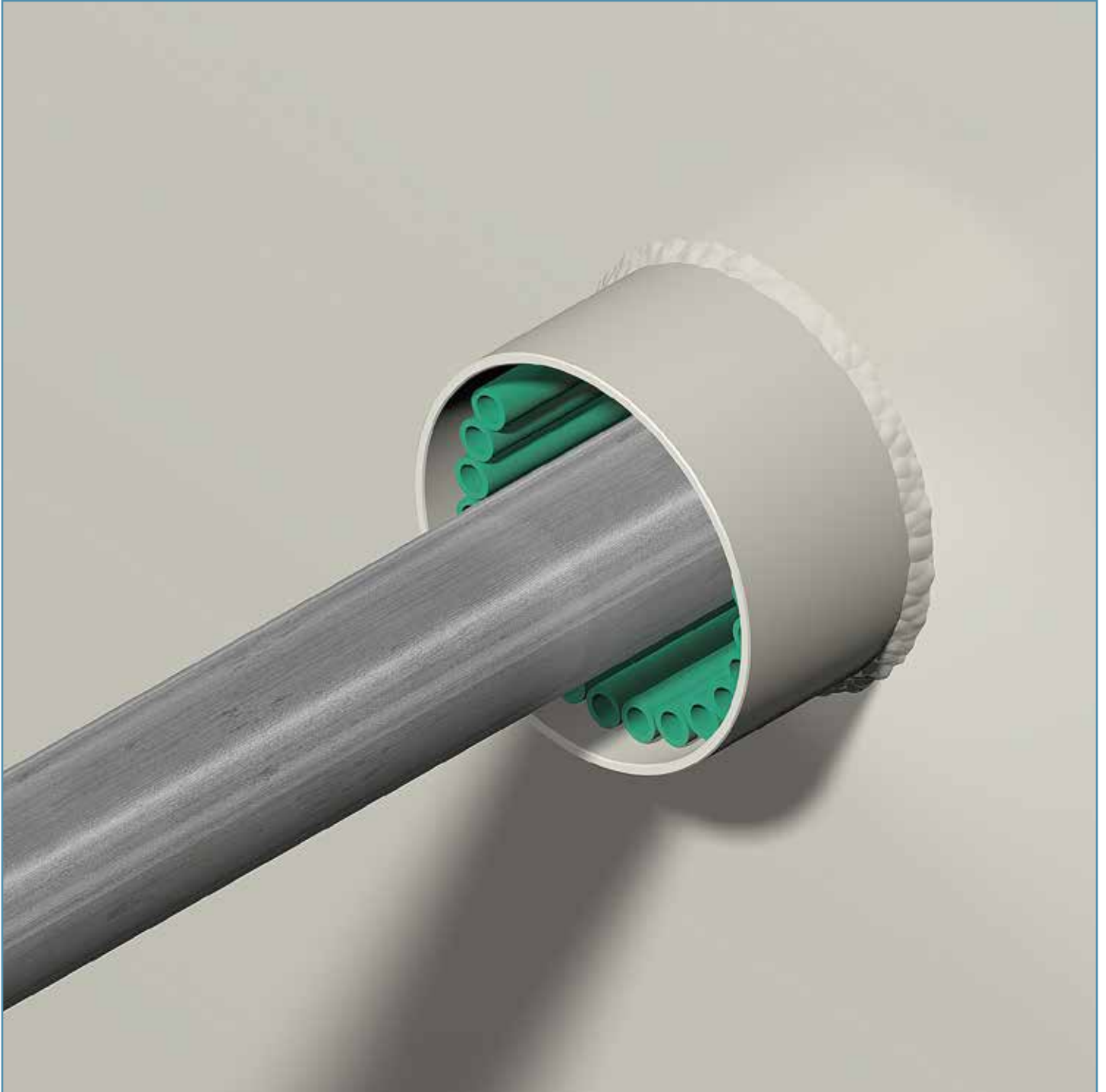
Before insertion of the NOFIRNO®/Cer filler sleeves, the inside of the conduit sleeve has to be cleaned, and any dirt, oil, grease and other residues or corrosion should be removed from the inside of the conduit sleeve.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



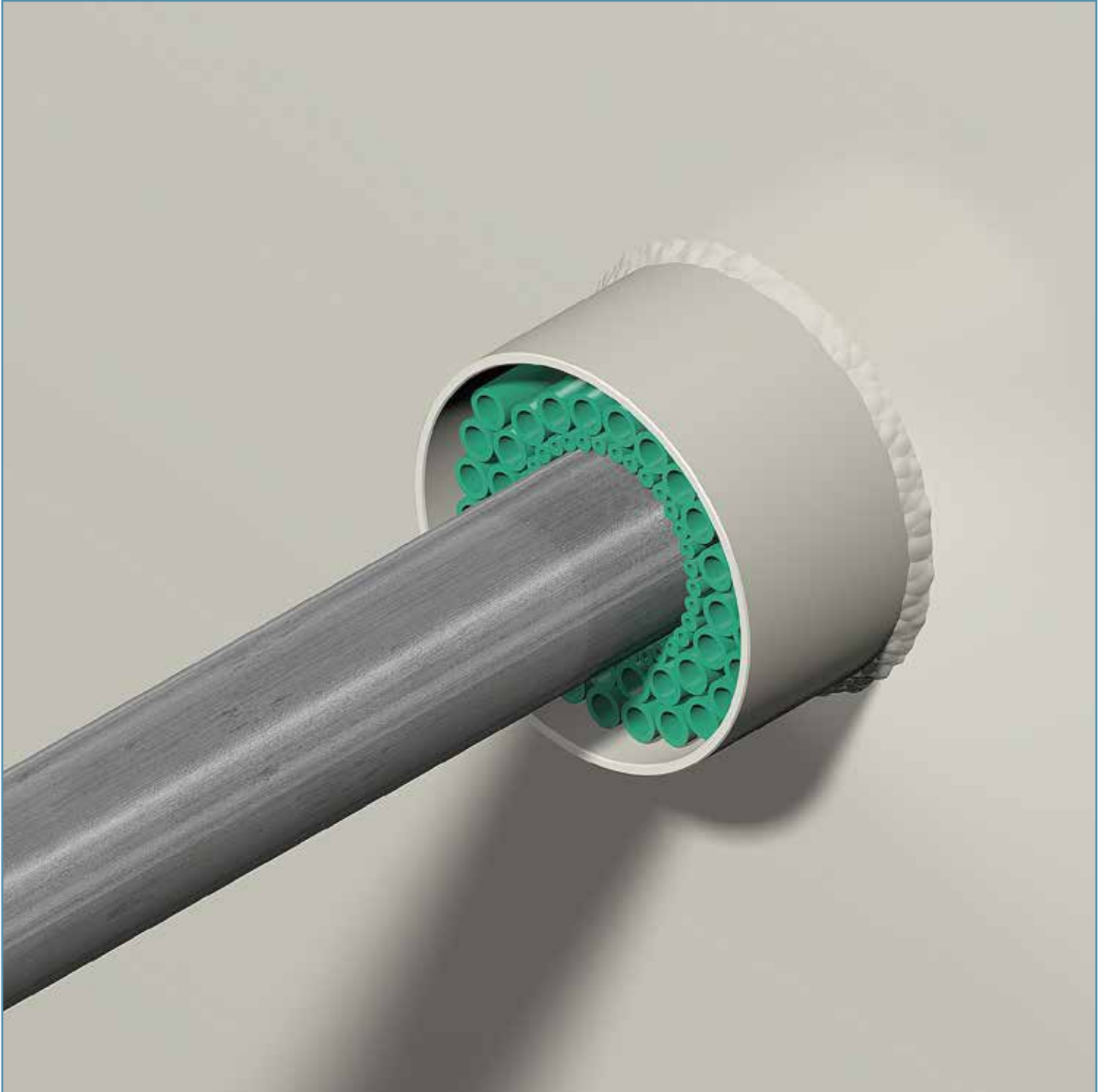
Before insertion of the NOFIRNO®/Cer filler sleeves, the ducted pipes also has to be cleaned from any dirt, oil, grease and other residues or corrosion.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



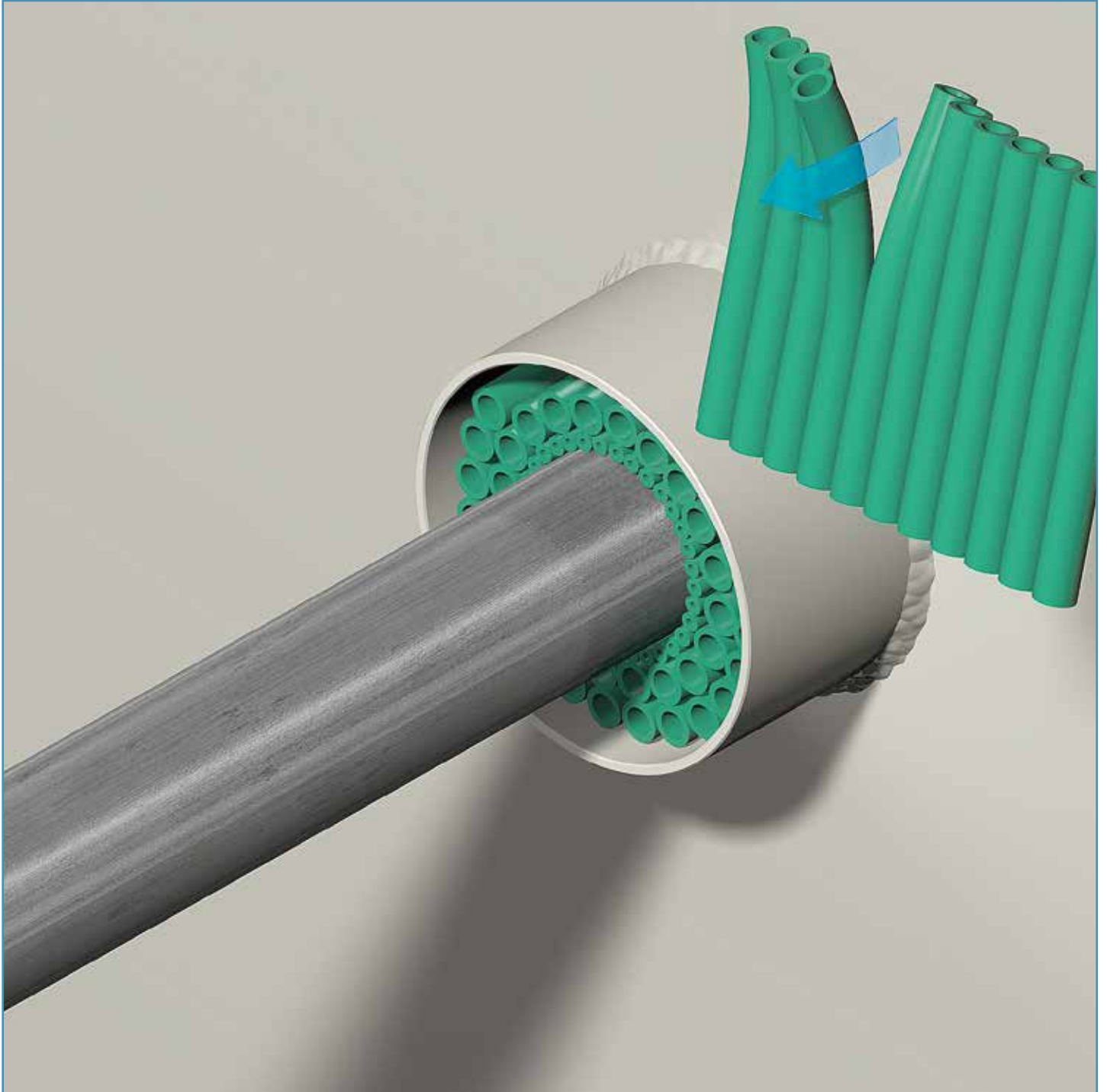
The open space between the conduit sleeve and the ducted pipe is filled with NOFIRNO®/Cer filler sleeves type 22/15.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



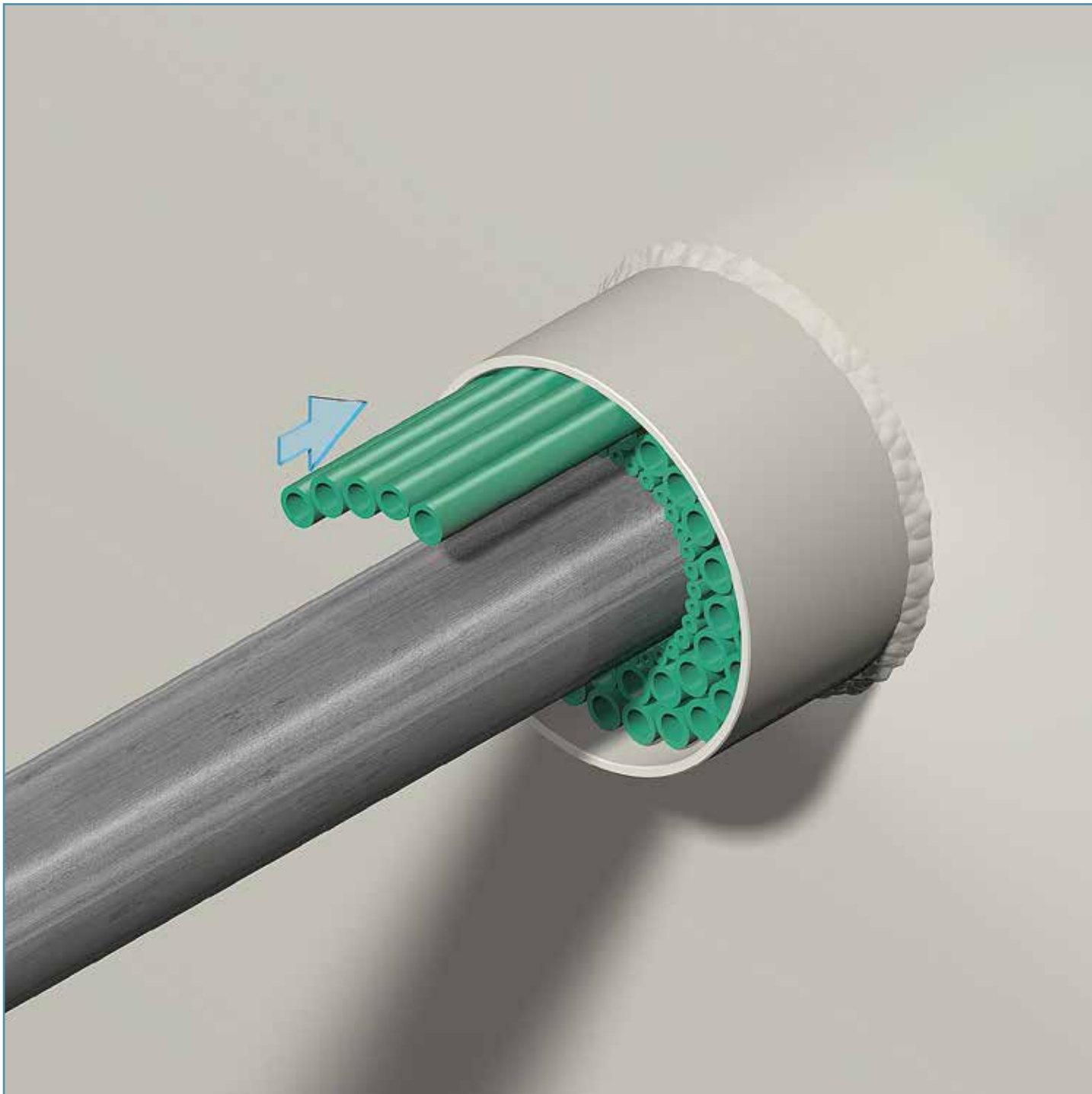
A combination of NOFIRNO®/Cer filler sleeves type 10/4, 15/8, 18/12, 20/12 and 22/15 is used to optimize for a tight fit of the set of filler sleeves. For ease of filling, the NOFIRNO®/Cer filler sleeves are supplied non-split and in multi-sets. Adjustment of the set of sleeves to the 20 mm recess can be carried out just before applying the sealant.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



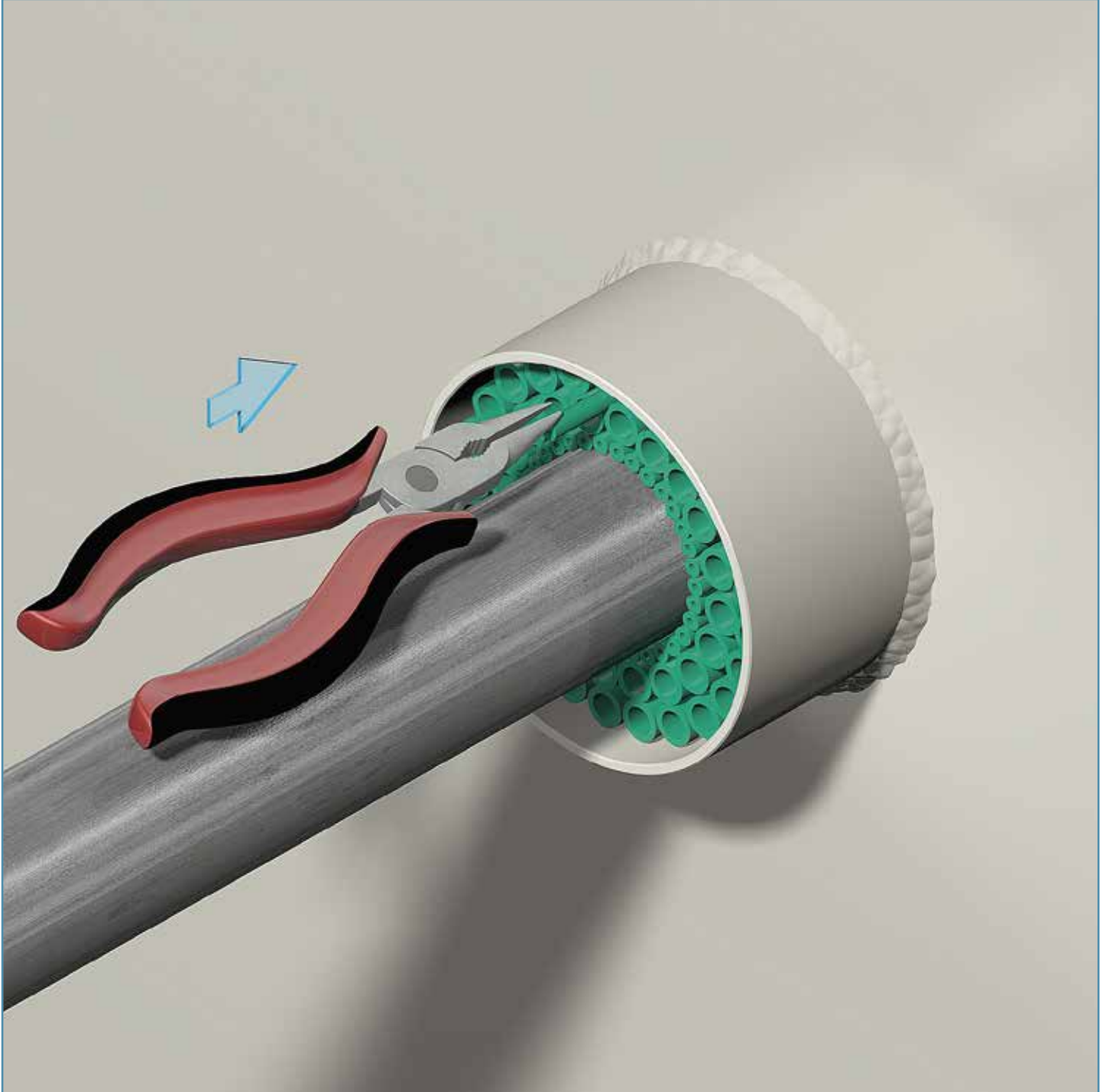
The smaller openings are now filled with parts of the sets of multi-filler sleeves. To tear off sleeves from the multi-set, the procedure is to do this by moving and tearing backwards/forwards and not tearing off sideways. This is because of the strength of the intermediate rubber parts.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



In order to maintain mechanical properties, the set of filler sleeves has to be applied very tight. In this way not only the pressure rating is optimized, but also movement and/or displacement of the ducted pipe is allowed within limits, that can be accommodated by the sealant layer.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



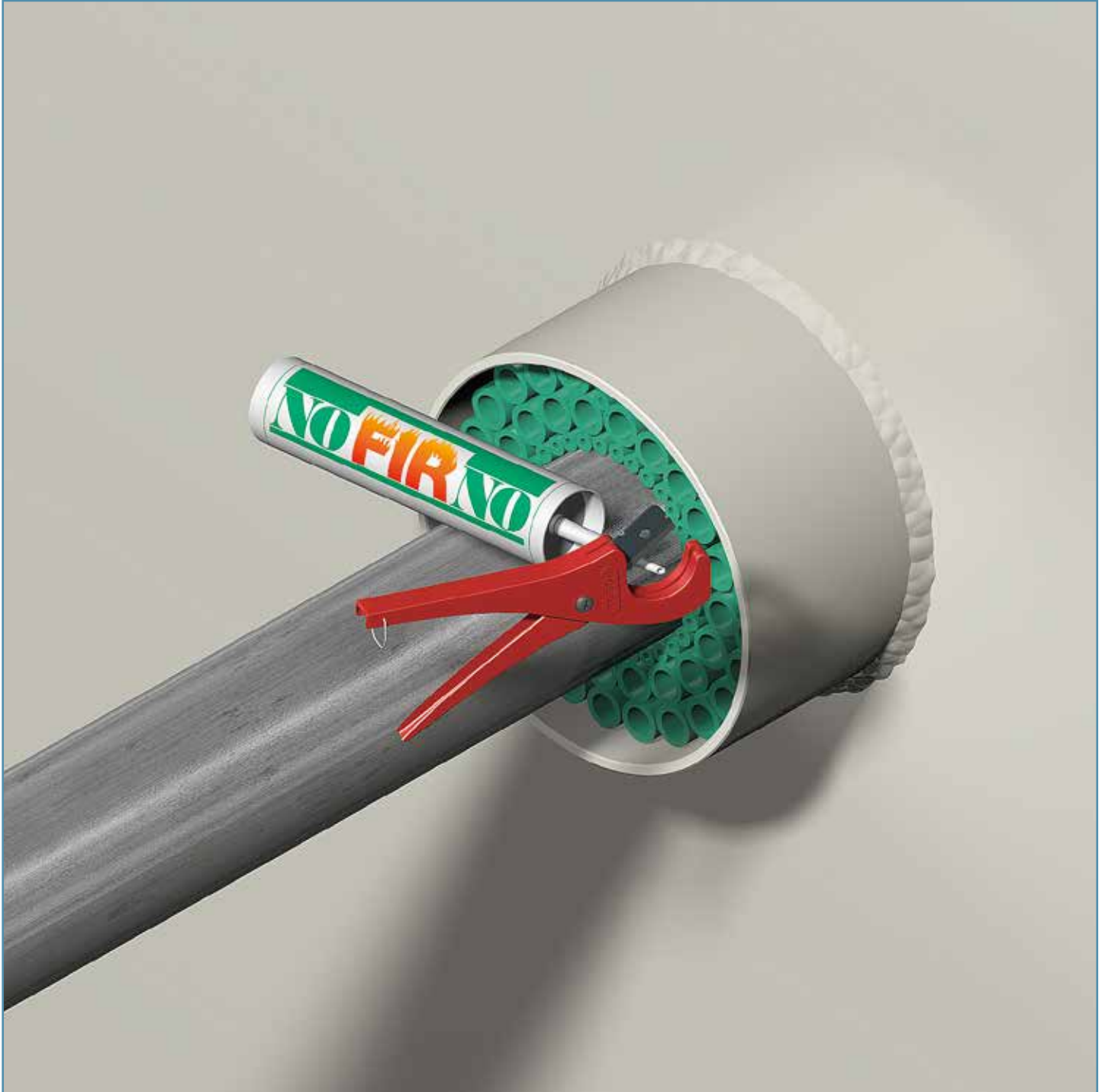
With a flat nose pliers, NOFIRNO®/Cer single filler sleeves are inserted in the remaining smaller open spaces in the set of fillers. A very tight fit of the filling is vital to the performance of the sealing system. Single filler sleeves sometimes might be inserted too deep. A 20 mm free space at the front and back of the sealing system is a must to obtain optimum sealing capacity of the sealing system.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



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

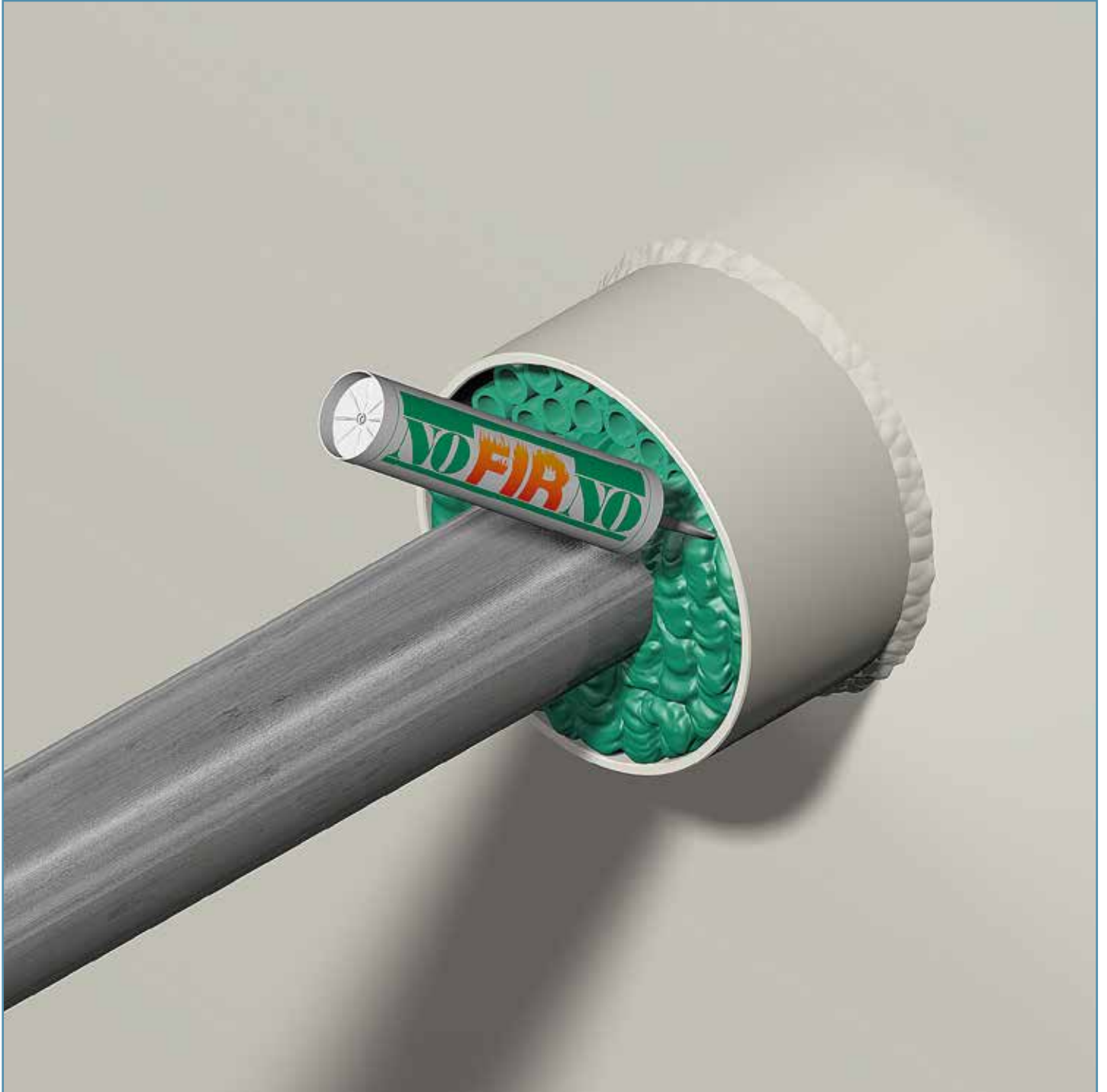
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



A 20 mm thick layer of NOFIRNO®/Cer 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.

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. Furthermore, it is advisable to use professional motorized sealant dispensers. 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®/Cer H-class PIPE TRANSIT SEALING SYSTEM

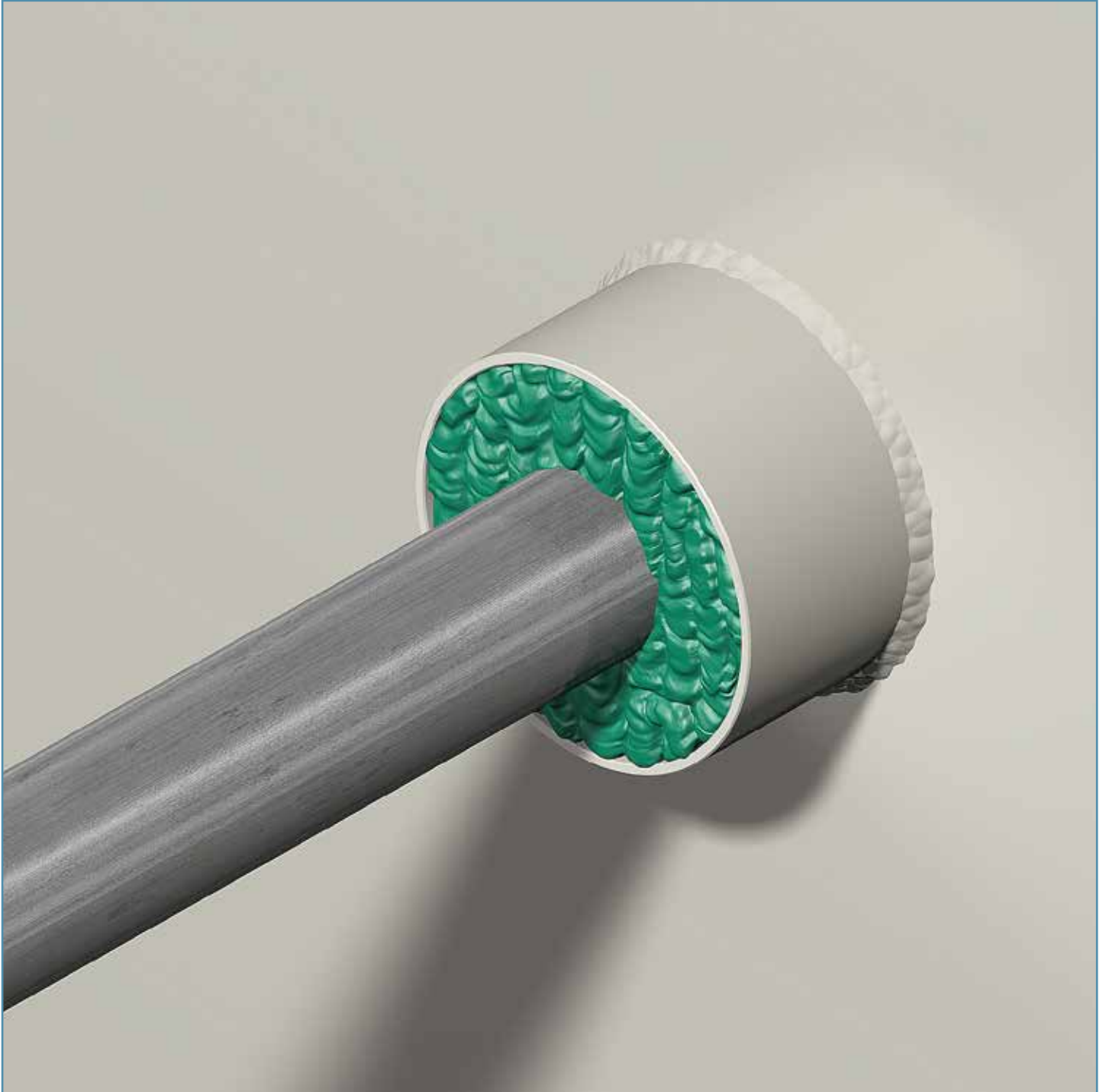


NOFIRNO®/Cer sealant has an engineered viscosity, preventing the sealant from sagging, and also allowing for a perfect flow of the sealant.

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.

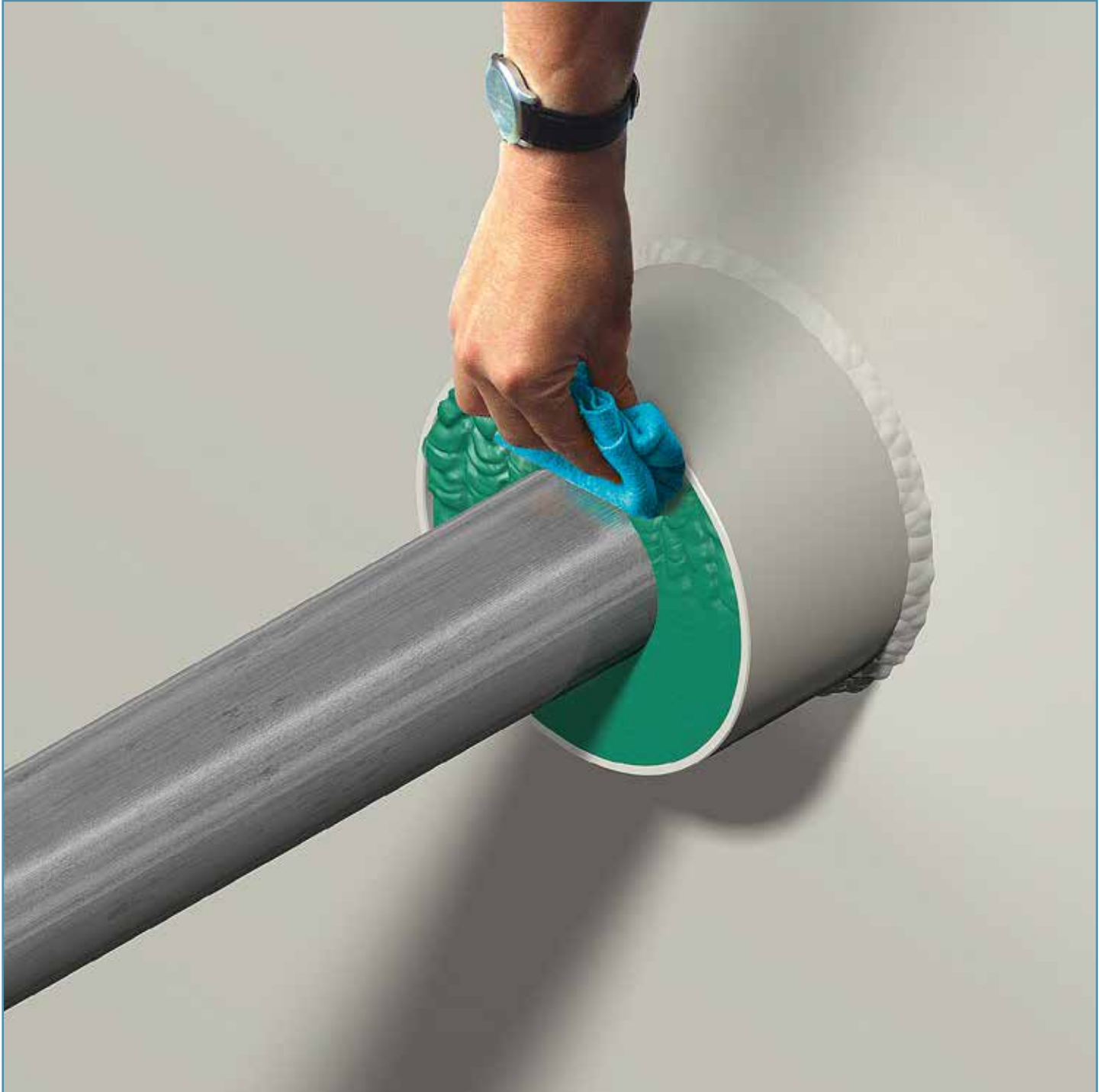
Please refer to the Safety Data Sheet for more information about the working environment.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



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

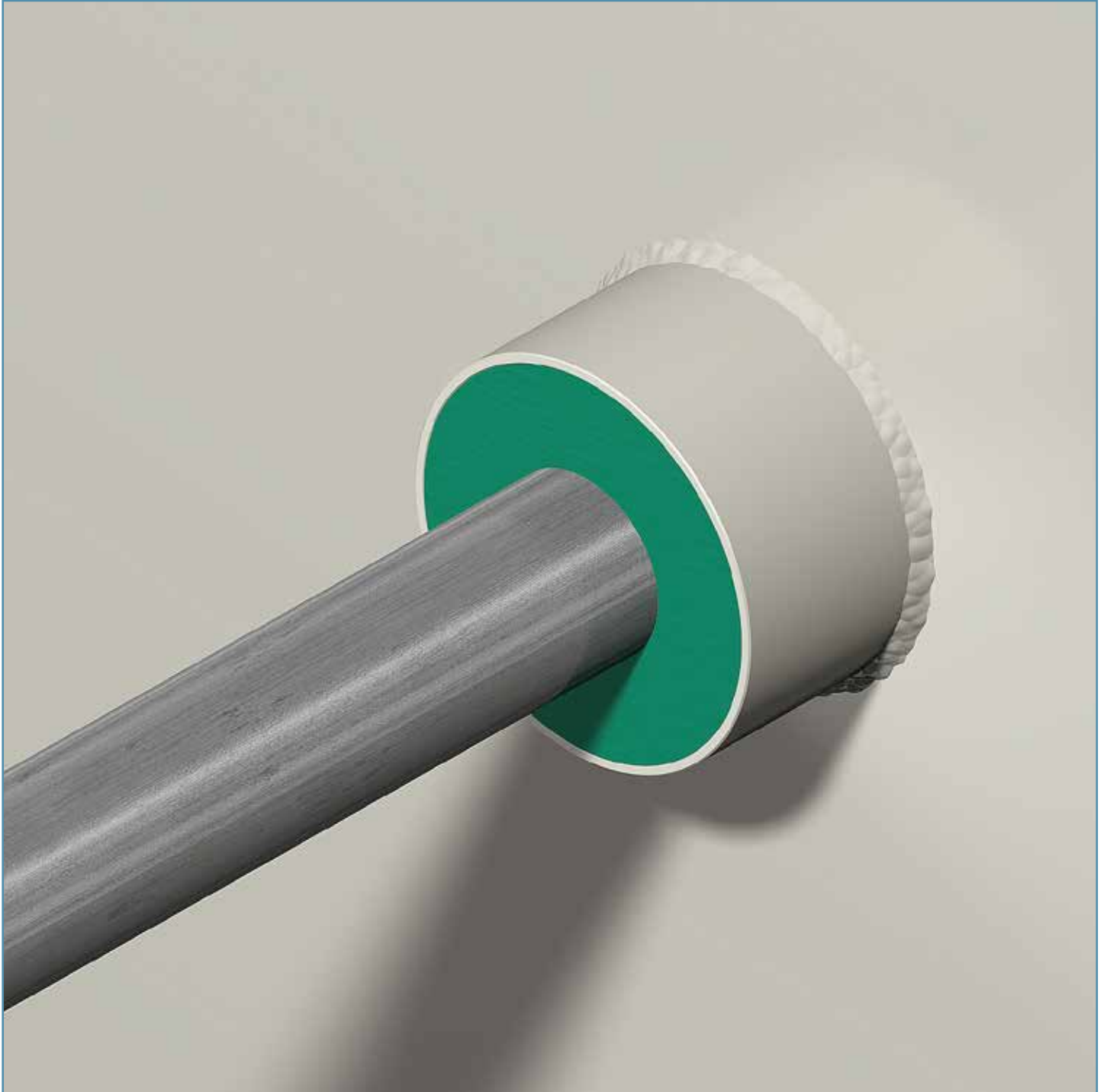
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



A wet cloth is used to press down the sealant layer flush with the end of the conduit sleeve. It is of utmost importance to ensure that the sealant is compressed very tightly into all empty spaces of the NOFIRNO®/Cer 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.

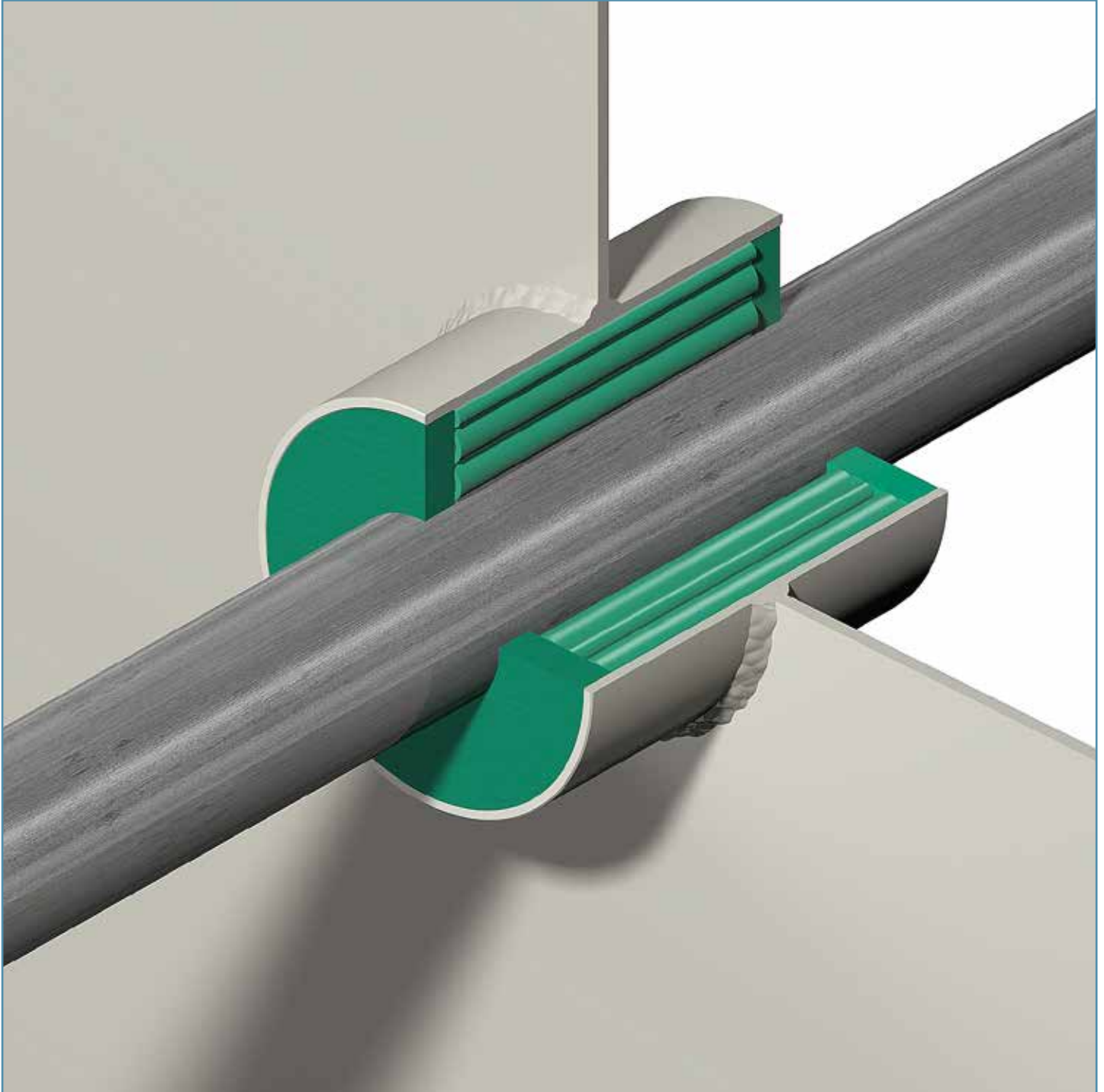
Please refer to the Safety Data Sheet for more information about the working environment.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class 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.

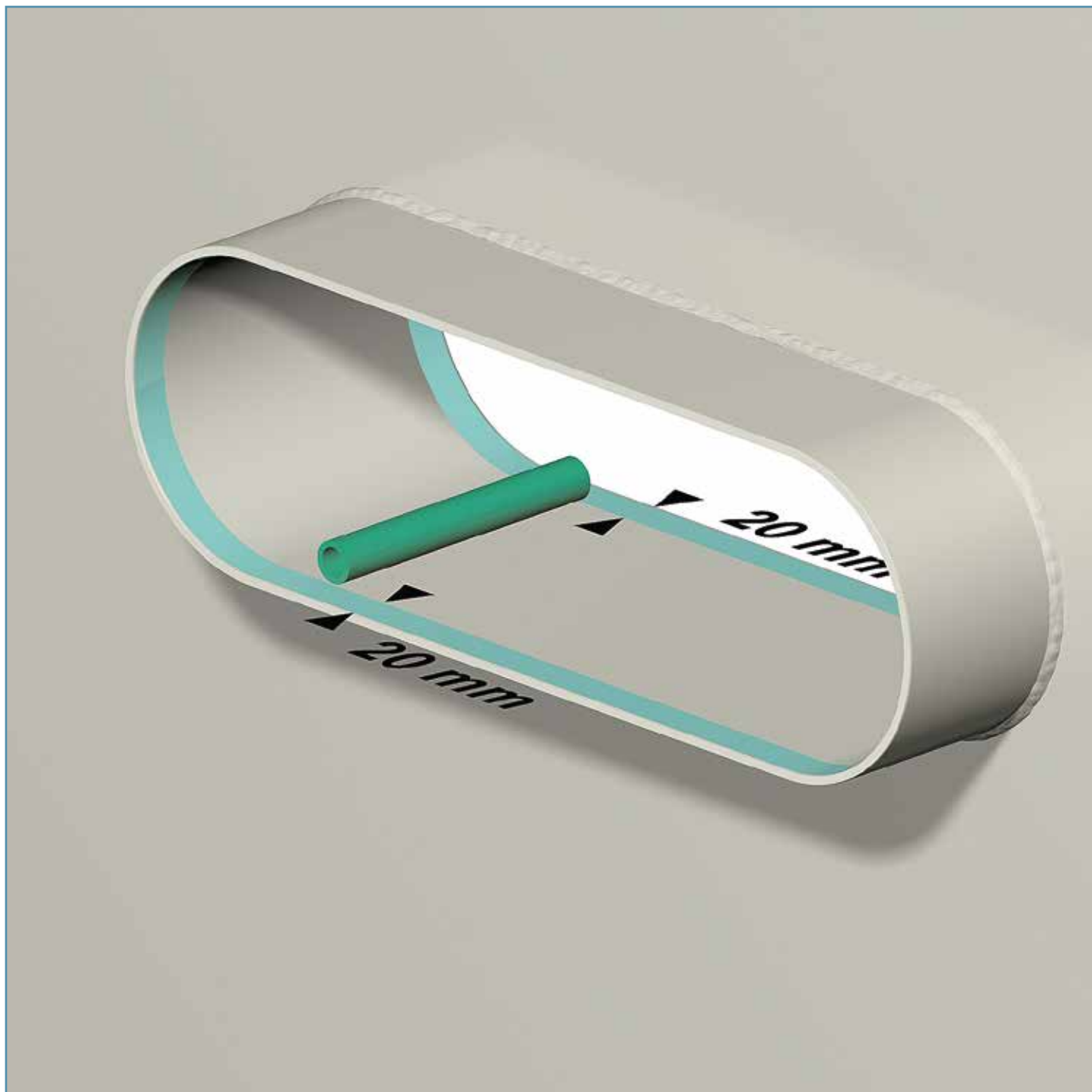
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



For H-class penetrations (which are insulated), the NOFIRNO®/Cer pipe conduit sleeve needs to be insulated only at the insulated side of the bulkhead, or the lower side of the deck. Also approved for H-0 penetrations. Check for the insulation lengths to be applied around the ducted pipes to fulfill the criteria of the maximum temperature rise for H-class penetrations according to the FTP code.

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).

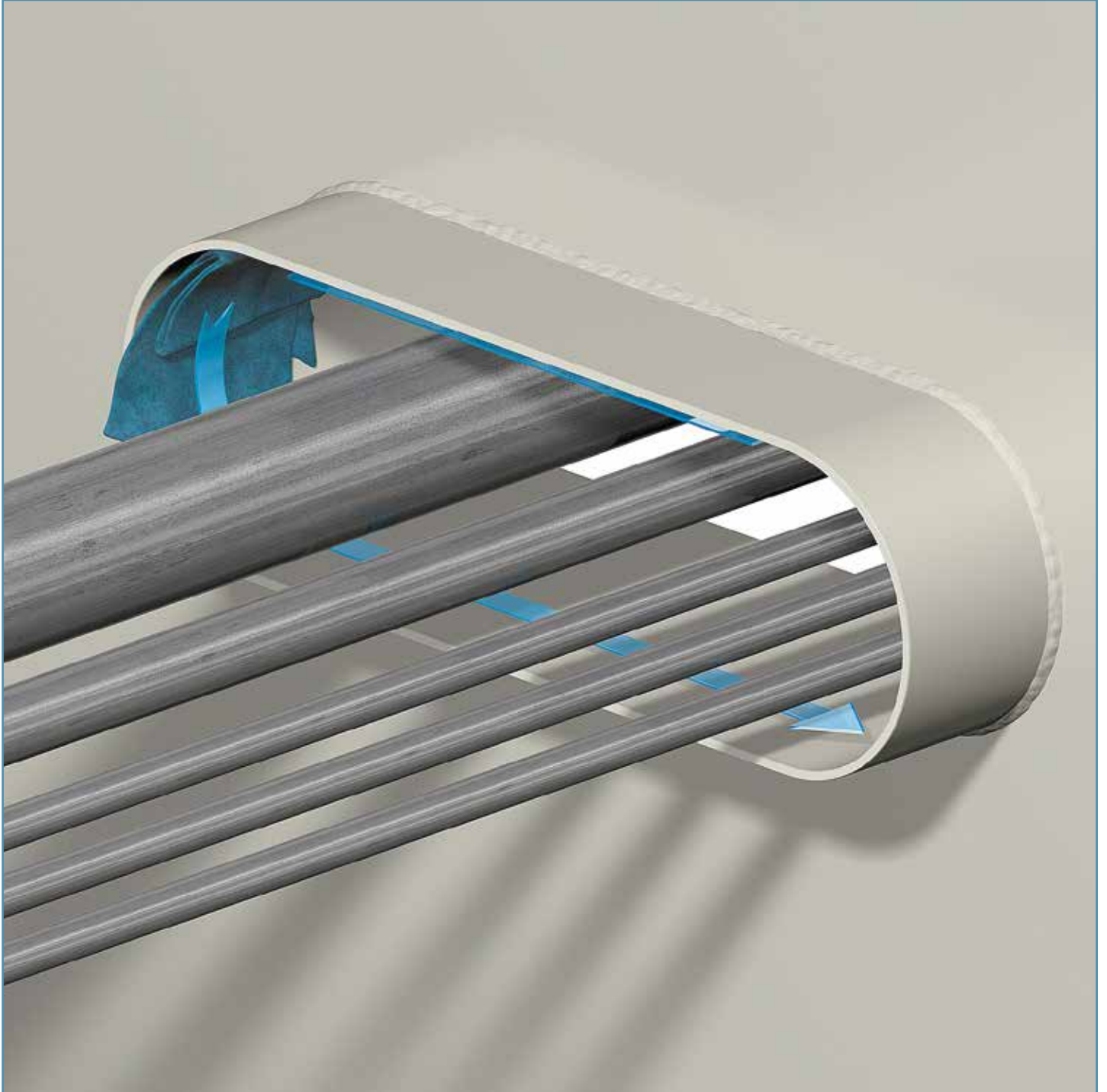
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



The NOFIRNO®/Cer 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.

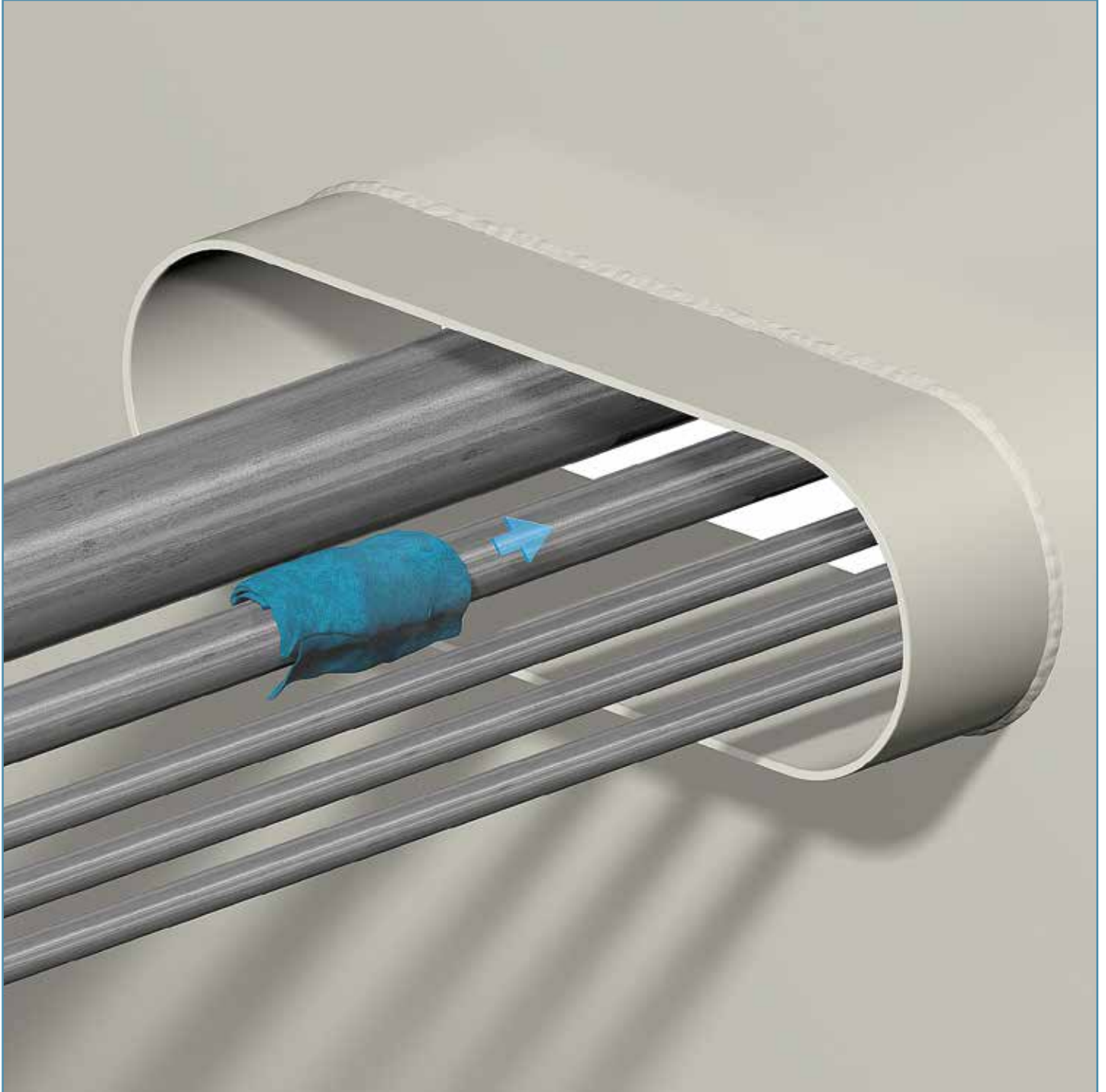
The pipes can be ducted through the transit frame in random order. It is most important that they are ducted with the required inter-spacing according to the certified drawings, and with not less than the minimum allowable distance to the wall of the conduit frame.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



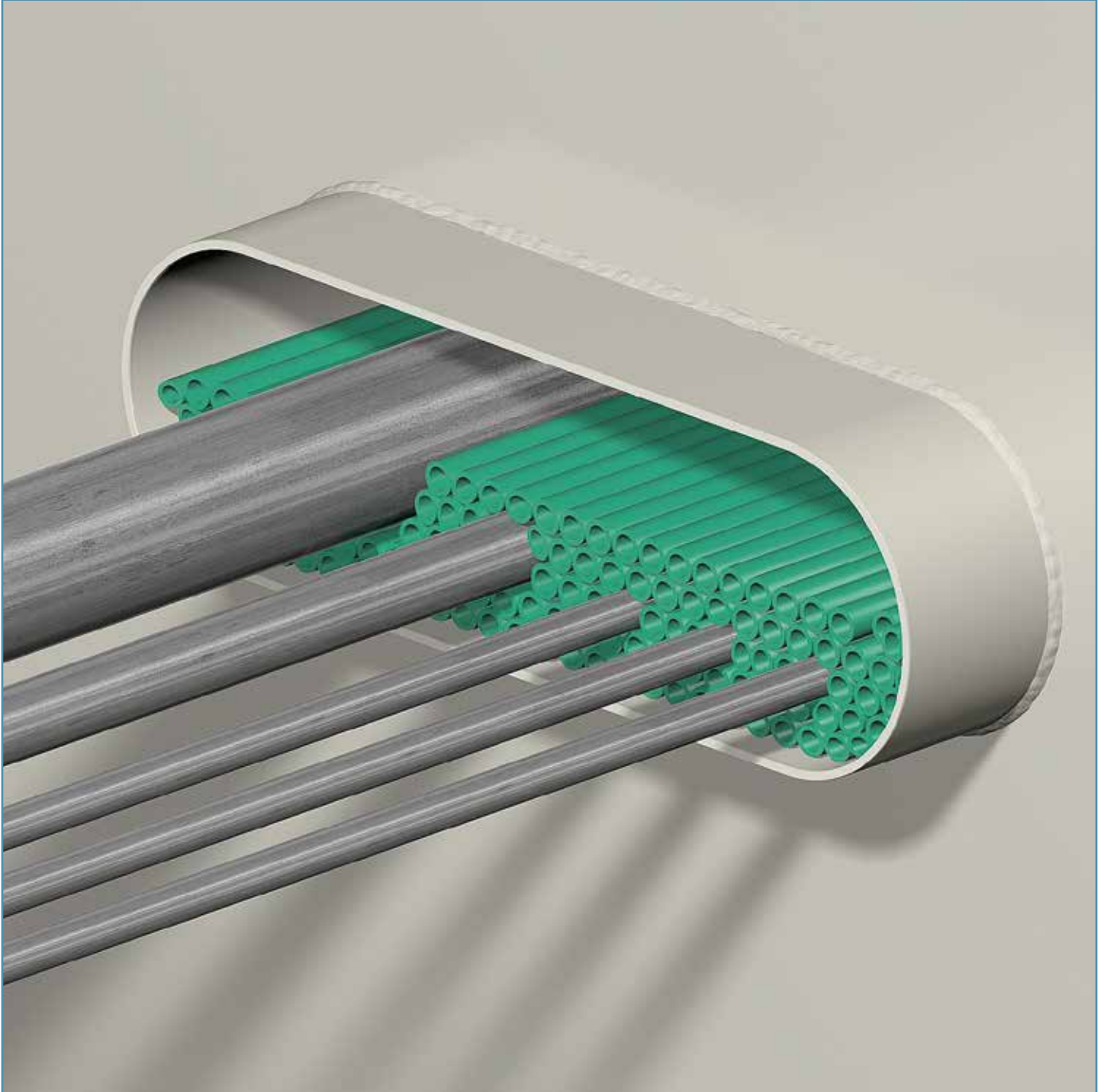
Before insertion of the NOFIRNO®/Cer filler sleeves, the inside of the conduit frame has to be cleaned, and any dirt, oil, grease and other residues or corrosion should be removed from the inside of the conduit frame. For adequate cleaning purposes (which is an important step), sufficient separation of the ducted pipes and access to the inner wall of the conduit frame is of utmost importance.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (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®/Cer sealant to be applied after filling the transit frame.

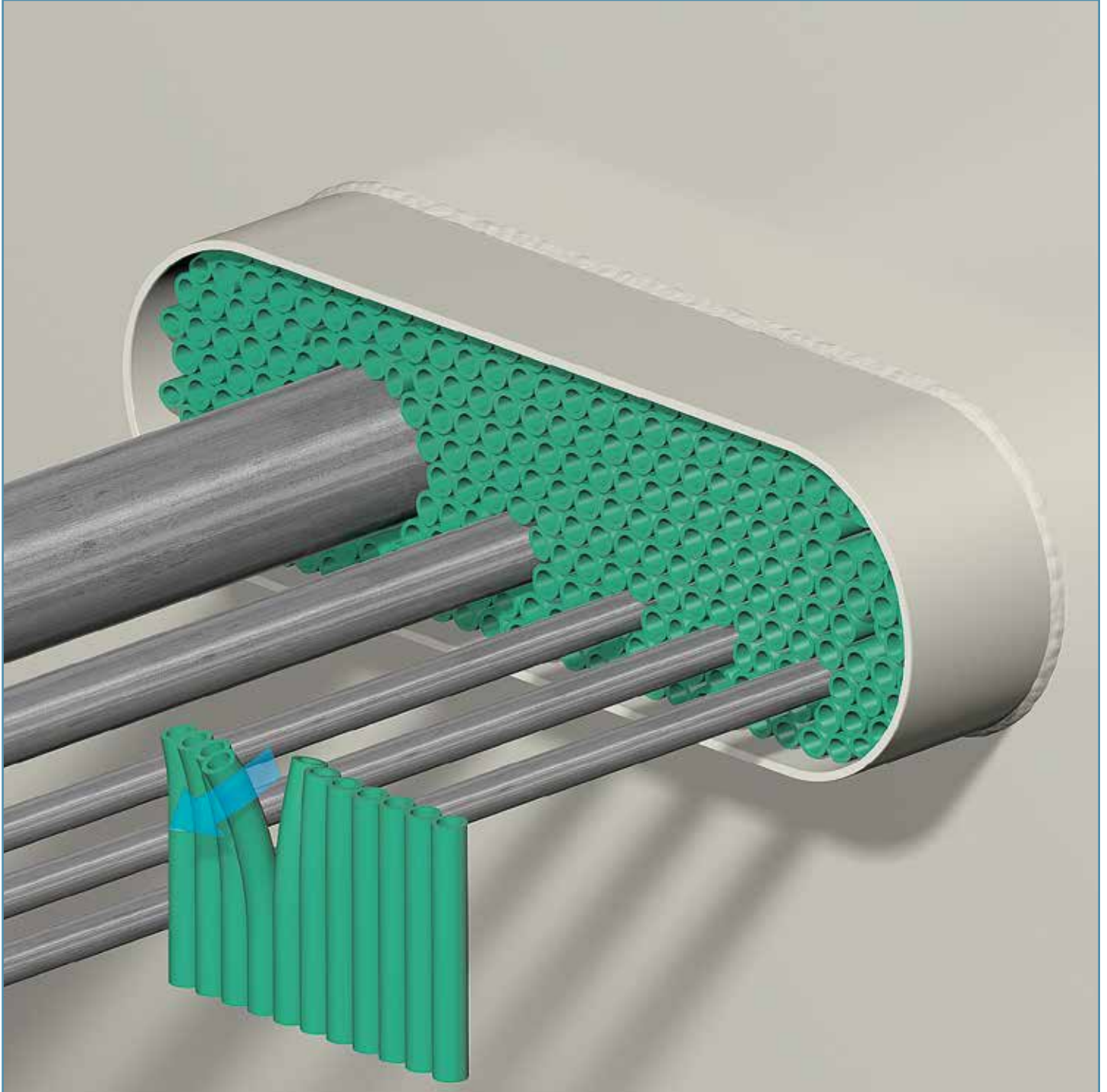
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



A combination of NOFIRNO®/Cer filler sleeves type 10/4, 15/8, 18/12, 20/12 and 22/15 is used to optimize for a tight fit of the set of filler sleeves. For ease of filling, the NOFIRNO®/Cer filler sleeves are supplied non-split and in multi-sets. Adjustment of the set of sleeves to the 20 mm recess can be carried out just before applying the sealant.

For later extensions, it is advisable to use NOFIRNO®/Cer single filler sleeves at the top of the conduit for ease of removal when a new pipe has to be ducted.

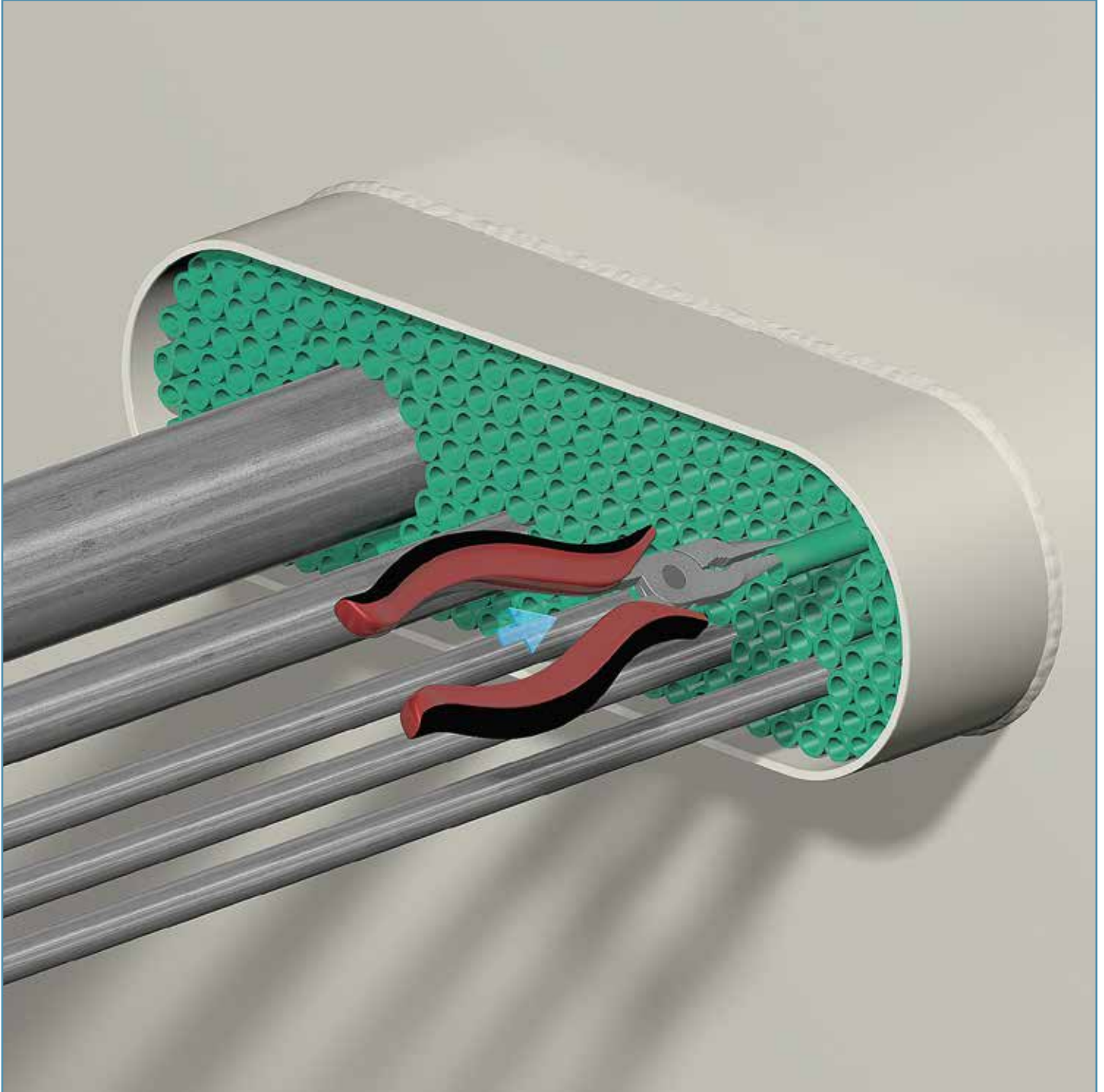
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



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 by moving and tearing backwards/forwards and not tearing off sideways. This is because of the strength of the intermediate rubber parts.

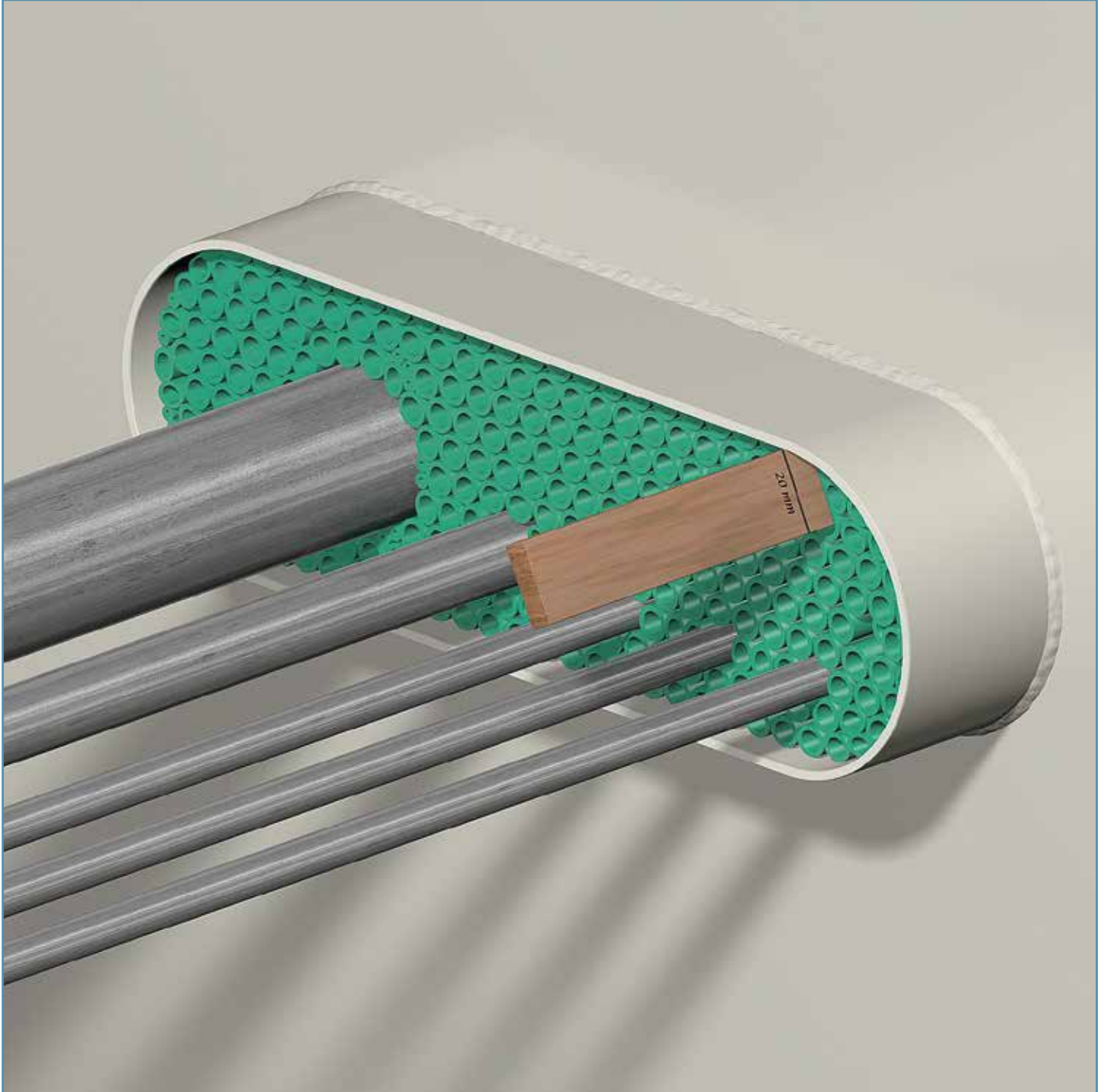
Push the filler sleeves into the transit frame in such a way as to leave about 20 mm free space at the front and the back. The insertion does not have to be precise in this regard. Adjustment of the set of sleeves to the 20 mm recess can be carried out just before applying the sealant.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



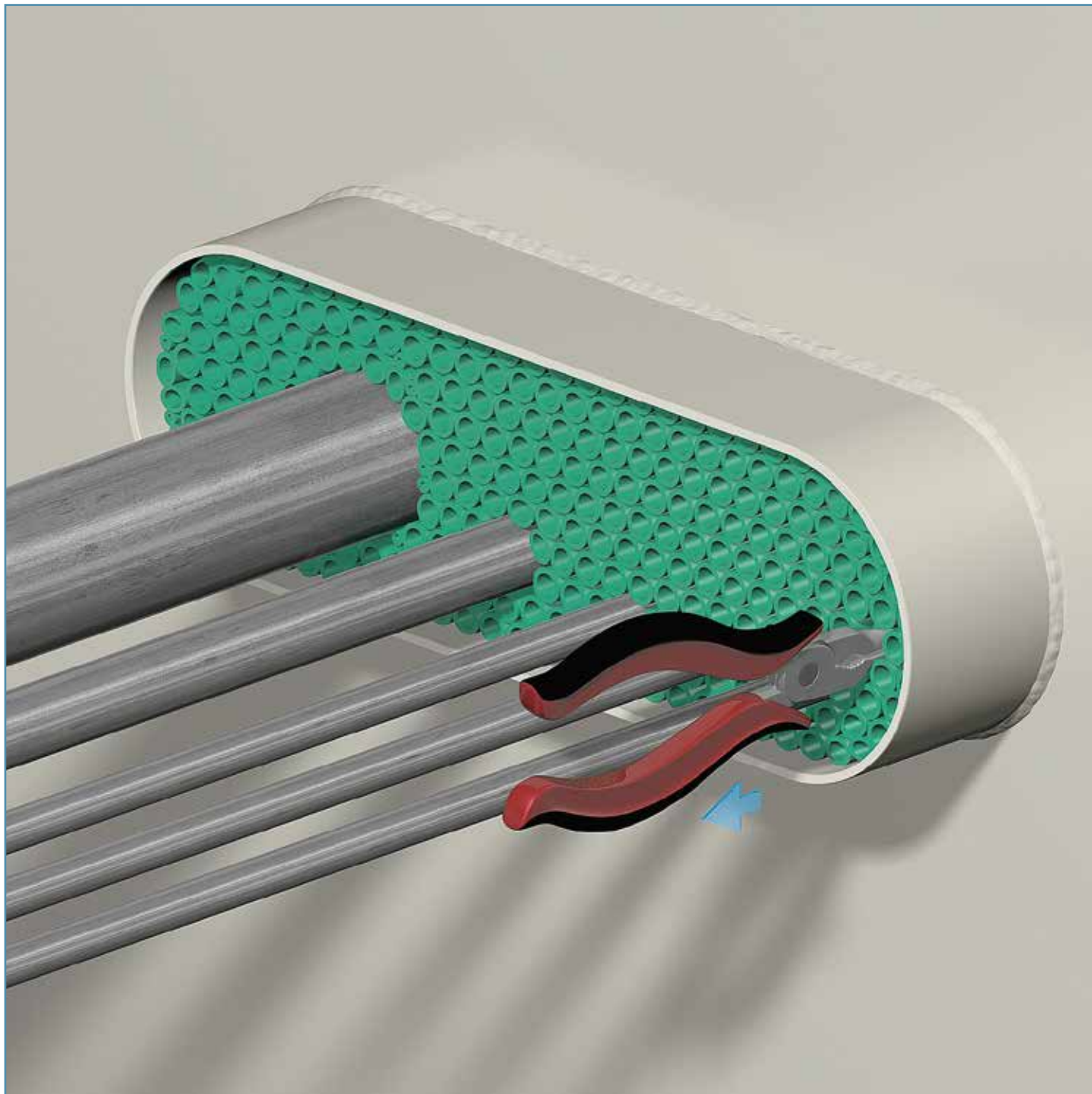
With a flat nose pliers, NOFIRNO®/Cer single filler sleeves are inserted in the remaining smaller open spaces in the set of fillers. A very tight fit of the filling is vital to the performance of the sealing system.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



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

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (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®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



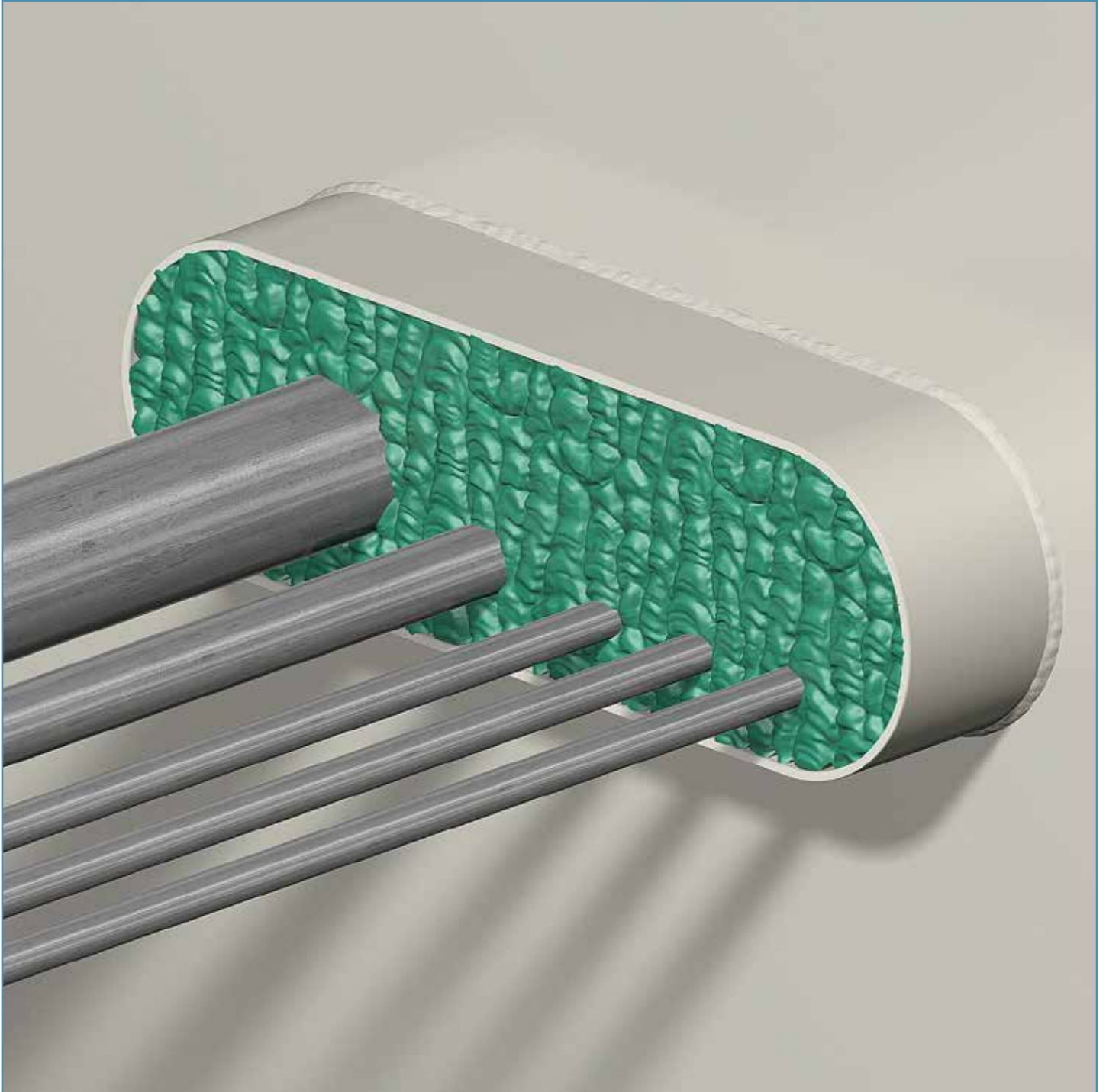
Cut the injection nozzles of the cartridges in an angled way to create a medium sized dispersing opening. This will improve the flow of the sealant in between the set of pipes. Furthermore, it is advisable to use professional sealant guns. Hand fatigue is prevented, and an optimum flow of the sealant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

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



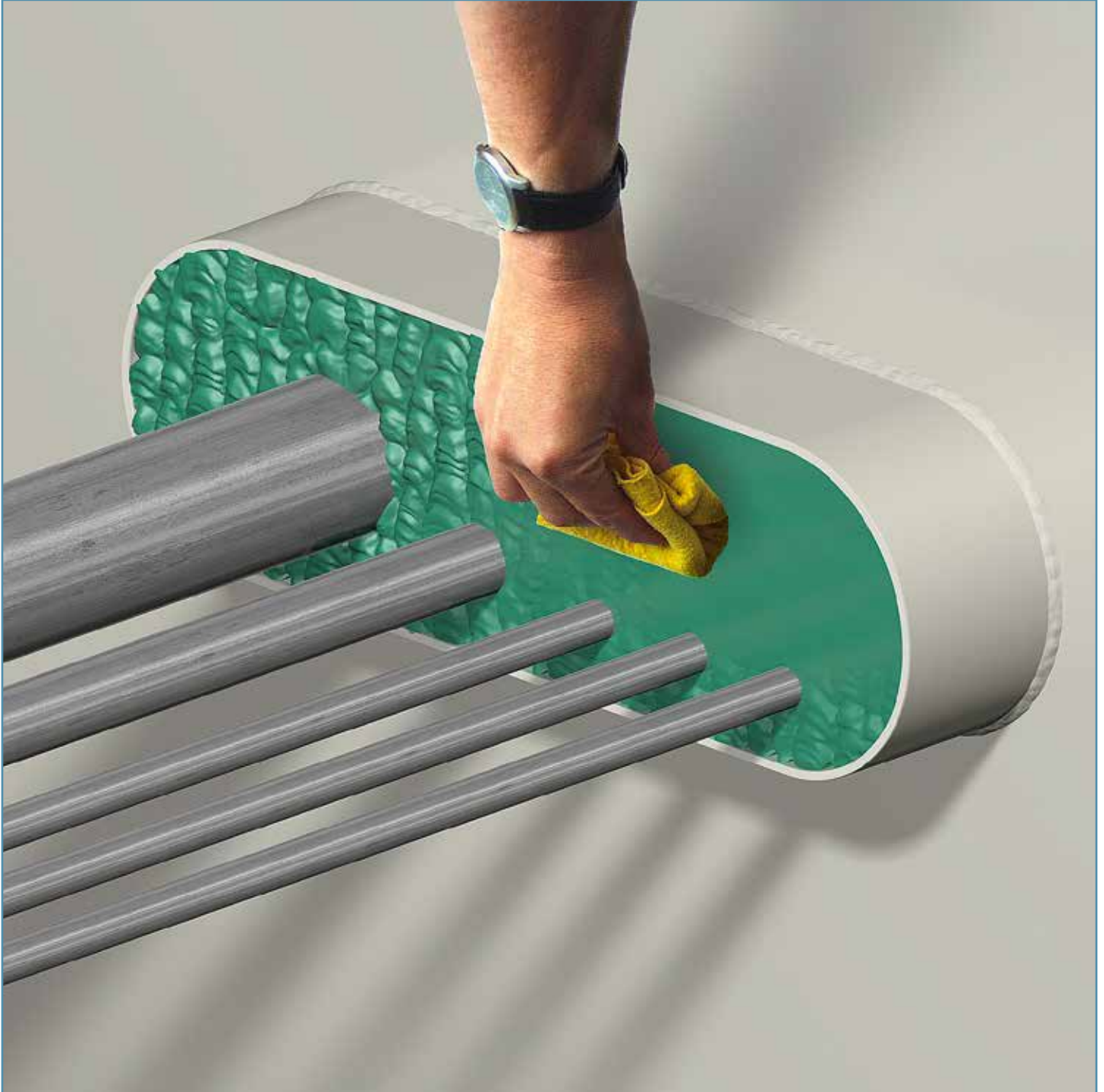
Skin formation of the sealant takes place after ca. 10-15 minutes. In case of larger transits with a low pipe filling rate, do not apply more sealant than can be finished within this time-frame.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



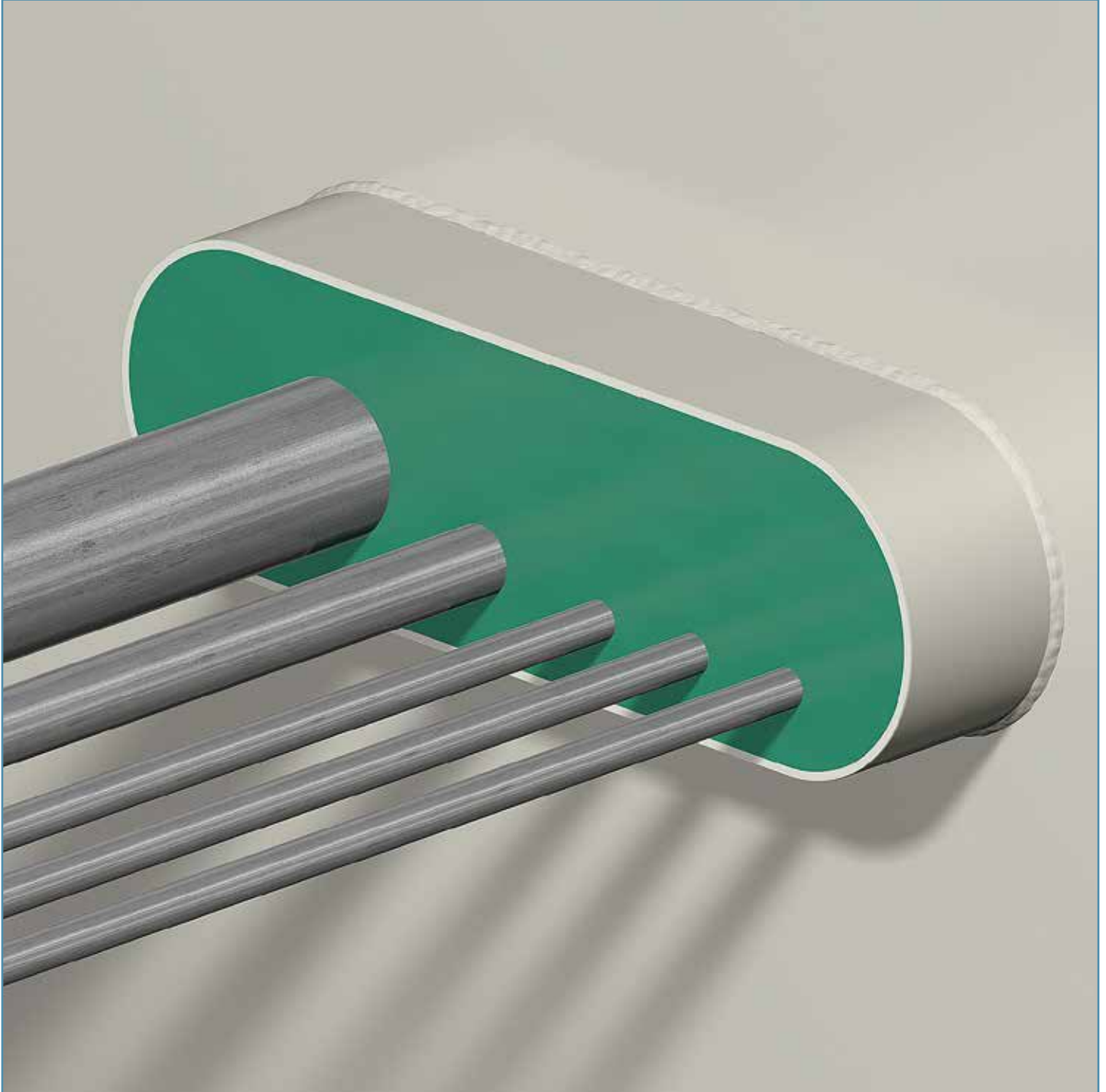
The multi-pipe transit should be overfilled with NOFIRNO®/Cer sealant, because some sealant will be pushed into the empty spaces between and into the hollow NOFIRNO®/Cer (multi) filler sleeves during further finishing. This will contribute also to obtain higher tightness ratings.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



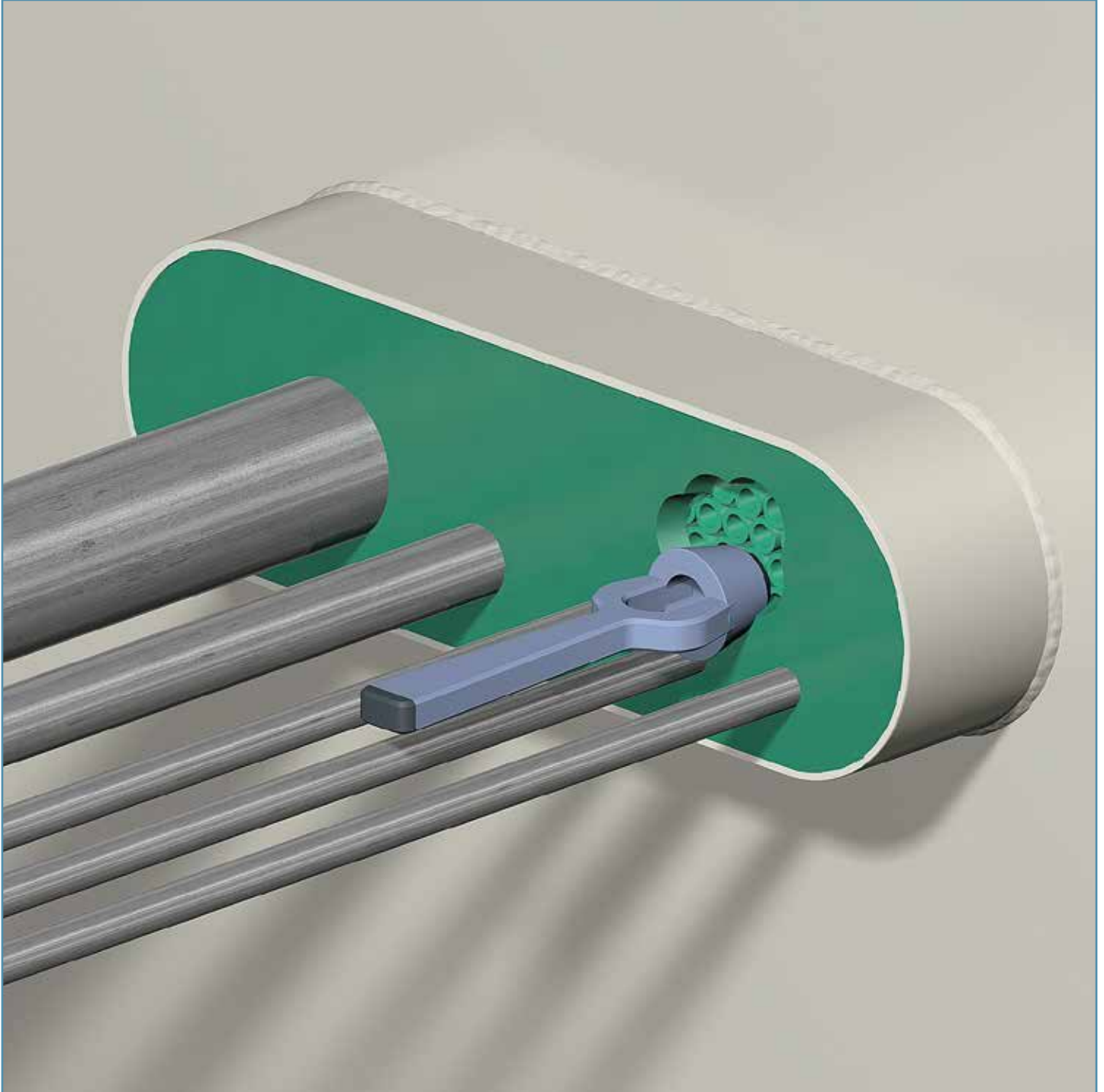
A wet cloth is used to press down the sealant layer flush with the end of the transit frame. It is of utmost importance to ensure that the sealant is compressed very tightly so that the sealant is compressed into all empty spaces of the NOFIRNO®/Cer filler sleeve set, including partially into the hollow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

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



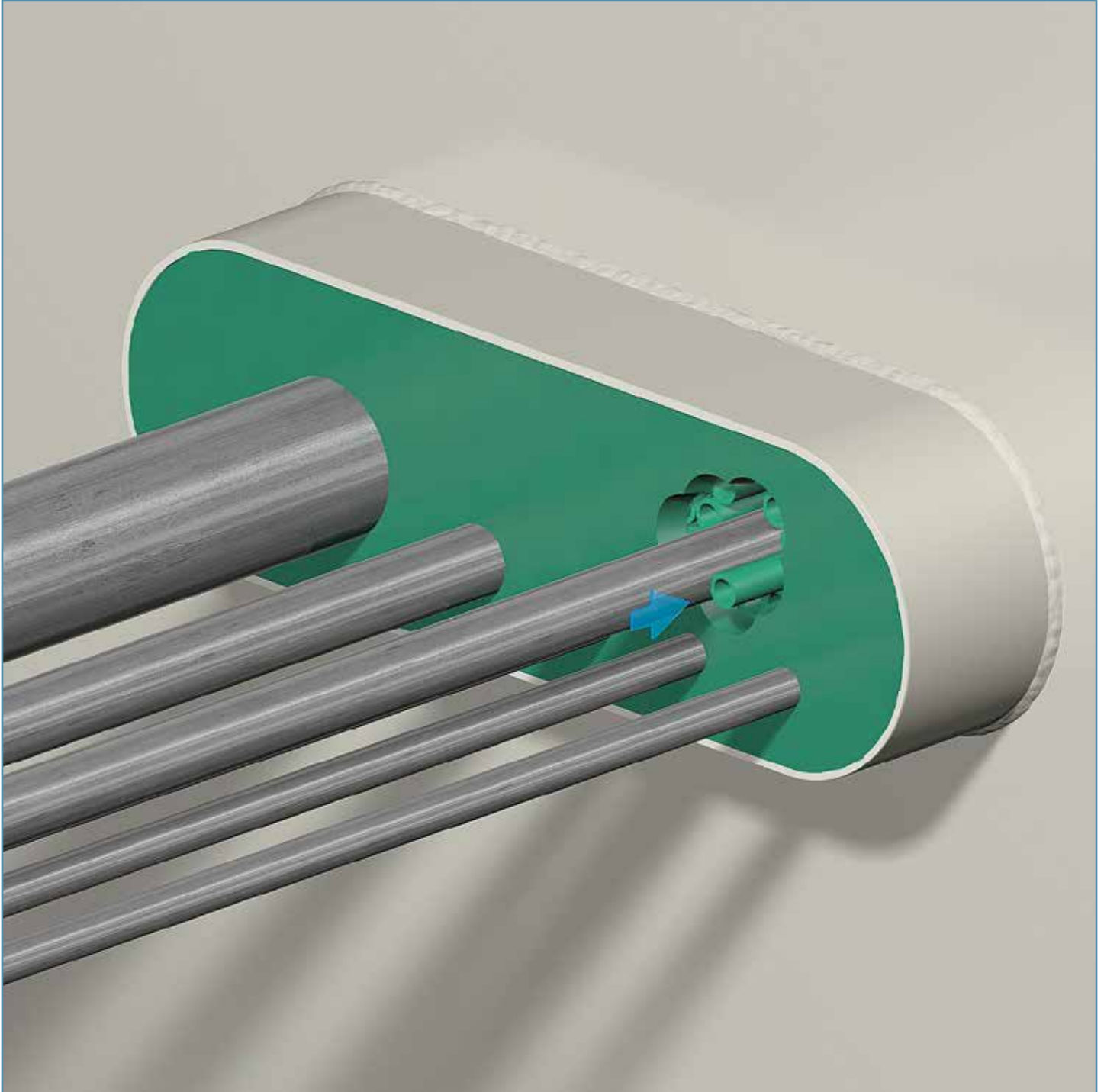
To obtain optimum adhesion during the curing process of the sealant, the pipes should be tightly fixed at both sides of the transit, as close as possible to the transit, and immediately after finishing the transit. Movement of the pipes during the curing process will impair the adhesion process to the 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®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



Adding an extra pipe through a finished NOFIRNO®/Cer multi-pipe transit is an easy job. With the use of NOFIRNO®/Cer filler sleeves as separators, 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 tapered shape, at a spot where there is sufficient spare space visible on the surface of the sealant layer.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



Refill the open spaces around the ducted pipe with NOFIRNO®/Cer 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®/Cer H-class (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®/Cer 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®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



Covenant
K104935/02



Issued 2021-03-01

Replaces K104935/01

Page 1 of 20

COVENANT

Sealing systems for pipe penetrations through “H” Class divisions

STATEMENT BY KIWA

With this Covenant, issued in accordance with the Kiwa Regulations for Product Certification, Kiwa declares that legitimate confidence exists that the products supplied by

Beele Engineering B.V.

as specified in this product certificate and marked with the Kiwa®-mark in the manner as indicated in this product certificate may, on delivery, be relied upon to comply with Kiwa Covenant manual K15013 dated April 2018.



Ron Scheepers
Kiwa

Publication of this certificate is allowed.

Advice: consult www.kiwa.nl in order to ensure that this certificate is still valid.

Kiwa Nederland B.V.
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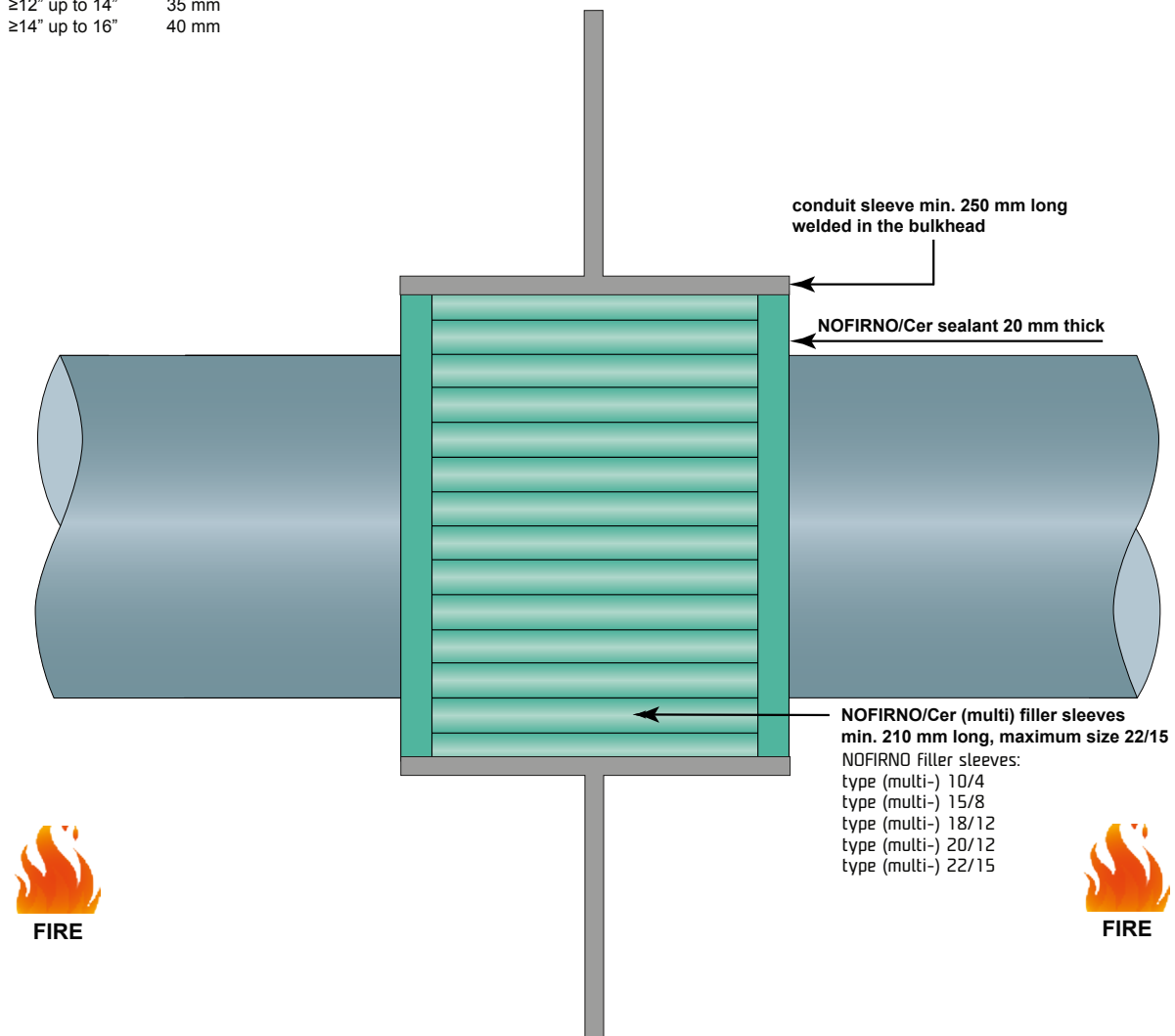
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM

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/Cer SEALING SYSTEM for steel/ss/CuNi pipes min. 1/16" - max. 16" NPS and for min. 1" - max 16" GRP pipes



conduit frame positioned:
- symmetrical
or in case of fire from only one
side
- non-symmetrical with longest
length on non-fire side



Description: NOFIRNO/Cer sealing system for H0 class bulkheads/decks

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

06-12-2019

Scale:

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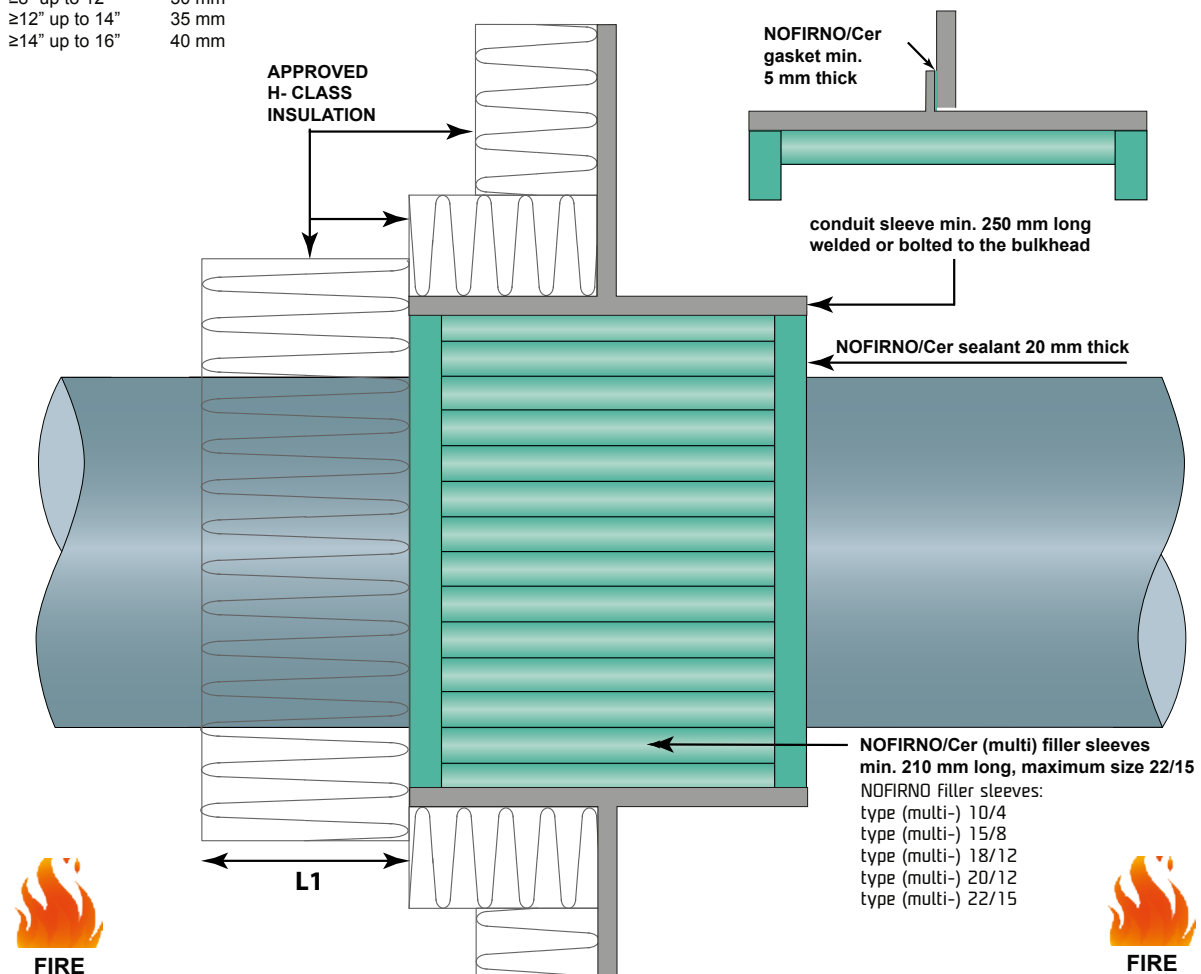
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM

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/Cer SEALING SYSTEM for steel/ss/CuNi pipes min. 1/16" - max. 16" NPS and for min. 1" - max 16" GRP pipes



L1 = length of Insulation around ducted pipe:

	H60	H120
up to 3"	550 mm	1150 mm
≥ 3" up to 6"	800 mm	1700 mm
≥ 6" up to 8"	1000 mm	2050 mm
≥ 8" up to 10"	1200 mm	2400 mm
≥10" up to 14"	1500 mm	3000 mm
≥14" up to 18"	1700 mm	3500 mm

Note: alternative 50% of length on both sides of the penetration.

conduit sleeve positioned:
- symmetrical
or
- non-symmetrical with longest
length on insulated side



Description: NOFIRNO/Cer sealing system for H120 class bulkheads

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

06-12-2019

Scale:

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INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM

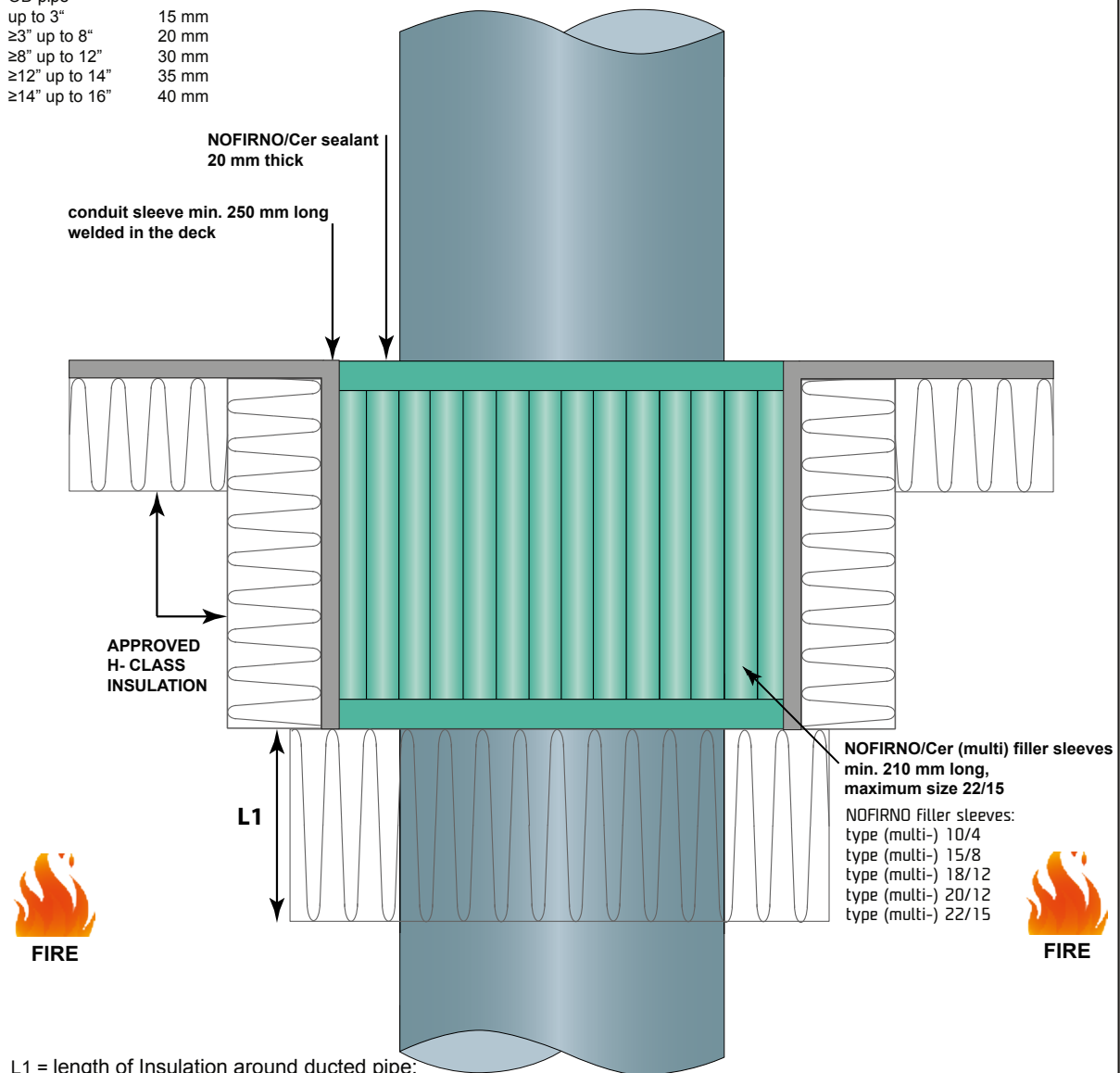
direction of exposure:

fire from either side (BELOW AND ABOVE DECK)

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/Cer SEALING SYSTEM
for steel/ss/CuNi pipes
min. 1/16" - max. 16" NPS and for
min. 1" - max 16" GRP pipes



L1 = length of Insulation around ducted pipe:

	H60	H120
up to 3"	550 mm	1150 mm
≥ 3" up to 6"	800 mm	1700 mm
≥ 6" up to 8"	1000 mm	2050 mm
≥ 8" up to 10"	1200 mm	2400 mm
≥ 10" up to 14"	1500 mm	3000 mm
≥ 14" up to 18"	1700 mm	3500 mm

Note: alternative 50% of length on both sides of the penetration.

**conduit sleeve positioned
totally below deck up to totally
above deck**



Description: NOFIRNO/Cer sealing system for H120 class decks

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

06-12-2019

Scale:

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INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM

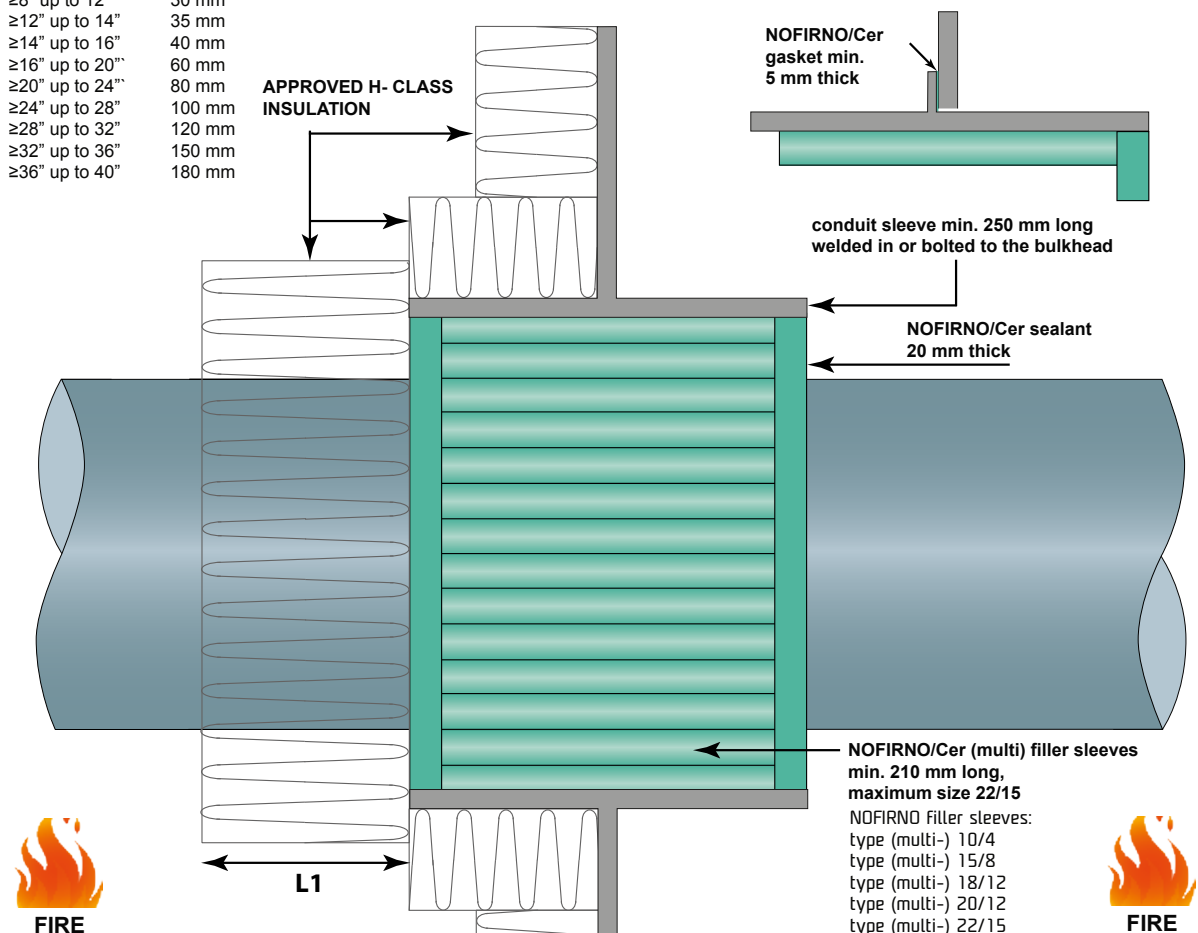
direction of exposure:
fire from either side

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
≥16" up to 20"	60 mm
≥20" up to 24"	80 mm
≥24" up to 28"	100 mm
≥28" up to 32"	120 mm
≥32" up to 36"	150 mm
≥36" up to 40"	180 mm

**APPROVED H-CLASS
INSULATION**

NOFIRNO/Cer SEALING SYSTEM
for steel/ss/CuNi pipes
up to 1016 mm - 40" NPS



L1 = length of Insulation around ducted pipe:

	H60	H120
up to 3"	550 mm	1150 mm
≥ 3" up to 6"	800 mm	1700 mm
≥ 6" up to 8"	1000 mm	2050 mm
≥ 8" up to 10"	1200 mm	2400 mm
≥ 10" up to 14"	1500 mm	3000 mm
≥ 14" up to 18"	1700 mm	3500 mm
≥ 18" up to 24"	2200 mm	4500 mm
≥ 24" up to 30"	2600 mm	5400 mm
≥ 30" up to 36"	3000 mm	6300 mm
≥ 36" up to 40"	3300 mm	6900 mm

Note: alternative 50% of length on both sides of the penetration.

conduit sleeve positioned:
- symmetrical
or
- non-symmetrical with longest
length on insulated side



Description: NOFIRNO/Cer sealing system for H120 class bulkheads

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

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FIRE

42

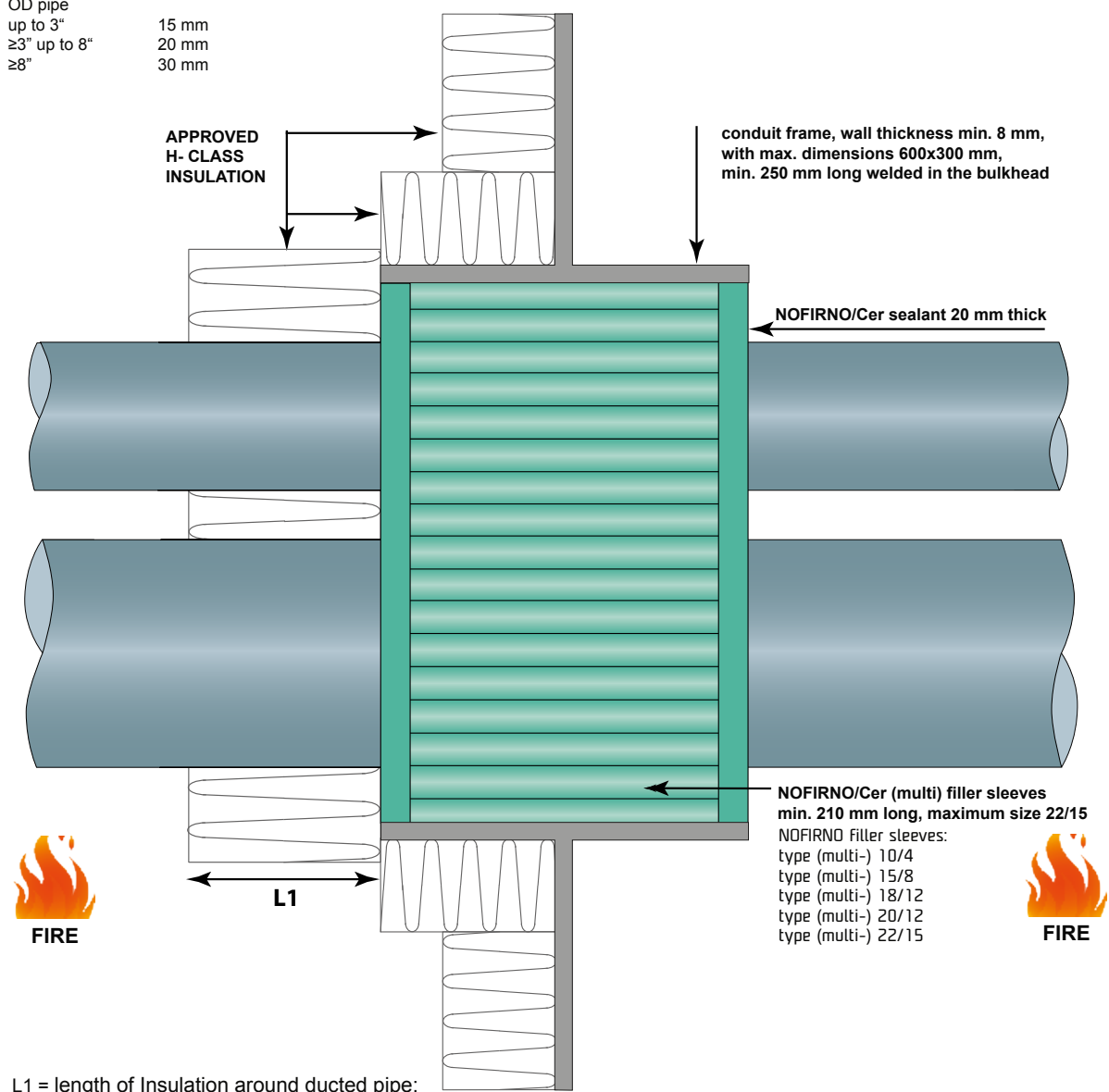
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM

direction of exposure: fire from either side

Minimum clearance between
conduit sleeve and ducted pipe
and between ducted pipes:

OD pipe up to 3"	15 mm
≥3" up to 8"	20 mm
≥8"	30 mm

NOFIRNO/Cer SEALING SYSTEM FOR MULTI-PIPE TRANSITS for steel/ss/CuNi pipes min. 1/16" - max. 8" NPS



L1 = length of Insulation around ducted pipe:

	H60	H120
up to 3"	550 mm	1150 mm
≥ 3" up to 6"	800 mm	1700 mm
≥ 6" up to 8"	1000 mm	2050 mm
≥ 8" up to 10"	1200 mm	2400 mm

Note: alternative 50% of length on both sides of the penetration.

conduit frame positioned:
- symmetrical
or
- non-symmetrical with longest
length on insulated side



Description: NOFIRNO/Cer sealing system for H120 class bulkheads

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

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INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM

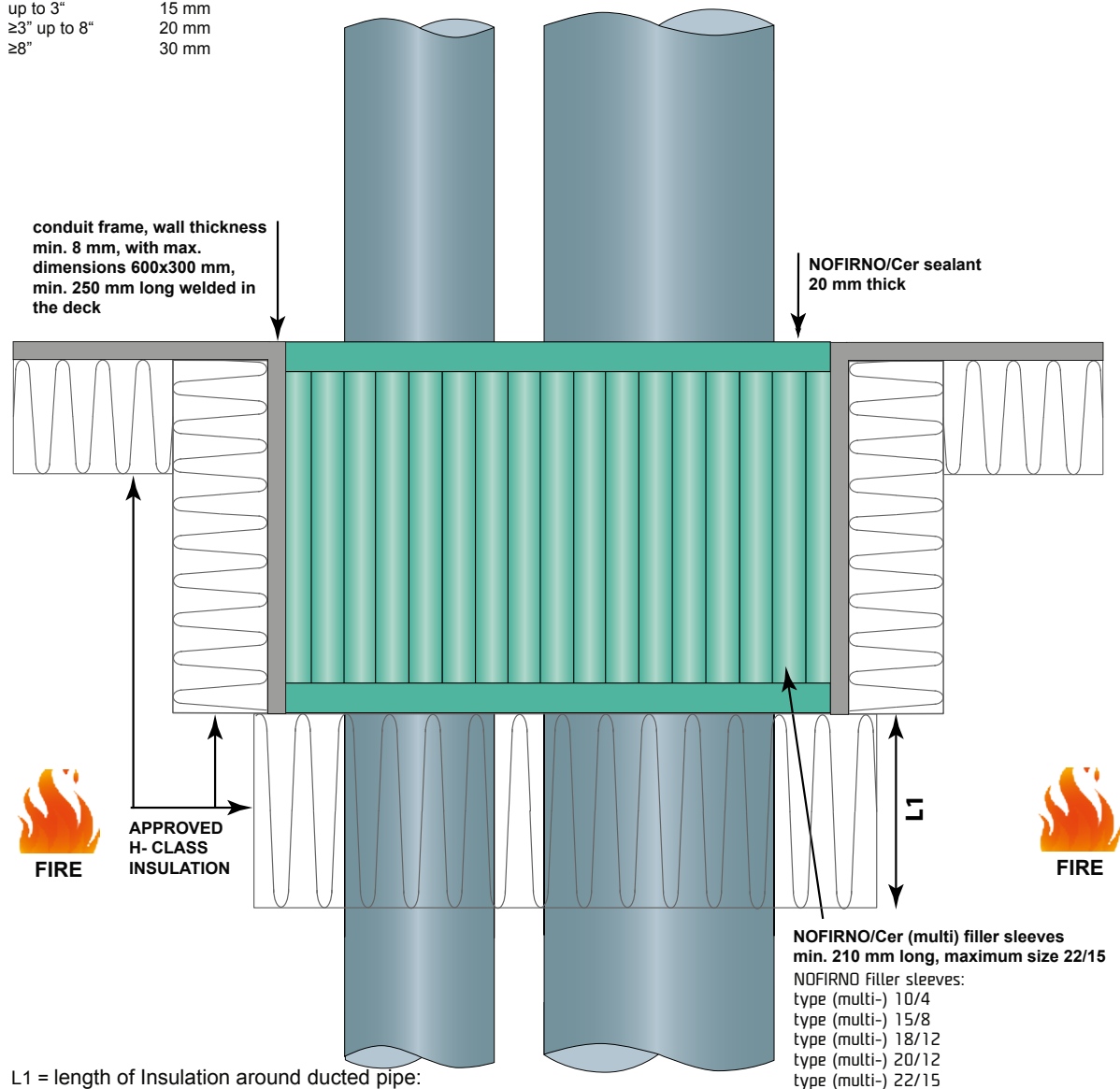
direction of exposure:

fire from either side (BELOW AND ABOVE DECK)

Minimum clearance between
conduit sleeve and ducted pipe
and between ducted pipes:

OD pipe	
up to 3"	15 mm
≥3" up to 8"	20 mm
≥8"	30 mm

NOFIRNO/Cer SEALING SYSTEM FOR MULTI-PIPE TRANSITS for steel/ss/CuNi pipes min. 1/16" - max. 8" NPS



L1 = length of Insulation around ducted pipe:

	H60	H120
up to 3"	550 mm	1150 mm
≥ 3" up to 6"	800 mm	1700 mm
≥ 6" up to 8"	1000 mm	2050 mm
≥ 8" up to 10"	1200 mm	2400 mm

Note: alternative 50% of length on both sides of the penetration.

conduit frame positioned
totally below deck up to totally
above deck



Description: NOFIRNO/Cer sealing system for H120 class decks

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

06-12-2019

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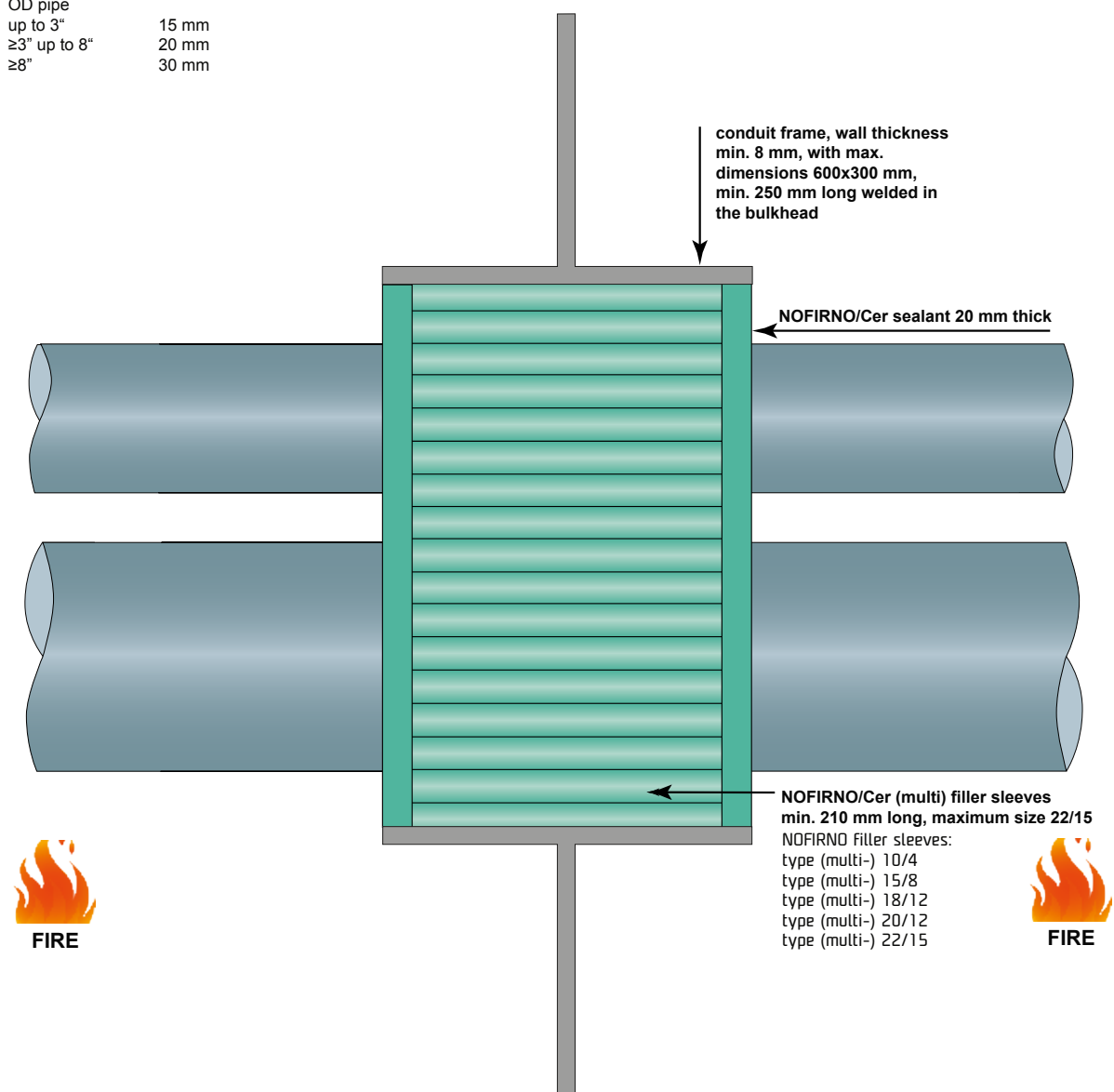
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM

direction of exposure: fire from either side

Minimum clearance between
conduit sleeve and ducted pipe
and between ducted pipes:

OD pipe up to 3"	15 mm
≥3" up to 8"	20 mm
≥8"	30 mm

NOFIRNO/Cer SEALING SYSTEM FOR MULTI-PIPE TRANSITS for steel/ss/CuNi pipes min. 1/16" - max. 8" NPS



conduit frame positioned:
- symmetrical
or in case of fire from only one
side
- non-symmetrical with longest
length on non-fire side



Description: NOFIRNO/Cer sealing system for H0 class bulkheads/decks

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

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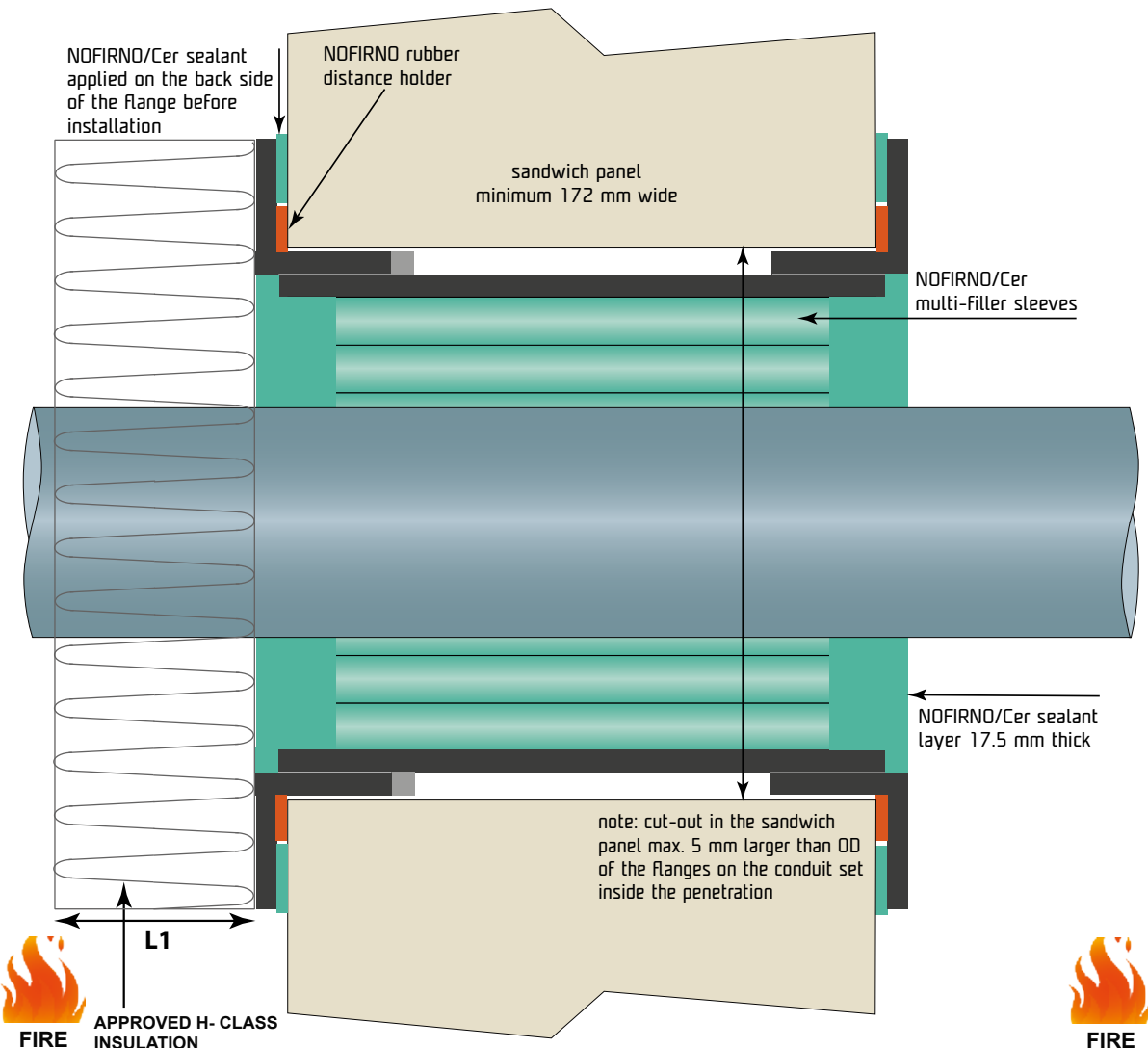
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM

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"	30 mm

H120 class pipe transits with
steel/ss/CuNi pipes max. OD 168 mm - 6" NPS sealed
with the NOFIRNO/Cer sealing system installed in HR
plastic conduit sleeves max. 250 mm ID
in H-120 certified sandwich panels



L1 = length of Insulation around ducted pipe:

	H60	H120
up to 3"	550 mm	1150 mm
≥ 3" up to 6"	800 mm	1700 mm
≥ 6"	1000 mm	2050 mm

Note: alternative 50% of length on both sides of the penetration.

NOFIRNO/Cer-HR sealing
system for walls and floors

H-120



Description: NOFIRNO/Cer sealing system for H-120 sandwich panels

Mat.: NOFIRNO/Cer sleeves/sealant - HR conduits

Ref.: JAB

Date:

11-02-2021

Scale:

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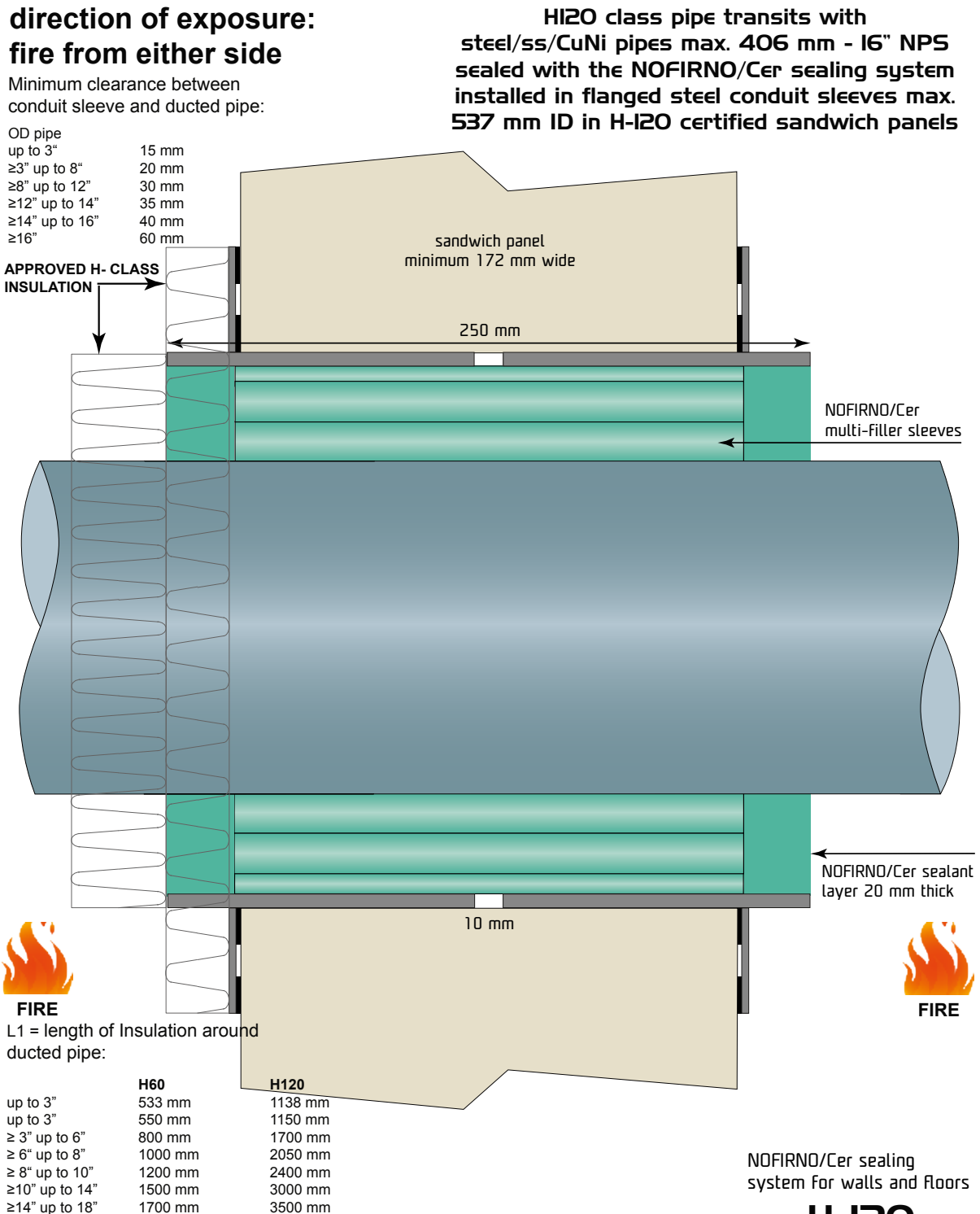
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM

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
≥16"	60 mm

APPROVED H-CLASS
INSULATION



Note: alternative 50% of length on both sides of the penetration.



Description: NOFIRNO/Cer sealing system for H-120 sandwich panels

Mat.: NOFIRNO/Cer sleeves/sealant - steel conduits

Ref.: JAB

Date:

11-02-2021

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INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



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IFC FIELD OF APPLICATION REPORT

**Field of Application of the Fire Resistance of
NOFIRNO/Cer penetration seals for steel and Cu/Ni pipes
with diameter 21mm – 1600mm when
installed in steel deck or steel bulkhead
constructions insulated to Class H60 or H120**

IFC Report PAR/14793/01 Revision B

Prepared on behalf of:

Beele Engineering b.v.
Beunkdijk 11
7122 NZ Aalten
The Netherlands

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Ref: #20791

Issue Date – May 2020
Valid Until – May 2025

International Fire Consultants Ltd

Head & Registered Office: Park Street Business Centre, Princes Risborough, Buckinghamshire, England HP27 9AH

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Registered No: 2194010 England

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INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM

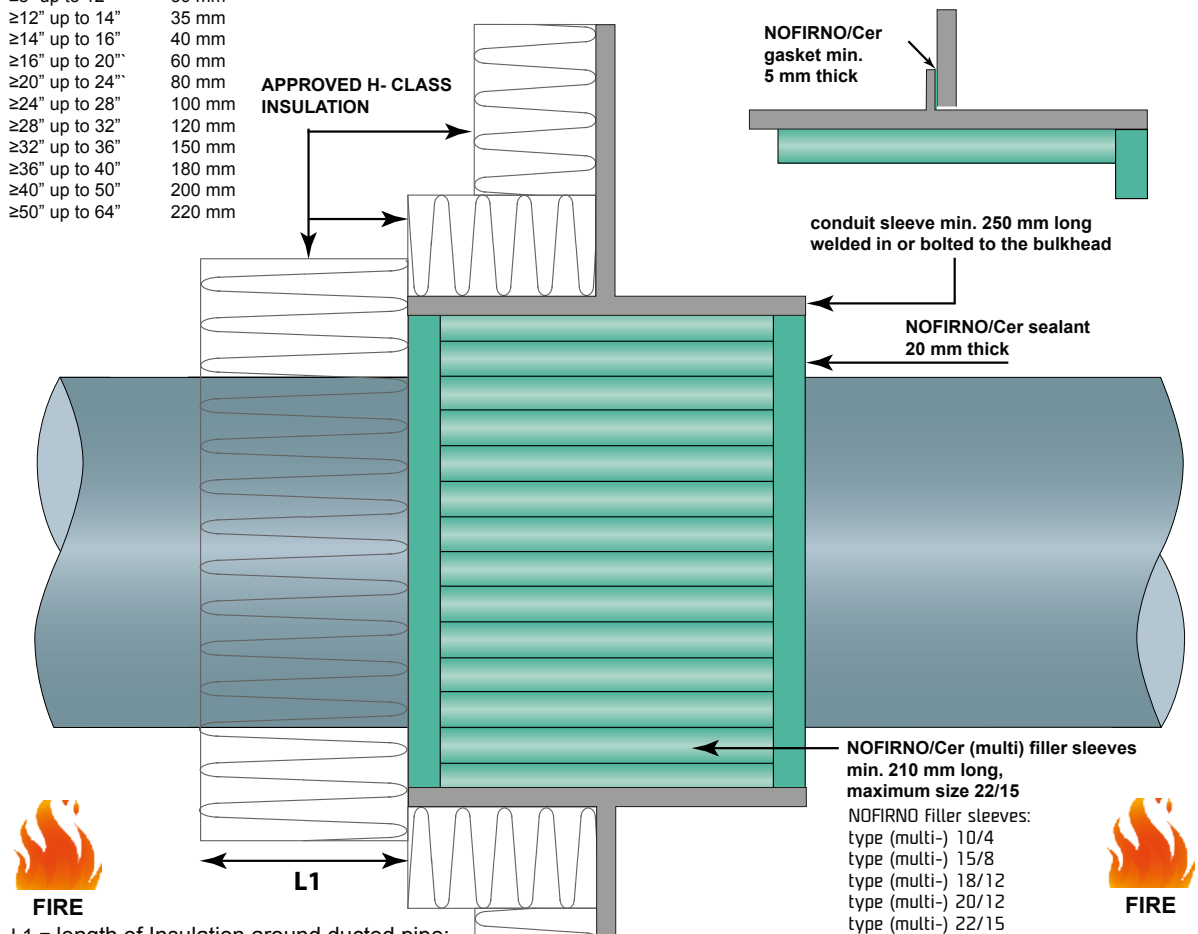
direction of exposure:
fire from either side

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
≥16" up to 20"	60 mm
≥20" up to 24"	80 mm
≥24" up to 28"	100 mm
≥28" up to 32"	120 mm
≥32" up to 36"	150 mm
≥36" up to 40"	180 mm
≥40" up to 50"	200 mm
≥50" up to 64"	220 mm

**APPROVED H-CLASS
INSULATION**

NOFIRNO/Cer SEALING SYSTEM
for steel/ss/CuNi pipes
up to 1600 mm - 63" NPS



L1 = length of Insulation around ducted pipe:

	H60	H120
up to 3"	533 mm	1138 mm
up to 3"	550 mm	1150 mm
≥ 3" up to 6"	800 mm	1700 mm
≥ 6" up to 8"	1000 mm	2050 mm
≥ 8" up to 10"	1200 mm	2400 mm
≥10" up to 14"	1500 mm	3000 mm
≥14" up to 18"	1700 mm	3500 mm
≥18" up to 24"	2200 mm	4500 mm
≥24" up to 30"	2600 mm	5400 mm
≥30" up to 36"	3000 mm	6300 mm
≥36" up to 40"	3300 mm	6900 mm
≥40" up to 50"	3793 mm	8091 mm
≥40" up to 64"	4861 mm	10371 mm

Note: alternative 50% of length on both sides of the penetration.

conduit sleeve positioned:
- symmetrical
or
**- non-symmetrical with longest
length on insulated side**



Description: NOFIRNO/Cer sealing system for H120 class bulkheads

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

30-11-2020

Scale:

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INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM

direction of exposure:

fire from either side (BELOW AND ABOVE DECK)

NOFIRNO/Cer SEALING SYSTEM

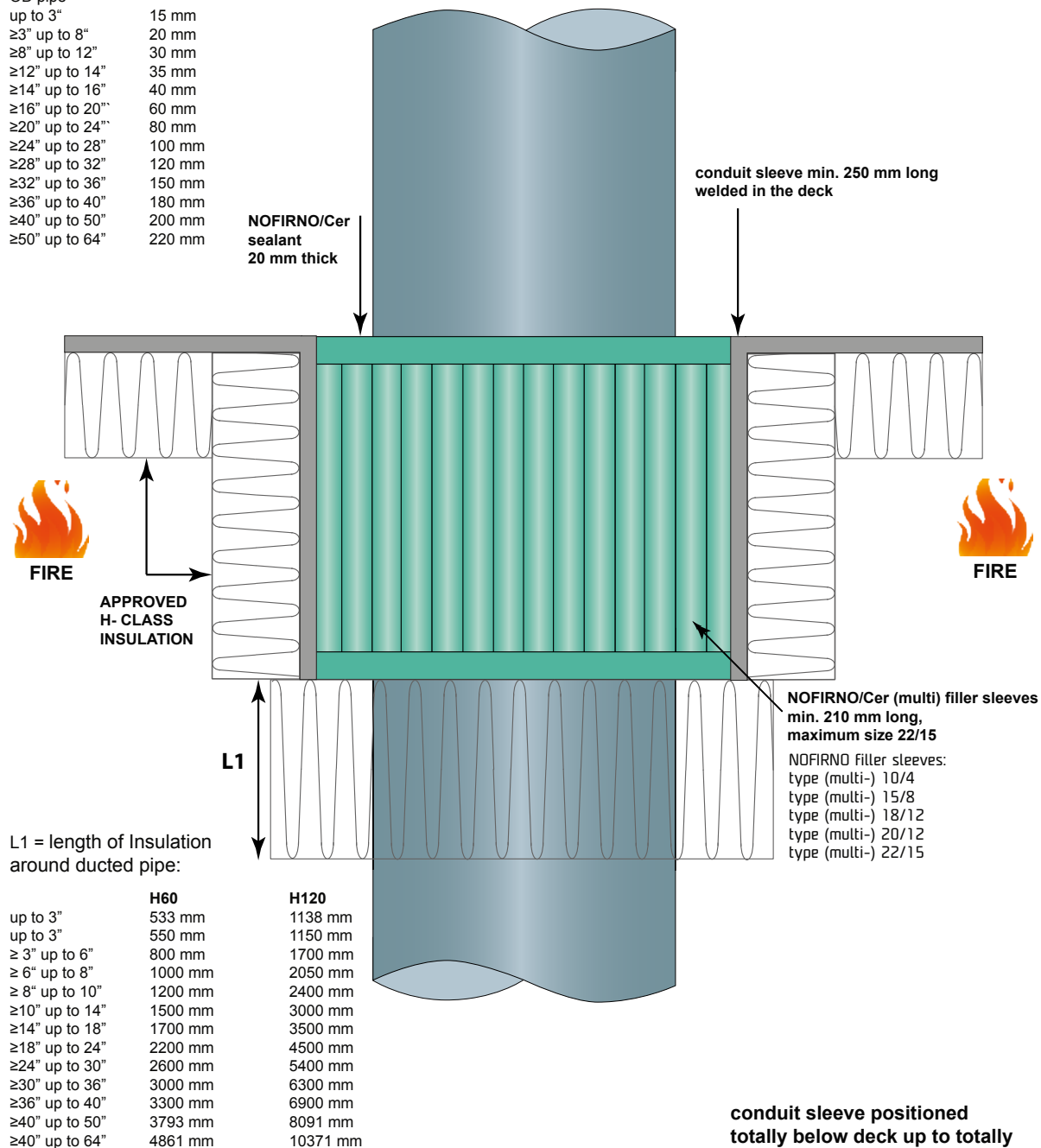
**for steel/ss/CuNi pipes
up to 1016 mm - 40" NPS**

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
≥16" up to 20"	60 mm
≥20" up to 24"	80 mm
≥24" up to 28"	100 mm
≥28" up to 32"	120 mm
≥32" up to 36"	150 mm
≥36" up to 40"	180 mm
≥40" up to 50"	200 mm
≥50" up to 64"	220 mm

NOFIRNO/Cer
sealant
20 mm thick

conduit sleeve min. 250 mm long
welded in the deck



Note: alternative 50% of length on both sides of the penetration.



Description: NOFIRNO/Cer sealing system for H120 class decks

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

30-11-2020

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INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



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IFC FIELD OF APPLICATION REPORT

PAR/14838/01 Revision A

**Field of Application of the Fire Resistance of
NOFIRNO/Cer penetration seals for GRP pipes
with diameter 25mm – 1000mm when
installed in steel deck or steel bulkhead
constructions to Class H0**

Prepared on behalf of:

Beele Engineering b.v.
Beunkdijk 11
7122 NZ Aalten
The Netherlands

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Ref: #20792

Issue Date – May 2020
Valid Until – May 2020

International Fire Consultants Ltd

Head & Registered Office: Park Street Business Centre, Princes Risborough, Buckinghamshire, England HP27 9AH

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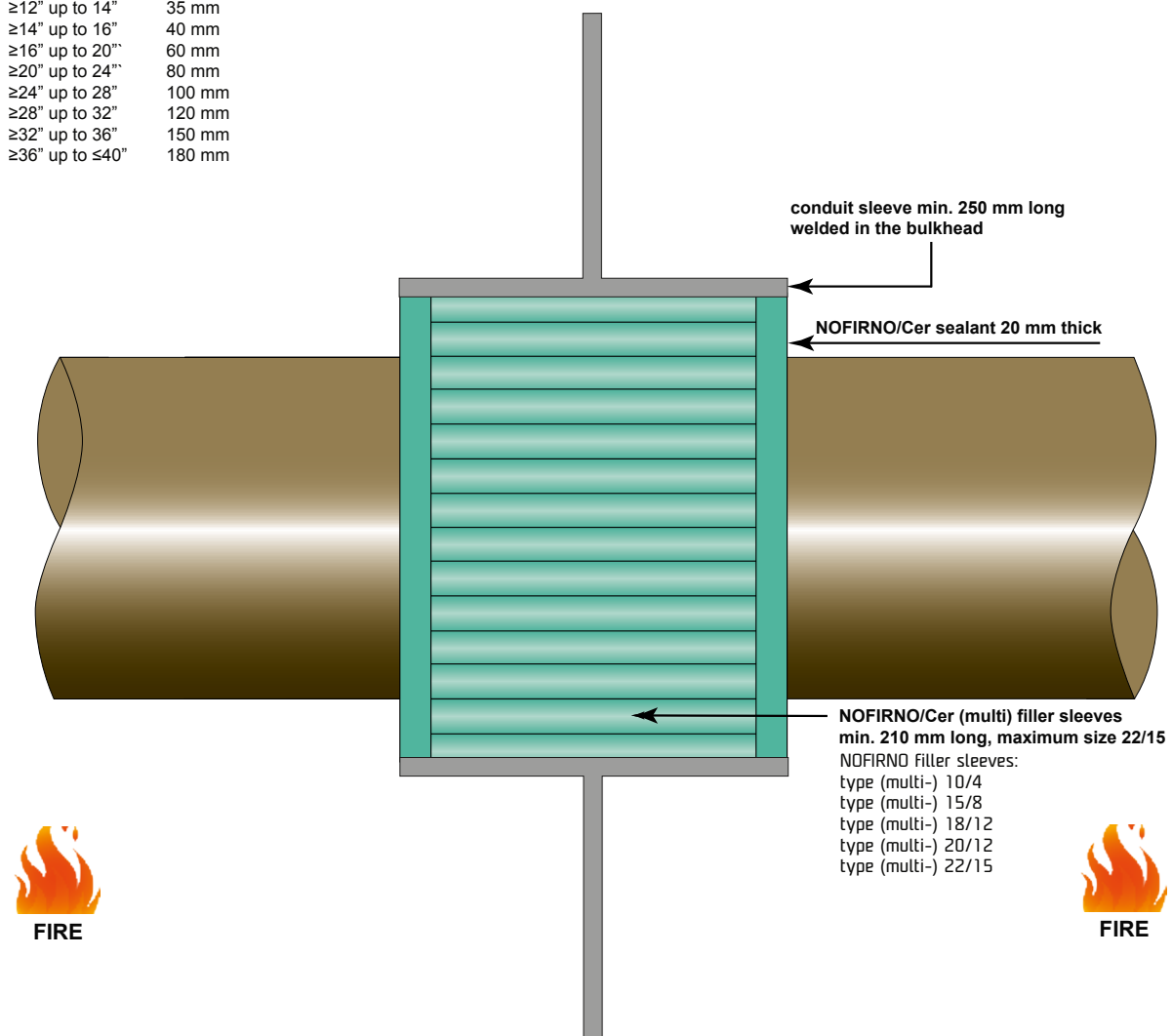
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM

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
≥16" up to 20"	60 mm
≥20" up to 24"	80 mm
≥24" up to 28"	100 mm
≥28" up to 32"	120 mm
≥32" up to 36"	150 mm
≥36" up to ≤40"	180 mm

NOFIRNO/Cer SEALING SYSTEM
for GRP pipes
min. 25 mm - max 1000 mm



conduit frame positioned:
- symmetrical
or in case of fire from only one
side
- non-symmetrical with longest
length on non-fire side



Description: NOFIRNO/Cer sealing system for H0 class bulkheads/decks

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

04-11-2020

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INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer J-class (MULTI-) PIPE TRANSIT SEALING SYSTEM

**7 JET FIRE TESTS CARRIED OUT 2020
AT RISE FIRE RESEARCH, NORWAY**



INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer J-class (MULTI-) PIPE TRANSIT SEALING SYSTEM

**7 JET FIRE TESTS CARRIED OUT 2020
AT RISE FIRE RESEARCH, NORWAY**



INSTALLATION INSTRUCTIONS FOR NOFIRNO®/CER J-class PIPE TRANSIT SEALING SYSTEM



INTERNATIONAL FIRE
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IFC FIELD OF APPLICATION REPORT

**Field of Application of the Jet-Fire Resistance of
NOFIRNO/CER penetration seals for steel and Cu/Ni pipes
with diameter 21mm – 1600mm when
installed in steel deck or steel bulkhead
constructions insulated to Class J60, J120 or J240**

IFC Report PAR/21507/01

Prepared on behalf of:

Beele Engineering b.v.
Beunkdijk 11
7122 NZ Aalten
The Netherlands

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Ref: #21507

Issue Date – November 2020
Valid Until – November 2025

International Fire Consultants Ltd

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INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer J-class PIPE TRANSIT SEALING SYSTEM

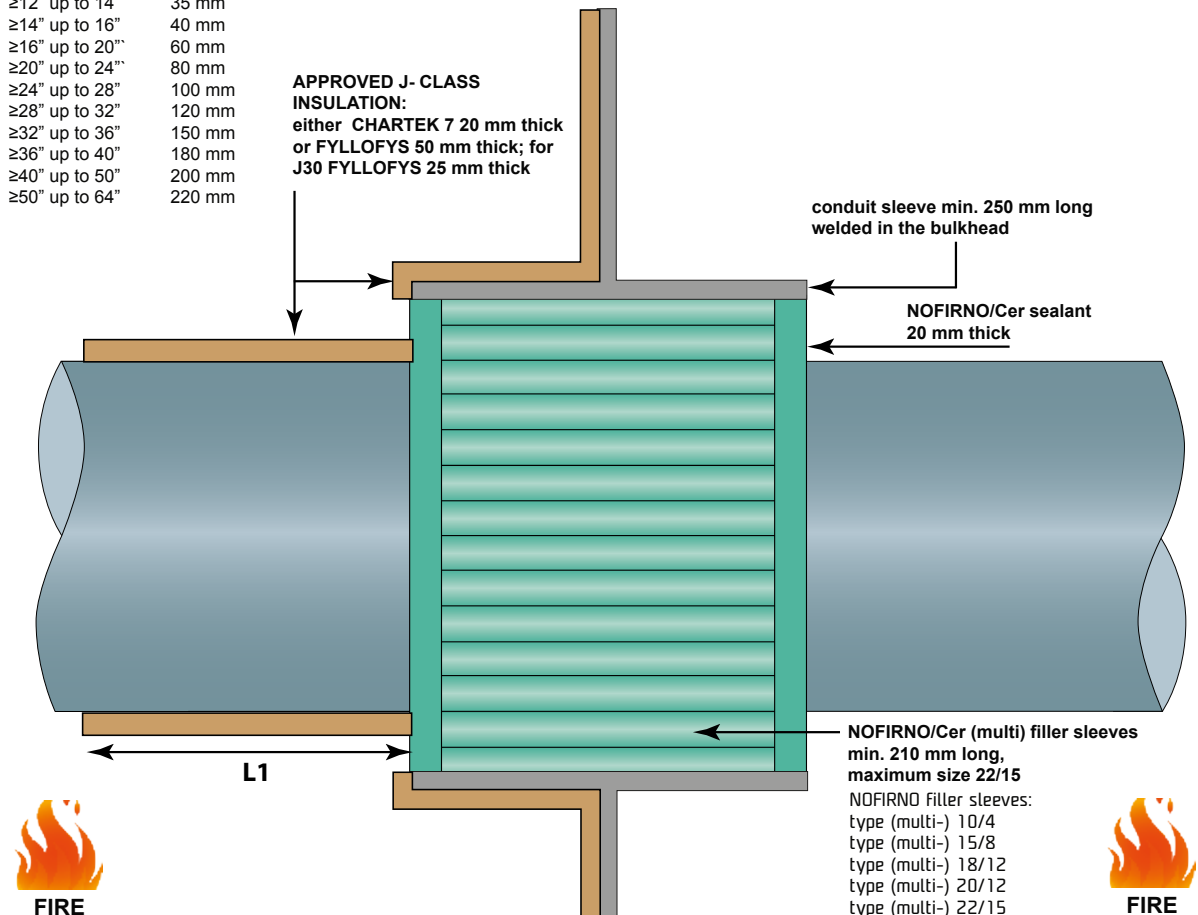
direction of exposure:
fire from either side

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
≥16" up to 20"	60 mm
≥20" up to 24"	80 mm
≥24" up to 28"	100 mm
≥28" up to 32"	120 mm
≥32" up to 36"	150 mm
≥36" up to 40"	180 mm
≥40" up to 50"	200 mm
≥50" up to 64"	220 mm

**APPROVED J-CLASS
INSULATION:**
either CHARTEK 7 20 mm thick
or FYLLOFYS 50 mm thick; for
J30 FYLLOFYS 25 mm thick

NOFIRNO/Cer SEALING SYSTEM
for steel/ss/CuNi pipes
up to 1600 mm - 64" NPS



L1 = length of Insulation around ducted pipe:

	J60	J120
up to 3"	533 mm	1138 mm
≥ 3" up to 6"	791 mm	1688 mm
≥ 6" up to 8"	946 mm	2017 mm
≥ 8" up to 10"	1106 mm	2359 mm
≥10" up to 14"	1347 mm	2874 mm
≥14" up to 18"	1640 mm	3498 mm
≥18" up to 24"	2074 mm	4425 mm
≥24" up to 30"	2506 mm	5346 mm
≥30" up to 36"	2936 mm	6263 mm
≥36" up to 40"	3222 mm	6973 mm
≥40" up to 50"	3793 mm	8091 mm
≥40" up to 64"	4861 mm	10371 mm

Note: alternative 50% of length on both sides of the penetration.

**High Heat Flux 350 kW/M2 Jet Fire
Class J60**

conduit sleeve positioned:
- symmetrical
or
- non-symmetrical with longest
length on insulated side



Description: NOFIRNO/Cer sealing system for J120 class bulkheads

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

04-11-2020

Scale:

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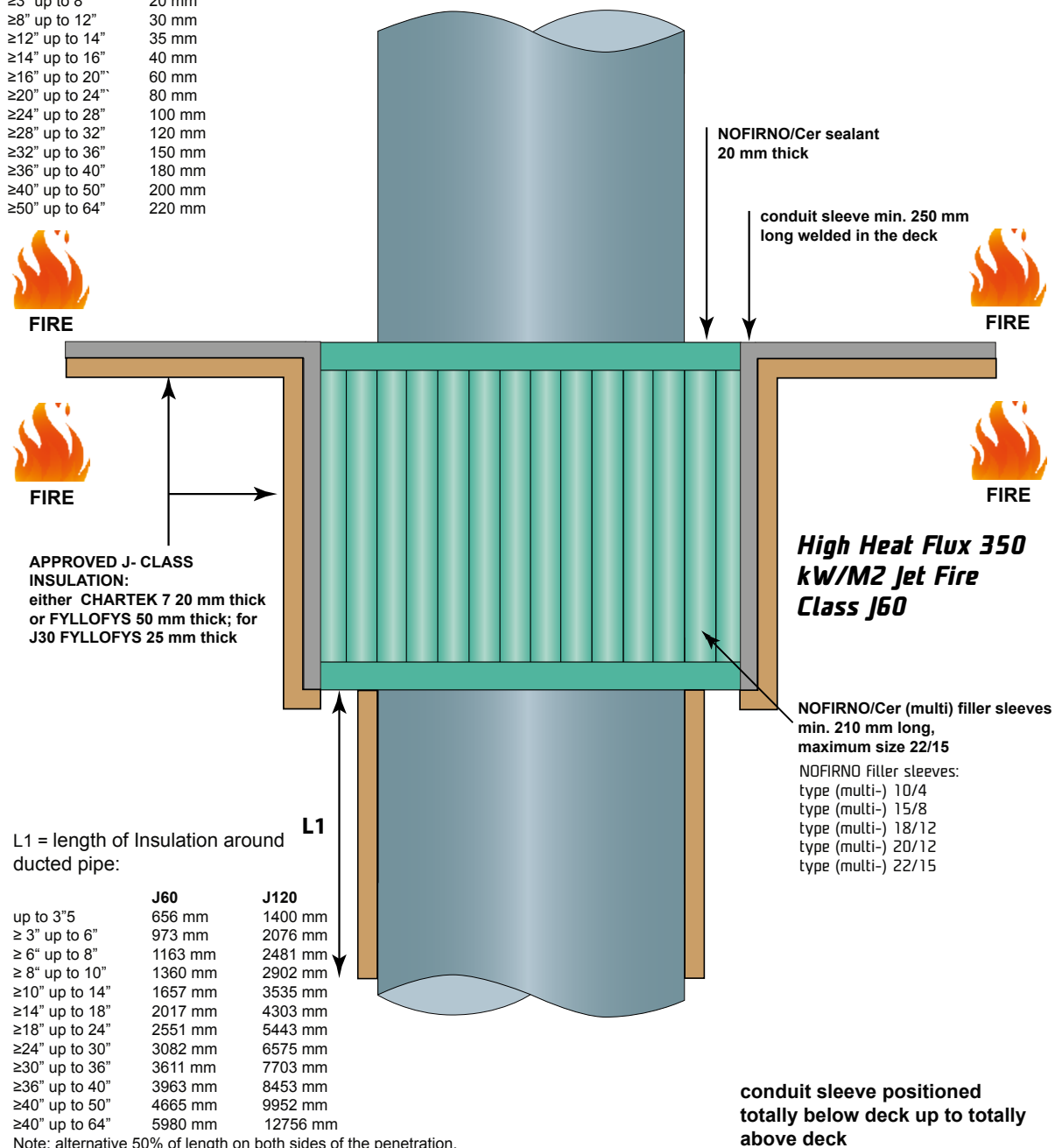
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer J-class PIPE TRANSIT SEALING SYSTEM

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
≥16" up to 20"	60 mm
≥20" up to 24"	80 mm
≥24" up to 28"	100 mm
≥28" up to 32"	120 mm
≥32" up to 36"	150 mm
≥36" up to 40"	180 mm
≥40" up to 50"	200 mm
≥50" up to 64"	220 mm

NOFIRNO/Cer SEALING SYSTEM
for steel/ss/CuNi pipes
up to 1600 mm - 64" NPS



Description: NOFIRNO/Cer sealing system for J60-J120 class decks

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

04-11-2020

Scale:

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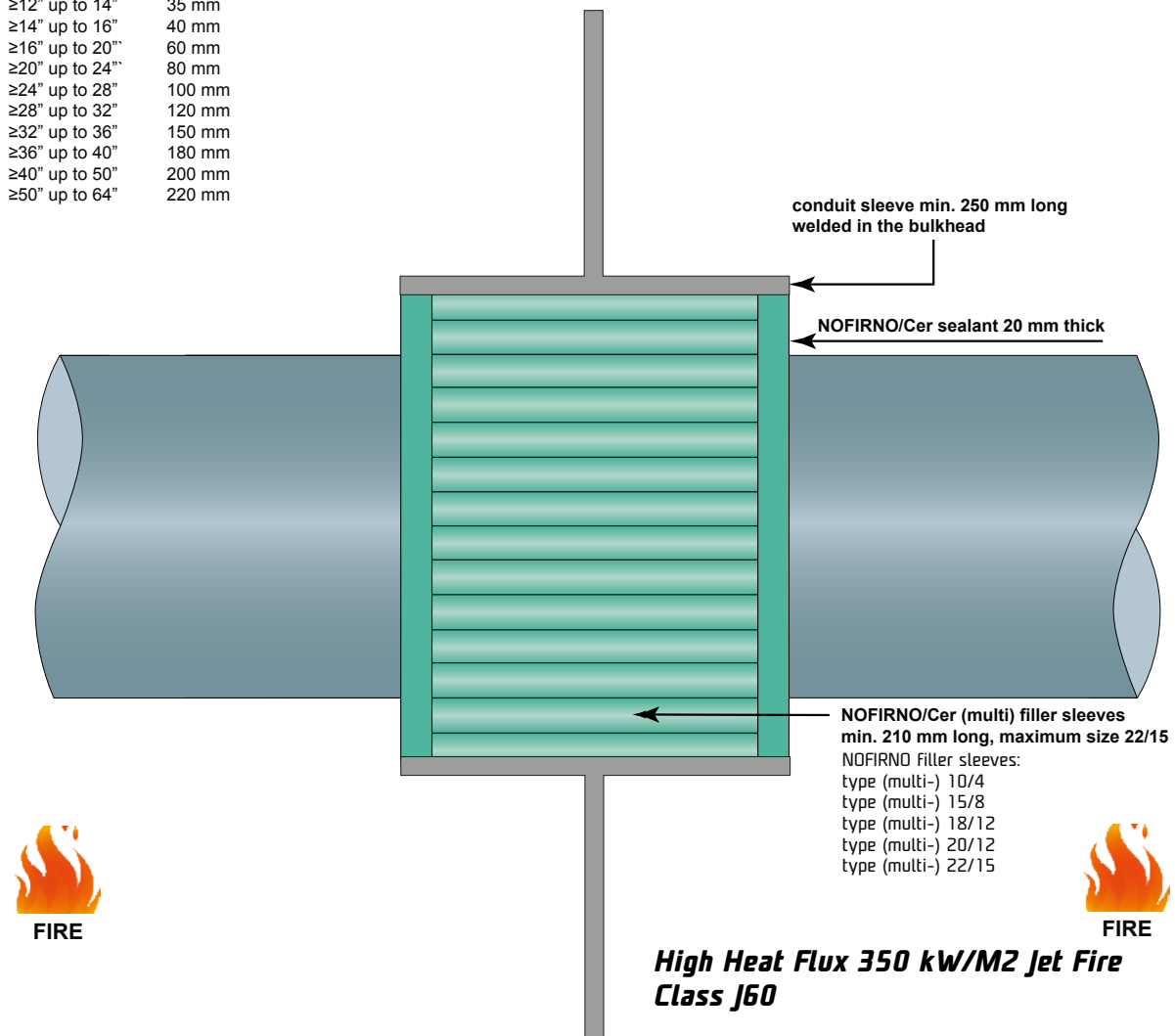
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer J-class PIPE TRANSIT SEALING SYSTEM

**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
≥16" up to 20"	60 mm
≥20" up to 24"	80 mm
≥24" up to 28"	100 mm
≥28" up to 32"	120 mm
≥32" up to 36"	150 mm
≥36" up to 40"	180 mm
≥40" up to 50"	200 mm
≥50" up to 64"	220 mm

**NOFIRNO/Cer SEALING SYSTEM
for steel/ss/CuNi pipes
up to 1600 mm - 64" NPS**



**J0 without any insulation tested
for 4 hours (J240)
No temperature measurement**

conduit frame positioned:
- symmetrical
or in case of fire from only one
side
- non-symmetrical with longest
length on non-fire side



Description: NOFIRNO/Cer sealing system for J240 class bulkheads/decks

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

04-11-2020

Scale:

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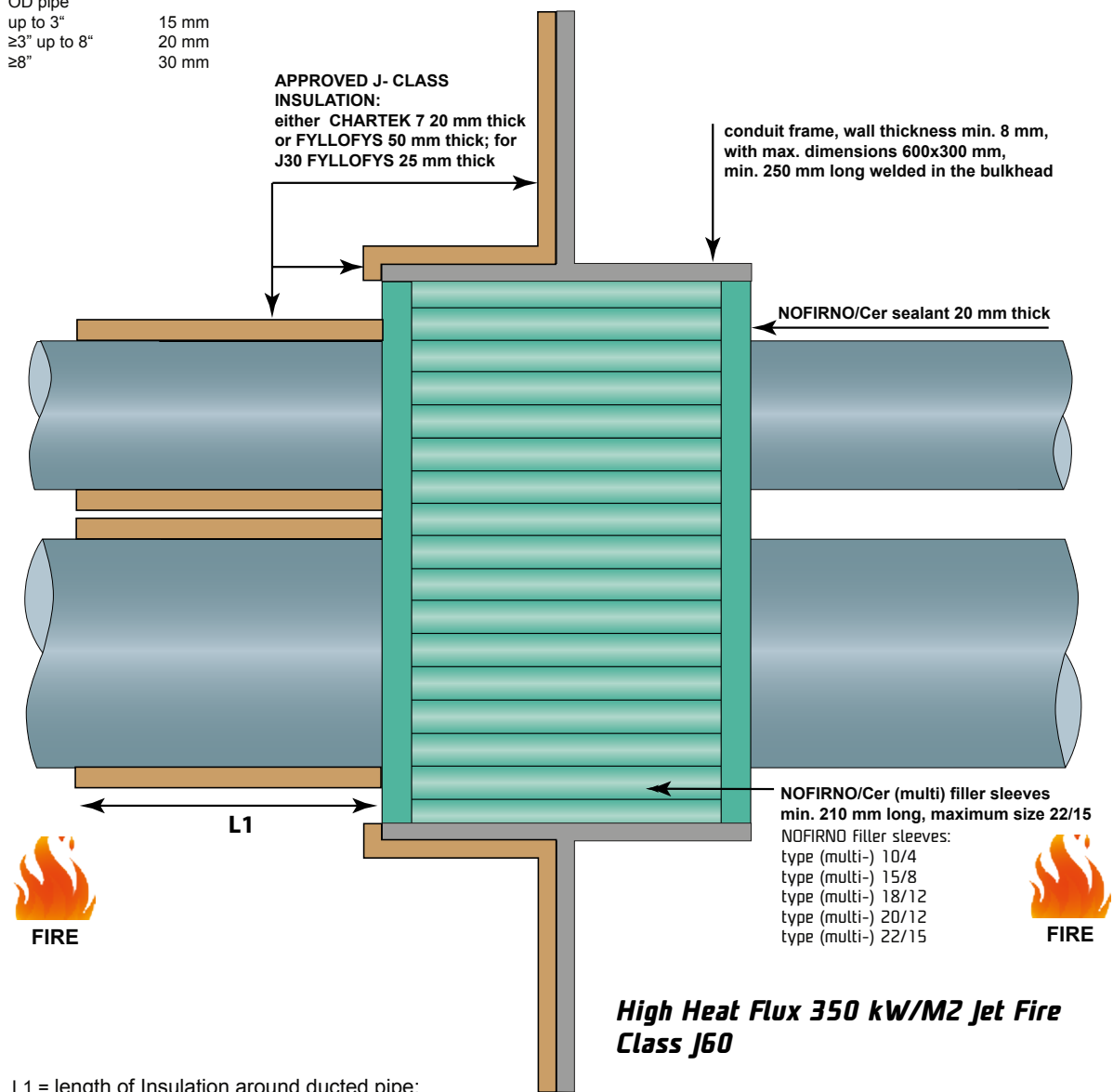
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer J-class PIPE TRANSIT SEALING SYSTEM

direction of exposure: fire from either side

Minimum clearance between
conduit sleeve and ducted pipe
and between ducted pipes:

OD pipe	
up to 3"	15 mm
≥3" up to 8"	20 mm
≥8"	30 mm

NOFIRNO/Cer SEALING SYSTEM FOR MULTI-PIPE TRANSITS for steel/ss/CuNi pipes min. 1/16" - max. 8" NPS



L1 = length of Insulation around ducted pipe:

	J60	J120
up to 3"	550 mm	1150 mm
≥ 3" up to 6"	800 mm	1700 mm
≥ 6" up to 8"	1000 mm	2050 mm
≥ 8" up to 10"	1200 mm	2400 mm

Note: alternative 50% of length on both sides of the penetration.

conduit frame positioned:
- symmetrical
or
- non-symmetrical with longest
length on insulated side



Description: NOFIRNO/Cer sealing system for J60-J120 class bulkheads

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

04-11-2020

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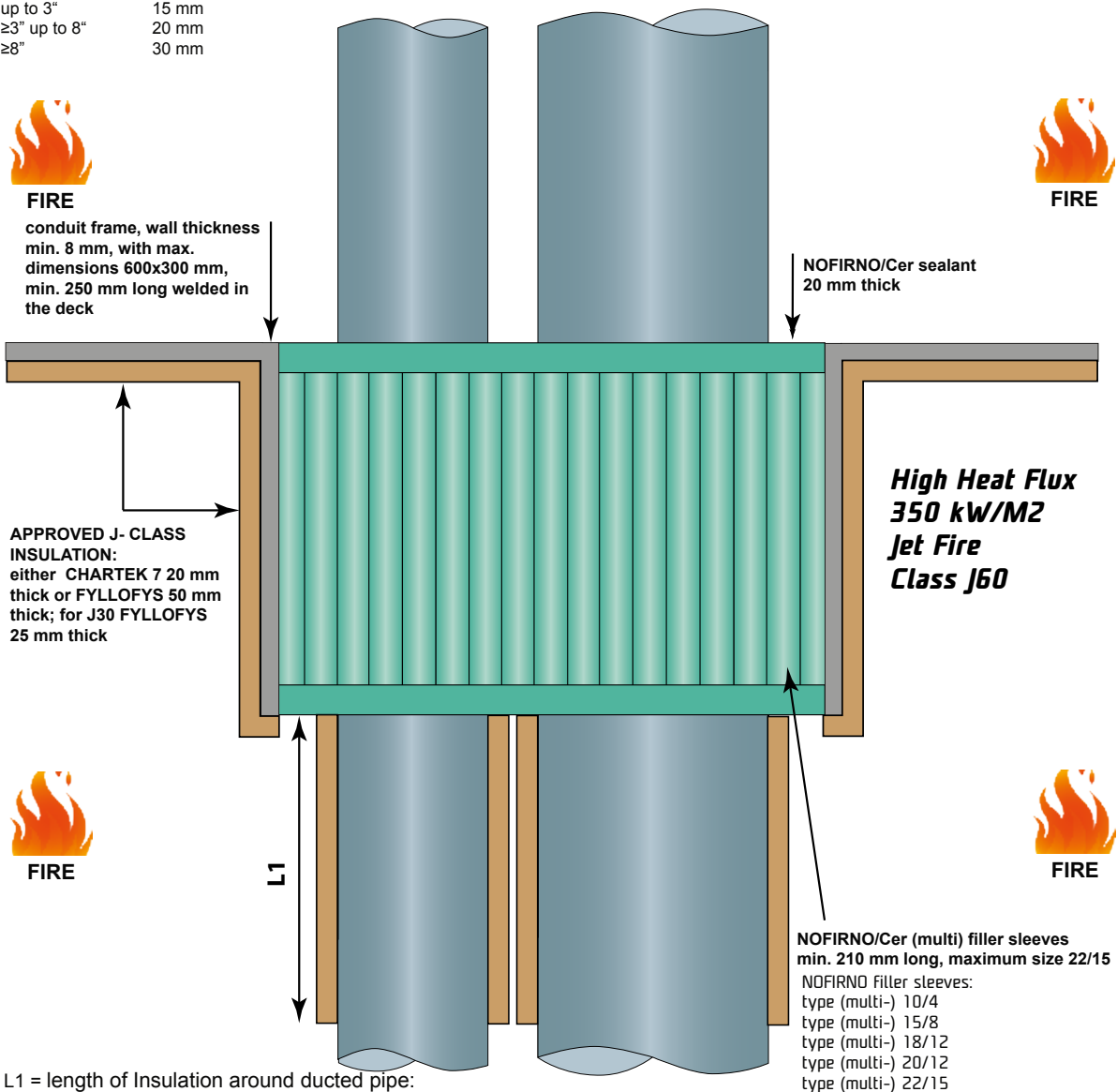
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer J-class (MULTI-) PIPE TRANSIT SEALING SYSTEM

direction of exposure:
fire from either side

Minimum clearance between
conduit sleeve and ducted pipe
and between ducted pipes:

OD pipe up to 3"	15 mm
≥3" up to 8"	20 mm
≥8"	30 mm

**NOFIRNO/Cer SEALING SYSTEM
FOR MULTI-PIPE TRANSITS**
for steel/ss/CuNi pipes
min. 1/16" - max. 8" NPS



L1 = length of Insulation around ducted pipe:

	JH60	JH120
up to 3"	550 mm	1150 mm
≥ 3" up to 6"	800 mm	1700 mm
≥ 6" up to 8"	1000 mm	2050 mm
≥ 8" up to 10"	1200 mm	2400 mm

Note: alternative 50% of length on both sides of the penetration.

**conduit frame positioned
totally below deck up to totally
above deck**



Description: NOFIRNO/Cer sealing system for J60-J120 class decks

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

04-11-2020

Scale:

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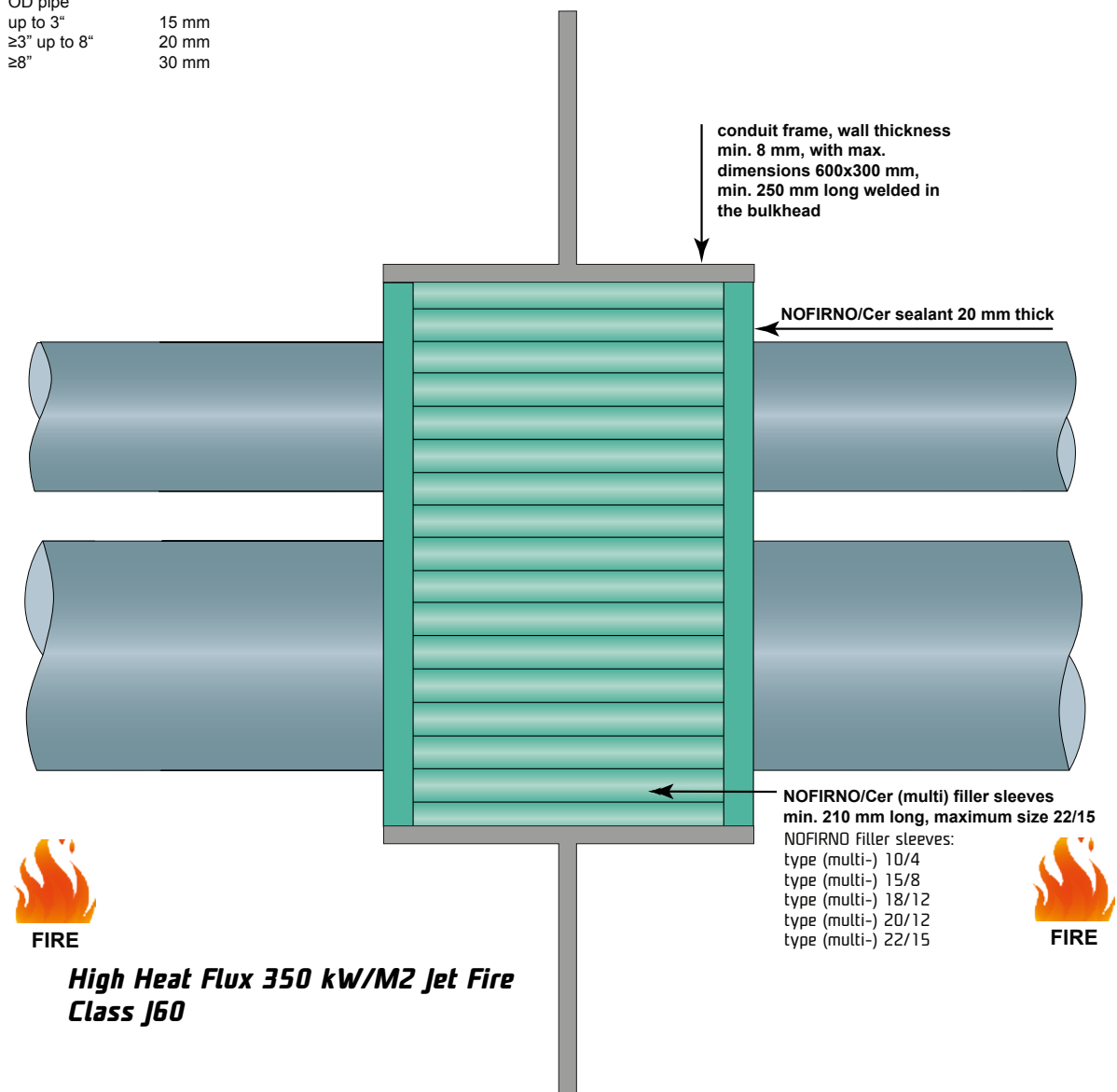
INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer J-class (MULTI-) PIPE TRANSIT SEALING SYSTEM

direction of exposure: fire from either side

Minimum clearance between
conduit sleeve and ducted pipe
and between ducted pipes:

OD pipe up to 3"	15 mm
≥3" up to 8"	20 mm
≥8"	30 mm

NOFIRNO/Cer SEALING SYSTEM FOR MULTI-PIPE TRANSITS for steel/ss/CuNi pipes min. 1/16" - max. 8" NPS



**J0 without any insulation tested
for 4 hours (J240)
No temperature measurement**

conduit frame positioned:
- symmetrical
or in case of fire from only one
side
- non-symmetrical with longest
length on non-fire side



Description: NOFIRNO/Cer sealing system for J240 class bulkheads/decks

Mat.: NOFIRNO/Cer rubber sleeves/sealant

Ref.: JAB

Date:

04-11-2020

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INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE 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/B0 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-s1-d0 class rating.
- FISSIC®** successfully tested according to ISO 1716 for A2-s1-d0. 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

FYLLOFYS

FISSIC

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



CERTIFICATE

Certificate of
EC Type-examination (Module B)
192130007/AA/00
Product Category: MED/3.13
USCG Approval No: 164.109/EC0560



Issued	26 July 2019	Date of expiration of validity	25 July 2024
Page	1 of 5 Certificate has three Annexes	Last date of placement	25 July 2024

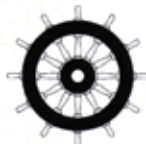
With respect to Marine Equipment Directive 2014/90/EU and the implementing Regulation (EU) 2018/773, Kiwa Telefication Notified Body 0560 declares that the equipment:

Product description:	FYLLOFYS thermal insulation material
Trademark:	FYLLOFYS
Type designation:	non-combustible thermal insulation material

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




Hans Naus
Assessor



Kiwa Telefication
Edisonstraat 12A
6902 PK ZEVENAAR
The Netherlands
Tel: +31 316 583 180
Fax: +31 316 583 189
www.telefication.com

Chamber of commerce
51565536

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM

Page 1 / 2



Marine & Offshore

Certificate number: 39278/B0 MED

File number: ACI1330/088/001

Item number: MED/3.18b

USCG Module B number: 164.112 / EC2690

This certificate is not valid when presented without the full
attached schedule composed of 7 sections
www.veristar.com

Notified Body 2690 - MARINE EQUIPMENT DIRECTIVE 2014/90/EU

EC TYPE EXAMINATION CERTIFICATE

as per Module B of Directive 2014/90/EU of the European Parliament and of the Council of 23 July 2014 as transposed in the French Regulations
and Commission Implementing Regulation (EU) 2018/773 of 15 May 2018

This certificate is issued to:

BEELE ENGINEERING

Aalten - NETHERLANDS

for the type of product

SURFACE MATERIALS AND FLOOR COVERINGS WITH LOW FLAME-SPREAD

CHARACTERISTICS: PAINT SYSTEMS

FISSIC fire resistant, water resistant coating (from 1 mm to 3 mm)

Requirements:

SOLAS 74 convention as amended, Regulations II-2/3, II-2/5, II-2/6, II-2/9, X/3
IMO Res. MSC.36(63) -(1994 HSC Code)- as amended, 7
IMO Res. MSC.97(73) -(2000 HSC Code)- as amended, 7
IMO Res MSC.307(88) -(2010 FTP Code)-
IMO MSC/Circ.1120

This certificate is issued on behalf of the French Maritime Authorities to attest that Bureau Veritas Marine & Offshore did undertake the relevant
type-examination procedures for the product identified above which was found to comply with the relevant requirements of the Directive
2014/90/EU of the European Parliament and of the Council of 23 July 2014 as transposed in the French Regulations.

This certificate will expire on: 21 Jan 2024

For Bureau Veritas Marine & Offshore Notified Body 2690,

At BV GRONINGEN, on 21 Jan 2019,

John Mondt




This certificate does not allow to issue the Declaration of Conformity and to affix the mark of conformity (wheelmark ) to the products corresponding
to this type. To this end, the production-control phase module (D, E or F) of Annex II of the Directive is to be complied with and controlled by a written
inspection agreement with a notified body.

This certificate remains valid until the date stated above, unless cancelled or revoked, provided the conditions indicated in the subsequent page(s) are complied with
and the product remains satisfactory in service. This certificate will not be valid if the applicant makes any changes or modifications to the approved product, which
have not been notified to, and agreed in writing with Bureau Veritas Marine & Offshore. Should the specified regulations or standards be amended during the validity
of this certificate, the product(s) is/are to be re-approved prior to it/they being placed on board vessels to which the amended regulations or standards apply. Bureau
Veritas Marine & Offshore is designated by the French Maritime Authority as a "notified body" under the terms of the French Regulations Division 140 Chapter 140-2.
This certificate is issued within the scope of the General Conditions of Bureau Veritas Marine & Offshore available on the internet site www.veristar.com. Any Person
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INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



INTERNATIONAL FIRE
CONSULTANTS LIMITED

PRIVATE & CONFIDENTIAL

IFC ENGINEERING ASSESSMENT REPORT

**Engineering Assessment of the
Jet-Fire Resistance Performance of Steel I-
Section Beams, Columns, Steel Bulkheads
and Decks protected with Fyllofys boards if
exposed to ISO 22899-1 Jet-Fire Conditions
at Design Temperatures of 350°C to 750°C**

Fire Resistance Test Standard: ISO 22899-1

IFC Report PAR/21597/01

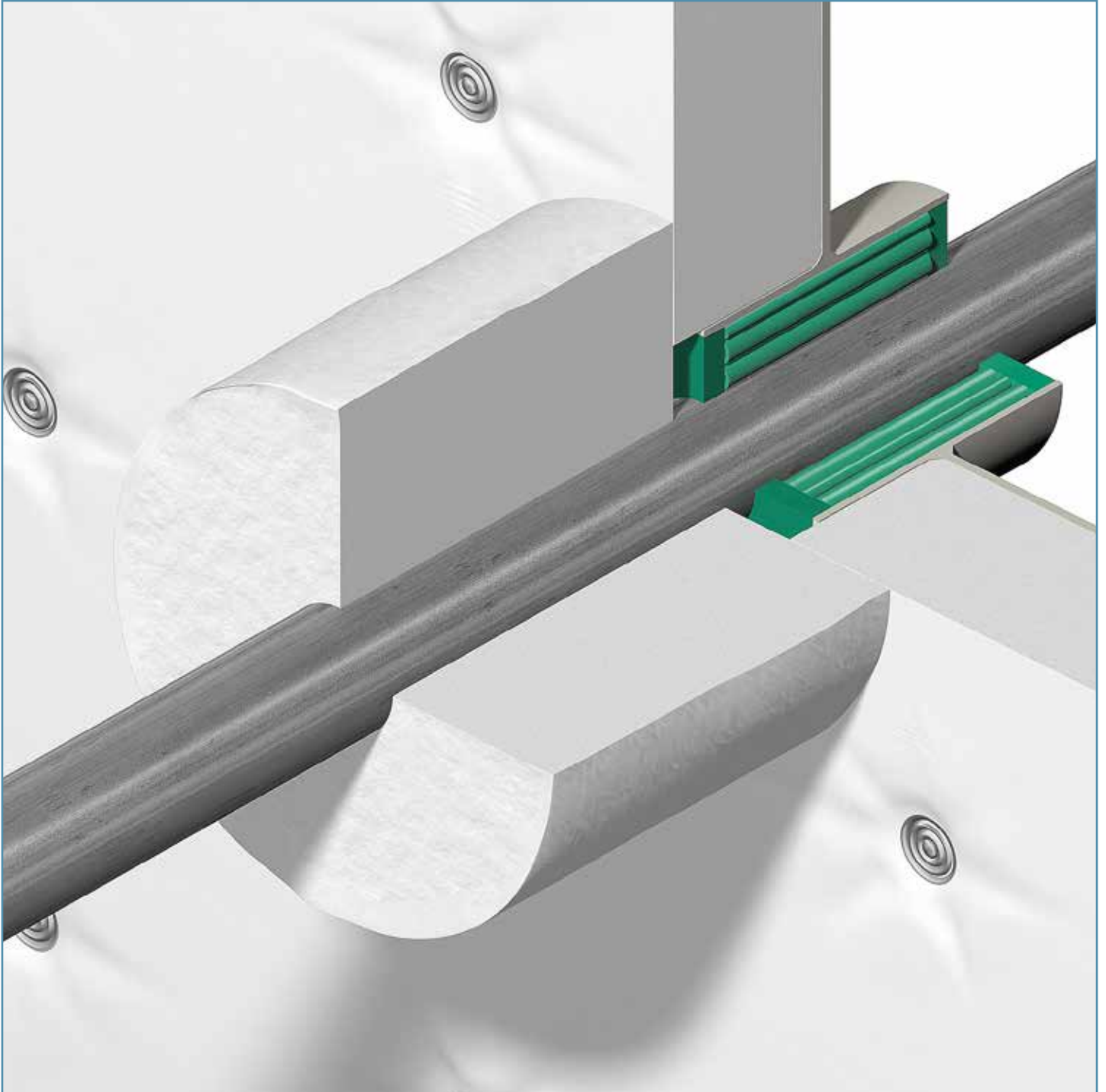
Prepared on behalf of: Beele Engineering B.V.
Beunkdijk 11
7122 NZ Aalten
The Netherlands

NOTE: This report should not be manipulated, abridged or otherwise presented without the written consent of International Fire Consultants Ltd

Ref: #21597

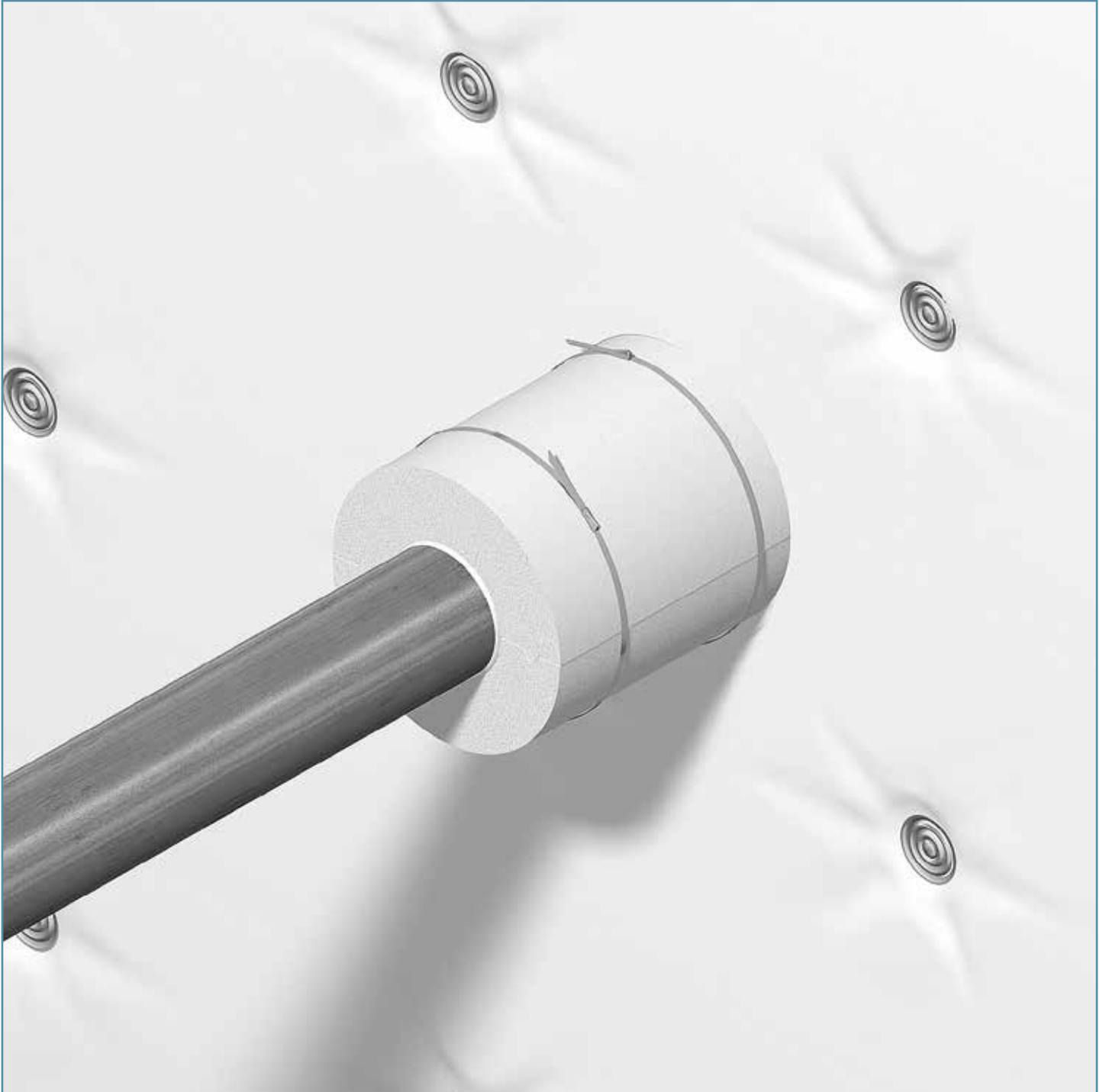
Issue Date – January 2021
Valid Until – January 2026

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



For H60-H120 classification a max. temperature rise of max. 180 °C is set in the test procedures. This means that the bulkhead, the conduit sleeve and the ducted pipe have to be insulated to prevent exceeding the specified criterion. Generally the insulation of the ducted pipe is the same insulation as used for the bulkhead.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



BEELE Engineering has developed for H-class applications a removable coat back with a thickness of 50 mm on ducted pipes as an alternative to fiber bats. Based on the 50mm thickness the inter-spacing between ducted pipes can be limited compared to the use of mineral fiber bats.

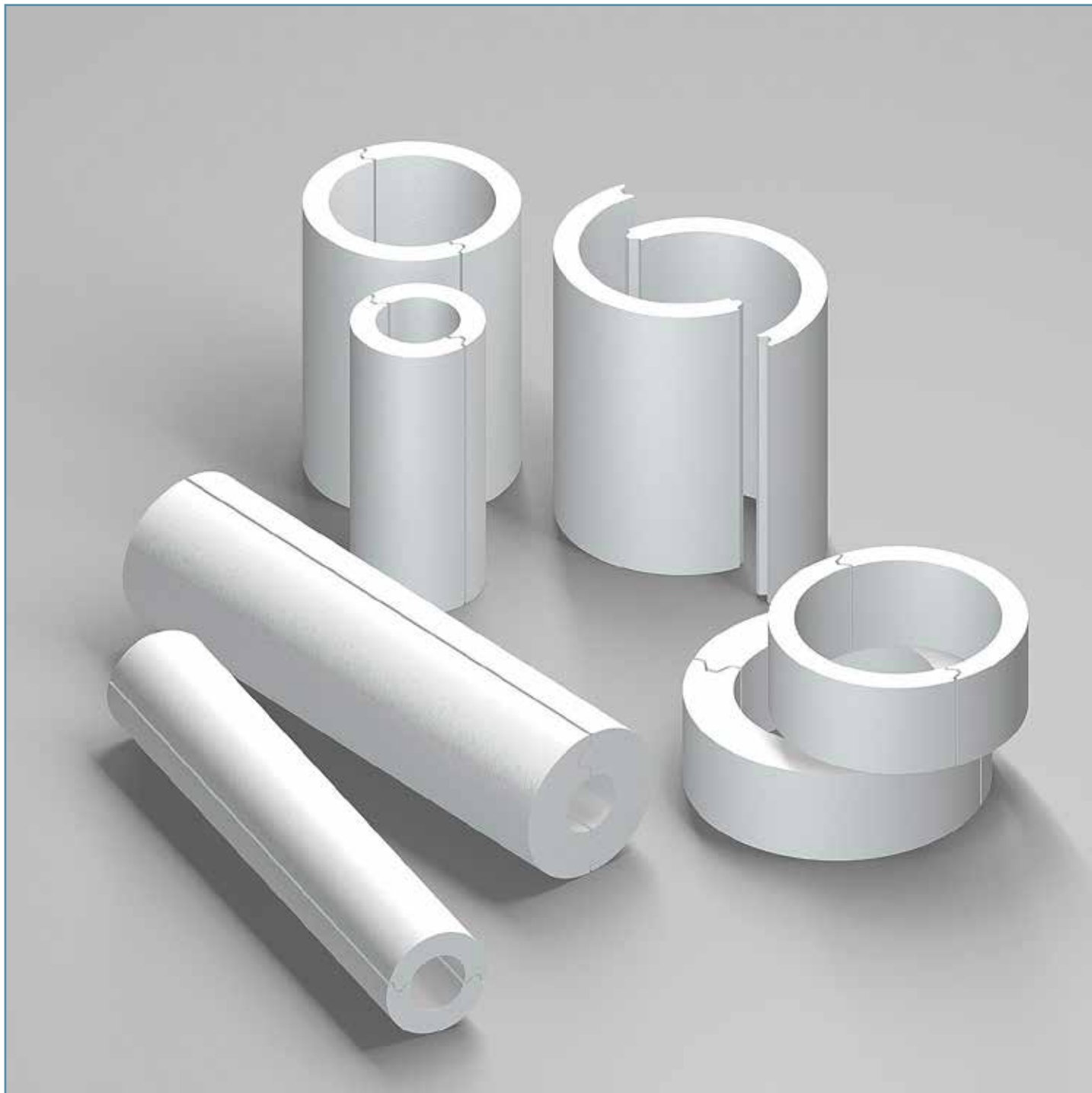
FYLLOFYS®/FISSIC® shells are placed around the ducted pipe, fixed with jubilee clips and sealed at the front side with NOFIRNO® sealant.

FYLLOFYS® is a rigid, non-combustible material.

TYPES AND APPLICATION OF FYLLOFYS® THERMAL INSULATION SHELLS, PROTECTED WITH FISSIC® STRUCTURAL COATING

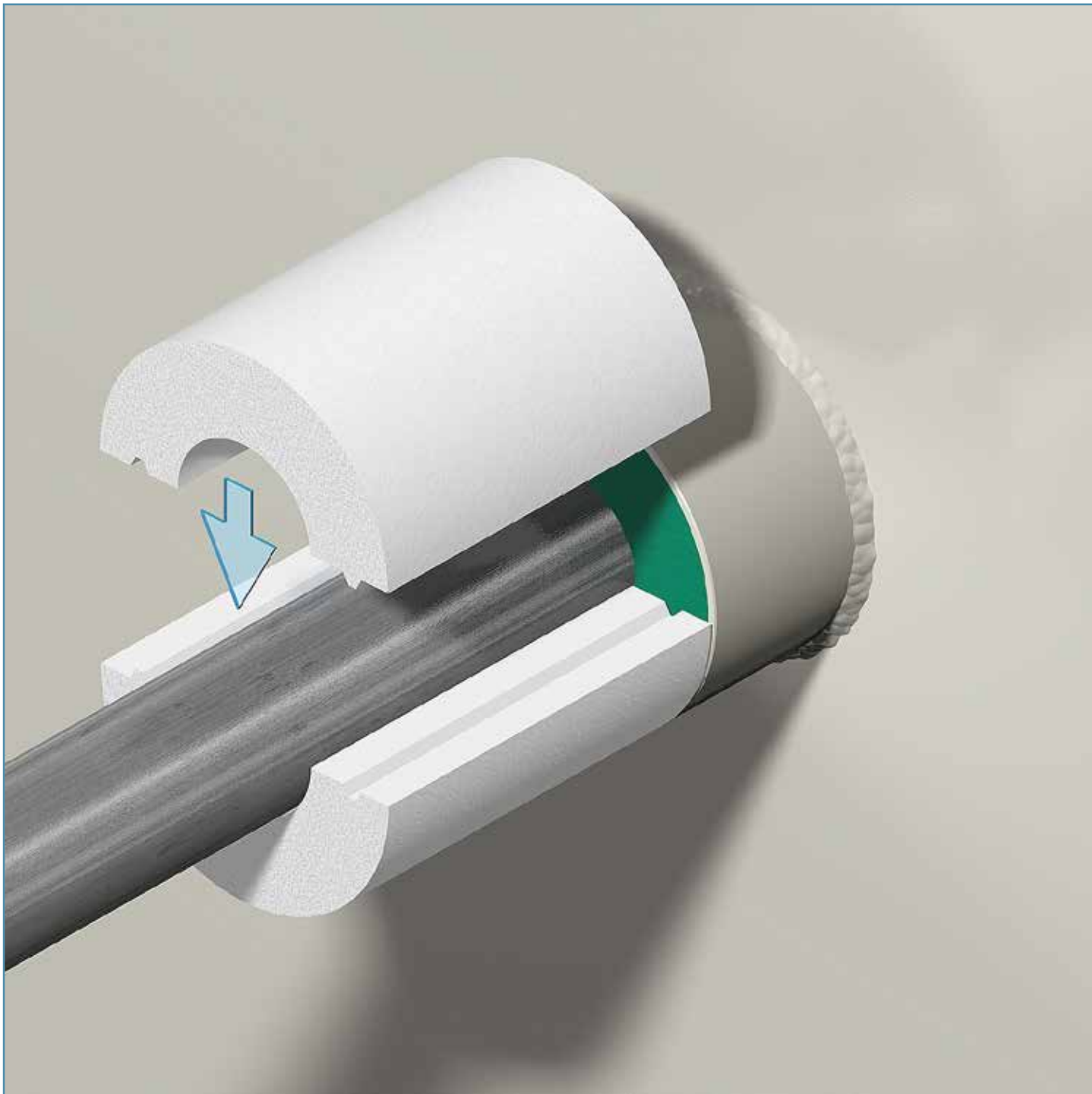
pipe diameter	FYLLOFYS type/length	article number	pipe diameter	FYLLOFYS type/length	article number	sheets thickness	FYLLOFYS dimensions	article number
STEEL PIPES (H-class 50 mm thick)			STEEL PIPES (A-class 25 mm thick)			FYL20	400x400	55.1100
76.1	FYL50 76.1-300	55.0604	48.3	FYL25 48.3-100	55.0110	FYL25	400x400	55.1101
88.9	FYL50 88.9-300	55.0605	60.3	FYL25 60.3-100	55.0111	FYL30	400x400	55.1102
114.3	FYL50 114.3-300	55.0606	76.1	FYL25 76.1-100	55.0112	FYL40	400x400	55.1103
139.7	FYL50 139.7-300	55.0607	88.9	FYL25 88.9-100	55.0113	FYL50	400x400	55.1104
168.3	FYL50 168.3-300	55.0608	114.3	FYL25 114.3-100	55.0114	FYL60	400x400	55.1105
219.1	FYL50 219.1-300	55.0609	139.7	FYL25 139.7-100	55.0115	FYL80	400x400	55.1106
273.0	FYL50 273.0-300	55.0610	168.3	FYL25 168.3-100	55.0116	FYL90	400x400	55.1107
323.9	FYL50 323.9-300	55.0611	219.1	FYL25 219.1-100	55.0117	FYL100	400x400	55.1108
355.6	FYL50 355.6-300	55.0612						
406.4	FYL50 406.4-300	55.0620	76.1	FYL25 76.1-200	55.0132	FYL100	1000x500	55.1150
457.2	FYL50 457.2-300	55.0621	88.9	FYL25 88.9-200	55.0133	NOTE: FYLLOFYS® sheets can be cut to sizes with a wood saw. After cutting the edges have to be coated with FISSIC®.		
508.0	FYL50 508.0-300	55.0630	114.3	FYL25 114.3-200	55.0134			
609.6	FYL50 609.6-300	55.0640	139.7	FYL25 139.7-200	55.0135	On demand moulded products can be manufactured dependent on dimensions and quantities.		
762.0	FYL50 762.0-300	55.0650	168.3	FYL25 168.3-200	55.0136			
			219.1	FYL25 219.1-200	55.0137	FYLLOFYS		
76.1	FYL50 76.1-450	55.0704	76.1	FYL25 76.1-300	55.0152			
88.9	FYL50 88.9-450	55.0705	88.9	FYL25 88.9-300	55.0153	FISSIC COATING		
114.3	FYL50 114.3-450	55.0706	114.3	FYL25 114.3-300	55.0154			
139.7	FYL50 139.7-450	55.0707	139.7	FYL25 139.7-300	55.0155	FISSIC		
168.3	FYL50 168.3-450	55.0708	168.3	FYL25 168.3-300	55.0156			
219.1	FYL50 219.1-450	55.0709	219.1	FYL25 219.1-300	55.0157	article number		
273.0	FYL50 273.0-450	55.0710	76.1	FYL25 76.1-450	55.0172			
323.9	FYL50 323.9-450	55.0711	88.9	FYL25 88.9-450	55.0173	FISSIC drum 1ltr		
355.6	FYL50 355.6-450	55.0712	114.3	FYL25 114.3-450	55.0174			
406.4	FYL50 406.4-450	55.0720	139.7	FYL25 139.7-450	55.0175	FISSIC drum 10 ltr		
457.2	FYL50 457.2-450	55.0721	168.3	FYL25 168.3-450	55.0176			
508.0	FYL50 508.0-450	55.0730	219.1	FYL25 219.1-450	55.0177	FISSIC drum 15 ltr		
609.6	FYL50 609.6-450	55.0740	76.1	FYL25 76.1-600	55.0192			
762.0	FYL50 762.0-450	55.0750	88.9	FYL25 88.9-600	55.0193	NOTE: for more information of the FISSIC® protective coating see the separate brochure.		
76.1	FYL50 76.1-600	55.0604	114.3	FYL25 114.3-600	55.0194			
88.9	FYL50 88.9-600	55.0605	139.7	FYL25 139.7-600	55.0195	55.0002		
114.3	FYL50 114.3-600	55.0606	168.3	FYL25 168.3-600	55.0196			
139.7	FYL50 139.7-600	55.0607	219.1	FYL25 219.1-600	55.0197	55.0003		
168.3	FYL50 168.3-600	55.0608	STEEL PIPES (A-class 25 mm thick)					
219.1	FYL50 219.1-600	55.0609	273.0	FYL25 273.0-300	55.0310	55.0004		
273.0	FYL50 273.0-600	55.0810	323.9	FYL25 323.9-300	55.0311			
323.9	FYL50 323.9-600	55.0811	355.6	FYL25 355.6-300	55.0312	55.0005		
355.6	FYL50 355.6-600	55.0812	406.4	FYL25 406.4-300	55.0320			
406.4	FYL50 406.4-600	55.0820	457.2	FYL25 457.2-300	55.0321			
457.2	FYL50 457.2-600	55.0821	508.0	FYL25 508.0-300	55.0330			
508.0	FYL50 508.0-600	55.0830	609.6	FYL25 609.6-300	55.0340			
609.6	FYL50 609.6-600	55.0840	762.0	FYL25 762.0-300	55.0350			
762.0	FYL50 762.0-600	55.0850						
NOTE: FYLLOFYS® for pipes > 219 mm OD are manufactured in strips bonded together.			273.0	FYL25 273.0-450	55.0410			
			323.9	FYL25 323.9-450	55.0411			
			355.6	FYL25 355.6-450	55.0412			
			406.4	FYL25 406.4-450	55.0420			
			457.2	FYL25 457.2-450	55.0421			
			508.0	FYL25 508.0-450	55.0430			
			609.6	FYL25 609.6-450	55.0440			
			762.0	FYL25 762.0-450	55.0450			
			273.0	FYL25 273.0-600	55.0510			
			323.9	FYL25 323.9-600	55.0511			
			355.6	FYL25 355.6-600	55.0512			
			406.4	FYL25 406.4-600	55.0520			
			457.2	FYL25 457.2-600	55.0521			
			508.0	FYL25 508.0-600	55.0530			
			609.6	FYL25 609.6-600	55.0540			
			762.0	FYL25 762.0-600	55.0550			

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class (MULTI-) PIPE TRANSIT SEALING SYSTEM



H-60/H-120 class penetrations require insulation of the transit collar and the ducted pipes to prevent a temperature rise of 180 °C on the non-exposed side of the partition. Generally this is done with fibre mats. However, besides the loose fiber mats not being easy to apply around rounded surfaces, working with these fibre mats is not pleasant. For this reason, FYLLOFYS® thermal insulation products have been developed for fitting around collars and pipes. FYLLOFYS® thermal insulation is non-combustible. Tested according FTP code 2010 - Part 1 and ISO 1182:2010. Test report EFR-17-OMI-003574 of Efectis France. MED certificate 192130007/AA/00 issued by KIWA Telefication Netherlands.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



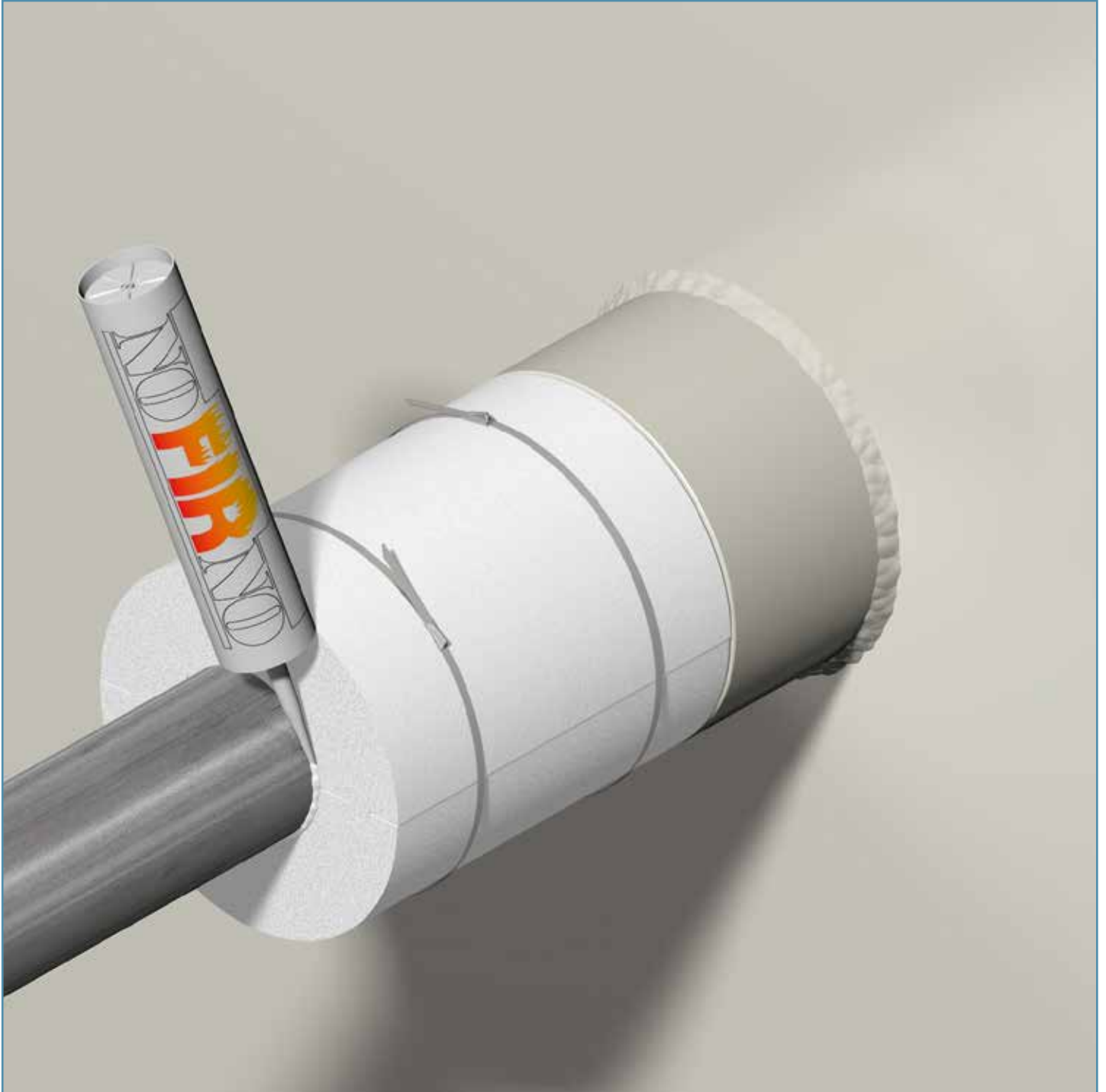
FYLLOFYS® thermal insulation shells are placed in front of the penetration around the conduit sleeve.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



The FYLLOFYS® shells should be tightened with stainless steel jubilee clips.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



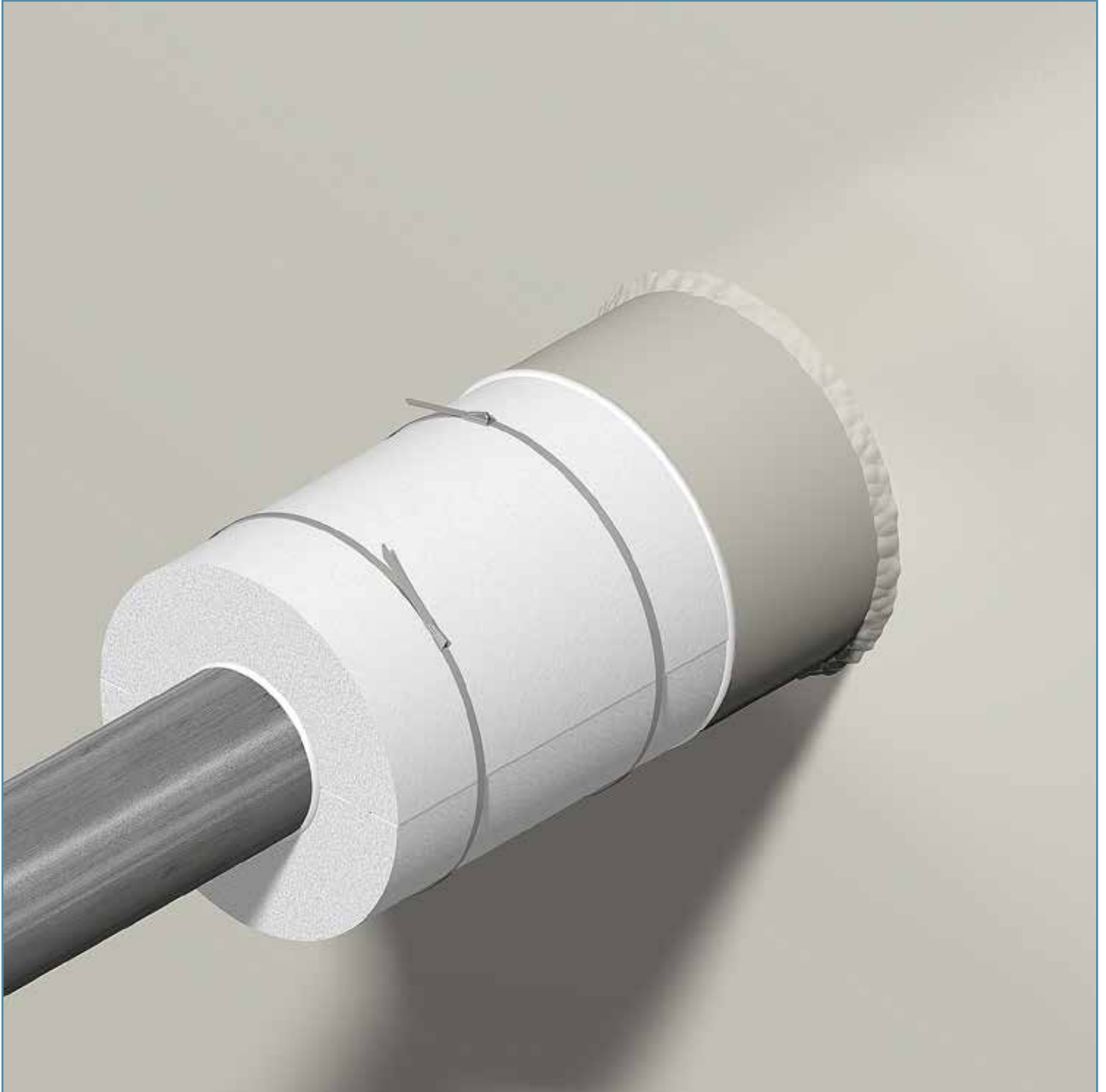
NOFIRNO® sealant is applied at the front side of the FYLLOFYS® shells to prevent moisture/water ingress.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



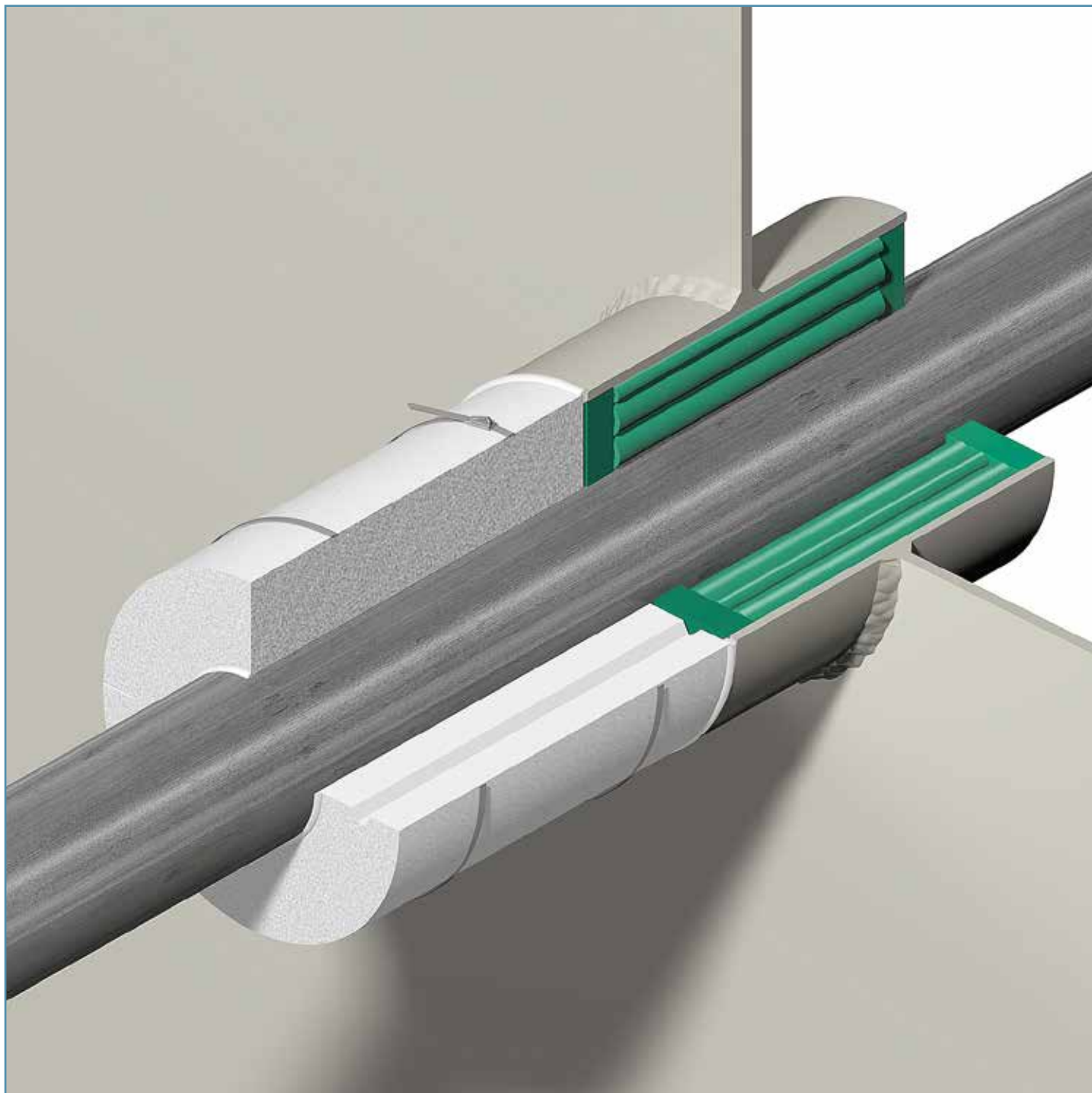
NOFIRNO® sealant is applied at the connection of the FYLLOFYS® shells with the NOFIRNO®/Cer sealing system to prevent moisture/water ingress.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



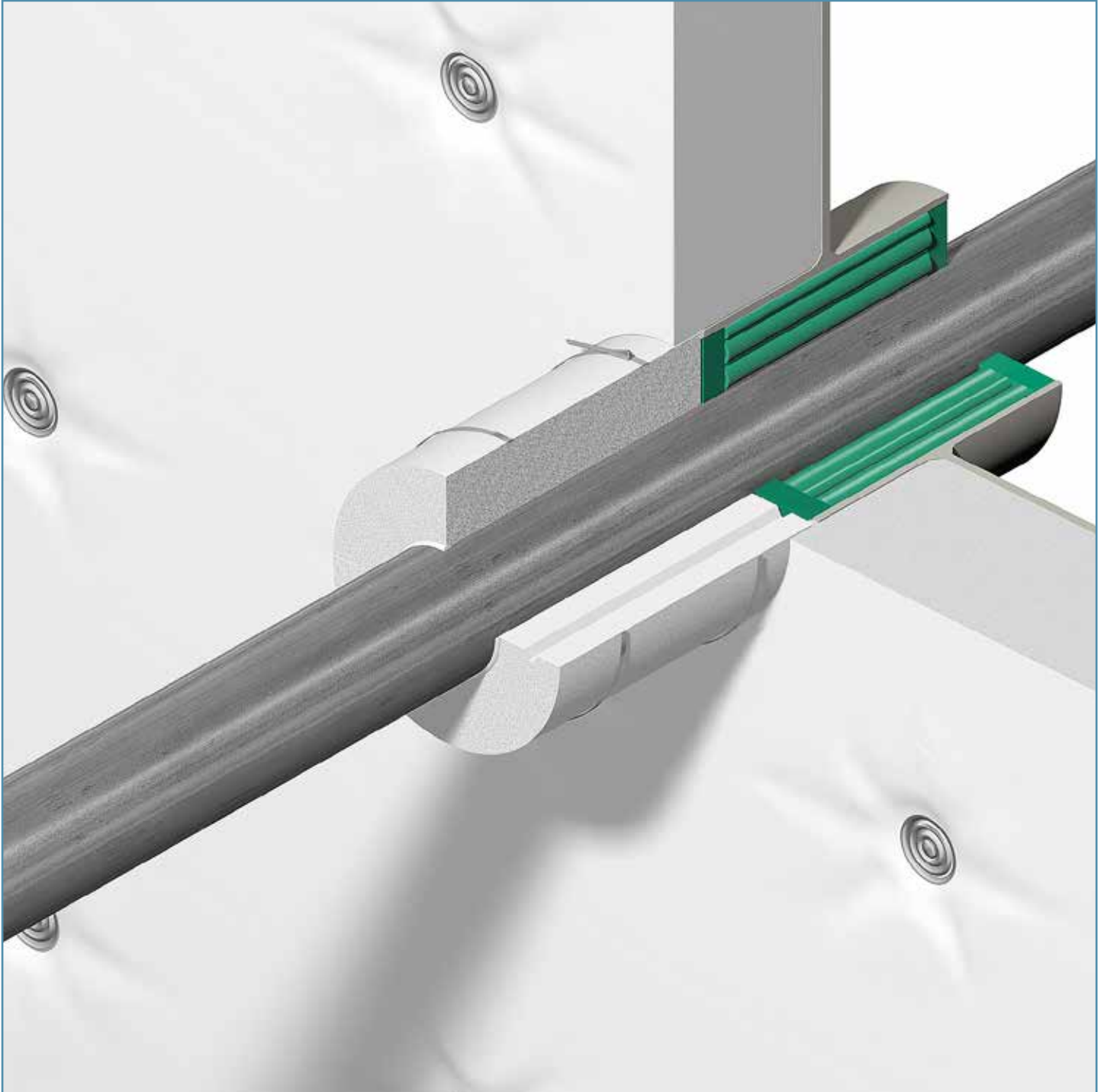
The finished NOFIRNO®/Cer penetration with 50 mm thick FYLLOFYS® around ducted pipe.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



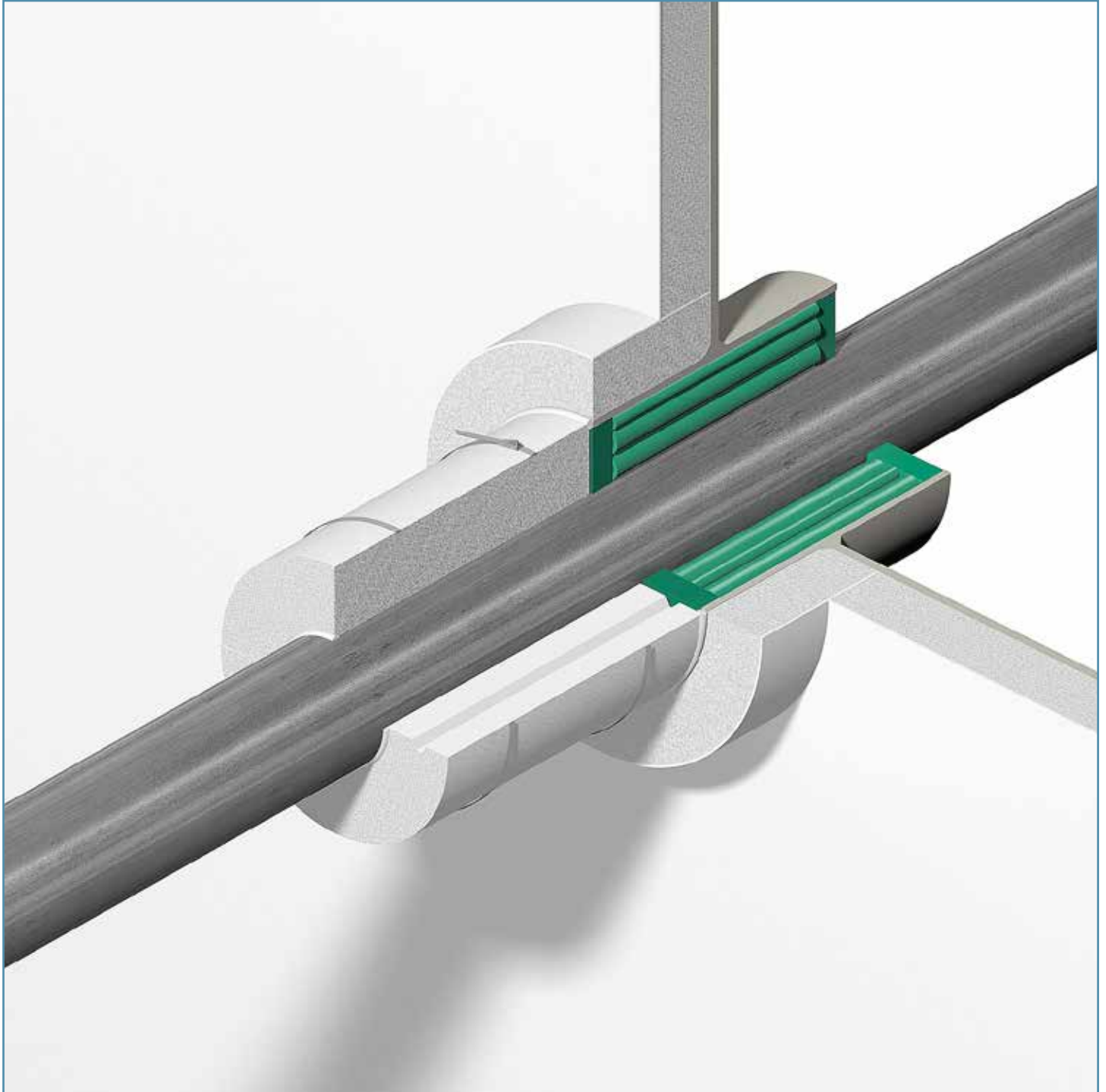
The finished NOFIRNO®/Cer penetration with 50 mm thick FYLLOFYS® around ducted pipe.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer H-class PIPE TRANSIT SEALING SYSTEM



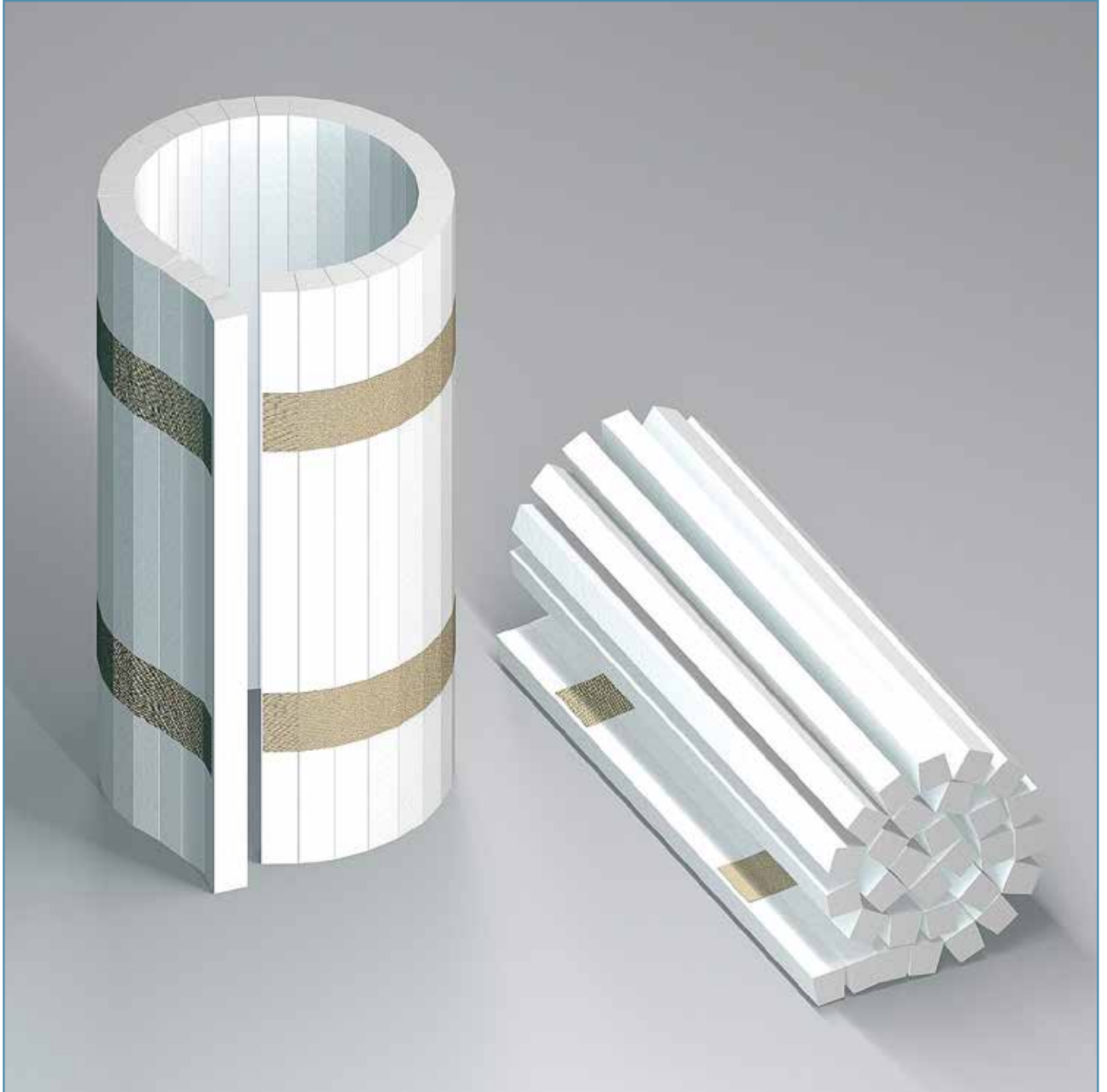
Mineral fiber bats applied to the bulkhead, FYLLOFYS® around ducted pipe.

**INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer
J-class PIPE TRANSIT SEALING SYSTEM**



FYLLOFYS® applied to the bulkhead and to the ducted pipe.

INSTALLATION INSTRUCTIONS FOR NOFIRNO®/Cer J-class PIPE TRANSIT SEALING SYSTEM



FYLLOFYS® thermal insulation products have been developed for fitting around the transit collar and the ducted pipes. Up to pipes size 219.1 mm (8" NPS) FYLLOFYS® shells, consisting of two parts, are manufactured by moulding. Due to the machine sizes needed for this type of manufacturing, it is not possible for larger pipe dimensions.

For larger pipe applications with greater diameter than 219.1 mm, FYLLOFYS® thermal insulation products are made from slats designed to fit around the pipes or sleeves.

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

NOFIRNO

NOFIRNO

slipsil
slipsil
XL-120

DYNATITE

CRUSHER

NOFIRNO® & NOFIRNO®/Cer

- 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® and NOFIRNO®/Cer rubber sleeves and sealant will remain stable and not be consumed by fire.
- **Breakthrough - highest fire ratings by forming ceramics.**
- Approved for any combination of cable and/or metallic, GRP/GRE or plastic pipes!

SLIPSIL®

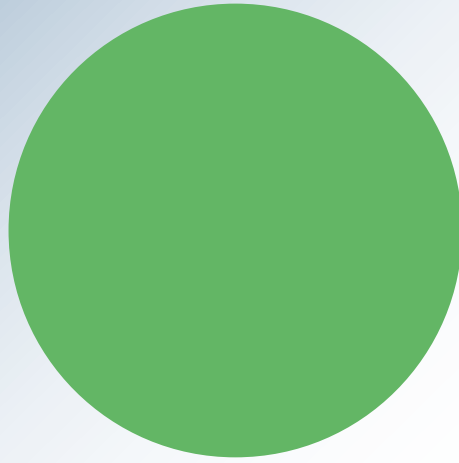
- Designed to provide fire safe, gas and watertight seals for pipe penetrations.
- For transits carrying single or multiple metal pipes with the same diameter (hydraulic and pneumatic lines).
- Installs in a couple of minutes. Lubricate and push - that is it!
- No bolting or other mechanical devices.
- 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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