SAFETY SEALING SYSTEMS

BEELE WE CARE

INSTALLATION INSTRUCTIONS NOFIRNO® SEALING SYSTEM FOR GAPS WITH EXCESSIVE WIDTHS IN CONSTRUCTIONS

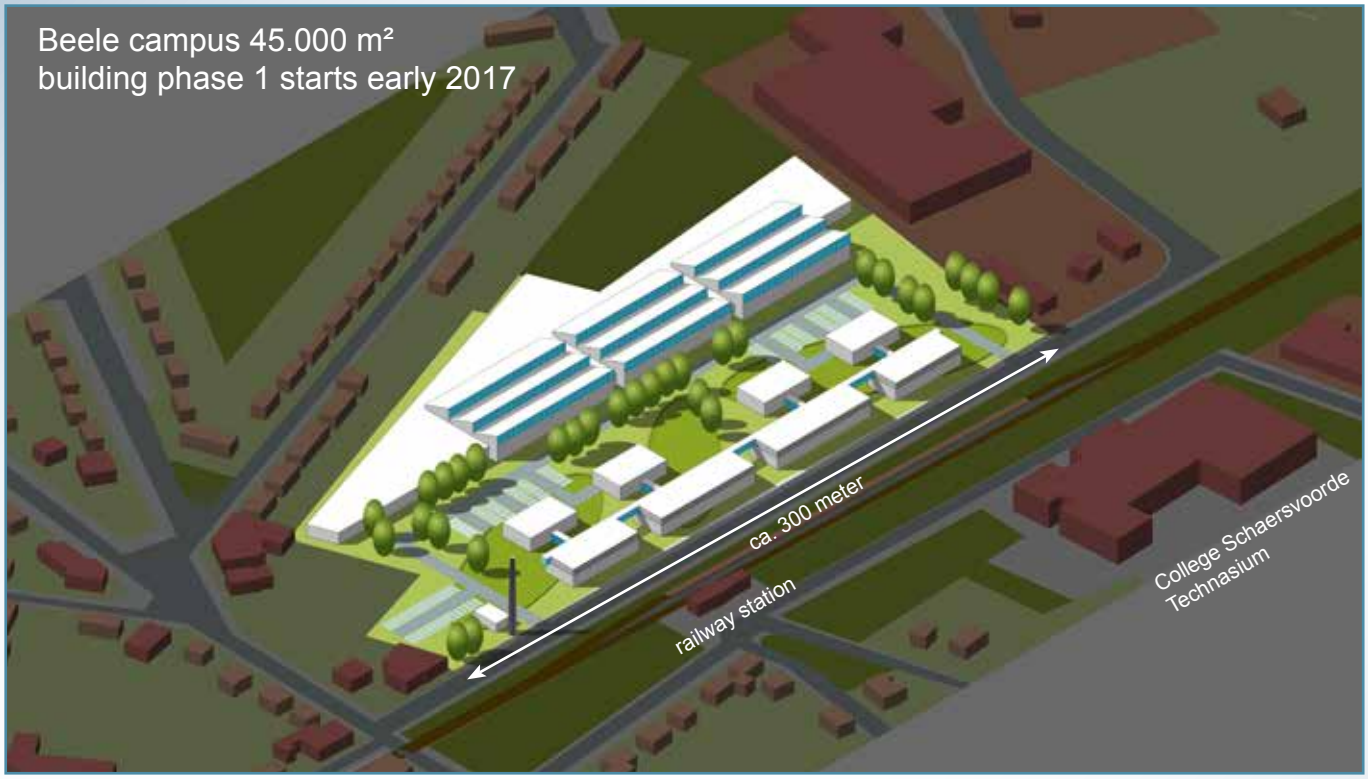
NOFIRNO

TECHNOLOGY DEVELOPED BY BEELE ENGINEERING BV
COMPOUNDING AND PRODUCTION IN THE ULTRA-MODERN MANUFACTURING FACILITIES IN AALTEN/THE NETHERLANDS
UNDER A STRINGENT ISO 9001:2015 QUALITY SYSTEM
MORE THAN 45 YEARS R&D ON QUALITY, DURABILITY & FUNCTIONALITY

WE CARE
WE SOLVE

SEALING VALLEY.COM

KNOWLEDGE TRANSFER, EDUCATION AND TRAINING



INSTALLATION INSTRUCTIONS FOR NOFIRNO®
LARGE GAP SEALING SYSTEM

NOFIRNO® multi-filler sleeves

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

filler sleeves are supplied in
multi-sets of 10 sleeves

NOFIRNO® multi-filler	sleeve length	article number	all dimensions in mm	NOFIRNO® multi-filler	sleeve length	article number	all dimensions in mm	NOFIRNO® multi-filler	sleeve length	article number
22/15 multi	140	80.5072		18/12 multi	140	80.5052		27/19 multi	140	80.5062
22/15 multi	160	80.5073		18/12 multi	160	80.5053		27/19 multi	160	80.5063
22/15 multi	210	80.5074		18/12 multi	210	80.5054		27/19 multi	210	80.5064

PRODUCT INFORMATION SEALANT

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

article number 50.0102

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).

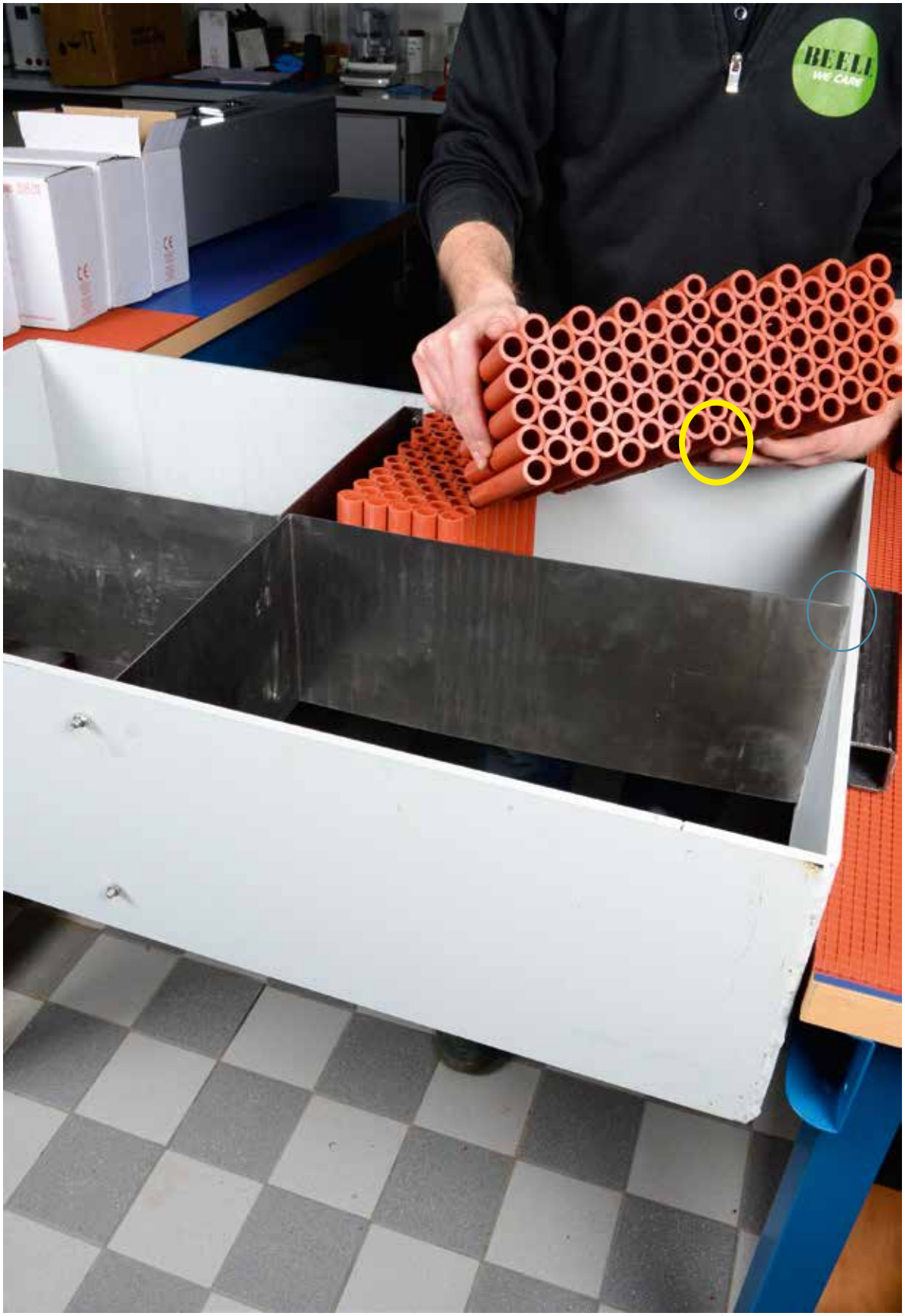
Shelf life of the sealants is 12 months when stored properly. Since we have no control on storage, we can only guarantee for 6 months.

To simulate gaps with a width of 600 mm, a steel casing 1000x600 mm, with a depth of 250 mm has been made. Since it is impossible to install the NOFIRNO filler sleeves in such wide gaps in floors, angled steel partitions with a wall thickness of 2 mm are fixed against the wall and floor in turns (blue circles). No fixation of the partitions over the length of the gap (red circles).

To allow for movements (compression of the sealing system) the steel partitions are placed in a way to leave some space between each other. In this case the partitions are 500x300 mm to divide the 1 meter gap into 4 sections.

The fixation of the steel partitions against the “wall” and “floor”. The depth of the coaming is 250 mm (note: a steel casing is only used for the installation instruction; in praxis the system is applied directly in the concrete floor against the wall). The steel partitions should be 240 mm high, leaving at both sides 5 mm recess inside the coaming. The NOFIRNO sealant will be applied over these partitions to prevent corrosion.

Use is made of NOFIRNO filler sleeves type 22/15. The NOFIRNO multi-sleeves are stacked on top of each other for a fit into the gap created by the separating partitions. To enable proper handling the stacked multi-sets of sleeves (10) are split into sets of 5 sleeves. Note: insertion of the filler sleeves starts at the strongest point of the partition, close to the bending. Length of the filler sleeves is 210 mm.



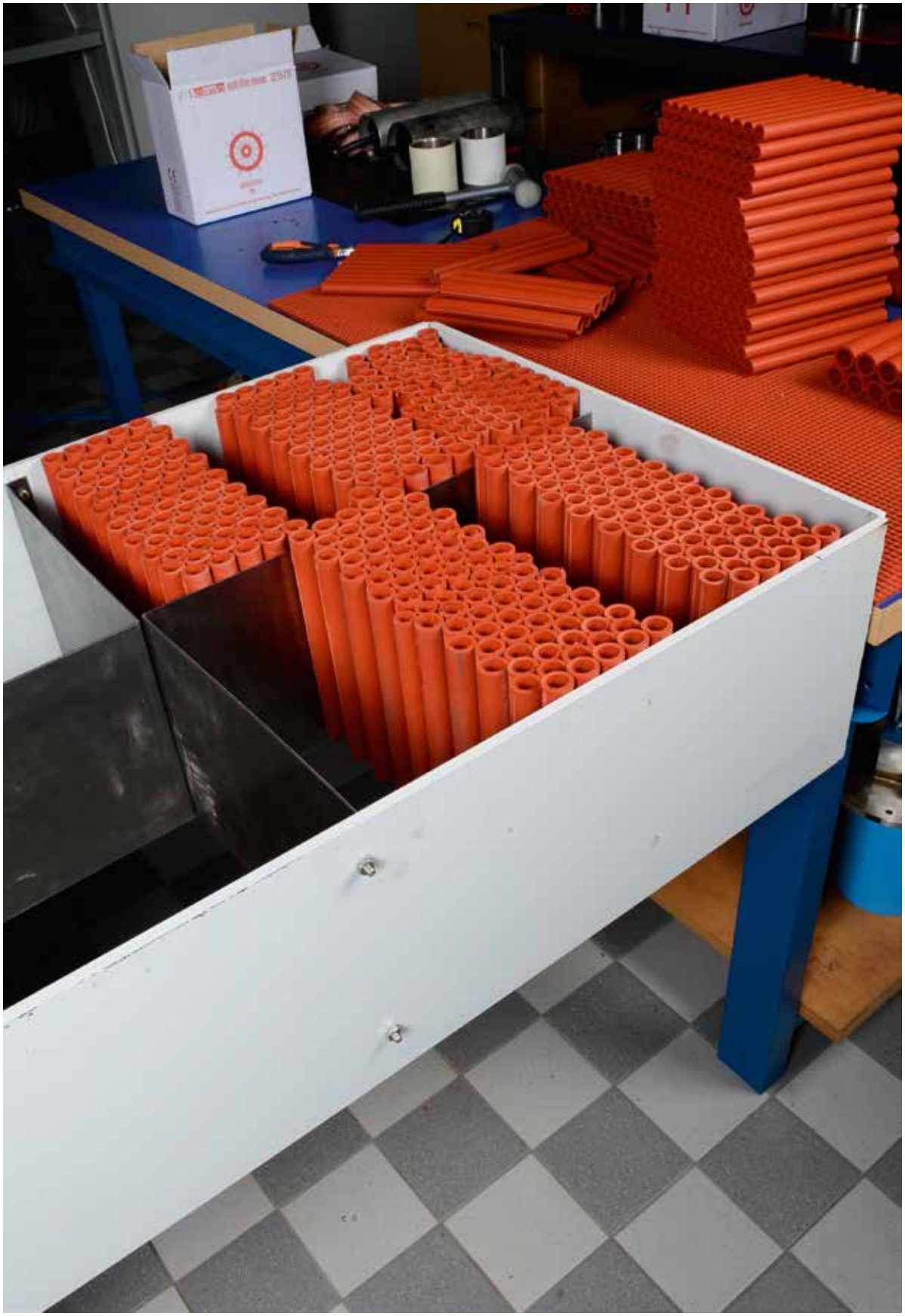
A stacked set of NOFIRNO multi-filler sleeves 22/15 with in the middle a multi-sleeve type 18/12 (yellow circle) to make the set fitting into the partition. Filler sleeves 18/12 and 27/19 are used to adjust the length of the set of sleeves. A proper fit prevents sleeves from falling down. The set with a length of ca. 300 mm is easy to handle. Note: no fixation of the steel partition at the spot of the blue circle.

The next set of filler sleeves is inserted in the opposite partition to stabilize the longest length of the steel partition in between the sets of rubber.

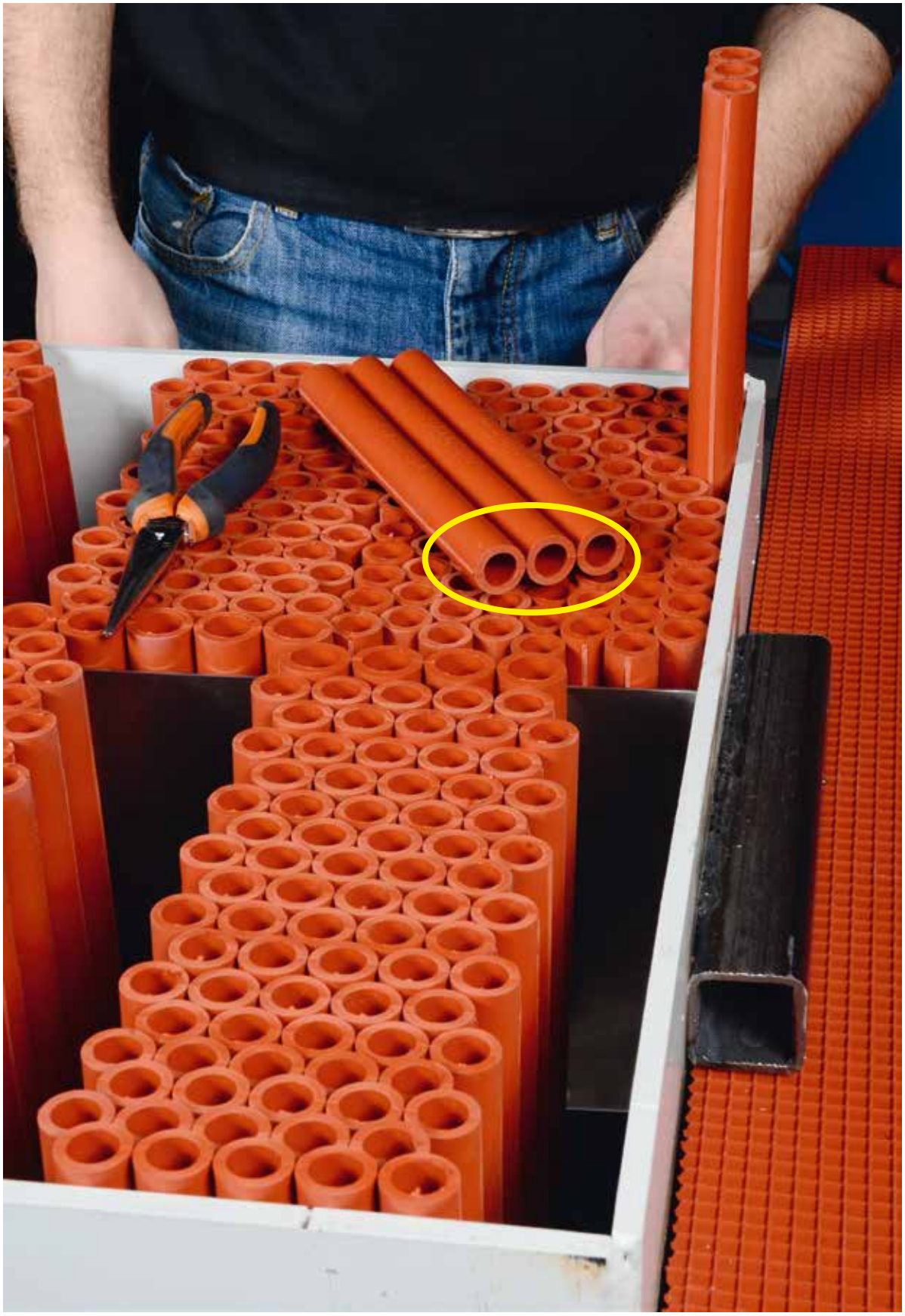
The stacked set of NOFIRNO filler sleeves is pressed into the cavity created by the steel partition. It shows that gaps with a width up to 300 mm can be installed without making use of partitions. The design size of a section is important with a view of the demanded tightness ratings. The smaller, the higher the ratings.

The stacked sets of filler sleeves placed at both sides of the partitions. At this stage the position of the filler sleeves is not important.

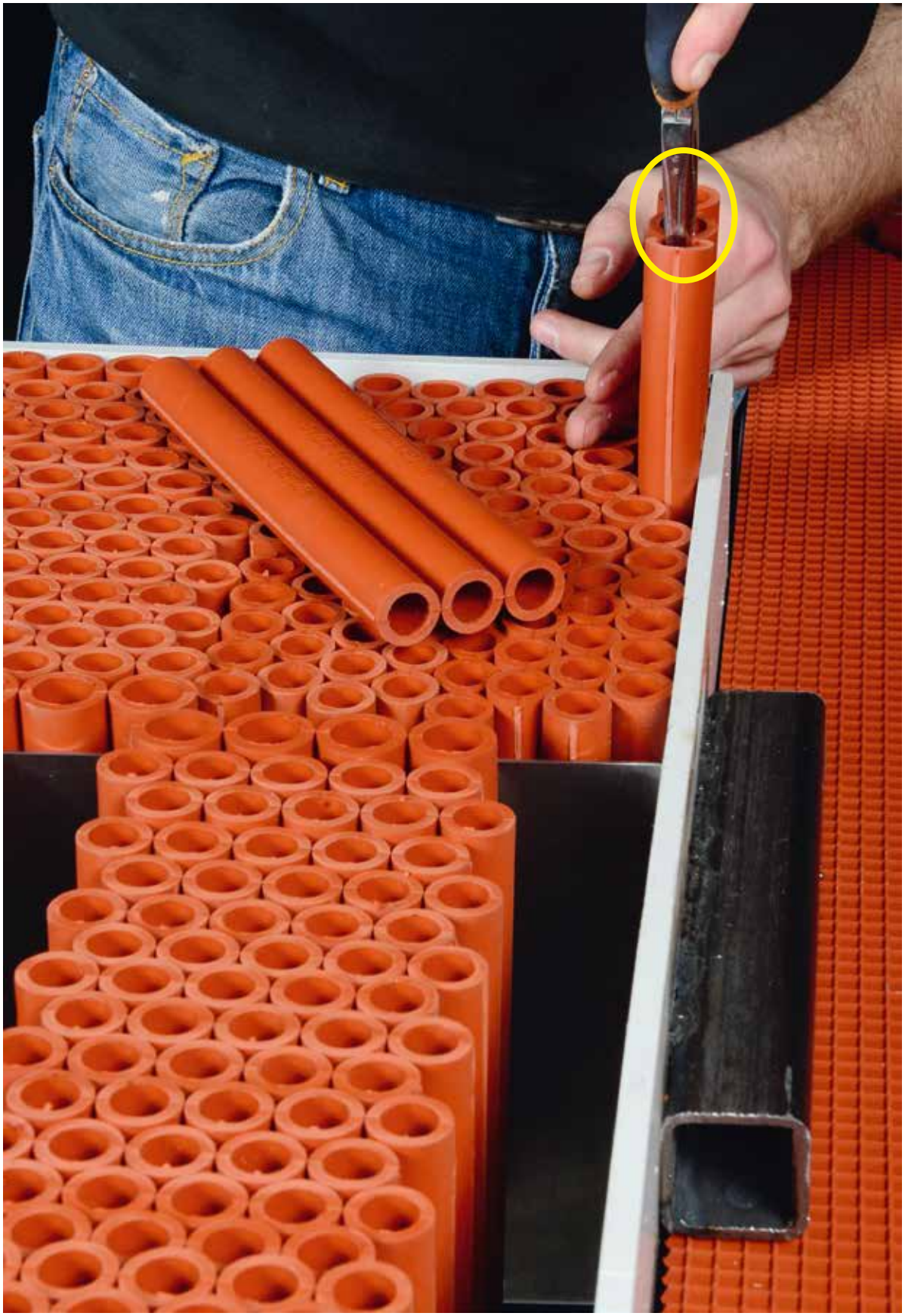
Another set of filler sleeves is inserted. In this case a set of NOFIRNO sleeves 27/19 is used for a good fit for insertion.



Placing the set of filler sleeves as shown above prevents bending of the non fixed 500 mm part of the steel partition. These parts should no be fixed since they are in the center of the gap over longer lengths than used for this installation.



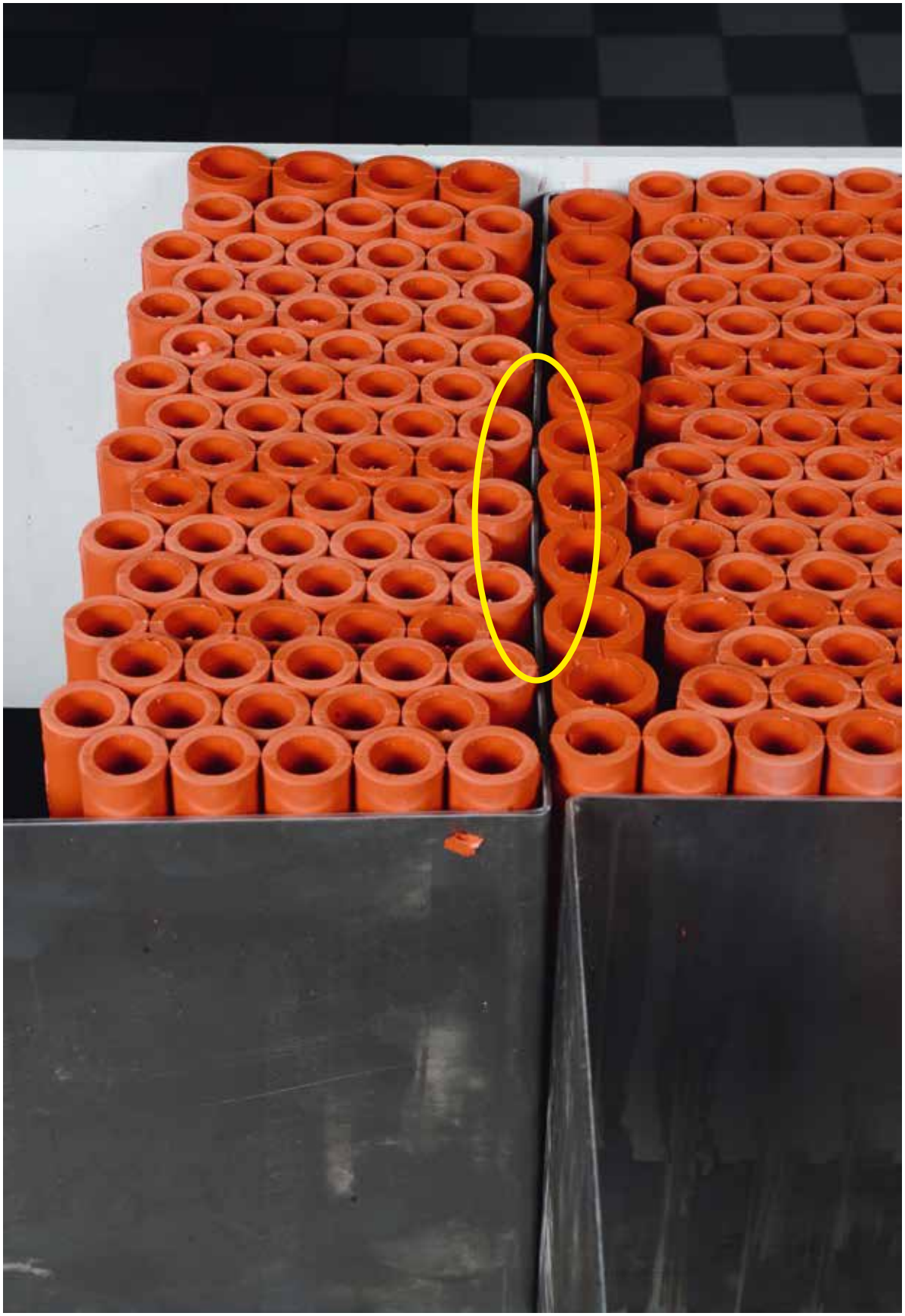
Smaller sets of NOFIRNO filler sleeves are torn off the larger sets to fill openings in between the already installed sets of filler sleeves. A flat nose pliers is used as an aid for insertion.



The flexibility and the smooth surfaces of the filler sleeves make insertion of the smaller sets of filler sleeves or single sleeves easy when using a flat nose pliers.

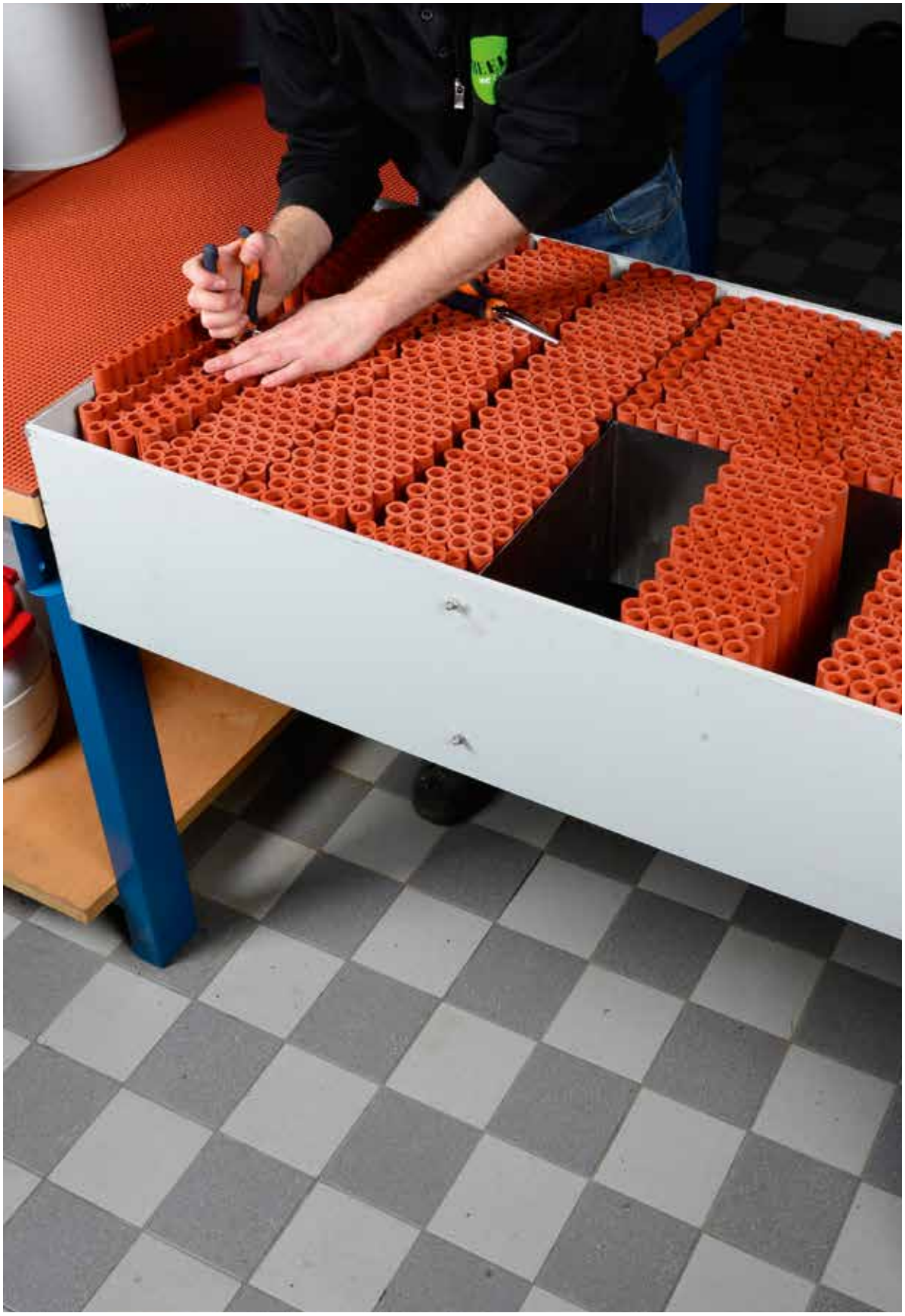
Larger openings in between the stacked sets of filler sleeves are filled with fitting sets of filler sleeves. In this case once more a combination of the types 22/15 and 18/12 is used. Note: for these larger “blind” seals a tight fit inside the gap is vital with regard to the required mechanical stability.

Single filler sleeves are then used the fill the remaining smaller openings.



Some bending occurred of the empty steel partition at the left side, due to the high clamping forces in the section at the right. It is recommended to finish final insertion of the filler sleeves once all cavities are more or less filled with filler sleeves. Too much bending could have a negative impact on the compression of the sealing system in case of larger movements of the floor.

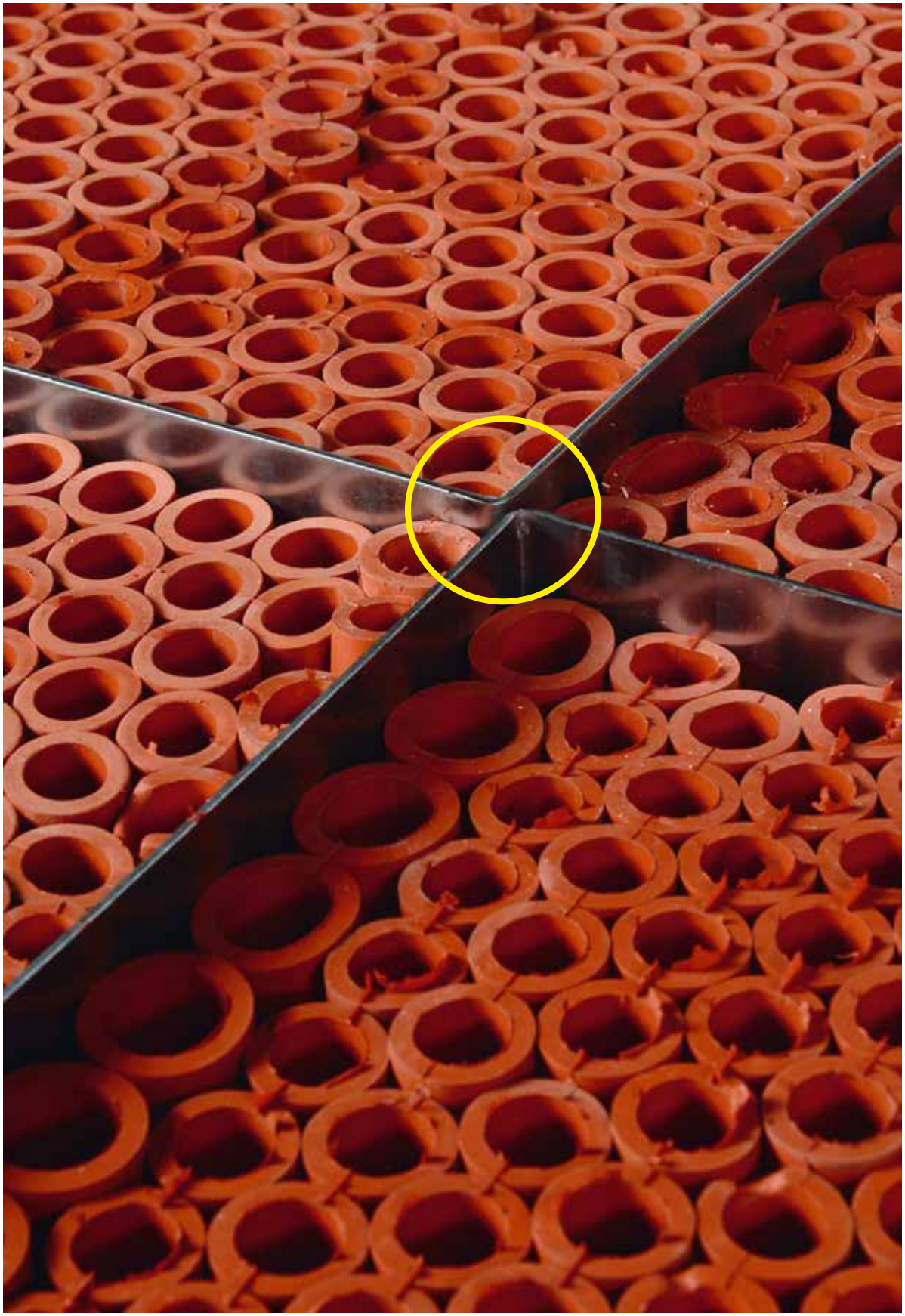
Overview of the filling in the four sections.



Insertion of more filler sleeves in all smaller openings in the set of fillers to obtain the sufficient clamping forces inside the sections.

The 1000x600 mm coaming, divided in 4 sections of 500x300 mm, is completely filled with NOFIRNO filler sleeves. Next step is to position the filler sleeves 20 mm deep inside the coaming.
Note: already at 2 bar overpressure a load of 3000 kg (3 tons) has to be absorbed by the sealing system on each of the sections. Mechanical stability is for this reason of utmost importance.

A wooden block is used to hammer the sets of filling sleeves 20 mm deep inside the sections of coaming (the gap in praxis).



The sets of filler sleeves will be 15 mm deep inside the steel partitions because after final finishing 5 mm of the steel partitions will be covered with the NOFIRNO sealant. The surfaces of the 15 mm protruding steel partitions are needed for the enlargement of the adhesive surface of the NOFIRNO sealant. Length of the adhesive surface of the sealant determines mechanical stability and tightness ratings of the system.

A layer of 20 mm thick NOFIRNO sealant is applied on top of the filling with filler sleeves. Cut the injection nozzles of the cartridges in an angled way to create a medium sized dispersing opening. For larger sized surfaces, as is the case with the gaps 600 mm wide, professional sealant dispensers should be used.

The NOFIRNO sealant layer is applied in parts. Skin formation of the sealant takes place after ca. 10-15 minutes. In case of larger transits, no more sealant should be applied than can be finished within this time-frame. People with sensitive skin should use gloves when working with NOFIRNO®. Please refer to the Safety Data Sheet for more information.

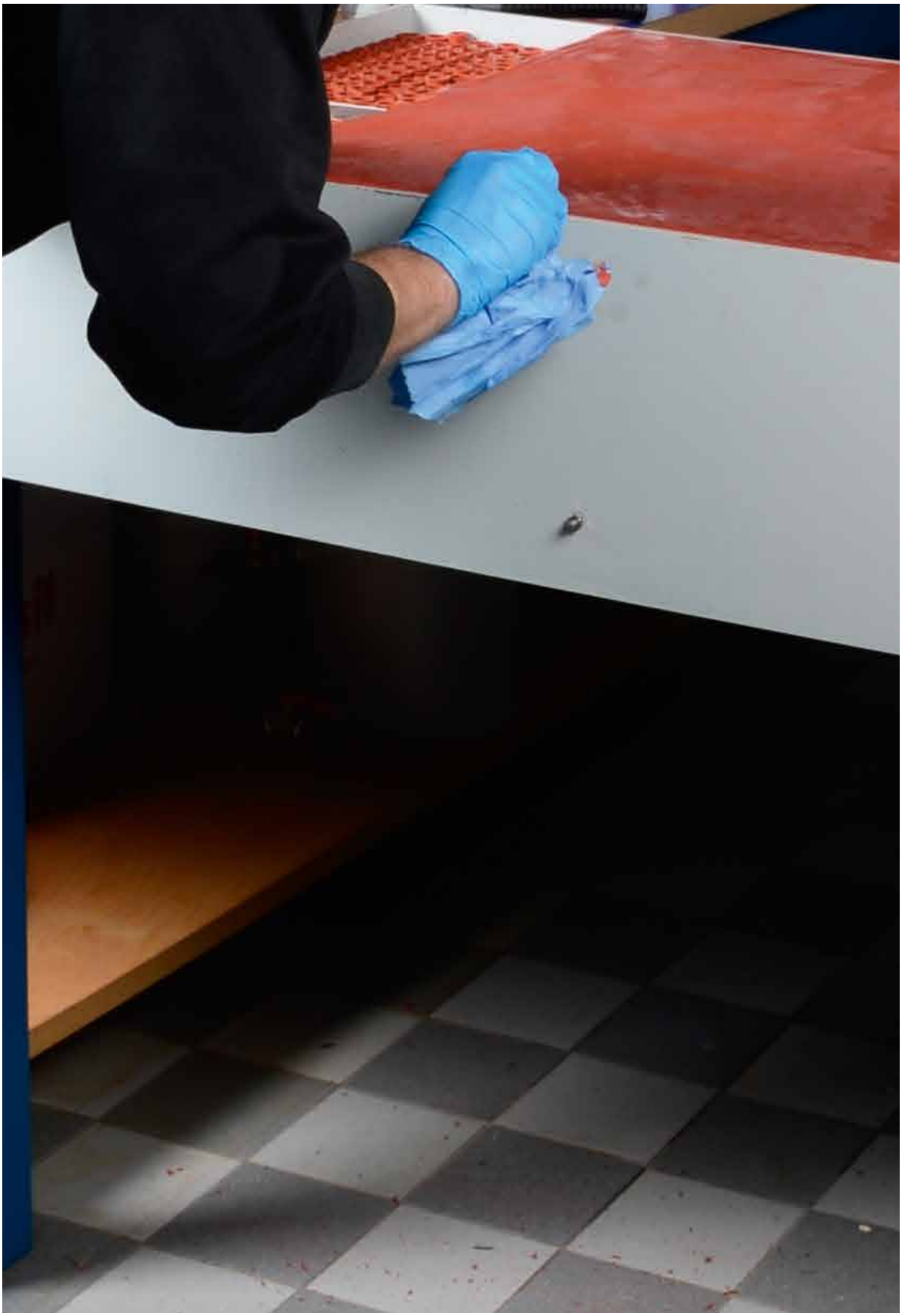
The “blind transit” should be overfilled with NOFIRNO® sealant, because sealant has to be pushed into the hollow NOFIRNO® (multi) filler sleeves during further finishing. This is of importance to create adhesion between the filler sleeves and the sealant. A cloth, sprayed with water is used to press the sealant down.

After pressing down the sealant, the surface can be smoothed by hand using some soap and water. Avoid any soap water on the connecting surfaces of the sealant layers. Soap water will impair adhesion.

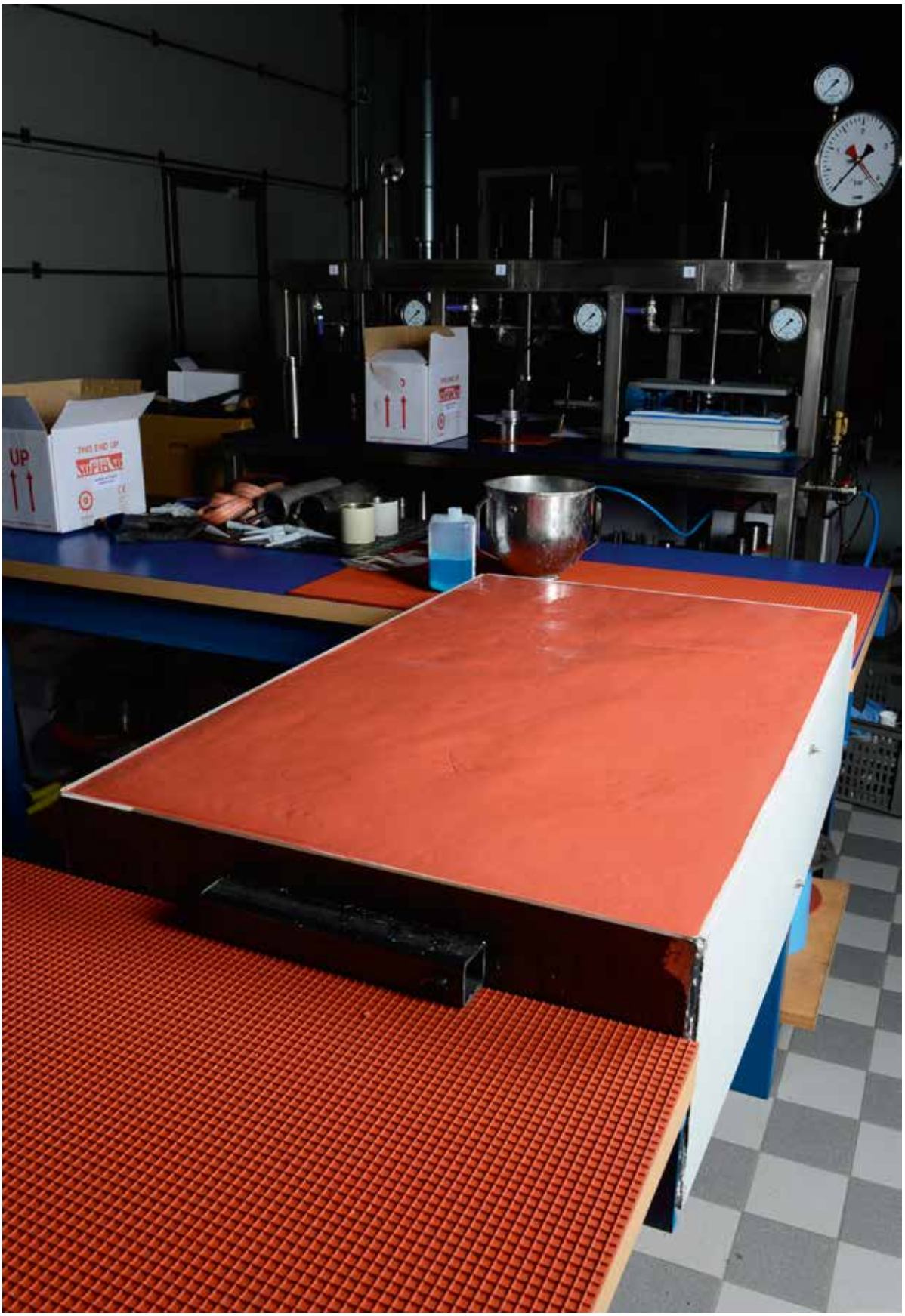
Covering the recessed steel partitions with the NOFIRNO sealant.

Half of the 1000x600 mm gap is already finished and smoothed. The viscosity of the NOFIRNO sealant allows for a sloped surface of the sealant layer. Water will in such cases easily flow off the surface.

View on the finished and non-finished part of the NOFIRNO gap seal.



With some soap water NOFIRNO sealant can be removed from the wall or floor (in this case from the wall of the steel casing). For application in the building industry tape can be used to avoid during installation sealant on the floor or the wall around the gap.



The finished NOFIRNO gap seal at the top. The NOFIRNO® sealant can be applied overhead underneath the floor without dripping or sagging.

STATE-OF-THE ART PIPE & CABLE TRANSIT SEALING SYSTEMS

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!

NOFIRNO®

- Proven system technology.
- Ease installation.
- Higher pressure ratings.
- Jet Fire tested for harshest applications.
- A-0 and H-0 up to A-60 and H-120.
- E240 ratings for the building industry
- Breakthrough - bundled cable sets approved.
- The system of choice for highest fire ratings and harshest environment!

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: -50 °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.

WE CARE

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

BEELE ENGINEERING

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