



Certificate of  
EC Type-examination (Module B)  
**222130001/AA/00**  
**Product Category: MED/3.26a**  
**USCG Approval No: 164.138/EC0560**

**Issued** 09 February 2022

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**Page** 1 of 33  
Certificate has four Annexes

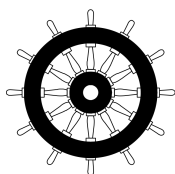
With respect to Marine Equipment Directive 2014/90/EU and the implementing Regulation (EU) 2021/1158, Kiwa Telefication Notified Body 0560 declares that the equipment:

Product description: **NOFIRNO SEALING SYSTEM**  
Trademark: **NOFIRNO**  
Type designation: **NOFIRNO SEALING SYSTEM FOR ELECTRIC CABLE TRANSITS THROUGH "A" CLASS DIVISIONS**

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**



**0560**

Gözde Tuzcu  
Assessor



**General conditions**

- Each product to which this certificate relates shall be provided with Marine markings. The Marine marking consist of symbol in the form of a wheel followed by the identification number of the responsible Notified Body for module D, E, F or G, and by the last two digits of the number of the year in which the mark is affixed.
- The holder of this Certificate has drawn up a Declaration of conformity to type with Directive 2014/90/EU and Implementing Regulations, declaring that the product(s) described in this EC Type- examination certificate, satisfy the requirements that apply to them.
- Each product shall be identified by means of type, batch and/or serial numbers and the name of the manufacturer and/or importer.
- If the equipment is to be modified, Telefication shall be notified immediately. Depending on the modifications, Telefication may have additional examinations carried out in consultation with the applicant.
- Enforcement of a new Implementing Regulation may void the validity of this certificate regarding (re)placement of the product onboard ships.

**Remarks and observations**

The following conditions are applicable:

**1. FIELDS OF APPLICATION****Penetrations through "A" Class divisions – electric cable transits**

The fields of application for the penetrations using the sealing system included in this certificate are specified here. In a separate annex the detailed drawings are presented.

The "A" class divisions (bulkheads and decks) are constructed of steel.

Non load bearing "A" class divisions may be constructed of sandwich or composite panels.

**Steel divisions**

For the design of heat resistant constructions of non-insulated A-0 Class steel decks it is recommended to consult EN 1993-1-2 "*Eurocode 3 Design of steel structures - Part 1-2: General rules - Structural fire design*".

**Aluminium divisions**

"A" class divisions constructed of aluminium alloy are only permitted when properly insulated to protect for heat. To comply with IMO Res.MSC.307(88)-(2010 FTP Code), the average temperature of the structural core shall not rise more than 200°C above its initial temperature at any time during minimum 60 minutes test duration. Referring to EN 1999-1-2 "Eurocode 9 - Design of aluminium structures - Part 1-2", the strength and stiffness of aluminium alloys severely decrease at temperatures above 150 °C. It is therefore strongly recommended that aluminium divisions do not exceed a core temperature of 150°C in any location. For fire from either side insulation is to be applied on both sides of aluminium divisions.

**Sandwich or composite panel divisions**

Non load bearing divisions may be constructed of A-60 class certified sandwich panels or composite panels. Sandwich panels typically consist of a minimum 100 mm thick mineral wool/glass fibre core bonded between thin steel panel skins. Composite panels typically consist of a minimum 34 mm thick mineral wool/glass fibre core bonded between thin rigid composite panels, additionally insulated with minimum 100 mm A-60 class insulation.

**Transit frames in steel divisions**

Transit frames made of steel may be circular transit sleeves ("pipes"), rectangular transit frames or rectangular transit frames with rounded edges. For A-60 class divisions: the transit frames are welded in or bolted to the bulkhead or deck. For A-0 class divisions: the transit frames are welded in the bulkhead or deck.

***Transit frames in sandwich or composite panels***

Transit frames made of steel (see above), HR frames made of glass reinforced fire resistant polymer or frames constructed of FYLLOFYS. HR frames may be circular or rectangular transit sleeves integrated with HR flanges, or modular HR split transit frames. HR frames are mechanically fixed or glued to the division, using NOFIRNO gaskets and NOFIRNO sealant for watertight adhesion and sealing. See detailed in the corresponding drawings.

***Cable range***

All sheathed electric cables and cables for tele- and data communication up to 105 mm outer diameter and 3x380 mm<sup>2</sup> copper conductors.

***NOFIRNO sealing system***

The NOFIRNO sealing system consists of a combination of NOFIRNO rubber filler sleeves, rubber cable sleeves and NOFIRNO sealant. All penetrating cables are provided with a cable sleeve. The cable sleeves provide the minimum separation distance between the cables. Multi tele- and data communication cables with outer diameter 5 mm may be bundled and placed in one filler sleeve. The aperture between penetrating cables and the inner wall of the transit frame is filled with filler sleeves. If possible, a minimum of one layer of filler sleeves shall be installed between the cable sleeves and the inner wall of the transit frame. The application of cable and filler sleeves guarantee a maximum safe filling rate. On both sides the transit frame opening is sealed with a sealant. The thickness of the sealant is minimum 15 mm.

For restricted applications NOFIRNO/EMC multi-cable transits can be used, consisting of NOFIRNO cable and filler sleeves and a 40 mm thick CONDUCTON flexible rubber layer on the fire side. There should be used minimum 20 mm NOFIRNO sealant on both sides for this application.

The filler sleeves are available in six diameter sizes and in five lengths. The cable inserts sleeves are available in 29 diameter sizes and in five lengths.

**A-60 class steel bulkhead transits****NOFIRNO Sealing System for cables up to 105 mm OD 3x380 mm<sup>2</sup>*****Drawing NFN 050E – Rev. 4 – 27-01-2021***

Construction range:

- The maximum OD of the transit frames are 600 x 300 mm (w x h) or 1800 cm<sup>2</sup> equivalent cross section with minimum 6 mm wall thickness; alternatively, transit frames maximum OD 450 x 170 mm (w x h) or 765 cm<sup>2</sup> equivalent cross section with minimum 4 mm wall thickness may be used. The minimum length of the transit frames is 160 mm. The transit frame welded in or bolted to the bulkhead. Transit frame positioned symmetrical in the bulkhead or non-symmetrical with the longest length on the insulated side of the bulkhead. Bulkhead and transit frame insulated with approved A-60 Class insulation on one side of the bulkhead.
- Slit cable sleeves type 12/6 up to and including to 110/90 and min. 130 mm long. NOFIRNO wraps for larger cable diameters.
- Multi-filler sleeves from type multi 10/4 up to and including max. size 22/15 with min. length of 130 mm long.
- NOFIRNO sealant min. 15 mm thick on both sides.
- Cables up to 105 mm OD 3x380 mm<sup>2</sup>

**A-0 class bulkhead transits****NOFIRNO SEALING SYSTEM for cables up to 105 mm OD 3x380 mm<sup>2</sup>*****Drawing NFN 051E – Rev. 4 – 27-01-2022***

Construction range:

- The maximum OD of the transit frames are 600 x 300 mm (w x h) or 1800 cm<sup>2</sup> equivalent cross section with minimum 6 mm wall thickness; alternatively, transit frames maximum OD 450 x 170 mm (w x h) or 765 cm<sup>2</sup> equivalent cross section with minimum 4 mm wall thickness may be used. The minimum length of the transit frames is 160 mm. The transit frame welded in the bulkhead. Transit frame positioned symmetrical in the bulkhead or non-symmetrical with the longest length on the insulated side of the bulkhead.
- Slit cable sleeves type 12/6 up to and including to 110/90 and min. 130 mm long. NOFIRNO wraps for larger cable diameters.
- Multi-filler sleeves from type multi 10/4 up to and including max. size 22/15 with min. length of 130 mm long.
- NOFIRNO sealant min. 15 mm thick on both sides.
- Cables up to 105 mm OD 3x380 mm<sup>2</sup>

**A-60 class blind bulkhead transits****NOFIRNO SEALING SYSTEM for blind transits*****Drawing NFN 052E – Rev. 4 – 27-01-2022***

Construction range:

- The maximum OD of the transit frames are 600 x 300 mm (w x h) or 1800 cm<sup>2</sup> equivalent cross section with minimum 6 mm wall thickness; alternatively, transit frames maximum OD 450 x 170 mm (w x h) or 765 cm<sup>2</sup> equivalent cross section with minimum 4 mm wall thickness may be used. The minimum length of the transit frames is 160 mm. The transit frame welded in or bolted to the bulkhead. Transit frame positioned symmetrical in the bulkhead or non-symmetrical with the longest length on the insulated side of the bulkhead.
- Bulkhead and transit frame insulated with approved A-60 Class insulation on one side of the bulkhead.
- Multi-filler sleeves from type multi 10/4 up to and including max. size 22/15 with min. length of 130 mm long.
- NOFIRNO sealant min. 15 mm thick on both sides.
- NOFIRNO gasket min. 5 mm thick between transit frame and bulkhead.

**A-60 class deck transits****NOFIRNO SEALING SYSTEM for cables up to 105 mm OD 3x380 mm<sup>2</sup>*****Drawing NFN 053E – Rev. 4 – 27-01-2022***

Construction range:

- The maximum OD of the transit frames are 600 x 300 mm (w x h) or 1800 cm<sup>2</sup> equivalent cross section with minimum 6 mm wall thickness; alternatively, transit frames maximum OD 450 x 170 mm (w x h) or 765 cm<sup>2</sup> equivalent cross section with minimum 4 mm wall thickness may be used. The minimum length of the transit frames is 160 mm. The transit frame welded in or bolted to the deck. Transit frame positioned totally below deck up to totally above deck.
- Deck and transit frame insulated with approved A-60 Class insulation below deck.
- Slit cable sleeves type 12/6 up to and including to 110/90 and min. 130 mm long. NOFIRNO wraps for larger cable diameters.
- Multi-filler sleeves from type multi 10/4 up to and including max. size 22/15 with min. length of 130 mm long.
- NOFIRNO sealant min. 15 mm thick on both sides.
- Cables up to 105 mm OD 3x380 mm<sup>2</sup>

**A-0 class deck transits****NOFIRNO SEALING SYSTEM for cables up to 105 mm OD 3x380 mm<sup>2</sup>*****Drawing NFN 054E – Rev. 4 – 21-01-2022***

Construction range:

- The maximum OD of the transit frames are 600 x 300 mm (w x h) or 1800 cm<sup>2</sup> equivalent cross section with minimum 6 mm wall thickness; alternatively, transit frames maximum OD 450 x 170 mm (w x h) or 765 cm<sup>2</sup> equivalent cross section with minimum 4 mm wall thickness may be used. The minimum length of the transit frames is 160 mm. The transit frame welded in the deck. Transit frame positioned totally above deck.
- Slit cable sleeves type 12/6 up to and including to 110/90 and min. 130 mm long. NOFIRNO wraps for larger cable diameters.
- Multi-filler sleeves from type multi 10/4 up to and including max. size 22/15 with min. length of 130 mm long.
- NOFIRNO sealant min. 15 mm thick on both sides.
- Cables up to 105 mm OD 3x380 mm<sup>2</sup>

**A-0 class blind transits applied in A-0 class decks****NOFIRNO SEALING SYSTEM for blind transits*****Drawing NFN 199E – 10-09-2021***

Construction range:

- The maximum OD of the transit frames are 600x300 mm (w x h) with a min. wall thickness of 6 mm. Transit frame welded into the deck. Transit frame positioned symmetrical, or in case of fire possible only from one side non-symmetrical with longest length on the non-fire side.
- Multi-filler sleeves from type multi 10/4 up to and including max. size 22/15 with min. length of 130 mm long.
- NOFIRNO sealant with a minimum thickness of 15 mm applied at both sides.

**A-60 class blind deck transits****NOFIRNO SEALING SYSTEM for blind transits*****Drawing NFN 055E – Rev. 4 – 27-01-2022***

Construction range:

- The maximum OD of the transit frames are 600 x 300 mm (w x h) or 1800 cm<sup>2</sup> equivalent cross section with minimum 6 mm wall thickness; alternatively, transit frames maximum OD 450 x 170 mm (w x h) or 765 cm<sup>2</sup> equivalent cross section with minimum 4 mm wall thickness may be used. The minimum length of the transit frames is 160 mm. The transit frame welded in or bolted to the deck. Transit frame positioned totally below up to totally above deck.
- Deck and transit frame insulated with approved A-60 Class insulation below deck.
- Multi-filler sleeves from type multi 10/4 up to and including max. size 22/15 with min. length of 130 mm long.
- NOFIRNO sealant min. 15 mm thick on both sides.
- NOFIRNO gasket min. 5 mm thick between transit frame and deck.

**A-60 class EMC Bulkhead transits****NOFIRNO SEALING SYSTEM for cables up to 105 mm OD 3x380 mm<sup>2</sup>*****Drawing NFN 056E – Rev. 4 – 27-01-2022***

Construction range:

- The maximum OD of the transit frames are 600 x 300 mm (w x h) or 1800 cm<sup>2</sup> equivalent cross section with minimum 6 mm wall thickness; alternatively, transit frames maximum OD 450 x 170 mm (w x h) or 765 cm<sup>2</sup> equivalent cross section with minimum 4 mm wall thickness may be used. The minimum length of the transit frames is 200 mm. The transit frame welded in or bolted to the bulkhead. Transit frame positioned symmetrical in the bulkhead or non-symmetrical with the longest length on the insulated side of the bulkhead.
- Bulkhead and transit frame insulated with approved A-60 Class insulation on one side of the bulkhead.
- On the non-insulated side 40 mm CONDUCTON EMC (flexible, compressible conductive rubber).
- Slit cable sleeves type 12/6 up to and including to 110/90 and min. 120 mm long. NOFIRNO wraps for larger cable diameters.
- Multi-filler sleeves from type multi 10/4 up to and including max. size 22/15 with min. length of 120 mm long.
- NOFIRNO Sealant min. 20 mm thick on both sides.
- Cables up to 105 mm OD 3x380 mm<sup>2</sup>

**A-60 class EMC Deck transits****NOFIRNO SEALING SYSTEM for cables up to 105 mm OD 3x380 mm<sup>2</sup>*****Drawing NFN 057E – Rev. 4 – 27-01-2022***

Construction range:

- The maximum OD of the transit frames are 600 x 300 mm (w x h) or 1800 cm<sup>2</sup> equivalent cross section with minimum 6 mm wall thickness; alternatively, transit frames maximum OD 450 x 170 mm (w x h) or 765 cm<sup>2</sup> equivalent cross section with minimum 4 mm wall thickness may be used. The minimum length of the transit frames is 200 mm. The transit frame welded in or bolted to the deck. Transit frame positioned totally below deck up to totally above deck.
- Deck and transit frame insulated with approved A-60 Class insulation below deck.
- On the non-insulated side 40 mm CONDUCTON EMC (flexible, compressible conductive rubber).
- Slit cable sleeves type 12/6 up to and including to 110/90 and min. 120 mm long. NOFIRNO wraps for larger cable diameters.
- Multi-filler sleeves from type multi 10/4 up to and including max. size 22/15 with min. length of 120 mm long.
- NOFIRNO Sealant min. 20 mm thick on both sides.
- Cables up to 105 mm OD 3x380 mm<sup>2</sup>

**A-60/EI-60 class sandwich panels applied with HR plastic conduit sleeves****NOFIRNO SEALING SYSTEM for cables up to 105 mm OD 3x380 mm<sup>2</sup>*****Drawing NFN 097E – Rev. 2 – 27-01-2022***

Construction range:

- The maximum ID of the HR plastic conduit sleeves max. 250 mm and HR conduit frames max. ID 300x150 mm (or equivalent of 450 cm<sup>2</sup>) in A-60/EI-60 certified sandwich panels. Sandwich panel min. 100 mm thick. Cut-out in the sandwich panel max. 5 mm larger than OD of the ranges on the conduit set inside the penetration. The HR plastic conduit sleeves need to be installed with a distance holder and a NOFIRNO sealant layer to be installed at site.
- Types of conduits sleeves allowed for 100 or 150 mm sandwich panels: HR 50 FLC, HR 80 FLC, HR 100 FLC, HR 125 FLC, HR 160 FLC and HR 200 FLC (see drawing for corresponding article numbers).
- Types of conduits frames for 100 or 150 mm sandwich panels: HR 150x150 FLCC, HR 300x150 FFLC (see drawing for corresponding article numbers).
- For 100 mm sandwich panels the NOFIRNO cable and filler sleeves need to have a length of 80 mm and for 150 mm sandwich panels the length needs to be 130 mm.
- NOFIRNO sealant of 17,5 mm thick at both sides with a tolerance between 15 and 20 mm.
- Cables up to 105 mm OD 3x380 mm<sup>2</sup>

**A-60/EI-60 class sandwich panels applied with HR telescopic conduit sleeves****NOFIRNO SEALING SYSTEM for cables with max. of 40, 55 or 75 mm OD*****Drawing NFN 098E – Rev. 2 – 27-01-2022***

Construction range:

- The maximum ID of the telescopic conduit sleeves is respectively 80, 100 or 125 mm applied in A-60/EI-60 certified sandwich panels. Sandwich panel min. 100 mm wide. Cut-out in the sandwich panel max. 5 mm larger than OD of the ranges on the conduit set inside the penetration. The HR telescopic conduit sleeves need to be installed with a distance holder and a NOFIRNO sealant layer to be installed at site.
- Types of Telescopic conduits sleeves allowed for 100, 150 or 200 mm sandwich panels: HR 80 TLC, HR 100 TLC, HR 125 TLC (drawing for corresponding article numbers).
- For 100 mm sandwich panels the NOFIRNO cable and filler sleeves need to have a length of 80 mm and for 150 mm sandwich panels the length needs to be 130 mm.
- NOFIRNO sealant of 17,5 mm thick at both sides with a tolerance between 15 and 20 mm.
- Cables corresponding to the correct telescopic conduit sleeves 40, 55 or 75 mm.



**A-60/EI-60 class sandwich panels applied with steel coamings****NOFIRNO SEALING SYSTEM for cables with max. 105 mm OD 3x380 mm<sup>2</sup>*****Drawing NFN 099E – Rev. 1 – 27-01-2022***

Construction range:

- Steel coamings of max. OD 450x250 mm or equivalent of 1125 cm<sup>2</sup> in A-60/EI-60 certified sandwich panels. Sandwich panel min. 100 mm thick. Transit frame bolted to van Dam Gen. IV panel. Transit min. 200 mm long.
- Slit cable sleeves type 12/6 up to and including to 110/90 and min. 160 mm long. NOFIRNO wraps for larger cable diameters.
- Multi-filler sleeves from type multi 10/4 up to and including max. size 22/15 with min. length of 160 mm long.
- NOFIRNO sealant of min. 20 mm thick applied at both sides.
- Cables up to 105 mm OD 3x380 mm<sup>2</sup>

**A-60/EI-60 class sandwich panels applied with HR split (multi-window) conduit frames****NOFIRNO SEALING SYSTEM for cables with max. 105 mm OD 3x380 mm<sup>2</sup>*****Drawing NFN 104E – Rev.2 – 08-09-2021***

Construction range:

- HR split (multi-window) conduit frames each 150x150x80 mm in A-60/EI-60 certified sandwich panels. Sandwich panel min. 100 mm thick. Cut-out in the sandwich panel max. 5 mm larger than ID of the split modular frame. The HR split modular frame mechanically fixed or glued to the sandwich panel. The HR split conduit frames should be installed with their corresponding gasket sets or NOFIRNO sealant. (see drawing for corresponding article numbers).
- NOFIRNO cable and filler sleeves of 60 mm length.
- NOFIRNO sealant of min. 20 mm thick applied at both sides.
- Cables up to 105 mm OD 3x380 mm<sup>2</sup>

**A-60/EI-60 class composite bulkheads applied with HR plastic conduits sleeves and HR conduit frames**

**NOFIRNO SEALING SYSTEM for cables with max. 105 mm OD 3x380 mm<sup>2</sup>*****Drawing NFN 109E –Rev. 1 – 27-01-2022***

Construction range:

- HR plastic conduit sleeves with max. ID 250 mm and HR conduit frames max. ID 300x150 mm. Composite bulkhead 34 mm. Bulkhead insulated with 2x 50 mm A-60 approved insulation. To be applied with NOFIRNO distance holder and NOFIRNO sealant to be installed at site and applied on the back side of the flange before installation.
- Types of conduits sleeves allowed for 100 or 150 mm sandwich panels: HR 50 FLC, HR 80 FLC, HR 100 FLC, HR 125 FLC, HR 160 FLC and HR 200 FLC (see drawing for corresponding article numbers).
- Types of conduits frames for 100 or 150 mm sandwich panels: HR 150x150 FLCC, HR 300x150 FFLC (see drawing for corresponding article numbers).
- NOFIRNO cable and filler sleeves can be cut to size on site (see drawing).
- NOFIRNO sealant layer 17,5 mm thick applied at both sides with tolerance of 2,5 mm (15-20 mm).
- Cables up to 105 mm OD 3x380 mm<sup>2</sup>

**A-60/EI-60 class composite bulkheads applied with HR split (multi-window) conduit frames****NOFIRNO SEALING SYSTEM for cables with max. 105 mm OD 3x380 mm<sup>2</sup>*****Drawing NFN 112E – Rev. 1 – 08-09-2021***

Construction range:

- HR split (multi-window) modular frame each 150x150x80 mm glued to the A-60 certified composite bulkhead panel. Composite bulkhead 34 mm. Insulation 2x 50 mm. Cut-out in the sandwich panel max. 5 mm larger than ID of the split modular frame.
- The HR split conduit frames should be installed with their corresponding gasket sets (distance holders) and NOFIRNO sealant. NOFIRNO sealant is also used to fix the split conduit frames the composite bulkhead (see drawing for corresponding article numbers).
- NOFIRNO Sealant min. 20 mm thick on both sides.
- NOFIRNO cable and filler sleeves of 60 mm length.
- Cables up to 105 mm OD 3x380 mm<sup>2</sup>

**A-60/EI-60 class composite sandwich panels applied with FYLLOFYs\* conduit frames****NOFIRNO SEALING SYSTEM for cables with max. 105 mm OD 3x380 mm<sup>2</sup>****Drawing NFN 198E –Rev. 1 – 27-01-2022**

Construction range:

- FYLLOFYs conduit frames applied in A-60/EI-60 certified sandwich panels with minimum thickness 150 mm. The FYLLOFYs conduit frame has a thickness of 20 mm and is to be assembled at site. The max. size of aperture is ID 300x160 mm or equivalent size of 480 cm<sup>2</sup>. A flange also to be made of FYLLOFYs of 40 mm all around (see drawing for more detailed information).
- FISSIC\*\* coating is to be applied on all cut edges and for the adhesion of the flanges to the body on the frame.
- NOFIRNO sealant to be applied on the back side of the flange before installation.
- For a sandwich panel of 150 mm thick NOFIRNO cable and filler sleeves of 160 mm are to be used. In case of thicker sandwich panels a corresponding longer length should be used.
- NOFIRNO sealant layer 17,5 mm thick applied at both sides with tolerance of 2,5 mm (15-20 mm).
- Cables up to 105 mm OD 3x380 mm<sup>2</sup>

\*: FYLLOFYs, Kiwa Telefication, NoBo No 0560, MED-B certificate 192130007/AA/00

\*\* : FISSIC coating, Kiwa Teleficiation, NoBo No 0560, MED-B certificate 222130003/AA/00

Consult technical information of approved A-60 Class insulation. Consult the installation manual of the manufacturer.

**Notes:**

**OD:** Outer Diameter / Outer Dimensions

**ID:** Inner diameter / Inner Dimensions

**DN:** Nominal Diameter

**Each product is to be supplied with its manual for installation, use and maintenance.**

A U.S. Coast Guard approval number will be assigned to the equipment when the production module has been completed and will appear on the production module certificate (module D, E or F) as allowed by the "Agreement between the European Community and United States of America on Mutual Recognition of Certificates of Conformity for Marine Equipment" signed 27 February 2004 and the "Agreement between the United States and the EEA EFTA states on mutual recognition of certificates of conformity for marine equipment" signed 17 October 2005.

## 2. ADDITIONAL APPLICATION / INFORMATION (Not part of the Marine Equipment requirements)

### 2.1 Watertightness

The NOFIRNO sealing system is watertight and resistant to submerged conditions. This was verified by type testing at defined hydrostatic pressure on transit sealing systems. Type testing was done before and after a minimum of 1 year after installation, without any allowed manipulation (repair, replacement, re-tightening, et cetera) of the sealing system after the initial installation.

The maximum allowed hydrostatic pressure depends on the dimensions of the opening in the bulkhead or deck, the transit frame, the number and dimensions of the ducted cables and the thickness of the sealant layer(s).

The relation between maximum pressure and transit design is worked out in Kiwa assessment report 20180315HN/02. With the construction details the allowed maximum pressure can be calculated for each cable transit. The watertightness for cable transits is also certified by Kiwa in Covenant K90720 (Watertight and airtight sealing systems for cable transits) and is also described in covenant K96711 (NOFIRNO cable transits trough "A" Class divisions).

In the extra Annex an overview of the values for **blind** transits as described in this certificate with the NOFIRNO sealing system is presented in table 1. Various transits with different dimensions are presented. The calculated allowable pressure for each presented (blind) transit is given. Transits with cables allow higher values of hydrostatic pressure than blind transits. Therefore the allowable pressure increases with the presence of cables. If a higher allowable pressure is required for a (blind) transit a welded partition will increase the allowable pressure as indicated in table 1 in the extra Annex.

Users of the NOFIRNO sealing system shall consult Beele Engineering for the pressure rating for the applicable specific applications.

### 2.2 Airtightness

The NOFIRNO sealing system is airtight. This was verified by type testing at defined static air pressure on transit seals. This was done before and after a minimum of 1 year after installation, without any allowed manipulation (repair, replacement, re-tightening, et cetera) of the sealing system after initial installation.

Because of the behaviour of flexible sealing products, assessment of the air/gas tightness is necessary for both low pressure as well as high pressure applications.

Transits with cables allow higher values of static pressure than blind transits.

The NOFIRNO sealing system is airtight for all configurations at low pressure from 0 to 33 mbar.

Transits with cables allow higher values of static pressure than blind transits. Please refer to the table in the extra Annex for information on high pressures.

#### **Further references:**

- Kiwa assessment report 20180315HN02 – Water and air tightness of the NOFIRNO sealing system
- Kiwa Covenant K90720
- Kiwa Covenant K96711

**Documentation lodged for this EC type-examination**

## Test Reports:

- Efectis: 2016-Efectis-R000925 Beele Engineering nks.pdf, 01 December 2016
- BEELE ENGINEERING: ABS 1612-215 signed.pdf, 13 December 2016
- Efectis: 2016-Efectis-R000934 BEELE Engineering nks.pdf, 01 January 2017
- BEELE ENGINEERING: ABS 1612-216 signed.pdf, 13 December 2016
- BEELE ENGINEERING: 20170331 Beele Engineering Nofirno 1703-226.pdf, 31 March 2017
- BEELE ENGINEERING: 201703311 Beele Engineering Nofirno 1703-226 ABS Centria panel.pdf, 31 March 2017
- BEELE ENGINEERING: 20180405 Beele Engineering NOFIRNO FYLLOFYS FT 1804-268.pdf, 05 April 2018
- Kiwa Nederland B.V.: Kiwa witness report\_20180405\_Sealing Valley Aalten\_fire test 1804-268\_FTP2010\_NOFIRNO\_Cu\_pipes\_A60\_sandwich panel.pdf, 05 April 2018
- BEELE ENGINEERING: report 1702-219.pdf, 06 February 2017
- Kiwa Nederland B.V.: Kiwa witness report\_20170206\_Sealing Valley Aalten\_fire test 1702-219\_FTP2010\_NOFIRNO\_multi\_cable\_A60\_sandwich panel.pdf, 06 February 2017
- BEELE ENGINEERING: report 1702-223.pdf, 23 February 2017
- Kiwa Nederland B.V.: Kiwa witness report\_20170223\_Sealing Valley Aalten\_fire test 1702-223\_FTP2010\_NOFIRNO\_multi\_cable\_A60\_sandwich panel.pdf, 23 February 2017
- BEELE ENGINEERING: report 1804-269 ftp.pdf, 22 April 2018
- Kiwa Nederland B.V.: Kiwa witness report\_20180419\_Sealing Valley Aalten\_fire test 1804-269\_FTP2010\_NOFIRNO\_pipes\_cables\_A60\_A0\_composite panel.pdf, 19 April 2018
- BEELE ENGINEERING: report 1806-276.pdf, 25 June 2018
- Kiwa Nederland B.V.: Kiwa witness report\_20180622\_Sealing Valley Aalten\_fire test 1806-276\_FTP2010\_NOFIRNO\_pipes\_cables\_A60\_composite panel.pdf, 22 June 2018
- BEELE ENGINEERING: 0712-060.pdf, 12 January 2007
- BEELE ENGINEERING: 20120605\_test report 1206-104.pdf, 05 June 2012
- BEELE ENGINEERING: ABS 1612-217 signed.pdf, 14 December 2016

## Product Documentation:

- Bill of materials
- External photos
- Manual
- Technical description or data sheets
- Label and label placement
- Test setup photos
- Risk assessment

**International Instruments and test standards**

The equipment complies with:

MSC Resolution 307(88)  
MSC.1/Circ. 1488

December, 2010  
January, 2015

## Technical features and characteristics

The product includes the following features and characteristics:

- Not Applicable

## Trademarks and Type designations:

The product as described in this EC type-examination includes the following type designations:

- Product description: NOFIRNO SEALING SYSTEM
- Trademark: NOFIRNO
- Type designation: NOFIRNO SEALING SYSTEM FOR ELECTRIC CABLE TRANSITS THROUGH "A"  
CLASS DIVISIONS

**The following pages include the content of the extra annex for this certificate**



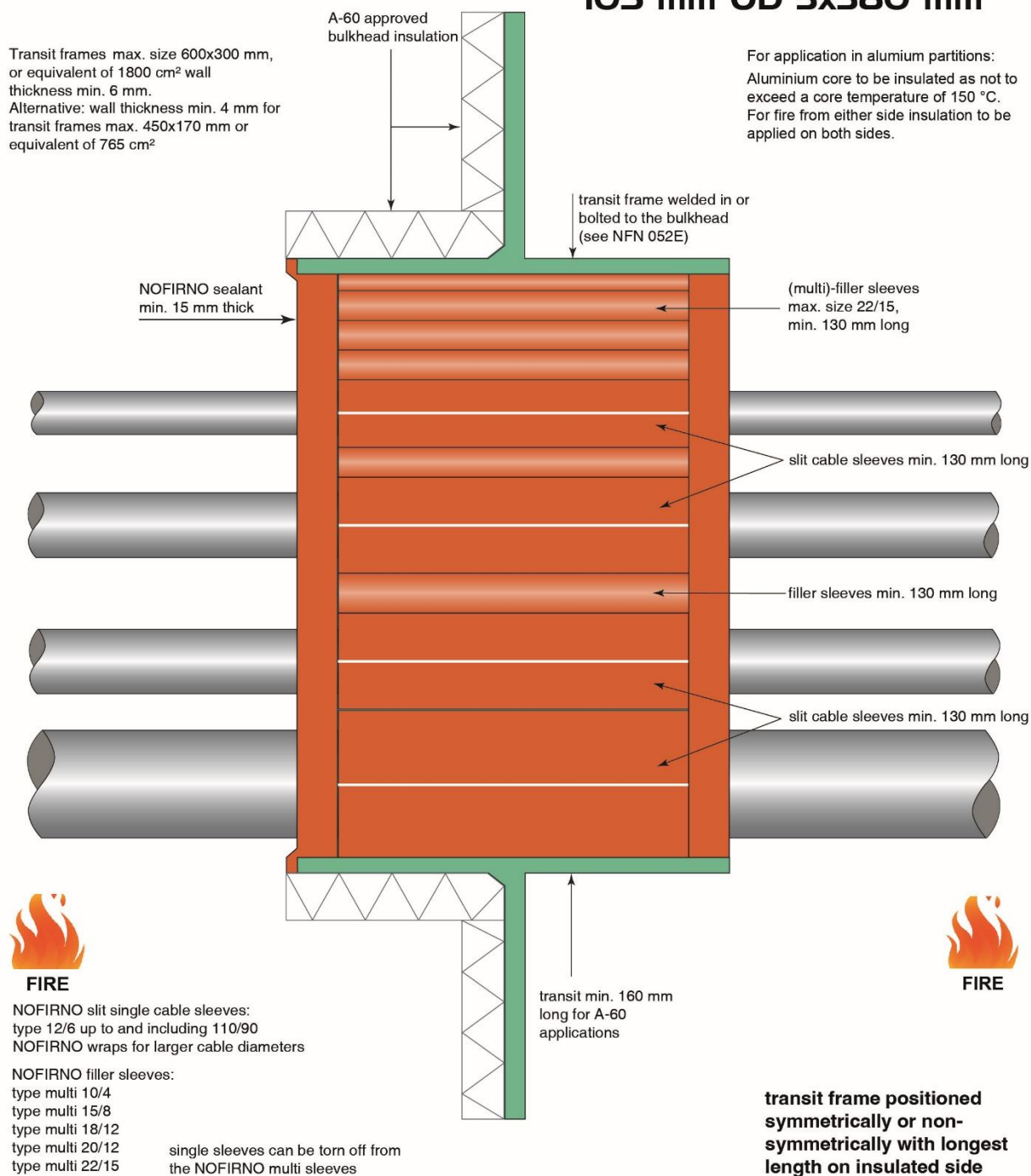
## Technical Drawings

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

## NOFIRNO SEALING SYSTEM for cables up to 105 mm OD 3x380 mm<sup>2</sup>

Transit frames max. size 600x300 mm,  
or equivalent of 1800 cm<sup>2</sup> wall  
thickness min. 6 mm.  
Alternative: wall thickness min. 4 mm for  
transit frames max. 450x170 mm or  
equivalent of 765 cm<sup>2</sup>

For application in aluminium partitions:  
Aluminium core to be insulated as not to exceed a core temperature of 150 °C.  
For fire from either side insulation to be applied on both sides.



Description: NOFIRNO sleeve type multi-cable transit system for A-60 class bulkhead transits

Mat.: NOFIRNO rubber & sealant

Ref.: JAB

Date:

22-04-17

Scale:

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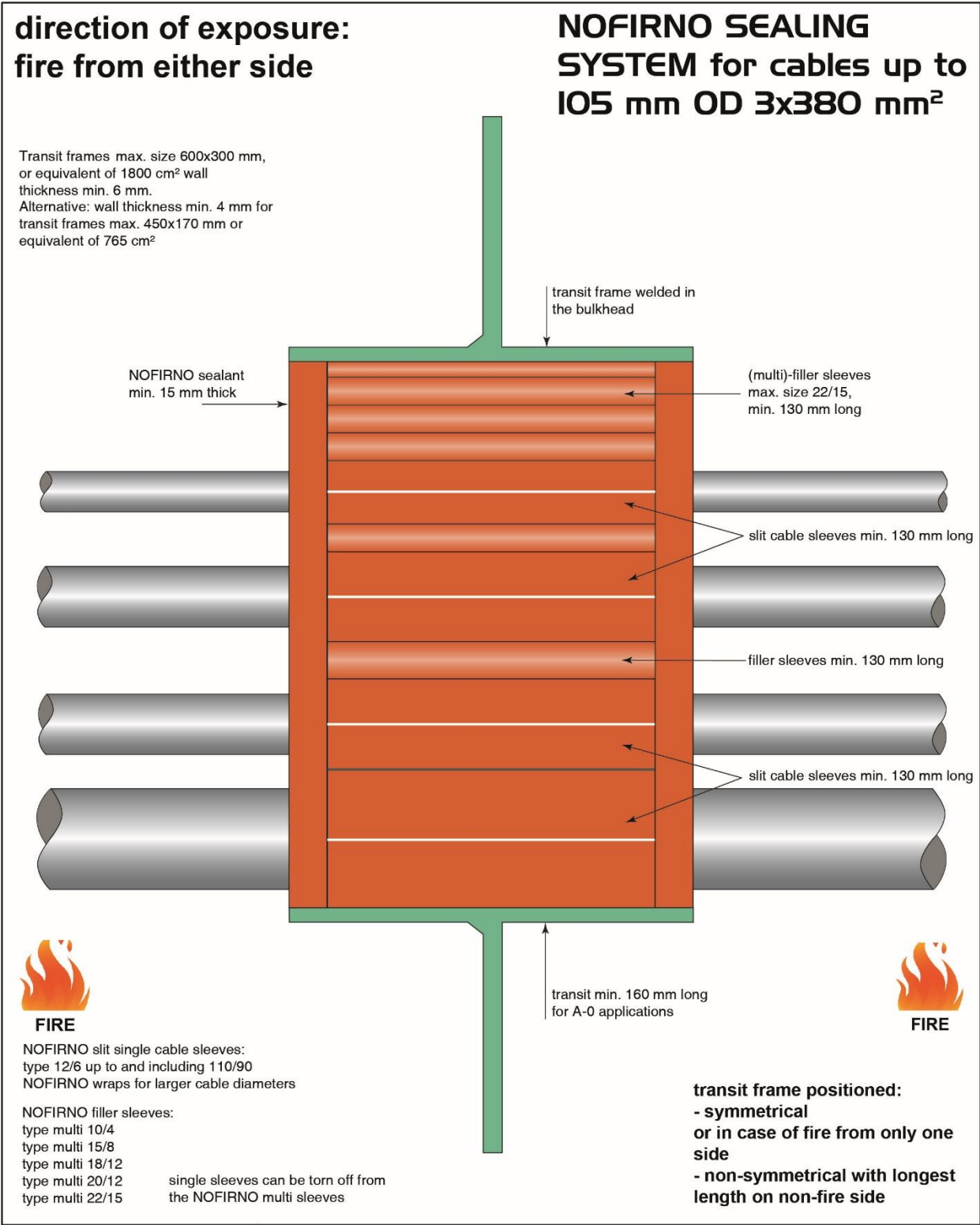
Rev. 3

08-09-21

Rev. 4

27-01-22

NFN 050E



	Description: NOFIRNO sleeve type multi-cable transit system for A-0 class bulkhead transits			
	Mat.: NOFIRNO rubber & sealant			
	Ref.: JAB	Date:	22-04-17	Scale:
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	Rev. 4	27-01-22		

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

Transit frames max. size 600x300 mm,  
or equivalent of 1800 cm<sup>2</sup> wall  
thickness min. 6 mm.  
Alternative: wall thickness min. 4 mm for  
transit frames max. 450x170 mm or  
equivalent of 765 cm<sup>2</sup>

For application in aluminium partitions:  
Aluminium core to be insulated as not to exceed a core temperature of 150 °C.  
For fire from either side insulation to be applied on both sides.

NOFIRNO sealant  
min. 15 mm thick

A-60 approved  
bulkhead insulation

# NOFIRNO SEALING SYSTEM for blind transits

NOFIRNO gaske  
min. 5 mm thick

transit frame welded in or bolted to the bulkhead

(multi)-filler sleeves  
- max. size 22/15,  
min. 130 mm long

transit min. 160 mm long  
for A-60 applications

NOFIRNO gasket



## FIRE



**FIRE**

NOFIRNO filler sleeves:

type multi 10/4  
type multi 15/8  
type multi 18/12  
type multi 20/12  
type multi 22/15

single sleeves can be torn off from the NOFIRNO multi sleeves

**transit frame positioned  
symmetrically or non-  
symmetrically with longest  
length on insulated side**



Description: NOFIRNO sleeve type multi-cable transit system for A-60 class blind bulkhead transits

Mat.: NOFIRNO rubber & sealant

Ref.: JAB

Date:

22-04-17

Scale:

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NFN 052E

Transit frames max. size 600x300 mm, or equivalent of 1800 cm<sup>2</sup> wall thickness min. 6 mm.

Alternative: wall thickness min. 4 mm for transit frames max. 450x170 mm or equivalent of 765 cm<sup>2</sup>

For application in aluminum partitions:  
Aluminium core to be insulated as not to exceed a core temperature of 150 °C.  
For fire from either side insulation to be applied on both sides.

## NOFIRNO SEALING SYSTEM for cables up to 105 mm OD 3x380 mm<sup>2</sup>

transit frame welded in or bolted to the deck (see NFN 055E)

(multi)-filler sleeves max. size 22/15, min. 130 mm long

slit cable sleeves min. 130 mm long

filler sleeves min. 130 mm long

slit cable sleeves min. 130 mm long

A-60 approved deck insulation

transit min. 160 mm long for A-60 applications

NOFIRNO sealant min. 15 mm thick


**FIRE**

NOFIRNO slit single cable sleeves:  
type 12/6 up to and including 110/90  
NOFIRNO wraps for larger cable diameters

NOFIRNO filler sleeves:  
type multi 10/4  
type multi 15/8  
type multi 18/12  
type multi 20/12  
type multi 22/15

single sleeves can be torn off from the NOFIRNO multi sleeves

transit frame positioned totally below deck up to totally above deck

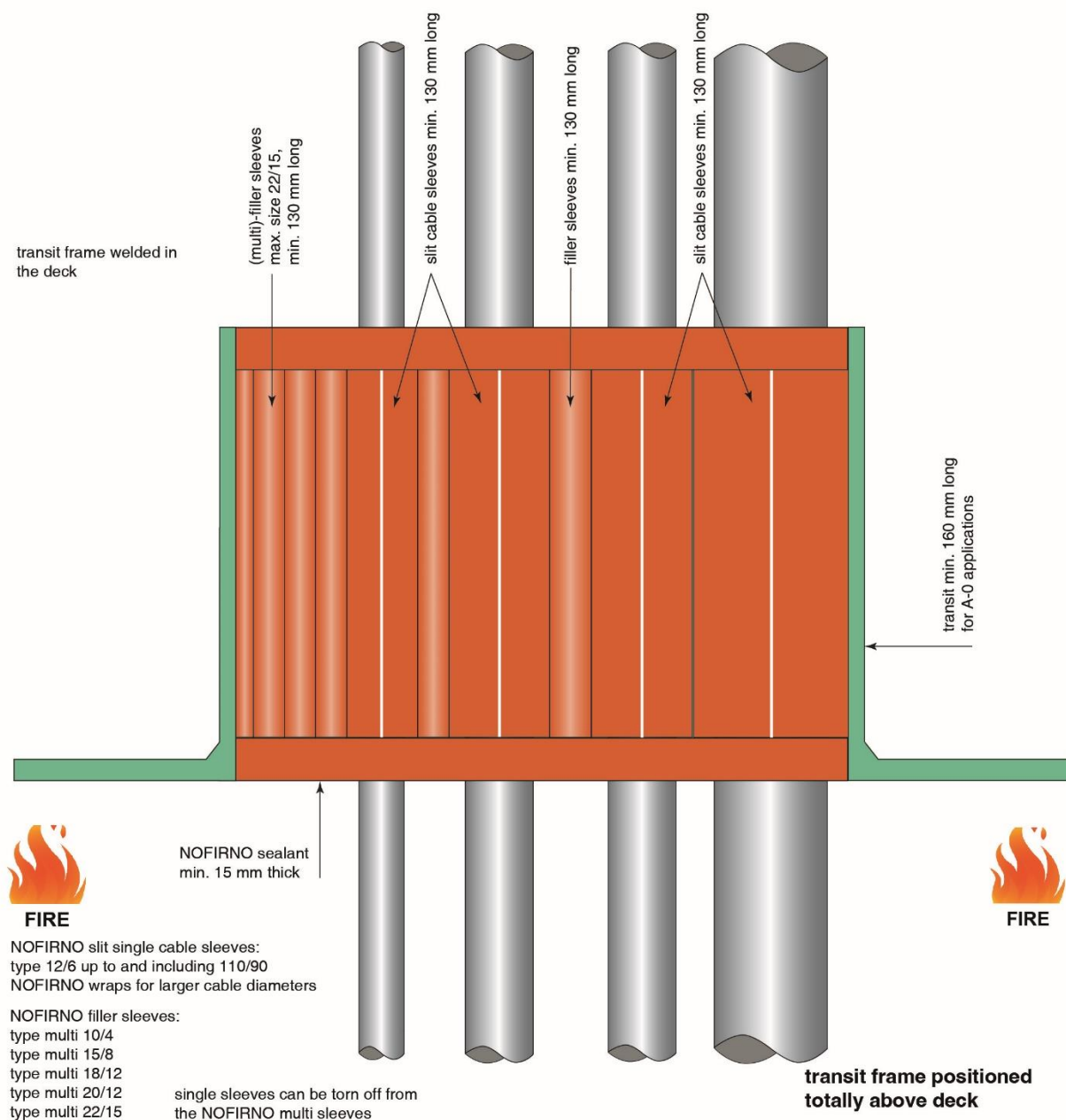
	Description: NOFIRNO sleeve type multi-cable transit system for A-60 class deck transits			
	Mat.: NOFIRNO rubber & sealant			Scale:
	Ref.: JAB	Date:	22-04-17	
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	Rev. 4	27-01-22		



Transit frames max. size 600x300 mm,  
or equivalent of 1800 cm<sup>2</sup> wall  
thickness min. 6 mm.

Alternative: wall thickness min. 4 mm for transit frames max. 450x170 mm or equivalent of 765 cm<sup>2</sup>

## NOFIRNO SEALING SYSTEM for cables up to 105 mm OD 3x380 mm<sup>2</sup>



Description: NOFIRNO sleeve type multi-cable transit system for A-0 class deck transits

Mat.: NOFIRNO rubber & sealant

Ref.: JAB

Date:

22-04-17

Scale:

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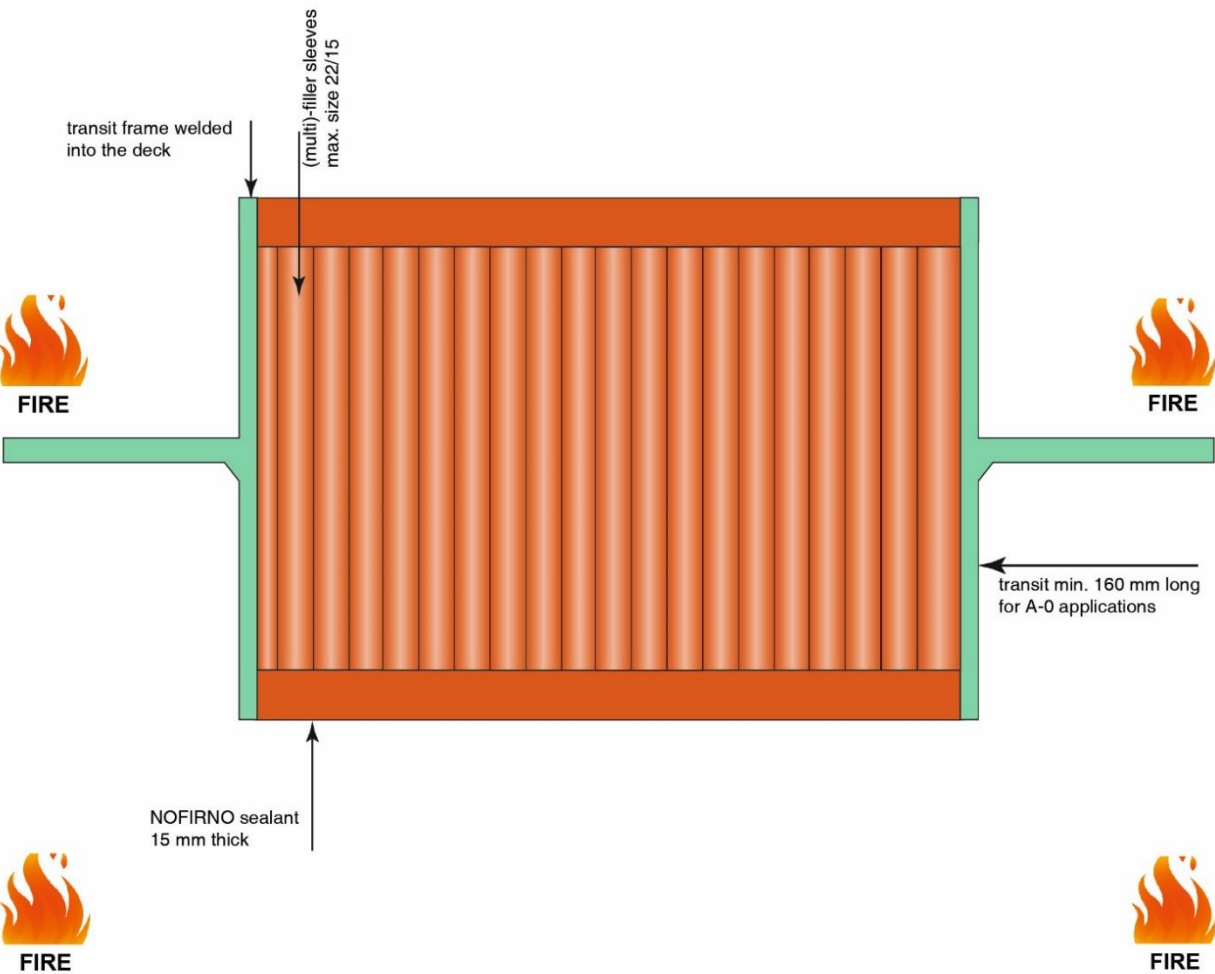
27-01-22

NFN 054E

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

**AO class blind transits with**  
**sealed with the**  
**NOFIRNO sealing system**


Transit frames max. size 600x300 mm  
wall thickness min. 6 mm;



NOFIRNO filler sleeves:  
type multi 10/4  
type multi 15/8  
type multi 18/12  
type multi 20/12  
type multi 22/15

single sleeves can be torn off from the NOFIRNO multi sleeves

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

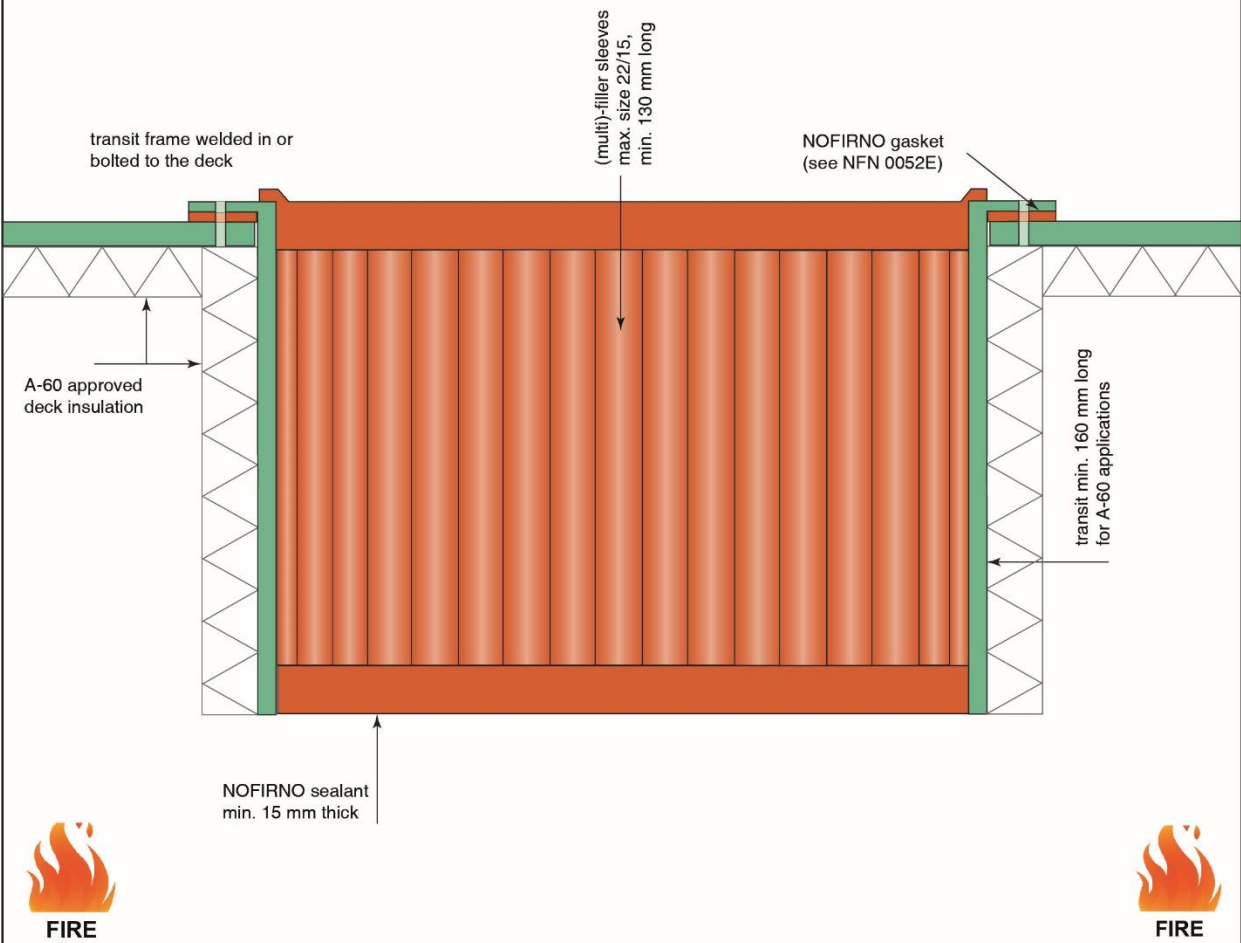
	Description: NOFIRNO sealing system for blind cable transits in A-0 class decks and bulkheads			
	Mat.: NOFIRNO sleeves/sealant			
	Ref.: JAB	Date:	10-09-2021	Scale:
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		Rev. 2		

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

**NOFIRNO SEALING  
SYSTEM for blind  
transits**

Transit frames max. size 600x300 mm,  
or equivalent of 1800 cm<sup>2</sup> wall  
thickness min. 6 mm.  
Alternative: wall thickness min. 4 mm for  
transit frames max. 450x170 mm or  
equivalent of 765 cm<sup>2</sup>

For application in aluminium partitions:  
Aluminium core to be insulated as not to  
exceed a core temperature of 150 °C.  
For fire from either side insulation to be  
applied on both sides.

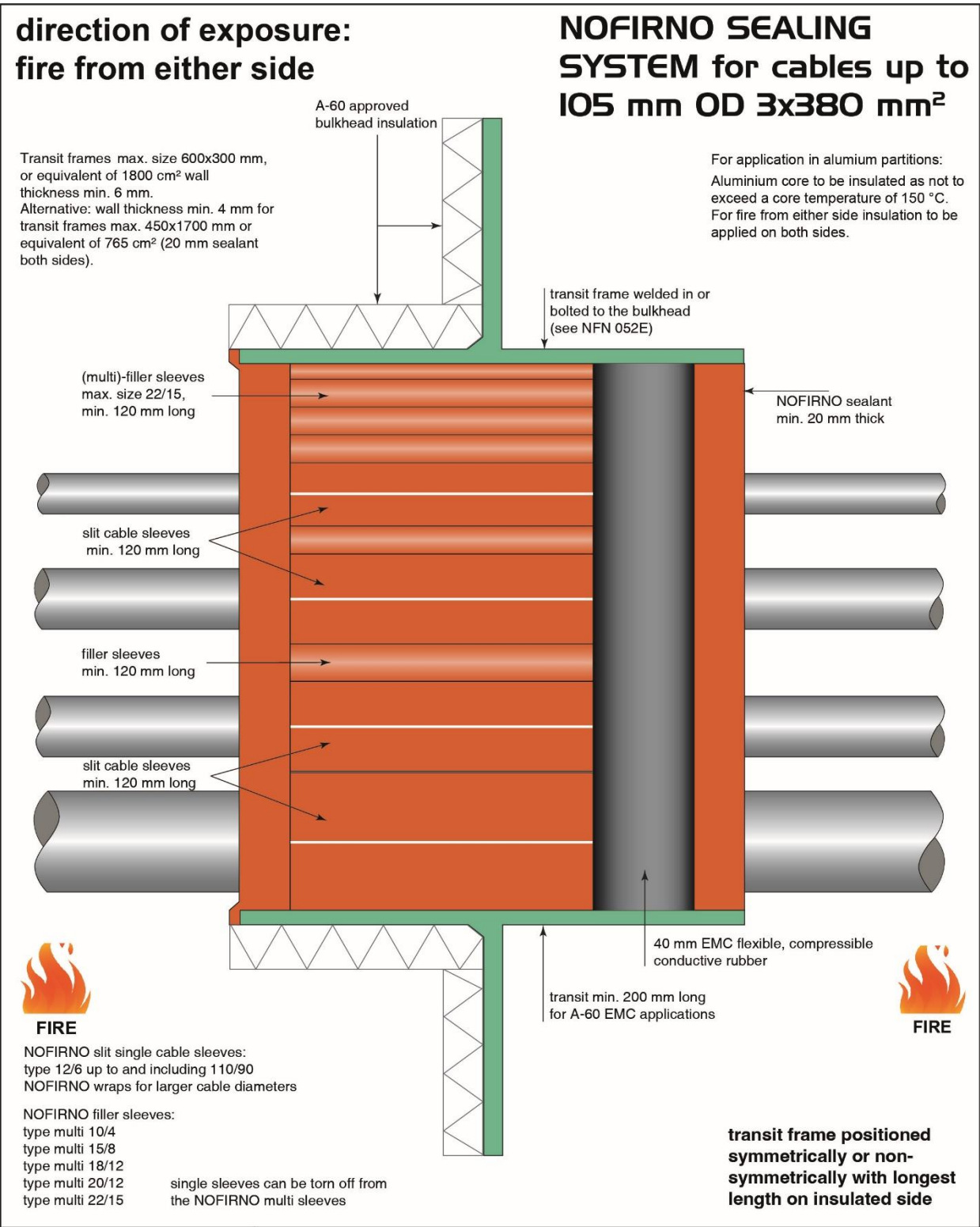


NOFIRNO filler sleeves:  
type multi 10/4  
type multi 15/8  
type multi 18/12  
type multi 20/12  
type multi 22/15

single sleeves can be torn off from  
the NOFIRNO multi sleeves

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

	Description: NOFIRNO sleeve type multi-cable transit system for A-60 class blind deck transits			
	Mat.: NOFIRNO rubber & sealant			
	Ref.: JAB	Date:	22-04-17	Scale:
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	Rev. 4	27-01-22		



	Description: NOFIRNO sleeve type multi-cable transit system for A-60 class EMC bulkhead transits			
	Mat.: NOFIRNO rubber/sealant, CONDUCTON rubber			
	Ref.: JAB	Date:	22-04-17	Scale:
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	Rev. 4	27-01-22		



### NOFIRNO SEALING SYSTEM for cables up to 105 mm OD 3x380 mm<sup>2</sup>

NOFIRNO slit single cable sleeves:  
type 12/6 up to and including 110/90  
NOFIRNO wraps for larger cable diameters

NOFIRNO filler sleeves:  
type multi 10/4  
type multi 15/8  
type multi 18/12  
type multi 20/12  
type multi 22/15

single sleeves can be torn off from the NOFIRNO multi sleeves

Transit frames max. size 600x300 mm, or equivalent of 1800 cm<sup>2</sup> wall thickness min. 6 mm.

Alternative: wall thickness min. 4 mm for transit frames max. 450x170 mm or equivalent of 765 cm<sup>2</sup> (20 mm sealant both sides).

For application in aluminum partitions:  
Aluminium core to be insulated as not to exceed a core temperature of 150 °C.  
For fire from either side insulation to be applied on both sides.

transit frame welded in or bolted to the deck (see NFN 055E)

A-60 approved deck insulation

40 mm EMC flexible, compressible CONDUCTON rubber

slit cable sleeves min. 120 mm long

filler sleeves min. 120 mm long

slit cable sleeves min. 120 mm long

(multi)-filler sleeves max. size 22/15, min. 120 mm long


transit min. 200 mm long for A-60 EMC applications

NOFIRNO sealant min. 20 mm thick

transit frame positioned totally below deck up to totally above deck

FIRE

FIRE



**BEELE**  
ENGINEERING

Description: NOFIRNO sleeve type multi-cable transit system for A-60 class EMC deck transits

Mat.: NOFIRNO rubber/sealant, CONDUCTON rubber

Ref.: JAB

Date: 22-04-17

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Rev. 4 27-01-22

Scale:

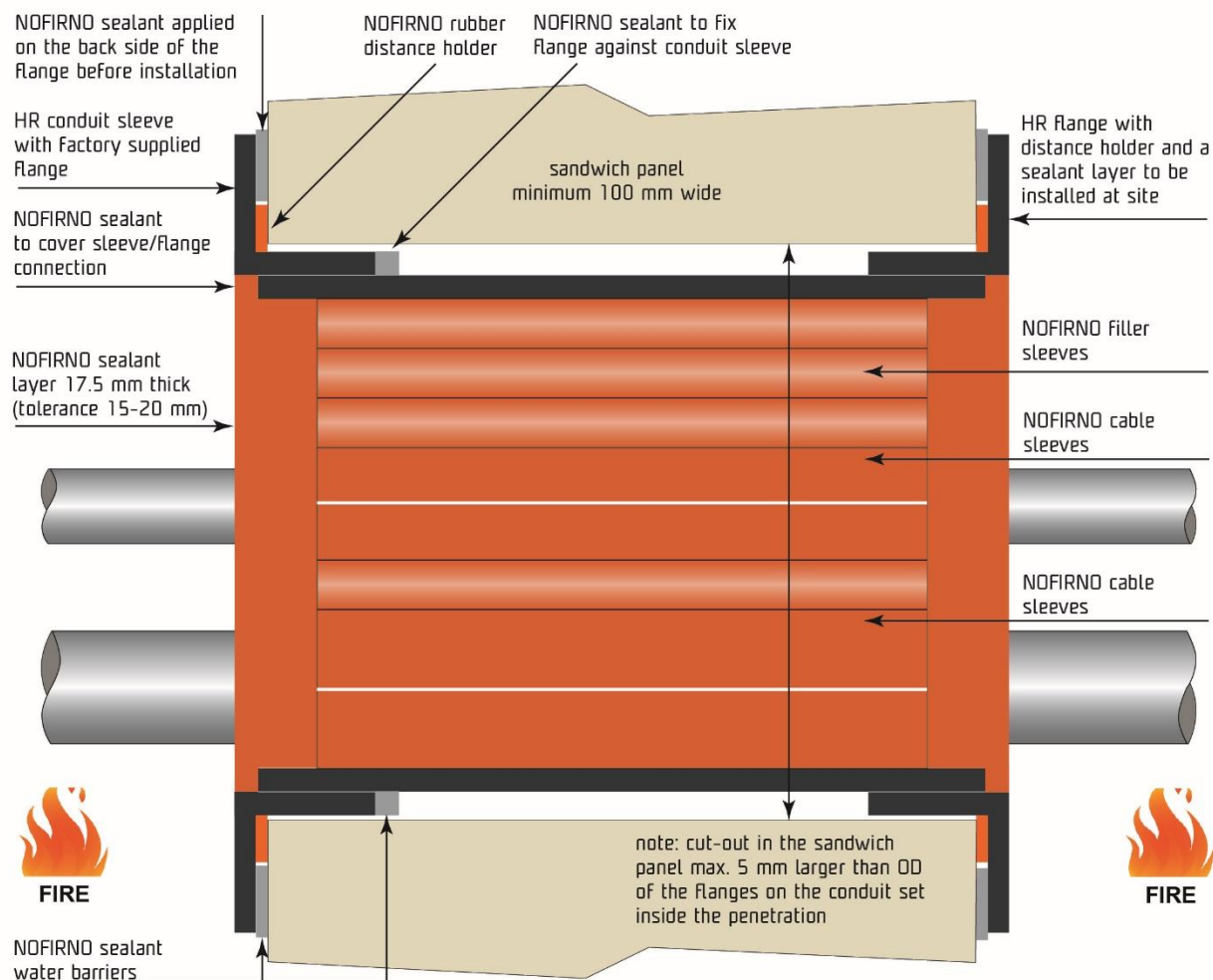
**NFN 057E**

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

note: for 100 mm sandwich panels the length of the NOFIRNO cable and filler sleeves is 80 mm and 130 mm for the 150 mm sandwich panels

**A-60/EI-60 class (multi-) cable transits with max. cable OD 105 mm, sealed with the NOFIRNO system applied in HR plastic conduit sleeves max. 250 mm ID and HR conduit frames max. 300x150 mm in A-60/EI-60 certified sandwich panels**



Conduit sleeves with fixed flange and lose flange, incl. NOFIRNO distance holders:

Conduit Frames with fixed flange and lose  
Flange, incl. NOFIRNO distance holders:

## NOFIRNO/HR sealing system for walls and floors

Type	100 mm	150 mm
HR 50 FLC	60.9700	60.9710
HR 80 FLC	60.9701	60.9711
HR 100 FLC	60.9702	60.9712
HR 125 FLC	60.9703	60.9713
HR 160 FLC	60.9704	60.9714
HR 200 FLC	60.9705	60.9715

Type	100 mm	150 mm
HR 150x150 FLC	60.9750	60.9760
HR 300x150 FLC	60.9751	60.9761

Note: the FLC and FLCC sets > size 50 can be made for walls with a thickness of >150 mm with a max. for 250 mm walls

tested according to IMO Res. MSC 307(88)  
alt. EN 1366-3:2009  
max. size of aperture 250 mm ID mm or  
300x150 mm equivalent of 450 cm<sup>2</sup>

# A-60/EI-60



Description: NOFIRNO sealing system for A-60/EI-60 class sandwich panels

Mat.: NOFIRNO rubber & sealant

Ref.: JAB

Date:

15-04-2018

Scale:

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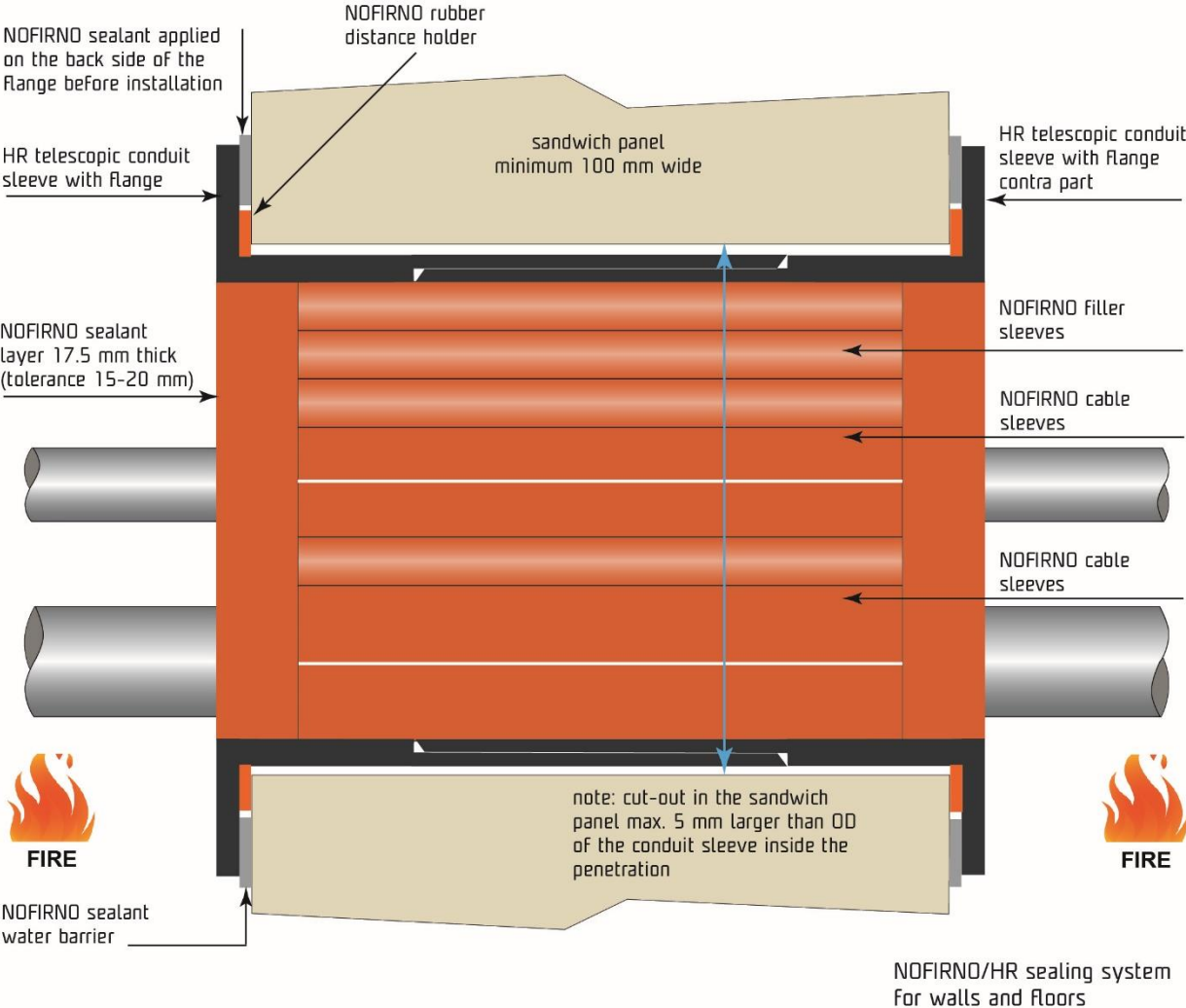
27-01-2022

NFN 097E

direction of exposure:  
fire from either side

note: For 100 mm sandwich panels the length of the NOFIRNO cable and filler sleeves is 80 mm and 130 mm for the 150 mm sandwich panels

A-60/EI-60 class (multi) cable transits with max. cable OD 40, 55, 75 mm sealed with the NOFIRNO system installed in HR telescopic conduit sleeves resp. 80, 100 and 125 mm ID in A-60/EI-60 certified sandwich panels



Conduit sleeves telescopic version, incl. NOFIRNO distance holders:

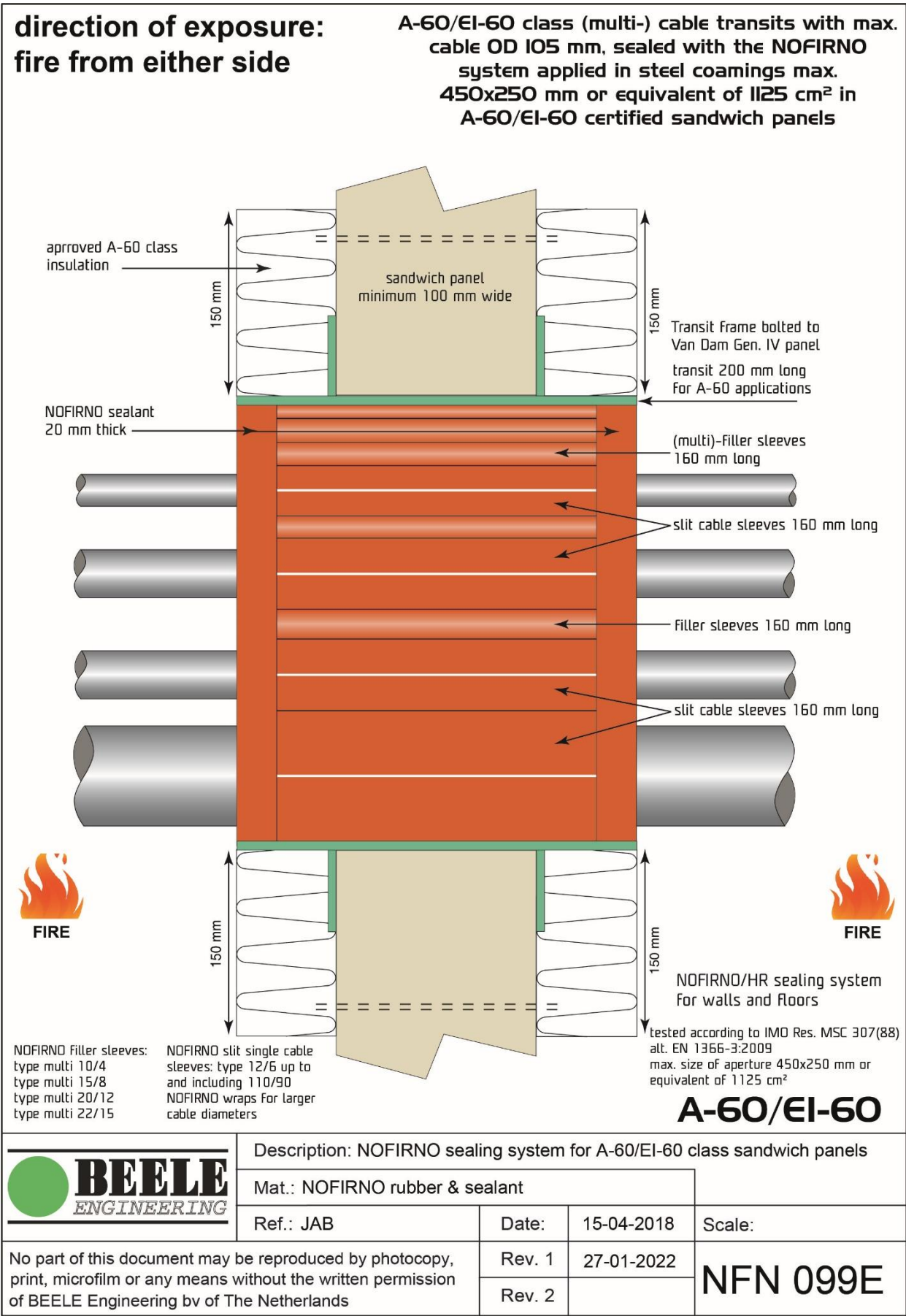
Type	100 mm	150-200 mm	max. cable OD
HR 80 TLC	60.9731	60.9721	40 mm
HR 100 TLC	60.9732	60.9722	55 mm
HR 125 TLC	60.9733	60.9723	75 mm

Note: the standard set covers 150-200 mm walls; For walls 100 mm the set is (has to be) made to size

tested according to IMO Res. MSC 307(88)  
alt. EN 1366-3:2009

**A-60/EI-60**

	Description: NOFIRNO sealing system for A-60/EI-60 class sandwich panels			
	Mat.: NOFIRNO rubber & sealant			
	Ref.: JAB	Date:	15-04-2018	Scale:
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	Rev. 2	27-01-2022		



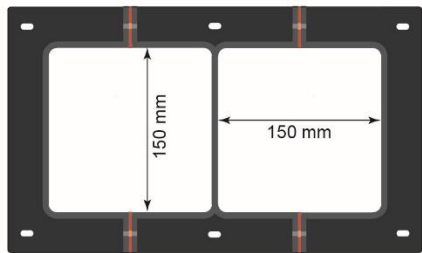
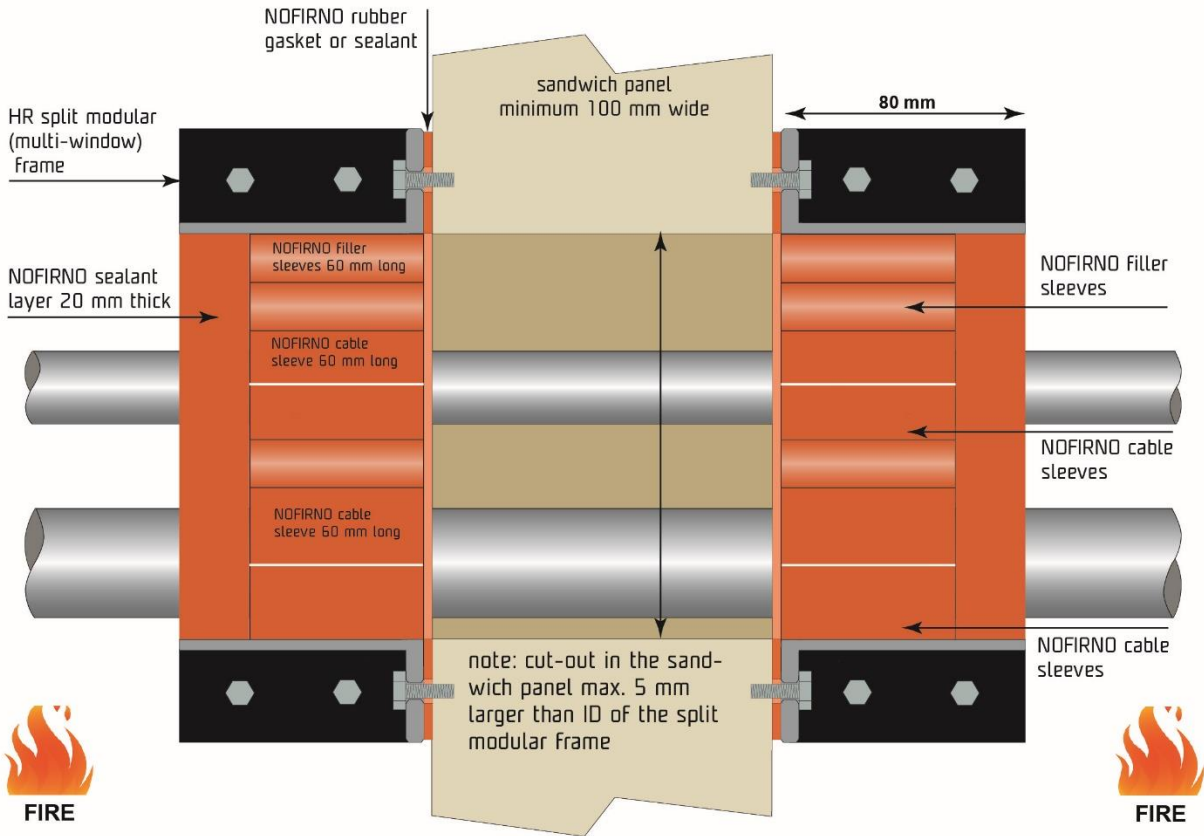


direction of exposure:  
fire from either side

note: available lengths of the NOFIRNO cable and filler sleeves 60, 80, 110, 130, 140, 160 and 210 mm. The sleeves can be cut to size on site.

HR split modular frame  
mechanically Fixed or glued  
to the sandwich panel

A-60/EI-60 class (multi-) cable transits max.  
cable OD 105 mm for existing installations sealed  
with the NOFIRNO system applied in HR split  
(multi-window) conduit frames each 150x150 mm  
in A-60/EI-60 certified sandwich panels



SPLIT CONDUIT FRAMES

frame 1x150 complete	60.9510
frame 2x150 complete	60.9511
frame 3x150 complete	60.9512
frame 4x150 complete	60.9513

GASKET SETS

gasket 1x150 complete	51.9510
gasket 2x150 complete	51.9511
gasket 3x150 complete	51.9512
gasket 4x150 complete	51.9513

NOFIRNO/HR sealing system  
for walls and floors

tested according to IMO Res. MSC 307(88)  
alt. EN 1366-3:2009

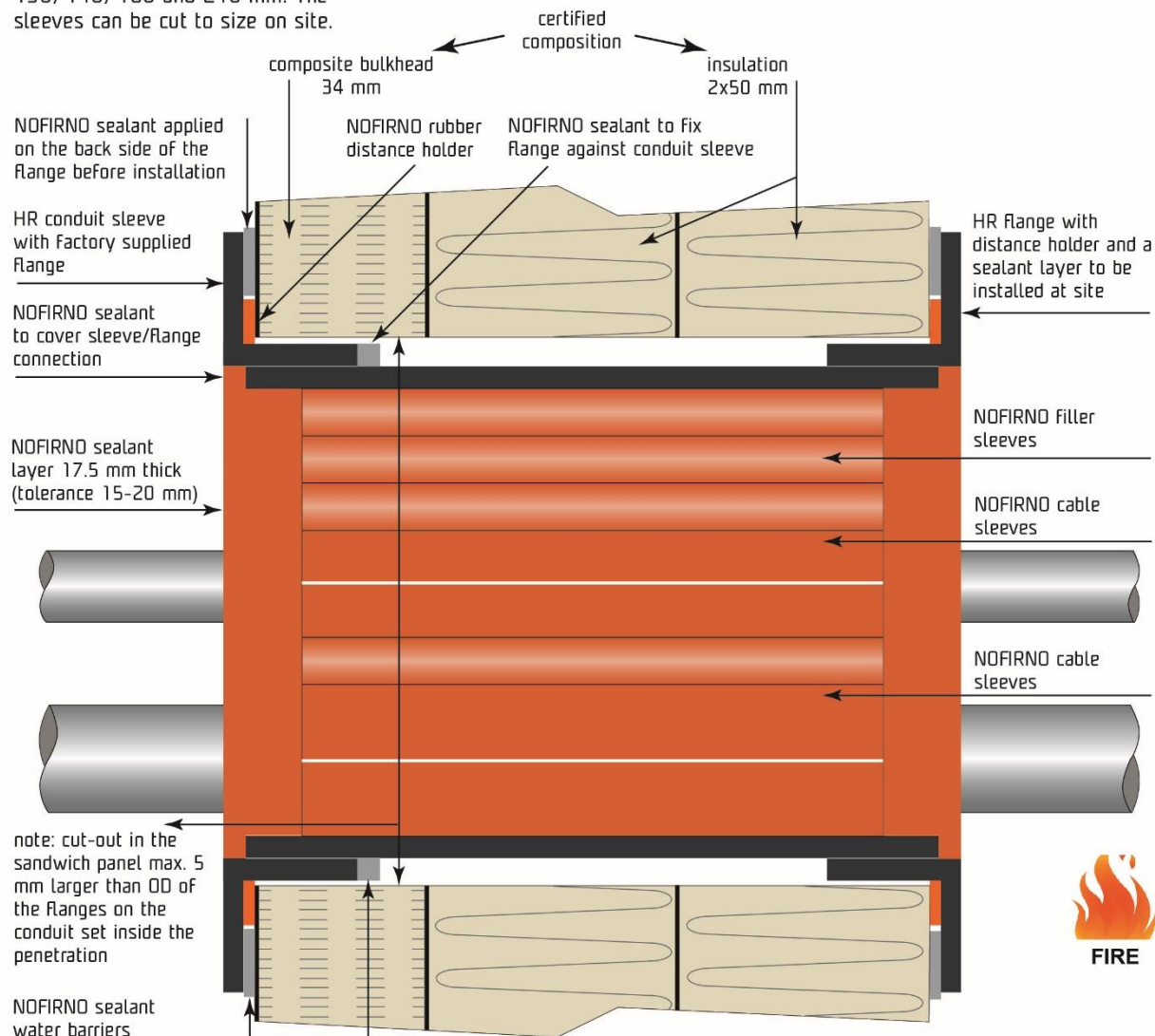
**A-60/EI-60**

	Description: NOFIRNO sealing system for A-60/EI-60 class sandwich panels			
	Mat.: NOFIRNO rubber & sealant			
	Ref.: JAB	Date:	15-05-2018	Scale:
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		Rev. 2	08-09-2021	

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

note: available lengths of the NOFIRNO cable and filler sleeves 60, 80, 110, 130, 140, 160 and 210 mm. The sleeves can be cut to size on site.

**A-60 class (multi-) cable transits with max. cable OD 105 mm, sealed with the NOFIRNO system applied in HR plastic conduit sleeves max. 250 mm ID and HR conduit frames max. 300x150 mm in A-60 certified composite bulkheads**



Conduit sleeves with Fixed flange and lose flange, incl. NOFIRNO distance holders:

Conduit Frames with Fixed Flange and lose Flange, incl. NOFIRNO distance holders:

Type	100 mm	150 mm	Type	100 mm	150 mm
HR 50 FLC	60.9700	60.9710	HR 150x150 FLCC	60.9750	60.9760
HR 80 FLC	60.9701	60.9711	HR 300x150 FLCC	60.9751	60.9761
HR 100 FLC	60.9702	60.9712			
HR 125 FLC	60.9703	60.9713			
HR 160 FLC	60.9704	60.9714			
HR 200 FLC	60.9705	60.9715			

Note: the FLC and FLCC sets > size 50 can be made for walls with a thickness of >150 mm with a max. for 250 mm walls

tested according to IMO Res. MSC  
307(88) alt. EN 1366-3:2009

Fire-resisting Division 60  
(FRD-60) ref. HSC 2000 Code  
(ref IMO Res. MSC.45/65)



Description: NOFIRNO sealing system for A-60 class composite bulkheads

Mat.: NOFIRNO rubber & sealant

Ref.: JAB

Date:

02-07-2018

Scale:

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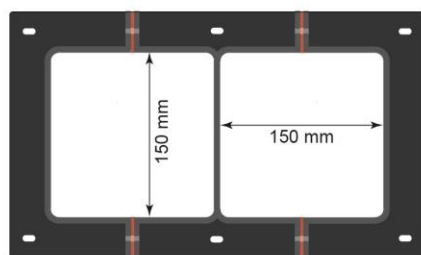
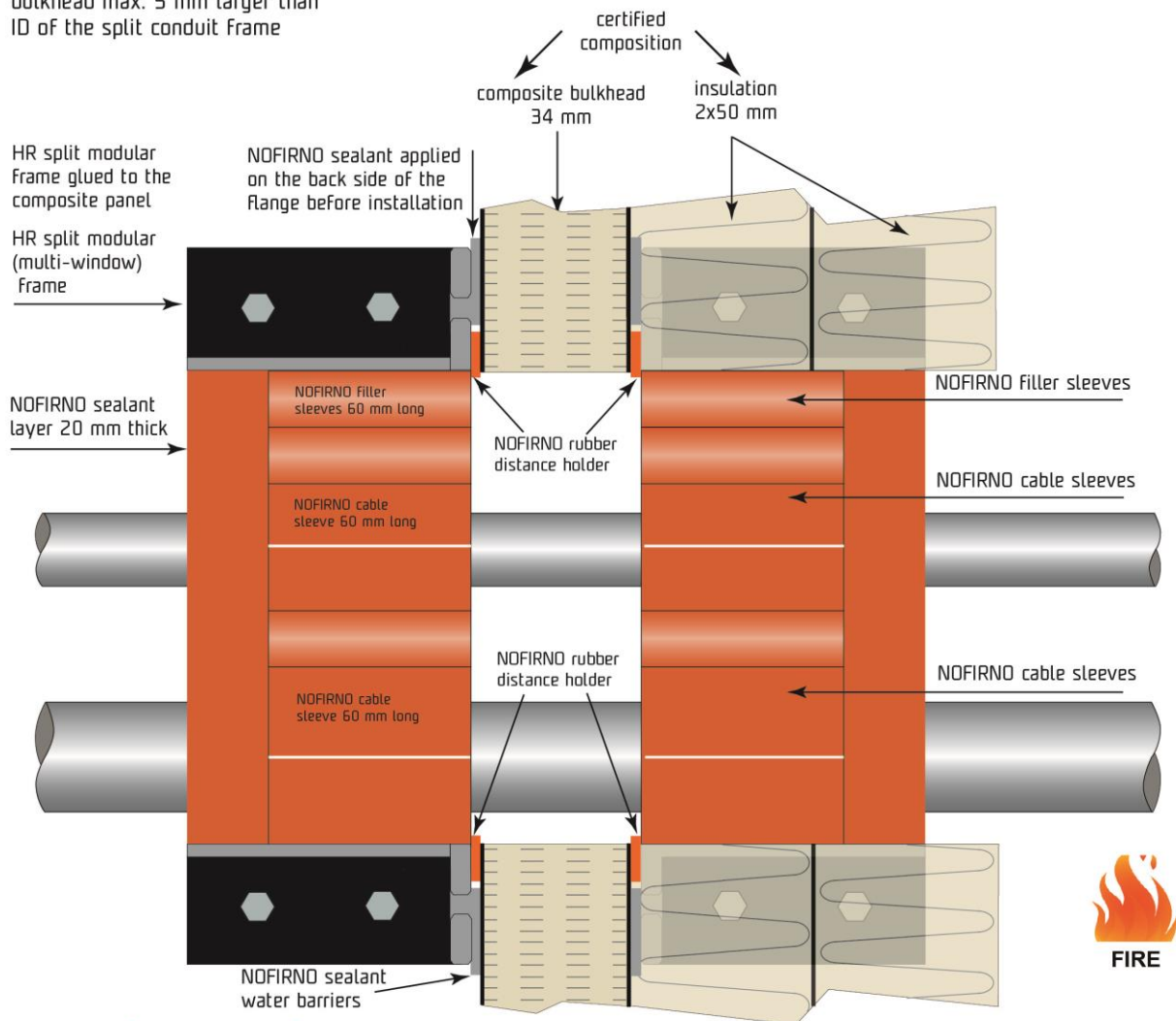
Rev. 2

NFN 109E

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

**A-60 class (multi-) cable transits max. cable OD 105 mm for existing installations sealed with the NOFIRNO system applied in HR split (multi-window) conduit frames each 150x150 mm in A-60 certified composite bulkheads**

note: cut-out in the composite bulkhead max. 5 mm larger than ID of the split conduit frame



## SPLIT CONDUIT FRAMES

```
frame 1x150 complete      60.9510
frame 2x150 complete      60.9511
frame 3x150 complete      60.9512
frame 4x150 complete      60.9513
```

## GASKET SETS

gasket 1x150 complete	51.9510
gasket 2x150 complete	51.9511
gasket 3x150 complete	51.9512
gasket 4x150 complete	51.9513

tested according to IMO Res. MSC  
307(88) alt. EN 1366-3:2009

Fire-resisting Division 60  
(FRD-60) ref. HSC 2000 Code  
(ref IMO Res. MSC.45/65)



Description: NOFIRNO sealing system for A-60 class composite bulkheads

Mat.: NOFIRNO rubber & sealant

Ref.: JAB

Date:

02-07-2018

Scale:

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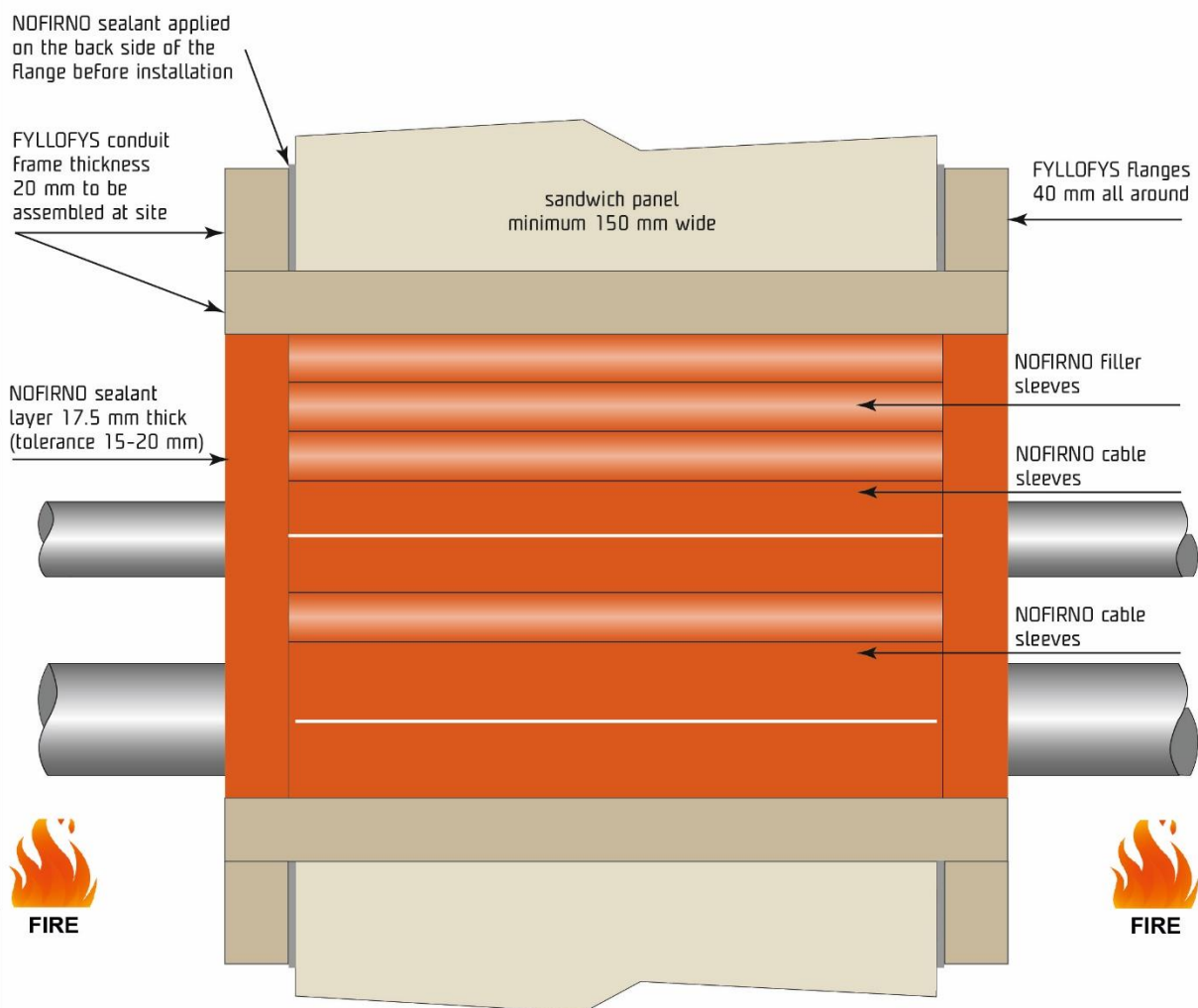
NFN 112E



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

note: for 150 mm sandwich panels the length of the NOFIRNO cable and filler sleeves is 160 mm.

**A-60/EI-60 class (multi-) cable transits with max. cable OD 105 mm, sealed with the NOFIRNO system applied in FYLLOFYS conduit frames max. 300x160 mm in A-60/EI-60 certified sandwich panels**



FYLLOFYS conduit frame  
thickness 20 mm to be  
assembled at site

FISSIC coating to be applied on all cut edges and to be used to glue the flanges to the body of the frame.

## NOFIRNO/FYLLOFYS sealing system for walls and floors

tested according to IMO Res. MSC 307(88)  
alt. EN 1366-3:2009  
max. size of aperture 300x160 mm  
equivalent of 480 cm<sup>2</sup>

# A-60/EI-60



Description: NOFIRNO sealing system for A-60/EI-60 class sandwich panels

Mat.: NOFIRNO sleeves/sealant - FYLLOFYS boards and FISSIC coating

Ref.: |AB

Date:

19-07-2021

Scale:

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NFN 198E



**Information on allowable pressures regarding water/air tightness****Table-1: overview of allowable pressures calculated for blind transits**

Circular transits Inner diameter [mm]		Applicable for drawings	Min. Sealant thickness [mm]	Cable range Outer diameter [mm]	Panel	Frame type	Remark	No. of partitions	Allowable* Pressure [Bar]
80		NFN 098E	15	Blind	Sandwich	HR-Telescopic	No partitions	0	7,5
100		NFN 098E	15	Blind	Sandwich	HR-Telescopic			6,0
125		NFN 098E	15	Blind	Sandwich	HR-Telescopic			4,8
250		NFN 109E	15	Blind	Composite	HR plastic			2,4
Rectangular transits W x H [mm]		Applicable for drawings	Min. Sealant thickness [mm]	Cable range Outer diameter [mm]	Panel	Frame type	Remark	No. of partitions	Allowable* Pressure [Bar]
W	H								
600	300	NFN 050E	15	Blind	Deck or Bulkhead	Steel	No partitions	0	1,5
		NFN 051E							
		NFN 052E							
		NFN 053E							
		NFN 054E							
		NFN 055E							
		NFN 199E							
600	300	All	15	Blind	Deck or Bulkhead	Steel	6 mm steel welded partition	4	3,1
200	170	various	15	Blind	Deck or Bulkhead	Aluminum	No partitions	0	3,3
600	300	NFN 056E	20	Blind	Deck or Bulkhead	Steel	EMC / No partitions	0	2,0
		NFN 057E							
450	250	NFN 099E	20	Blind	Sandwich	Steel	No partitions	0	2,5
300	160	NFN 198E	15	Blind	Sandwich	FYLLOFYS	No partitions	0	2,9
300	150	NFN 097E	15	Blind	Sandwich	HR-plastic	No partitions	0	3,0
		NFN 109E		Blind	Composite				
150	150	NFN 104E	20	Blind	Sandwich	HR split (Multi-window)	No partitions	0	5,3
		NFN 112E		Blind	Composite				

\* As blind transits will have the lowest allowable pressure this represents a theoretical worst case situation. As soon as cables are installed correctly through the transits the allowable pressure will increase. Therefore these values represent a min. value for transits that have (multiple) cables. The allowable pressure can further be increased by using partitions to lower the surface area as smaller partitions result in higher allowable pressures. Users of the NOFIRNO sealing system shall consult Beele Engineering for the pressure rating for the applicable specific applications.