ZAPP-
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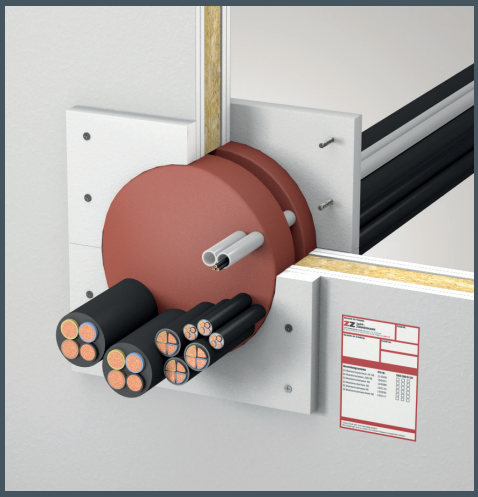
INNOVATIVE FIRE-PROTECTION SYSTEMS

System ZZ-Fire protection plug NE ETA-12/0088

INSATALLATION MANUAL



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Inhalt/ Content

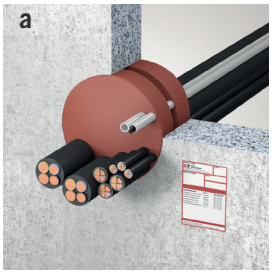
System ZZ-Fire protection plug NE

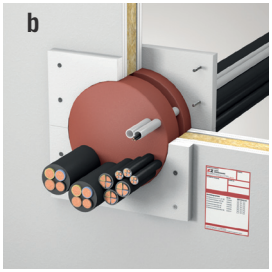
for cable penetration seals up to EI 120

The System ZZ-Fire protection plug NE restores the fire resistance in areas of walls and floors where cables penetrate the component.

System ZZ-Fire protection plug NE ETA-12/0088

Cable penetration seal up to EI 120 for rigid walls, rigid floors and flexible walls.
Through penetration firestop system for electrical, telecommunication and optical fibre cables and conduits





a. System ZZ-Fire protection plug NE in rigid wall

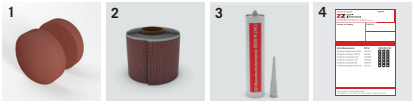
b. System ZZ-Fire protection plug NE in flexible wall

Specially suited for: 1. Core holes up to 240 mm in diameter in rigid walls and floors
2. Through penetration firestop systems with frequently changing penetrating elements

Fundamentals

/ For execution of the through penetration firestop system the European technical approval ETA-12/0088 issued by the Austrian Institute of Construction Engineering (Österreichisches Institut für Bautechnik) is authoritative.
/ All technical specifications of the ETA, such as maximum opening size, wall types/floor types, fire resistance classifications, penetrating elements and the first support of the penetrating elements, working clearances, etc. are provided in the approval.
/ It must be ensured that the stability of the adjacent component is not impaired through installation of the through penetration firestop system, even in the event of fire. The information specified in the usability certification must be complied with.
/ All applicable directives and technical rules of other trades, particularly those that relate to electrical engineering, must be complied with.
/ Through penetration firestop systems in floors must be safeguarded against loads, in particular also against being walked on, through suitable measures (e.g. through enclosure or through covering with a grate).
/ In accordance with ETAG 026-2, the through penetration firestop system can be assigned to use category Z_1. This means that the permissible ambient conditions for use of the product are indoor areas with any level of humidity and temperatures above 0 °C.
/ Comply with the instructions on the safety data sheets for the products.

System components



Designation	Art. no.	PU
1. ZZ-Plug NE	*See variants*	
2. ZZ-Wrap NE (5000 x 150 x 3 [mm]) *incl. 40 steel clips*	B04N00-0004	1
3. ZZ-Mastic NE 310 ml	B15N00-0013	12
4. Identification plate ETA *Please pay attention to the section, Supplemental national regulations*	B16H00-0051	1

Variants	Max. opening size [mm]	Art. no.	PU
1. ZZ-Plug NE 65 mm	65	B02N00-0067	20
1. ZZ-Plug NE 78 mm	78	B02N00-0068	20
1. ZZ-Plug NE 107 mm	104	B02N00-0069	20
1. ZZ-Plug NE 122 mm	118	B02N00-0070	20
1. ZZ-Plug NE 134 mm	128	B02N00-0071	20
1. ZZ-Plug NE 165 mm	160	B02N00-0072	20
1. ZZ-Plug NE 200 mm	194	B02N00-0073	20
1. ZZ-Plug NE 250 mm	240	B02N00-0074	10

Accessories

Designation	Art. no.	PU
5. Knife with serrated blade, narrow & magnetic blade protection	B16H00-0042	1
6. Knife with serrated blade, wide & magnetic blade protection	B16H00-0043	1
7. Professional dispensing gun 310 ml	B16H00-0024	1
8. EconoMax dispensing gun (310 ml cartridge & 580 ml tubular bag)	B16H00-0052	1
9. PowerMax dispensing gun (310 ml cartridge & 580 ml tubular bag)	B16H00-0053	1

General instructions

/ The cables, control lines, or conduits must be fastened on the cable trays and cable ladders or in support devices in accordance with the technical rules.
/ The cable support systems (cable trays and ladders) and the associated supports or fastenings must be made of steel and fastened on both sides of the through penetration firestop systems in such a manner that in the event of fire, additional mechanical stress cannot act on the through penetration firestop systems over the period of time specified by the required fire resistance class. In this regard, the technical rules and specifications provided by the manufacturer of the cable support system and of the fastening system must be complied with.
/ Cable trays and ladders may optionally be routed through the through penetration firestop system.
/ Conduits must be plugged with mineral wool on the ends so that it is smoke gas tight, or it must be sealed with ZZ-Mastic NE.
/ The total cross section area of the penetrating elements based on the area of the through penetration firestop system must not exceed 60 %.
/ The first support of the cables, cable trays or ladders or conduits must be mounted maximum 200 mm in front of the through penetration firestop system for wall and floor installation (maximum distance in floors only required top-side).

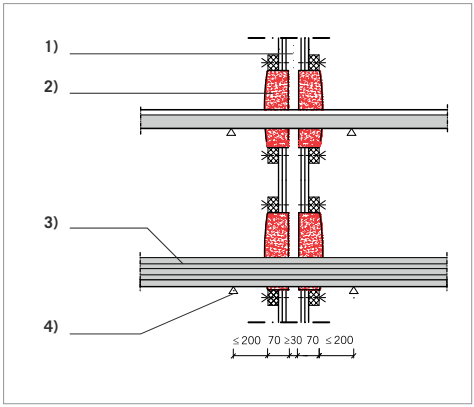


Fig. 1:
Support of cables/cable support systems in walls

Legend
1) Flexible wall
2) ZZ-Plug NE
3) Cables/cable support systems, conduits
4) First support of the cables/cable support systems, conduits

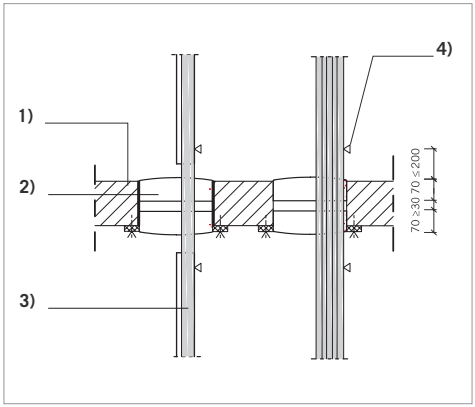


Fig. 2:
Support of cables/cable support systems in floors

Legend
1) Rigid floor
2) ZZ-Plug NE
3) Cables/cable support systems, conduits
4) First support of the cables/cable support systems, conduits

Permissible install locations of the through penetration firestop system

Components	Minimum thickness	Classification of the component	Fire resistance qualification *	Minimum seal thickness *	Maximum opening size
Rigid wall: Aerated concrete, concrete, reinforced concrete, masonry	100 mm	EN 13501-2	EI 120	170 mm or 200 mm	ø 250 mm
Flexible wall: Timber or steel studs lined on both sides	100 mm	EN 13501-2	EI 120	170 mm or 200 mm	ø 250 mm
Rigid floor: Aerated concrete, concrete, reinforced concrete	150 mm	EN 13501-2	EI 120	170 mm or 200 mm	ø 250 mm

* The required seal thickness depending on the fire resistance class and the penetrating element that is routed through is specified in the fire resistance classification table.

Approved penetrating elements

Cables

/ **Sheathed electrical cables, telecommunication cables, optical fibre cables** up to a maximum outer diameter of 80 mm
/ **Tied cable bundles** up to a total diameter of 100 mm consisting of sheathed electrical cables, telecommunication cables, optical fibre cables with a maximum outer diameter of 21 mm (sealing of the interstices in the interior is not necessary)
/ **Non-sheathed electrical cables** up to a maximum outer diameter of 24 mm

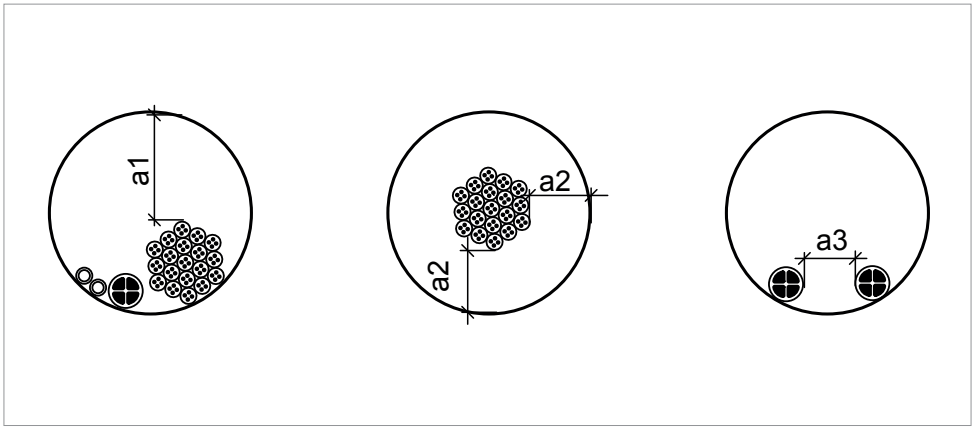
Control lines/conduits

/ **Conduits/pipes of steel** up to a maximum outer diameter of 16 mm with or without cables in the conduits/pipes
/ **Conduits/pipes of plastic** up to a maximum outer diameter of 16 mm with or without cables in the conduits/pipes

Cable support systems

/ Cable trays (perforated or non-perforated) of steel, optionally coated
/ Cable ladders of steel, optionally coated
/ Classification in accordance with EN 13501-1 at least A2-s1,d0

Minimum working clearances



Legend

a1: Penetrating element - top edge of aperture
a1: Penetrating element - lower or lateral edge of aperture
a3: Penetrating element - penetrating element

Minimum working clearances

Penetrating elements	a1	a2	a3
Cables, cable support systems and conduits	0 mm	0 mm	0 mm

Between two through penetration firestop systems of this approval	100 mm

Fire resistance classifications

Installation in flexible walls or rigid walls with a thickness ≥ 100 mm
or in rigid floors with a thickness ≥ 150 mm

	PENETRATING ELEMENTS	MINIMUM SEAL THICKNESS	
		170 mm	200 mm
Cables/ Cable trays and ladders	**Sheathed electrical cables, telecommunication cables and optical fibre cables** up to a maximum outer diameter of 21 mm	E 120 Walls: EI 90 / EI 120[1)] Floors: EI 120	E 120 Walls: EI 90 / EI 120[1)] Floors: EI 120
	Sheathed electrical cables, telecommunication cables, optical fibre cables up to a maximum outer diameter of 21 mm < Ø ≤ 50 mm	E 120 Walls: EI 90 Floors: EI 90 / EI 120[1)]	E 120 EI 90 / EI 120[1)]
	Sheathed electrical cables, telecommunication cables, optical fibre cables up to a maximum outer diameter of 50 mm < Ø ≤ 80 mm	E 120 Walls: EI 60 / EI 90[1)] Floors: EI 60	E 120 Walls: EI 90 Floors: EI 90 / EI 120[1)]
	Tied cable bundles up to a max. outer diameter of 100 mm consisting of sheathed electrical cables, telecommunication cables, optical fibre cables with a maximum outer diameter of 21 mm	E 120 EI 90	E 120 EI 90
	Non-sheathed electrical cables up to a maximum outer diameter of 17 mm	E 120 EI 90	E 120 EI 90
Conduits *	**Non-sheathed electrical cables** up to a maximum outer diameter of 24 mm	E 120 Walls: EI 60 Floors: EI 90	E 120 Walls: EI 60 Floors: EI 90
	Conduits/pipes of steel up to a maximum outer diameter of 16 mm with or without cables	E 120 Walls: EI 120 Floors: EI 90	E 120 Walls: EI 120 Floors: EI 90
	Conduits/pipes of plastic up to a maximum outer diameter of 16 mm with or without cables	E 120 EI 120	E 120 EI 120

1) The cables, cable bundles and cable support systems must be wrapped on both sides of the penetration seal with ZZ-Wrap NE.

* Beginning and end must be sealed smoke gas tight with ZZ-Mastic NE or mineral wool.

Particularities for installation in rigid walls and rigid floors

/ If the thickness of the rigid wall or rigid floor in the area of the through penetration firestop system is less than the required minimum seal thickness, then all around the opening, a board frame (see Fig. 3 & 4) of non-flammable drywall or silicate or calcium silicate boards (class A2-s1, d0 or A1 in accordance with EN 13501-1) must be provided, so that the ZZ-Plug NE completely rests on the board frame and the wall/floor.
/ For the fastening of the board frame (at least 50 mm wide) screws and metal anchors or screw anchors that are sufficiently large/long and suitable for the substrate must be used.

In aerated concrete dry-wall screws or chipboard screws without dowels must be used. At least four screws per board must be used.
/ The through penetration firestop system may be installed in apertures consisting of a pipe of PE-HD (EN 1519-1, EN 12201-2, EN 12666-1), ABS (EN 1455-1) or SAN+PVC (EN 1565-1) embedded flush in concrete (permanent formwork s. Fig 2)
/ Through penetration firestop systems in floors must be safeguarded against loads, particularly they must be safeguarded against being walked on, through a grate covering or enclosure.

Particularities for installation in flexible walls

/ In the area of the component opening, a board frame of non-flammable drywall, silicate or calcium silicate boards (class A2-s1, d0 or A1 in accordance with EN 13501-1) must be provided so that the ZZ-Plugs NE rest at least 60 mm on the board frame or wall planking. (s. Fig 1)
/ For the fastening of the board frame (at least 50 mm wide) dry-wall screws or chipboard screws that are sufficiently large/long must be used. At least four screws per board must be used.
/ The cavity between the boards of the flexible wall must be plugged tightly with mineral wool (melting point ≥ 1000 °C, minimum density 40 kg/m³) at least 10 cm around the perimeter.
/ For timber stud walls, at least a distance of 100 mm between the through penetration firestop system and timber studs must be present, and the cavity between must be plugged with mineral wool (classification A2-s1, d0 or A1 in accordance with EN 13501-1). The timber stud cross section should be at least 50 mm x 75 mm (width x depth).

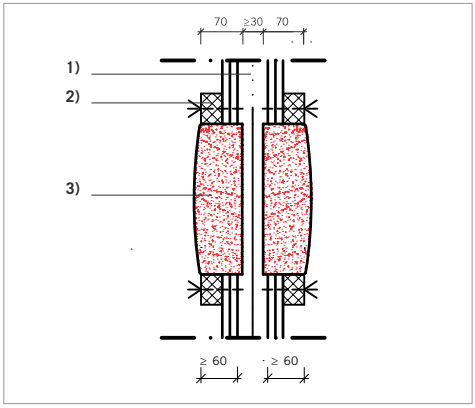


Fig. 1:
Board frame in flexible wall

Legend
1) Flexible wall
2) Board frame
3) ZZ-Plug NE

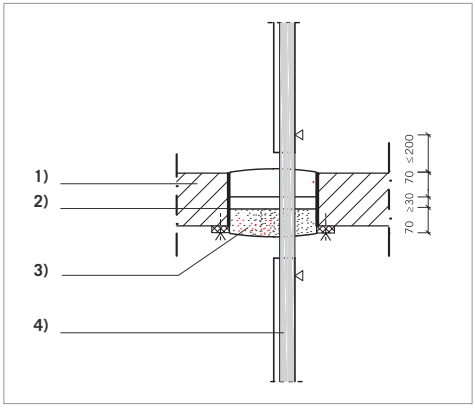


Fig. 2:
Installation in permanent formwork in rigid floor

Legend
1) Rigid floor
2) Permanent formwork (plastic pipe)
3) ZZ-Plug NE
4) Cables/cable support systems, conduits

Board frame

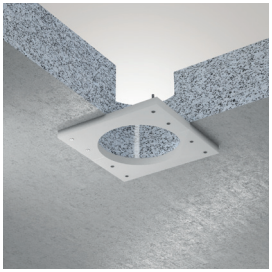
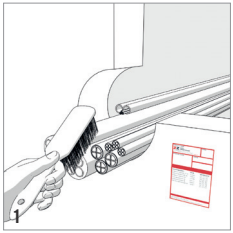
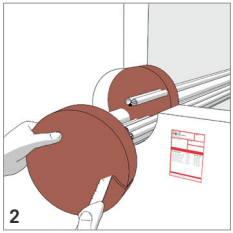


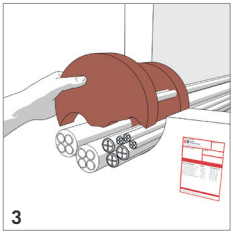
Fig. 3:
Board frame for rigid floor
(arranged either on one side or both sides)

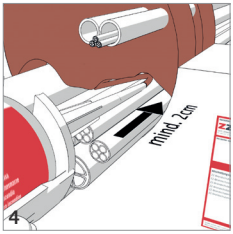
Fig. 4:
Board frame for rigid wall and flexible wall
(in rigid walls arranged either on one side or both sides)

Fig. 5:
Permanent formwork for rigid floor







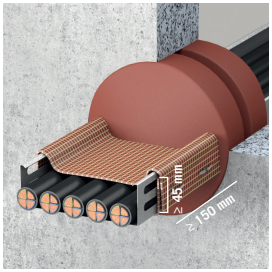


Installation steps

The approval, ETA-12/0088, and the respective national regulations are authoritive for execution of the through penetration firestop system.

1. Clean component opening.
2. Select the suitable size of the ZZ-Plug NE for the component opening (see system components). Cut two ZZ-Plugs NE to the appropriate size for the penetrating elements.
3. Insert the two ZZ-Plugs NE that have cut to size into the component opening so that they are tightly seated. The air gap between the two ZZ-Plugs NE has to be minimum 30 mm (seal thickness 170 mm) or minimum 60 mm (seal thickness 200 mm) (see table, Fire resistance classifications).
4. Interstices between cables and open joints must be filled with ZZ-Mastic NE at least 20 mm deep on both sides. Depending on the fire resistance classification it may be necessary to provide the cables or cable support systems with ZZ-Wrap NE (see Processing of ZZ-Wrap NE).

Processing of ZZ-Wrap NE



For cable penetration seals in some cases it is necessary to install ZZ-Wrap NE around the cables or cable support systems (see table, Fire resistance classifications):

/ Cut off a sufficient length of “ZZ-Wrap NE” and remove the white protective foil. Wrap one layer of ZZ-Wrap NE (150 mm wide) around the penetrating elements on both sides. The adhesive side must rest on the cables or the cable support systems. The glass fabric that serves as protection is on the outside.
/ The beginning and end of the ZZ-Wrap NE must be connected with at least two steel clips or steel wire (Ø 1 mm). The length of overlap must be at least 45 mm.
/ Multiple strips can also be arranged one after the other with an overlap of at least 45 mm. The butt joints must also be connected with steel clips or steel wire.

Retroactive installation of cables

/ Take the ZZ-Plugs NE out of the through penetration firestop system.
/ Cut the ZZ-Plugs NE to the appropriate size for the new penetrating cables, so that a sufficiently large opening is produced.
/ Reinsert the two ZZ-Plugs NE that have been cut to size into the component opening so that they are again tightly seated. Interstices between cables and open joints must be filled with ZZ-Mastic NE at least 20 mm deep on both sides.
/ Alternatively use a suitable cutting/drilling tool to make a sufficiently large opening in the through penetration firestop system (in compliance with the necessary protective measures and safety regulations).
/ Individual cables can be forced through ZZ-Plugs NE.
/ Interstices between cables and open joints must be filled with ZZ-Mastic NE at least 20 mm deep on both sides.
/ The newly added penetrating elements must satisfy all ETA requirements (for example, first support, if necessary, installation of ZZ-Wrap NE).

Tips

/ We recommend the knife with the wide or narrow serrated blade for optimal cutting of the ZZ-Fire protection products (see accessories).
/ After filling the interstices between the cables and open joints with ZZ-Mastic NE, these fillings can be smoothed with a brush moistened with water.
/ One-man installation is also possible for penetration seals in floors.
/ By cutting out a circular segment, ZZ-Plugs NE that are over-sized can easily be made to fit.
/ The through penetration firestop system can be painted over with off-the-shelf dispersion paint.

Supplemental national requirements

Germany

/ The through penetration firestop system must be permanently marked with an identification plate.
/ After the tasks have been concluded a written confirmation of conformance must be given to the client.

Product data ZZ-Foam plug NE

Reaction to fire in accordance with DIN EN 13501-1:	Class E
Transport/storage:	Dry, protected against dust and only in the original packaging
Air permeability:	$Q_{600} \leq 0.2$ m³/(h*m²) (at 600 Pa differential pressure) Test standard: EN 1026 (test specimen dimensions Ø 240 mm, seal thickness 150 mm, tested without penetrating elements)
Airborne sound insulation:	$D_{n,e,w}(C;C_{tr})$ = 68 (-2; -7) dB Test standard: EN ISO 717-1 (test specimen dimensions Ø 240 mm, seal thickness 150 mm, tested without penetrating elements)
Thermal conductivity:	λ = 0.103 W/(m*K), Test standard: DIN EN 12667
Resistance to static differential pressure:	P_{max} = 6500 Pa Test standard: In accordance with EN 12211 (test specimen dimensions Ø 240 mm, seal thickness 150 mm, tested without penetrating elements)

Testing the fire safety properties under environmental influences

Permissible ambient conditions:

In accordance with ETAG 026-2

Use category Z_1
Products for use in indoor areas with any level of humidity and temperatures above 0 °C

Declaration of performance

Links to the declaration of performance

System component	Link
ZZ-Plug NE	www.z-z.eu/dop-12-06
ZZ-Wrap NE	www.z-z.eu/dop-11-02
ZZ-Mastic NE	www.z-z.eu/dop-11-05

Impressum/ Legal notice

ZAPP-ZIMMERMANN GmbH
Marconistraße 7-9
50769 Köln

Phone: +49 221 97061-0
Fax: +49 221 97061-929
E-mail: info@z-z.eu
Internet: www.z-z.eu

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