

INNOVATIVE  
FIRE-PROTECTION  
SYSTEMS



# TABLE OF CONTENTS

<b>COMPANY</b>	<b>3-10</b>
Introduction	3
Credentials	4
Certified Safety	5
Approval Overview	6
<b>ETA SYSTEMS</b>	<b>11-28</b>
<b>MIXED PENETRATION SEAL</b>	
<b>ZZ® M30</b>	12
<b>ZZ® M20</b>	14
<b>CABLE PENETRATION SEAL</b>	
<b>ZZ® C10</b>	16
<b>ZZ® C30</b>	18
<b>ZZ® C31</b>	20
<b>PIPE PENETRATION SEAL</b>	
<b>ZZ® P40</b>	22
<b>JOINT SEAL</b>	
<b>ZZ® G30</b>	24
<b>ZZ® G50</b>	26
<b>UL SYSTEMS</b>	<b>29-46</b>
UL– Trough Penetrations Numbering System	30
UL Systems ZAPP-ZIMMERMANN	31
<b>TROUGH PENETRATION FIRESTOP SYSTEMS</b>	
<b>ZZ® 360</b> Fire Protection Foam	32
<b>ZZ® 260</b> Fire Protection Block	36
<b>ZZ® 160</b> Fire Protection Plug	40
<b>ZZ® 365</b> Fire Protection Sealant	44
<b>SYSTEM COMPONENTS &amp; ACCESSORIES</b>	<b>47-62</b>
<b>INDUSTRIAL SOLUTIONS</b>	<b>63-75</b>
<b>IMPRINT</b>	



## INNOVATIVE FIRE-PROTECTION SYSTEMS FOR MORE THAN 30 YEARS

ZAPP-ZIMMERMANN has been offering innovative fire safety systems since 1990, specialising in the areas of cable, pipe and combination penetration seals, as well as firestop joint seals. In addition to our proven product line of intumescent moulded parts made of PU Fire Protection Foam, we also offer other construction materials, such as silicone and acrylic for civil engineering, tunnel construction, shipbuilding, and rail vehicles.

For the above reasons, our customers in industry and in administrative, telecommunications or transport sectors have decided in favour of ZAPP-ZIMMERMANN fire protection solutions. Our large team of experts can put its vast expertise to work for you, providing you with the required consulting and training services. We have made it a principle of our corporate culture that excellent quality and product safety must be paired with excellent service.

In the course of harmonising fire safety in Europe, ZAPP-ZIMMERMANN GmbH tests its fire safety systems in accordance with the European test standards to obtain European Technical Assessments.

ZAPP-ZIMMERMANN also tests the successful firestop products according to the American standards ASTM E814 (UL 1479) to obtain UL classified firestop systems.

**We invite you to profit from our many years of experience and know-how in structural fire engineering and to make use of specialist's tried-and-trusted products.**



## CREDENTIALS



### Medicine

- University Medical Center Düsseldorf
- University Medical Center (Goethe), Frankfurt



### Management

- Allianz Deutschland AG
- Deutsche Telekom AG
- Deutsche Rentenvers. Bund
- Deutsche Rentenvers. Land



### Transport

- Cologne/Bonn Airport
- Munich Airport
- Berlin-Brandenburg Airport
- Düsseldorf Airport
- Frankfurt Airport
- Kölner Verkehrs-Betriebe AG
- Deutsche Bahn AG



### Industry

- Audi AG
- Ford AG
- Bayer AG
- Lanxess AG
- Evonik Industries AG
- Siemens AG
- ThyssenKrupp AG

## CERTIFIED SAFETY



ZAPP-ZIMMERMANN GmbH is a company certified in accordance with DIN ISO 9001. Successful annual surveillance audits, conducted by TÜV Rheinland, demonstrate the high priority placed on quality management in our company and our ongoing commitment to the highest quality.



Moreover, all of our tested and certified products are subject to regular external monitoring by the materials testing institutes, MPA Stuttgart and MPA Braunschweig. Employees of the materials testing institutes inspect the self-monitoring data and take product samples that are tested in the laboratory of the materials testing institute. Thus, you can be sure that all products always satisfy the specifications of the general technical approvals and assessments.



Our European approved products have a certificate of conformity or a certificate of constancy of performance issued by MPA Braunschweig and are CE marked. With that it is verified and confirmed that the products have been subjected to initial inspection, and are subjected to factory production control. In addition, an external inspection takes place yearly.



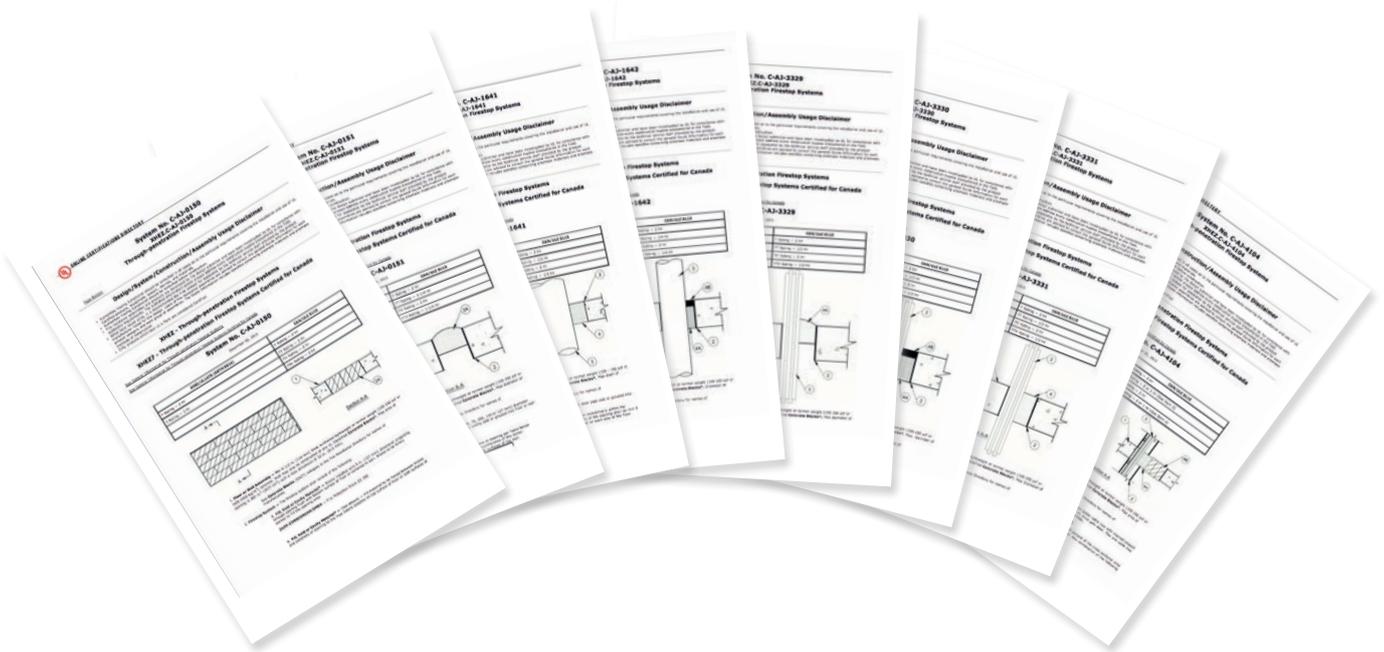
UL (Underwriters Laboratories) is an independent organization that inspects and certifies products with respect to safety. ZAPP-ZIMMERMANN has 15 applications listed in the UL directory. UL also inspects the manufacturer's production facilities unannounced at irregular intervals.



## EUROPEAN TECHNICAL ASSESSMENTS

The European Organisation for Technical Assessments (EOTA) was founded in the course of European harmonization. This organisation works out the fundamentals for granting European Technical Assessments (ETA). All European assessment bodies are represented in the EOTA (OIB, DIBt, etc.).

The assessment bodies issue European Technical Assessments for systems, which have to be tested in laboratories of notified test bodies. Through the introduction of ETAs, European test standards and uniform classifications fire-protection systems can be used throughout Europe. Each Member State is free to specify its level of safety in the construction sector, as well as the requisite fire resistance classifications.



## UL SYSTEMS

There is a UL promulgated system for each of our ZAPP-ZIMMERMANN Fire Stop Systems applications according to ASTM E 814 (ANSI/UL 1479) “Standard Test Method for Fire Tests of Through-Penetration Fire Stops.” A firestop system is a very specific, tested combination of the following parameters: substrate (wall or floor) and its specific properties (e.g., material, fire rating, thickness), penetrating items, hole size and/or materials used to seal the hole.

To evaluate firestop systems’ compliance with the US and Canadian codes, they are frequently tested by independent third-party test labs such as UL (Underwriters Laboratories) and ULC (Underwriters Laboratories of Canada). Successfully passing the test results in a UL promulgated firestop system. The last item above—the individual devices and/or materials used to seal the hole, colloquially referred to as firestopping—is a UL Classified or Certified product for the application.



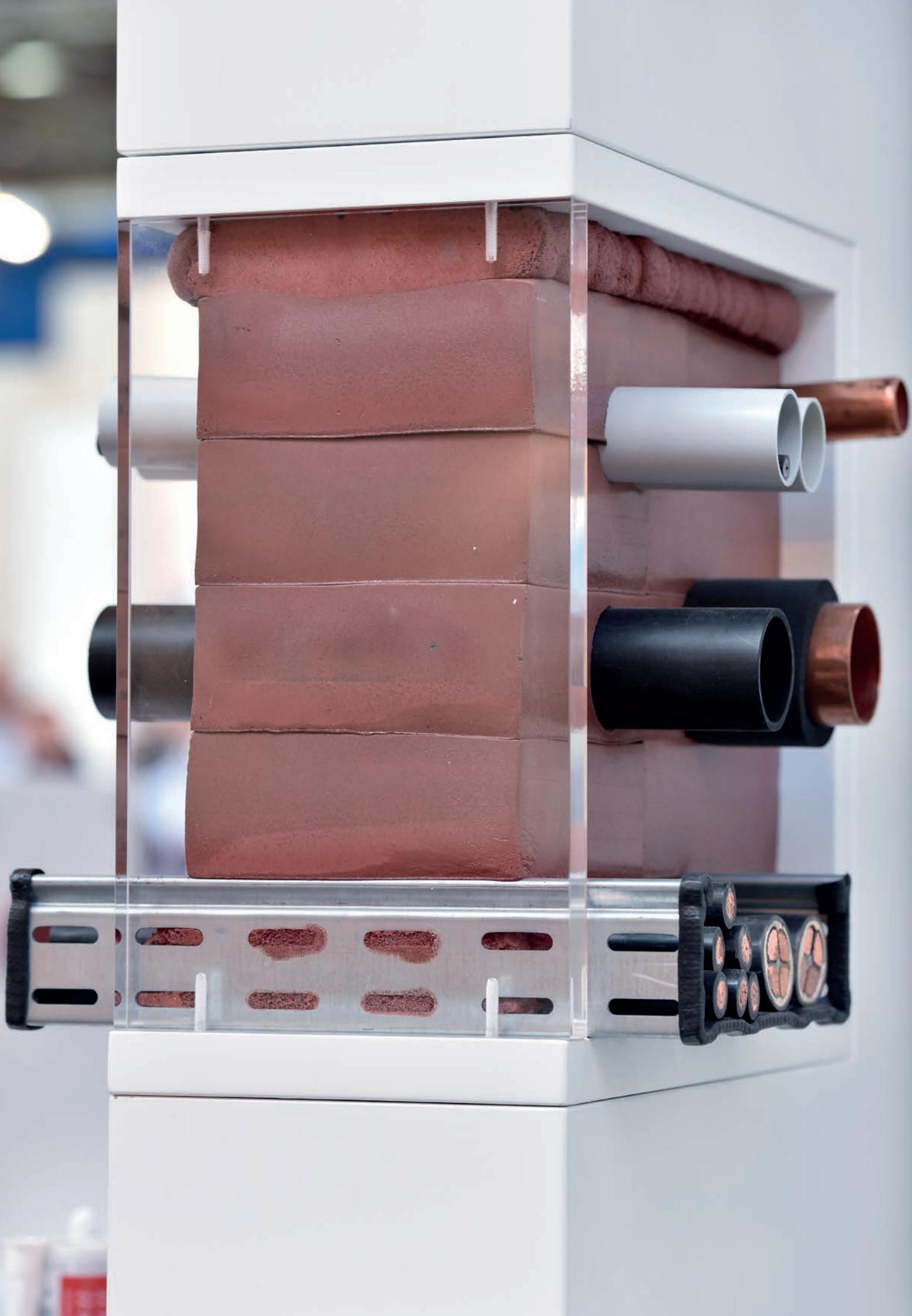
## CIVIL DEFENCE

The Civil Defence is an Emergency Management Organisation of Dubai, United Arab Emirates. The Dubai Civil Defence (DCD) and Abu Dhabi Civil Defence (ADCD) is a government organization under the Ministry of Interior of Dubai and Abu Dhabi. The fire department of DCD and ADCD is responsible for issuing local approvals (mentioned in the approval card) according to the international standards of UL ASTM E 814 (ANSI/UL 1479) and EN 13501-1 / 2.



## NATIONAL APPROVALS

In Germany, all our ZAPP-Zimmermann fire protection systems are approved by the German Institute for Construction Technology (DIBt). After passing the test, the Test report is submitted to the DIBt, after which a general type approval (aBG) is granted for the tested system. We have additional approvals for our fire protection systems for Switzerland (VKF) and Great Britain (Warrington Fire).



ETA SYSTEMS



## ZZ<sup>®</sup> M30 ETA-11/0206

### Application information

Mixed penetration seal or cable penetration seal up to EI 120 for rigid walls, rigid floors and flexible walls. Through penetration firestop system for electrical cables, telecommunication cables and optical fibre cables, conduits, as well as combustible and non-combustible pipes.

### Specific details

- ✓ Fast and easy sealing of openings
- ✓ Openings with many penetrating elements
- ✓ Openings that are difficult to access or that are irregular
- ✓ Easy retroactive-installation
- ✓ Single-product solution
- ✓ Fast and clean work

### Approved penetrating elements

- / **Sheathed electrical cables, telecommunication cables, optical fibre cables** up to an 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 between cables is not necessary)
- / **Non-sheathed electrical cables** up to a maximum outer diameter of 24 mm
- / **Individual lines of steel or plastic conduits** for control purposes up to a pipe outer diameter of 16 mm
- / **Cable support systems** (cable trays, cable racks, cable ladders) made of steel profiles can be routed through the penetration seal
- / **P-HD ducts for fibre optic or copper cables (speedpipes)**, up to Ø 12 mm each and bundles up to Ø 80 mm
- / **Plastic conduits** up to an outer diameter of 63 mm, bundles of multiple pipes up to an outer diameter of 100 mm
- / **Combustible pipes** with a pipe outer diameter up to 110 mm. No collar needed up to Ø 50 mm. From Ø >51 to 110 mm with additional **ZZ<sup>®</sup> 430-UNI-110 Fire Protection Collar**. Variations regarding kind of plastic and pipe wall thickness are described within the ETA.
- / **Pipes of steel, stainless steel, cast steel and copper** with a pipe outer diameter up to 88.9 mm and pipe wall thicknesses from 1.0 mm to 14.2 mm, pipes up to a diameter of 28 mm can optionally be sealed without insulation
- / **Pipes of steel, stainless steel and cast steel** with an outer pipe diameter of up to 168.3 and pipe wall thickness from 2.6 mm to 14.2 mm. Pipes of steel, stainless steel and cast steel up to an outer diameter of 35 mm can optionally be sealed without insulation.
- / **Insulation of non-combustible pipes, consisting of mineral wool shells** (density  $\geq 90 \text{ kg/m}^3$ ) can either be routed through the penetration seal or can end on the surface of the sealing system
- / **Rubber insulation AF/Armaflex of non-combustible pipes** can be routed through the penetration seal
- / **Non-combustible pre-insulated metal pipes** for air conditioners, heating and sanitary systems of type "WICU<sup>®</sup> Flex", "WICU<sup>®</sup> Frio", "WICU<sup>®</sup> Clim", "WICU<sup>®</sup> Eco", "Tubolit<sup>®</sup> Split" and "Tubolit<sup>®</sup> DuoSplit" with PE or PUR insulation can be fed through the penetration seal (areas of application, insulation thicknesses and possibly additional **ZZ<sup>®</sup> 451-150 Fire Protection Wrap**).
- / **Sealing system thicknesses from 100 mm** depending on the penetrating element and fire resistance classes
- / **Combination possibility with ZZ<sup>®</sup> 230-144 Fire Protection Block** in areas free of penetrating elements within the through penetration firestop system

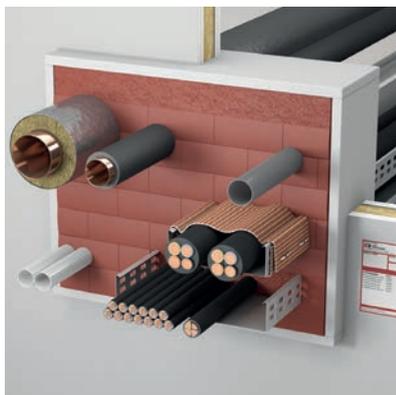
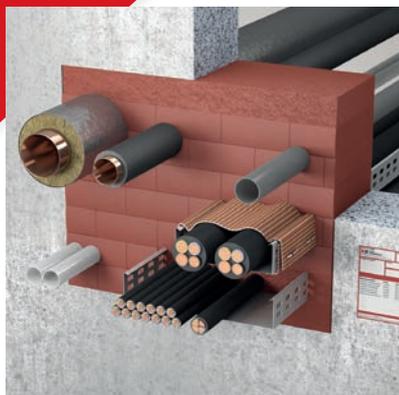
**Install locations and dimensions**

	Rigid wall	Rigid floor	Flexible wall
Maximum dimensions of the through penetration firestop system widthxheight [mm]	450x500	450x450	450x500
Minimum wall and floor thicknesses (Component thickness) [mm]	100	150	100

**System components**

Product	Designation	Art. no.	PU
	<b>ZZ® 330 Fire Protection Foam, 6pc.-set</b> 6 x 380 ml cartridge, incl. accessories, 12 x Mixing Nozzle 2K, 1 x Duct Tape, 6 x pairs of gloves	B15N01-0106	1
	<b>ZZ® 330 Fire Protection Foam Starter-Kit</b> 1 x 380 ml cartridge, 1 x Cartridge Gun EasyMax 2K, incl. accessories, 2 x Mixing Nozzle 2K, 1 x Identification Plate ETA	B15VP1-0106	60
	<b>ZZ® 330 Fire Protection Foam</b> 380 ml cartridge, 2 x Mixing Nozzle 2K	B16N00-0125	1
	<b>ZZ® 230-144 Fire Protection Block</b> 200 x 144 x 60 mm	B15V01-0001	1
		B01V01-0004	1
		B01V04-0003	4
		B01V18-0001	18
	<b>ZZ® 451-150 Fire Protection Wrap</b> width 150 mm, 5 m roll	B04N00-0004	1
	<b>ZZ® 430-110 Fire Protection Collar</b> for pipe-Ø 50, 75, 90 and 110 mm	B16N01-0003	1
	<b>Identification Plate ETA</b> for European Technical Assessment Systems	B16H00-0051	1

Accessories see chapter System components &amp; Accessories



## ZZ<sup>®</sup> M20 ETA-10/0431

### Application information

Mixed penetration seal up to EI 120 for rigid walls, rigid floors and flexible walls. Through penetration firestop system for electrical cables, telecommunication cables and optical fibre cables, conduits, P-HD ducts for fibre optic and waveguide cables as well as combustible and non-combustible pipes.

### Specific details

- ✓ **Medium-sized and large penetration seals with a medium to high density of penetrating elements**
- ✓ **Through penetration firestop systems with frequently changing penetrating elements**
- ✓ **If the ZZ<sup>®</sup> 230 Fire Protection Block is installed transversely (seal thickness 144 mm) a through penetration firestop system of fire resistance class EI 60 can be produced.**
- ✓ **If ZZ<sup>®</sup> 230 Fire Protection Block are installed lengthwise (penetration seal thickness 200 mm), a fire resistance class up to EI 120 can be assigned to the through penetration firestop systems (depending on the existing penetrating elements and, if necessary, with the use of ZZ<sup>®</sup> 451-150 Fire Protection Wrap).**
- ✓ **In areas with a high number of penetrating elements, ZZ<sup>®</sup> 230 Fire Protection Block can be used for closure.**

### Approved penetrating elements

- / **Sheathed electrical cables, telecommunication cables, optical fibre cables** up to an 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 between cables is not necessary)
- / **Non-sheathed electrical cables** up to a maximum outer diameter of 24 mm
- / **Individual lines of steel or plastic conduits** for control purposes up to a pipe outer diameter of 16 mm
- / **Cable support systems** (cable trays, cable racks, cable ladders) made of steel profiles can be routed through the penetration seal
- / **Plastic conduits** up to an outer diameter of 63 mm, bundles of several pipes up to an outer diameter of 100 mm
- / **P-HD ducts for fibre optic or copper cables (speedpipes)**, up to Ø 12 mm each and bundles up to Ø 80 mm
- / **Waveguides** up to Ø 59,9 mm
- / **Metal pipes** for air conditioner up to Ø 54 mm
- / **Foamglas-PSH insulated metal pipes**
- / **Combustible pipes** with a pipe outer diameter up to 110 mm. No collar needed up to Ø 50 mm. From Ø >51 to 110 mm with additional **ZZ<sup>®</sup> 430-UNI-110 Fire Protection Collar**. Variations regarding kind of plastic and pipe wall thickness are described within the ETA.
- / **Non-combustible pipes of steel, stainless steel, cast steel and copper** with a pipe outer diameter up to 88.9 mm and pipe wall thicknesses from 1.0 mm to 14.2 mm, pipes up to a diameter of 18 mm can optionally be sealed without insulation
- / **Pipes of steel, stainless steel and cast steel** with an outer pipe diameter up to 168.3 and pipe wall thickness from 2.6 mm to 14.2 mm. Pipes of steel, stainless steel and cast steel up to an outer diameter of 35 mm can optionally be sealed without insulation.
- / **Insulation of non-combustible pipes consisting of mineral wool shells** (density  $\geq 90$  kg/m<sup>3</sup>) can either be routed through the penetration seal or can end on the surface of the sealing system
- / **Rubber insulation of non-combustible pipes** (AF/Armaflex) can be routed through the penetration seal
- / **Combination possibility with ZZ<sup>®</sup> 330 Fire Protection Foam** in areas with dense penetrating elements and difficult accessibility

**Install locations and dimensions**

	Rigid wall	Rigid floor	Flexible wall
Maximum dimensions of the through penetration firestop system width x height [mm]	1000 x 600 or 600 x 1000	1000 x 600 or to 375 x unlimited (see ETA-10/0431 for details)	1000 x 600 or 600 x 1000
Minimum wall and floor thicknesses (Component thickness) [mm]	100	150	100

**System components**

Product	Designation	Art. no.	PU
	<b>ZZ® 230-144 Fire Protection Block</b> 200 x 144 x 60 mm	B01V01-0004	1
		B01V04-0003	4
		B01V18-0001	18
	<b>ZZ® 230-144-V Fire Protection Block</b> 200 x 144 x 60 mm, vacuum-packed	B01V02-0003	2
		B01V07-0001	7
	<b>ZZ® 230-144-S Fire Protection Block</b> 200 x 144 x 60 mm, silicone-coated	B01V04-0007	4
		B01V18-0003	18
	<b>ZZ® 330 Fire Protection Foam, 6pc.-set</b> 6 x 380 ml cartridge, incl. accessories, 12 x Mixing Nozzle 2K, 1 x Duct Tape, 6 x pairs of gloves	B15N01-0106	1
		B15VP1-0106	60
	<b>ZZ® 333 Fire Protection Mastic</b> 310 ml cartridge	B15N00-0013	1
		B15VP1-0013	900
	<b>ZZ® 451-150 Fire Protection Wrap</b> width 150 mm, 5 m roll	B04N00-0004	1
	<b>ZZ® 430-110 Fire Protection Collar</b> for pipe-Ø 50, 75, 90 and 110 mm	B16N01-0003	1
	<b>Identification Plate ETA</b> for European Technical Assessment Systems	B16H00-0051	1

Accessories see chapter System components &amp; Accessories



## ZZ<sup>®</sup> C10 ETA-12/0088

### Application information

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

### Specific details

- ✓ Coredrill holes up to 240 mm in diameter in rigid walls and floors
- ✓ Through penetration firestop systems with frequently changing penetrating elements

### Approved penetrating elements

- / **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
- / **Individual lines of steel or plastic conduits** for control purposes up to a pipe outer diameter of 16 mm
- / **Plastic conduits** up to an outer diameter of 16 mm
- / **Cable support systems** (cable trays, cable racks, cable ladders) made of steel profiles can be routed through the penetration seal

**Install locations and dimensions**

	Rigid wall	Rigid floor	Flexible wall
Maximum dimensions of the through penetration firestop system [mm]	Ø 240	Ø 240	Ø 240
Minimum wall thicknesses (Component thickness) [mm]	100	150	94

**System components**

Product	Designation	Art. no.	PU
	<b>ZZ® 130 Fire Protection Plug</b>	see variants	
	<b>ZZ® 451-150 Fire Protection Wrap</b> width 150 mm, 5 m roll	B04N00-0004	1
	<b>ZZ® 333 Fire Protection Mastic</b> 310 ml cartridge	B15N00-0013 B15VP1-0013	1 900
	<b>Identification Plate ETA</b> for European Technical Assessment Systems	B16H00-0051	1

Product	Variants	Max. opening diameter [mm]	Art. no.	PU
	<b>ZZ® 130-65 Fire Protection Plug</b> nominal-Ø 65 mm	65	B02V02-0009	2
			B02V04-0006	4
			B02V20-0008	20
	<b>ZZ® 130-78 Fire Protection Plug</b> nominal-Ø 78 mm	78	B02V02-0010	2
			B02V04-0007	4
			B02V20-0009	20
	<b>ZZ® 130-107 Fire Protection Plug</b> nominal-Ø 107 mm	104	B02V02-0011	2
			B02V04-0008	4
			B02V20-0010	20
	<b>ZZ® 130-122 Fire Protection Plug</b> nominal-Ø 122 mm	118	B02V02-0012	2
			B02V04-0009	4
			B02V20-0011	20
	<b>ZZ® 130-134 Fire Protection Plug</b> nominal-Ø 134 mm	128	B02V02-0013	2
			B02V04-0010	4
			B02V20-0012	20
	<b>ZZ® 130-165 Fire Protection Plug</b> nominal-Ø 165 mm	160	B02V02-0014	2
			B02V20-0013	20
	<b>ZZ® 130-200 Fire Protection Plug</b> nominal-Ø 200 mm	194	B02V02-0015	2
B02V10-0004			10	
<b>ZZ® 130-250 Fire Protection Plug</b> nominal-Ø 250 mm	240	B02V02-0016	2	
		B02V10-0002	10	

Accessories see chapter System components &amp; Accessories



## ZZ<sup>®</sup> C30 ETA-13/0093

### Application information

Cable penetration seal up to EI 120 for rigid walls, rigid floors and flexible walls.  
Through penetration firestop system for all types of sheathed cables except waveguides.

### Specific details

- ✓ Fast, easy and cost-effective
- ✓ ZZ<sup>®</sup> 333 Fire Protection Mastic has a high level of stability
- ✓ Flammable backfill is possible
- ✓ Low filling depth
- ✓ Can be used in flexible wall without additional lining

### Approved penetrating elements

- / Sheathed electrical cables, telecommunication cables, data cables and optical fibre cables except waveguides up to a maximum outer diameter of 21 mm
- / Retrofitting of additional cables allowed

**Install locations and dimensions**

	Rigid wall	Rigid floor	Flexible wall
<b>Maximum dimension of the through penetration firestop system width x height or Ø [mm]</b>			
EI 30/ EI 60/ EI 90/ EI 120	100 x 100 / Ø 113	100 x 100 / Ø 113	100 x 100 / Ø 113
<b>Minimum installation depth (penetration seal thickness) [mm]</b>			
EI 30/ EI 60/ EI 90	100	150	100
EI 120	150	150	150
<b>Minimum fill depth (per side) [mm]</b>			
EI 30/ EI 60/ EI 90	15	15	15
EI 120	50	50	50
<b>Minimum wall thicknesses and floor thicknesses (component thickness) [mm]</b>			
EI 30/ EI 60/ EI 90/ EI 120	100	150	100

**System components**

Product	Designation	Art. no.	PU
	<b>ZZ® 333 Fire Protection Mastic</b> 310 ml cartridge	B15N00-0013	1
		B15VP1-0013	900
	<b>Identification Plate ETA</b> for European Technical Assessment Systems	B16H00-0051	1

Accessories see chapter System components &amp; Accessories



## ZZ<sup>®</sup> C31 ETA-13/0123

### Application information

Cable penetration seal up to EI 120 for rigid walls, rigid floors and flexible walls.  
Through penetration firestop system for all types of sheathed cables except waveguides.

### Specific details

- ✓ Fast and easy sealing of openings
- ✓ Openings that are difficult to access and irregular
- ✓ Penetration seals in the outdoor area
- ✓ Small penetration seals
- ✓ Fast, easy and cost-effective, and excellently suited for through penetration firestop systems in outdoor areas
- ✓ ZZ<sup>®</sup> 345 Fire Protection Silicone has a high level of stability
- ✓ Flammable backfill is possible
- ✓ Low filling depth
- ✓ Can be used in flexible wall without lining

### Approved penetrating elements

- / Sheathed electrical cables, telecommunication cables, data cables and optical fibre cables except waveguides up to a maximum outer diameter of 21 mm
- / Retrofitting of additional cables allowed
- / Intended for use in conditions exposed to weathering, Category Type X

**Install locations and dimensions**

	Rigid wall	Rigid floor	Flexible wall
<b>Maximum dimension of the through penetration firestop system width x height or Ø [mm]</b>			
EI 30/ EI 60/ EI 90	100 x 100 / Ø 113	100 x 100 / Ø 113	100 x 100 / Ø 113
EI 120	-	100 x 100 / Ø 113	-
<b>Minimum installation depth (penetration seal thickness) [mm]</b>			
EI 30/ EI 60/ EI 90	150	150	150
EI 120	-	150	-
<b>Minimum fill depth (per side) [mm]</b>			
EI 30/ EI 60/ EI 90	15	15	15
EI 120	-	15	-
<b>Minimum wall thicknesses and floor thicknesses (component thickness) [mm]</b>			
EI 30/ EI 60/ EI 90/ EI 120	100	150	100
EI 120	-	150	-

**System components**

Product	Designation	Art. no.	PU
	<b>ZZ® 345-C Fire Protection Silicone</b> 310 ml cartridge	B15H00-0001	1
	<b>ZZ® 345-TB Fire Protection Silicone</b> 580 ml tubular bag	B15H00-0002	1
	<b>Identification Plate ETA</b> for European Technical Assessment Systems	B16H00-0051	1

Accessories see chapter System components &amp; Accessories



## ZZ<sup>®</sup> P40 ETA-13/0117

### Application information

Pipe penetration seal up to EI 120 for rigid walls, rigid floors and flexible walls.  
Through penetration firestop system for combustible pipes.

### Specific details

**ZZ<sup>®</sup> 430 Fire Protection Collar can be used for surface or as embedded installation.**

**Surface mounted: Pipe penetration seal of combustible pipes for retroactive installation**

- ✓ Through penetration firestop system for combustible pipes up to Ø 160 mm
- ✓ Retroactive installation of the pipe penetration seal on pipes that have already been embedded in concrete
- ✓ The fastening tabs are on the collar sheet metal

**Embedded installation: Pipe penetration seal of combustible pipes for direct installation**

- ✓ Through penetration firestop system for combustible pipes up to Ø 160 mm
- ✓ Direct installation of the fire protection collar together with the pipes
- ✓ Alternatively the fire protection collar can be fitted onto the component and fastened

### Approved penetrating elements

/ **Polyvinyl chloride pipes** that are free of softeners (PVC-U) in accordance with EN 1329-1, EN 1453-1, EN 1452-1, as well as DIN 8061/8062, and pipes of chlorinated polyvinyl chloride (PVC-C), in accordance with EN 1566-1 up to an outer diameter of 160 mm are permissible.

/ **Pipes of polyethylene (PE)** in accordance with EN 1519-1, EN 12666-1, EN 12201-2, as well as DIN 8074/8075, pipes of acrylonitrile butadiene styrene (ABS) in accordance with EN 1455-1 and pipes of styrene/copolymer blends (SAN + PVC) in accordance with EN 1565-1 up to an outer diameter of 160 mm are permissible.

/ **Insulated multi-layer composite pipes** permissible with AF/Armaflex, "Uponor Uni Pipe PLUS" up to an outer diameter of 32 mm and "Uponor MLC" up to an outer diameter of 110 mm

/ The detailed permissible pipe dimensions (pipe outside diameter, pipe wall thickness) depend on the selected installation variant. Details, see Fire resistance classifications of the ETA-13/0117

### Install locations and dimensions

Components	Min. thickness	Classification of the component	Fire resistance classification *	Permissible pipe diameter *
<b>Rigid wall</b> aerated concrete, concrete, reinforced concrete, masonry	100 mm	EN 13501-2	EI 120	up to 160 mm
<b>Flexible wall</b> timber or steel studs lined on both sides	100 mm	EN 13501-2	EI 120	up to 160 mm
<b>Rigid floor</b> aerated concrete, concrete, reinforced concrete	150 mm	EN 13501-2	EI 120	up to 160 mm

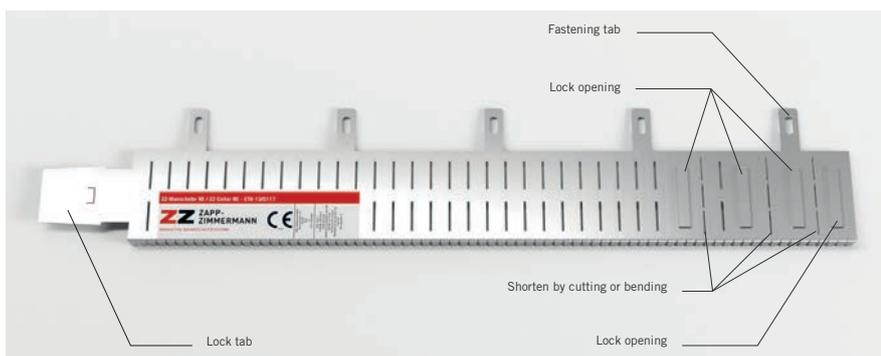
\* Details, see fire resistance classifications at ETA-13/0117

### System components

Product	Designation	Art. no.	PU
	<b>ZZ® 430 Fire Protection Collar</b>	see variants	1
	<b>Identification Plate ETA</b> for European Technical Assessment Systems	B16H00-0051	1

Product	Variants	Art. no.	PU
	<b>ZZ® 430-32 Fire Protection Collar</b> for pipe-Ø 32 mm	B16N01-0001	1
	<b>ZZ® 430-40 Fire Protection Collar</b> for pipe-Ø 40 mm	B16N01-0002	1
	<b>ZZ® 430-110 Fire Protection Collar</b> for pipe-Ø 50, 75, 90 and 110 mm	B16N01-0003	1
	<b>ZZ® 430-160 Fire Protection Collar</b> for pipe-Ø 125, 140, 150 and 160 mm	B16N01-0004	1

Accessories see chapter System components & Accessories



From the **ZZ® 430-110 Fire Protection Collar** and **ZZ® 430-160 Fire Protection Collar**, in addition three sizes can be produced by cutting or bending to size. For this purpose there are slots in the collar sheet metal (3 slots, see photo) that mark the point for cutting or bending.

### Collar types

Designation	Compatible pipe outside diameters [mm]	Thickness of the intumescent inlay [mm]	Width [mm]
<b>ZZ® 430-32 Fire Protection Collar</b> for pipe-Ø 32 mm	32	7	70
<b>ZZ® 430-40 Fire Protection Collar</b> for pipe-Ø 40 mm	40	7	70
<b>ZZ® 430-110 Fire Protection Collar</b> for pipe-Ø 50, 75, 90 and 110 mm	50, 75, 90, 110	7	70
<b>ZZ® 430-160 Fire Protection Collar</b> for pipe-Ø 125, 140, 150 and 160 mm	125, 140, 150, 160	12	80



## ZZ® G30 ETA-12/0118

### Application information

**ZZ® 345 Fire Protection Silicone** is suitable for sealing expansion joints in walls and floors that simultaneously must also satisfy fire protection requirements.

### Specific details

**Building construction joint in accordance with ISO 11600 and fire resistance classification up to EI 120**

- ✓ **Outdoor use suitability, Class ISO 11600-F-12.5 E**
- ✓ **Joint width up to 40 mm and 25% movement capability**
- ✓ **Backfill with the usual PE round cords or mineral wool**

### Approved penetrating elements

**/ Minimal fill depth:** Expansion joints can be sealed with a fill of  $\geq 5$  mm on one side and mineral wool backfill up to a joint width of 40 mm. As backfill material, not only mineral wool, but also PE and PUR can be used depending on the application. Mineral wool can be processed quickly and easily due to its low density of 40 kg/m<sup>3</sup>. With the minimal fill depths of **ZZ® 345 Fire Protection Silicone** and lower density of the mineral wool, the processor saves time and money.

**/ Application in building construction joints:** Through the verification in accordance with DIN EN ISO 11600 the fire protection silicone is suitable for outdoor use in building construction joints. As specified in the verification, **ZZ® 345 Fire Protection Silicone** satisfies the class F 20 LM requirements. Expansion and movement joints with up to 20% mechanically induced expansion remain permanently sealed, even under demanding climatic conditions (e.g. temperatures to  $-20^{\circ}\text{C}$ ).

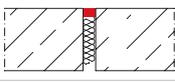
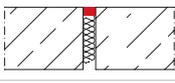
**/ Fire resistance:** Reaction to fire is classified as flame-retardant in accordance with DIN 4102-B1, and in addition satisfies the class E requirements in accordance with EN 13501-1. Due to the European technical approval ETA-12/0118, joint seals with **ZZ® 345 Fire Protection Silicone** can be classified up to a fire resistance class of EI 180. The fire protection properties also remain intact when used in outdoor areas, this has been tested through tests in accordance with ETAG 026-3 and is reflected in the use category X.

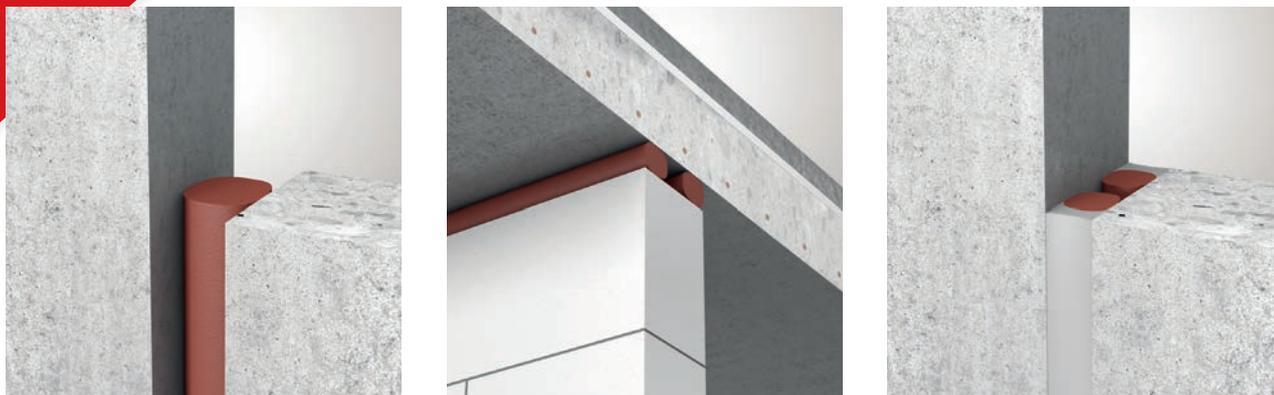
### System components

Product	Designation	Art. no.	PU
	<b>ZZ® 345-C Fire Protection Silicone</b> 310 ml cartridge	B15H00-0001	1
	<b>ZZ® 345-TB Fire Protection Silicone</b> 580 ml tubular bag	B15H00-0002	1

Accessories see chapter System components & Accessories

### Permissible install locations of the firestop joint seal

ZZ® G30	Installation	Installation	Thickness [mm]	Classification	Joint width [mm]	Movement [%]
		Double-sided seal, Backfill with PE/PUR round cord or mineral wool	Wall ≥ 100 Floor ≥ 150	EI15–EI120	5–40	± 7.5 Expansion (rigid joint)
		Single- or double-sided seal, Backfill with mineral wool	Wall ≥ 100 Floor ≥ 150	EI15–EI180	5–40	± 7.5 Expansion (rigid joint)
		Single- or double-sided seal, Backfill with mineral wool	Wall ≥ 150 Floor ≥ 150	EI15–EI120	5–40	± 25 Expansion or shear



## ZZ® G50 ETA-12/0119

### Application information

For moving joints in solid walls and floors for temporary or permanent preservation of fire resistance.

### Specific details

- ✓ Joint width up to 75 mm
- ✓ Up to 25% movement capability
- ✓ One product solution and application from one side

### Approved penetrating elements

- / **Parting and expansion joints** of large-surface solid components with a fire resistance class up to EI 120.
- / **One single product solution** ensures effective fire protection.

Additional custom solutions are permissible for other requirements such as appearance and humidity.

### System components

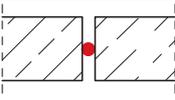
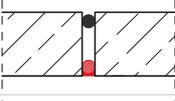
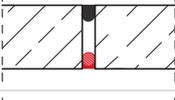
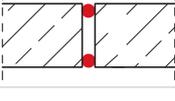
Product	Designation	Art. no.	PU
	<b>ZZ® 530 Fire Protection Joint Seal</b>	see variants	

Product	Variants	Max. joint width * [mm]	Art. no.	PU
	<b>ZZ® 530-16 Fire Protection Joint Seal</b> nominal-Ø 16 mm, length 1m	13	B08V20-0001	20
	<b>ZZ® 530-24 Fire Protection Joint Seal</b> nominal-Ø 24 mm, length 1m	21	B08V20-0002	20
	<b>ZZ® 530-30 Fire Protection Joint Seal</b> nominal-Ø 30 mm, length 1m	27	B08V20-0003	20
	<b>ZZ® 530-39 Fire Protection Joint Seal</b> nominal-Ø 39 mm, length 1m	35	B08V20-0004	20
	<b>ZZ® 530-49 Fire Protection Joint Seal</b> nominal-Ø 49 mm, length 1m	45	B08V10-0001	10
	<b>ZZ® 530-60 Fire Protection Joint Seal</b> nominal-Ø 60 mm, length 1m	55	B08V08-0001	8
	<b>ZZ® 530-70 Fire Protection Joint Seal</b> nominal-Ø 70 mm, length 1m	65	B08V06-0001	6
	<b>ZZ® 530-80 Fire Protection Joint Seal</b> nominal-Ø 80 mm, length 1m	75	B08V04-0001	4

\* incl. the permissible elongation (25%)

Accessories see chapter System components &amp; Accessories

### Permissible install locations of of the firestop joint seal

ZZ® G50	Installation	Installation	Thickness [mm]	Classification	Joint width [mm]	Movement [%]
		Installation of single <b>ZZ® 530 Fire Protection Joint Seal</b> (supplementary sealing such as silicon, acrylate, MS hybrid are permissible)	Wall ≥ 150 Floor ≥ 150	EI15–EI120	55–75	Expansion 7.5 Shear 7.5
		Combination of <b>ZZ® 530 Fire Protection Joint Seal</b> and silicone sealing compound	Wall ≥ 125 Wall ≥ 150 Floor ≥ 150	EI15–EI90 EI15–EI120 EI15–EI120	10–75	Expansion 7.5 Shear 7.5
		Combination of <b>ZZ® 530 Fire Protection Joint Seal</b> and silicone sealing compound	Wall ≥ 125 Floor ≥ 150	EI15–EI120	10–36	Expansion 25 Shear 7.5
		Double-sided <b>ZZ® 530 Fire Protection Joint Seal</b> (supplementary sealing such as silicon, acrylate, MS hybrid are permissible)	Wall ≥ 150 Floor ≥ 150	EI15–EI120	10–60	Expansion 25 Shear 7.5

# UL Systeme

## Fire Protection Foam ZZ 360

A new enhanced product in cartridges with advanced fire protection addition, increases in volume and forms a polyurethane foam after application.

## Fire Protection Plug ZZ 160

Plug shaped intumescent elastic product on the basis of polyurethane with intumescent fire protection addition.

## Fire Protection Block ZZ 260

A block shaped intumescent elastic product can be vacuum packed on the basis of polyurethane with intumescent fire protection addition.

## Fire Protection Sealant ZZ 365

Sealant in cartridges on the basis of waterborne polyurethane with intumescent fire protection addition.

Fire Protection Foam ZZ 360



Fire Protection Sealant ZZ 365



Fire Protection Plug ZZ 160



## UL Classified Systems

Combination of Fire Protection Foam ZZ 360 and Fire Protection Plug ZZ 160



## UL Classified Systems

Combination of Fire Protection Sealant ZZ 365 and Fire Protection Block ZZ 260



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## UL-THROUGH PENETRATIONS NUMBERING SYSTEM

For through penetration firestopping, UL uses an alphanumeric system that categorizes types of construction as well as the penetrating item(s). By following the guidelines of the chart below, you can achieve a basic understanding of each system and its uses.

### Example – UL system C-AJ-1641 translate to:

**C** = Either floor or wall is penetrated

**A** = Concrete floors with a minimum thickness less than or equal to 5"

**J** = Concrete walls with a minimum thickness less than or equal to 8"

**1641** = Metallic pipe, conduit or tubing as penetrating items.

The details vary within each system in a category such as, maximum pipe size, annular distances, products used, etc.

<b>F</b>	Floor is penetrated
<b>W</b>	Wall is penetrated
<b>C</b>	Either wall or floor is penetrated

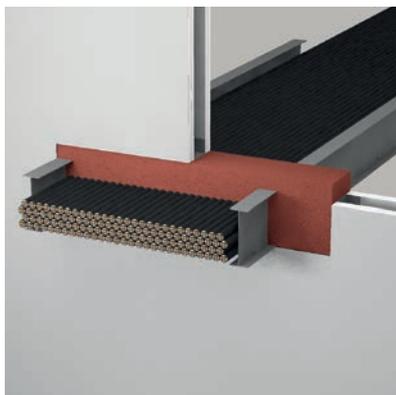
<b>A</b>	Concrete floors with a min. thickness of less than or equal to 5"
<b>B</b>	Concrete floors with a min. thickness greater than 5"
<b>C</b>	Framed floors
<b>D</b>	Steel deck in marine vessels
<b>E</b>	Floor ceiling assemblies consisting of concrete with membrane protection
<b>F-I</b>	Not currently used
<b>J</b>	Concrete or masonry wall with a min. thickness less than or equal 8"
<b>K</b>	Concrete or masonry wall with a min. thickness greater than 8"
<b>L</b>	Framed walls
<b>M</b>	Bulkheads in marine vessels
<b>N</b>	Composite panel walls
<b>O-Z</b>	Not currently used

<b>0000</b>	No penetrating items
<b>1000</b>	Metallic pipe, conduit, or tubing
<b>2000</b>	Non-metallic pipe, conduit, or tubing
<b>3000</b>	Electrical cables
<b>4000</b>	Cable trays with electrical cables
<b>5000</b>	Insulated pipes
<b>6000</b>	Misc. electrical penetrants such as bus ducts
<b>7000</b>	Misc. mechanical penetrants such as air ducts
<b>8000</b>	Groupings of penetrations including any combination of items listed above
<b>9000</b>	Not currently used

# UL SYSTEMS – ZAPP-ZIMMERMANN



Description		Benefit	Application				
			Blank opening	Metal pipes	Cables/ cable trays	Insulated metal pipes	Mixed penetration seal (incl. AC Lineset with plastic pipes)
	<p><b>ZZ® 360 Fire Protection Foam</b> A two component product in cartridges with intumescent fire protection additives. Increases in volume and forms a polyurethane foam after application.</p>	<p>“One-product solution”, no additional components, only one work step necessary.</p> <p>Fast and easy sealing of openings with many penetrating elements and for openings that are difficult to access or that are irregular.</p> <p>Easy retroactive installation of cables or pipes due to soft and elastic material characteristics.</p>		C-AJ-1641	C-AJ-3331, C-AJ-4104, W-L-4085	C-AJ-5368	C-AJ-8233, C-AJ-8235
	<p><b>ZZ® 260 Fire Protection Block</b> A block-shaped intumescent elastic product (can be vacuum-packed) on the basis of polyurethane with intumescent fire protection additives.</p>	<p>Fast and easy installation in rectangular openings up to 32 x 12 [in.]</p> <p>Especially suited for openings with big blank areas.</p> <p>Easy retroactive installation of cables or pipes due to soft and elastic material characteristics.</p>	C-AJ-0150, W-L-0046		C-AJ-4104, C-AJ-4105, W-L-4085		C-AJ-8233, C-AJ-8234
	<p><b>ZZ® 160 Fire Protection Plug</b> Plug-shaped intumescent elastic product on the basis of polyurethane with intumescent fire protection additives.</p>	<p>Very fast and easy installation in circular openings up to Ø 5 in. No special tools required.</p> <p>Easy retroactive installation of cables due to soft and elastic material characteristics.</p>	C-AJ-0151		C-AJ-3329		
	<p><b>ZZ® 365 Fire Protection Sealant</b> Sealant in cartridges on the basis of waterborne polyacrylate with intumescent fire protection additives.</p>	<p>The affordable and quick firestop solution for metallic pipes and cables.</p> <p>Suitable for small penetration seals, openings with many penetrating elements and openings that are difficult to access or that are irregular.</p>		C-AJ-1642	C-AJ-3330		



## ZZ<sup>®</sup> 360 FIRE PROTECTION FOAM

### Application information

**System No. C-AJ-1641; C-AJ-3331; C-AJ-4104; C-AJ-5368; C-AJ-8233; C-AJ-8235; W-L-4085**

Cable penetration seal, pipe penetration seal or mixed penetration seal. Through penetration firestop system for electrical cables, telecommunication cables, optical fibre cables, cable support systems, insulated and non-insulated non-combustible pipes, as well as combustible pipes. Max dimension of through penetration firestop system up to 32 x 12 in. or Ø 12 in. diameter.

### Specific details

- ✓ **Fast and easy installation**
- ✓ **Especially suited for openings with medium to high density of penetrants**
- ✓ **Perfect firestop solution for openings that are difficult to access or that are irregular**
- ✓ **The expanding ZZ<sup>®</sup> 360 Fire Protection Foam easily seals voids between and around penetrations such as cable bundles, conduits etc.**
- ✓ **Easy retroactive installation of cables or pipes due to soft and elastic material characteristics**

### Approved penetrating elements

		Systems					
		C-AJ-1641	C-AJ-3331	C-AJ-4104	C-AJ-5368	C-AJ-8233	C-AJ-8235
cables & cable tray	Max 300 pair No. 24 AWG (or smaller) copper conductor telecommunication cables		•	•		•	
	Max 1/C 500 kcmil (or smaller) copper conductor cables		•	•		•	
	Max 1/C 750 kcmil (or smaller) copper conductor cables		•			•	
	Max 3/C No. 2 AWG copper or aluminum conductor cables		•	•			
	Max 7/C No. 12 AWG copper conductor power and control cables		•	•		•	
	Multiple fiber optic communication cables		•	•		•	
	Max No. 18 AWG Type RG/6 coaxial cables			•		•	
	Max four pair No. 18 AWG (or smaller) thermostat cables						•
	Max 3/C copper conductor No. 10 AWG (or smaller) with bare aluminum ground, PVC insulated steel metal-clad cables		•				•
Cable support systems (cable trays) made of steel or aluminum profiles (can be routed through the penetration seal)				•			

**Approved penetrating elements**

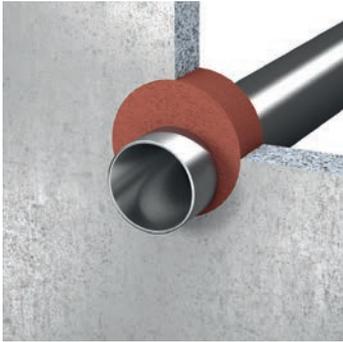
		Systems					
		C-AJ-1641	C-AJ-3331	C-AJ-4104	C-AJ-5368	C-AJ-8233	C-AJ-8235
pipes & insulation	Non-combustible pipes of steel or iron and steel conduits up to nom. 8 in. diameter	•			•		
	Non-combustible pipes of steel, iron or copper and steel conduits up to nom. 4 in. diameter	•			•	•	
	Non-combustible pipes of steel or copper and steel conduits up to nom. 1 in. diameter	•			•	•	•
	Plastic pipes (PVC or CPVC) or PVC conduits up to nom. 1 in. diameter						•
	Max. 1 in. thick glass fiber pipe insulation (density min. 3.5 pcf)				•	•	
	Max. 1/2 in. thick rubber insulation (AB/ PVC)						•

**System components**

Product	Designation	Art. no.	PU
	<b>ZZ<sup>®</sup> 360 Fire Protection Foam, 6 pc.-set</b> 6 x 380 ml cartridge, incl. accessories, 12 Mixing Nozzle 2K, 1 Duct Tape, 6 pairs of gloves	B15N01-0134	1
	<b>ZZ<sup>®</sup> 260-8 Fire Protection Block</b> 8 x 5 x 2-1/3 in.	B01V12-0001	12
	<b>ZZ<sup>®</sup> 260-40 Fire Protection Block</b> 40 x 5 x 2-1/3 in.	B06N00-0018	2

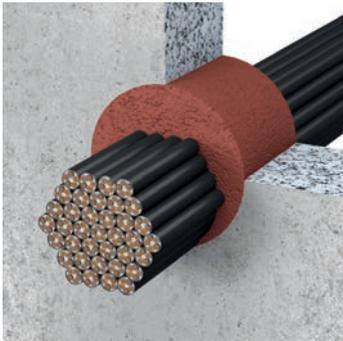
Accessories see chapter System components &amp; Accessories

## Application examples



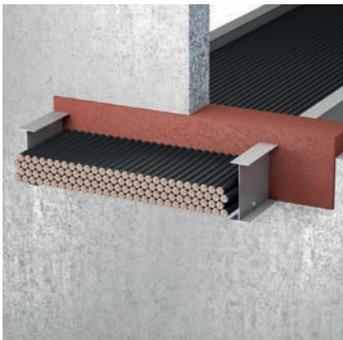
### Metallic pipe in solid wall or floor (C-AJ-1641)

- / Copper pipes up to 4 in. diameter and steel pipes, iron pipes or steel conduits up to 8 in. diameter
- / F-Rating: 2 h; T-Rating: ¼ h
- / Maximum diameter of opening is 12 in.
- / Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- / Annular space: Point contact to max. 4 in.
- / Optional: Steel sleeve grouted into floor or wall



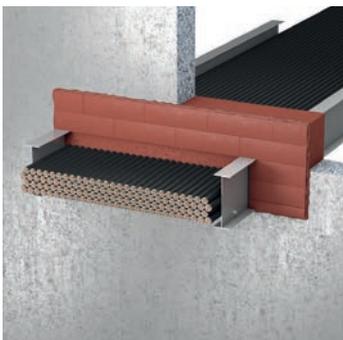
### Cables in solid wall or floor (C-AJ-3331)

- / Power and control cables, telecommunication cables, optical fibre cables
- / F-Rating: 2 h; T-Rating: ½ h
- / Max. 45% cable fill in opening of max. 8 in. diameter
- / Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- / Annular space: Point contact to max. 4 in.
- / Optional: Steel sleeve grouted into floor or wall



### Cable tray with cables in solid wall or floor (C-AJ-4104)

- / Up to 6 in. by 24 in. steel or aluminum cable tray with max. 45% cable fill
- / F-Rating: 2 h; T-Rating: 1 h
- / Max. opening size: 224 in.<sup>2</sup> with a max dimension of 32 in.
- / Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- / Annular space: point contact to max. 3-1/2 in. (vertical) and 8 in. (horizontal)



### Cable tray with cables in combination with ZZ<sup>®</sup> 260 Fire Protection Block in solid wall or floor (C-AJ-4104)

- / Up to 6 in. by 24 in. steel or aluminum cable tray with max. 45% cable fill
- / F-Rating: 2 h; T-Rating: 1 h
- / Maximum opening size: 384 in.<sup>2</sup> with a max dimension of 32 in.
- / Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- / Annular space: point contact to max. 3-1/2 in. (vertical) and 8 in. (horizontal) to periphery of opening or foam/block interface, rest of the opening has to be sealed with ZZ<sup>®</sup> 260 Fire Protection Block



### Insulated metal pipe in solid wall or floor (C-AJ-5368)

- / Copper pipes up to 4 in. diameter and steel pipes, iron pipes or steel conduits up to 8 in. diameter with glass fiber insulation
- / F-Rating: 2 h; T-Rating: 2 h
- / Maximum diameter of opening is 12 in.
- / Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- / Annular space: point contact to max. 4 in.
- / Optional: Steel sleeve grouted into floor or wall



### Mixed penetration seal in solid wall or floor (C-AJ-8233)

- / Cable bundle up to 4 in. diameter, metal pipes up to 4 in. diameter optionally glass fiber insulated
- / F-Rating: 2 h; T-Rating: 1/4 h, 1-1/4 h and 1-3/4 h
- / Maximum opening size: 224 in.<sup>2</sup> with a max. dimension of 32 in.
- / Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- / Annular space: point contact to max. 3-1/2 in. (vertical) and 8 in. (horizontal)



### Mixed penetration seal in combination with **ZZ**<sup>®</sup> 260 Fire Protection Block in solid wall or floor (C-AJ-8233)

- / Cable bundle up to 4 in. diameter, metal pipes up to 4 in. diameter optionally glass fiber insulated
- / F-Rating: 2 h; T-Rating: 1/4 h, 1-1/4 h and 1-3/4 h
- / Max. opening size: 384 in.<sup>2</sup> with a max. dimension of 32 in.
- / Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- / Annular space: point contact to max. 3-1/2 in. (vertical) and 8 in. (horizontal) to periphery of opening or foam/block interface, rest of the opening has to be sealed with **ZZ**<sup>®</sup> 260 Fire Protection Block



### Mixed penetration seal (AC lineset) in solid wall or floor (C-AJ-8235)

- / Up to four metallic pipes optionally AB/PVC insulated and one PVC/CPVC pipe each up to 1 in. diameter, four cables
- / F-Rating: 2 h; T-Rating: 1/4 h, 3/4 h and 2 h
- / Maximum diameter of opening is 6 in.
- / Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- / Annular space: point contact to max. 2 in.



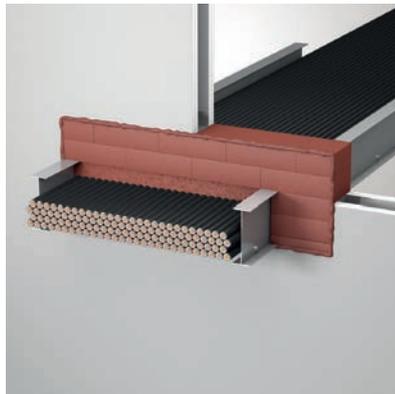
### Cable tray with cables in drywall (W-L-4085)

- / Up to 6 in. by 24 in. steel or aluminum cable tray with max. 45% cable fill
- / F-Rating: 2 h; T-Rating: 1 h
- / Maximum opening size: 224 in.<sup>2</sup> with a max. dimension of 32 in.
- / Fire rated gypsum board/ steel stud wall according to U400, V400 or W400 Series with minimum 2-1/2 in. wide studs
- / Annular space: point contact to max. 3-1/2 in. (vertical) and 8 in. (horizontal)



### Cable tray with cables in combination with **ZZ**<sup>®</sup> 260 Fire Protection Block in drywall (W-L-4085)

- / Up to 6 in. by 24 in. steel or aluminum cable tray with max. 45% cable fill
- / F-Rating: 2 h; T-Rating: 1 h
- / Maximum opening size: 384 in.<sup>2</sup> with a max. dimension of 32 in.
- / Fire rated gypsum board/ steel stud wall according to U400, V400 or W400 Series with minimum 2-1/2 in. wide studs
- / Annular space: point contact to max. 3-1/2 in. (vertical) and 8 in. (horizontal) to periphery of opening or foam/block interface, rest of the opening has to be sealed with **ZZ**<sup>®</sup> 260 Fire Protection Block



## ZZ<sup>®</sup> 260 FIRE PROTECTION BLOCK

### Application information

**System No. C-AJ-0150; C-AJ-4104; C-AJ-4105; C-AJ-8233; C-AJ-8234; W-L-0046; W-L-4085**

Blank penetration seal, cable penetration seal, pipe penetration seal or mixed penetration seal. Through penetration firestop system for electrical cables, telecommunication cables, optical fibre cables, cable support systems, insulated and non-insulated non-combustible pipes. Max dimension of through penetration firestop system up to 32 x 12 in.

### Specific details

- ✓ Fast and easy installation in rectangular openings up to 32 x 12 in.
- ✓ Especially suited for openings with big blank areas
- ✓ Use of wire mesh not required
- ✓ No mechanical fixing necessary
- ✓ Easy retroactive installation of cables or pipes due to soft and elastic material characteristics
- ✓ Perfect solution: combination of ZZ<sup>®</sup> 360 Fire Protection Foam and ZZ<sup>®</sup> 260 Fire Protection Block in rectangular openings up to 32 x 12 in.
- ✓ Closure of areas with medium to high density of penetrants with ZZ<sup>®</sup> 360 Fire Protection Foam
- ✓ The expanding ZZ<sup>®</sup> 360 Fire Protection Foam easily seals voids between penetrants such as cable bundles and pipes
- ✓ The remaining blank areas can be sealed quickly and easily with ZZ<sup>®</sup> 260 Fire Protection Block
- ✓ Medium-sized and large penetration seals
- ✓ Through penetration firestop systems with frequently changing penetrating elements
- ✓ Fast and easy installation in rectangular openings up to 32 x 12 in.

**Approved penetrating elements**

		Systems				
		C-AJ-0150	C-AJ-4104	C-AJ-4105	C-AJ-8233	C-AJ-8234
cables & cable tray	Blank opening	•				
	Max 300 pair No. 24 AWG (or smaller) copper conductor telecommunication cables		•	•	•	•
	Max 1/C 500 kcmil (or smaller) copper conductor cables		•	•	•	•
	Max 1/C 750 kcmil (or smaller) copper conductor cables				•	•
	Max 3/C No. 2 AWG copper or aluminum conductor cables		•	•		
	Max 7/C No. 12 AWG copper conductor power and control cables		•	•	•	•
	Multiple fiber optic communication cables		•	•	•	•
	Max No. 18 AWG Type RG/6 coaxial cables		•	•	•	•
	Max 3/C copper conductor No. 10 AWG (or smaller) with bare aluminum ground, PVC insulated steel metal-clad cables				•	•
	Cable support systems (cable trays) made of steel or aluminum profiles (can be routed through the penetration seal)		•	•		
pipes & insulation	Non-combustible pipes of steel, iron or copper and steel conduits up to nom. 4 in. diameter				•	•
	Max. 1 in. thick glass fiber pipe insulation (density min. 3.5 pcf)				•	•

**System components**

Product	Designation	Art. no.	PU
	<b>ZZ® 260-8 Fire Protection Block</b> 8 x 5 x 2-1/3 in.	B01V12-0001	12
	<b>ZZ® 260-40 Fire Protection Block</b> 40 x 5 x 2-1/3 in.	B06N00-0018	2
	<b>ZZ® 365 Fire Protection Sealant</b> 310 ml cartridge	B15N00-0016	12
	<b>ZZ® 360 Fire Protection Foam, 6 pc.-set</b> 6 x 380 ml cartridge, incl. accessories, 12 Mixing Nozzle 2K, 1 Duct Tape, 6 pairs of gloves	B15N01-0134	1

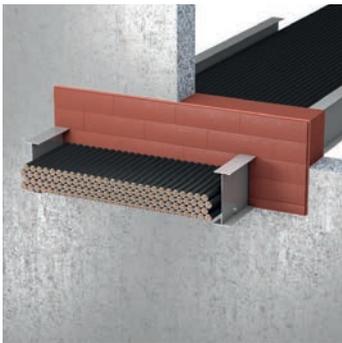
Accessories see chapter System components &amp; Accessories

## Application examples



### Blank opening in solid wall or floor (C-AJ-0150)

- /F-Rating: 2 h; T-Rating: 2 h
- /Maximum opening size: 384 in.<sup>2</sup> with a max. dimension of 32 in.
- /Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- /ZZ<sup>®</sup> 365 Fire Protection Sealant or ZZ<sup>®</sup> 360 Fire Protection Foam to be filled between ZZ<sup>®</sup> 260 Fire Protection Block and periphery of opening



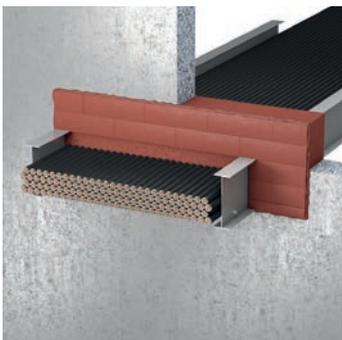
### Cable tray with cables in solid wall or floor (C-AJ-4105)

- /Up to 6 in. by 24 in. steel or aluminum cable tray with max. 45% cable fill
- /F-Rating: 2 h; T-Rating: 0 h
- /Maximum opening size: 384 in.<sup>2</sup> with a max dimension of 32 in.
- /Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- /Annular space: point contact to max. 8 in.
- /ZZ<sup>®</sup> 365 Fire Protection Sealant to be filled between cables, in voids between cables and ZZ<sup>®</sup> 260 Fire Protection Block and between periphery of opening and ZZ<sup>®</sup> 260 Fire Protection Block



### Mixed penetration seal in solid wall or floor (C-AJ-8234)

- /Cable bundle up to 4 in. diameter, metal pipes up to 4 in. diameter optionally glass fiber insulated
- /F-Rating: 2 h; T-Rating: 1/4 h, 1-1/2 h and 2 h
- /Max. opening size: 384 in.<sup>2</sup> with a max. dimension of 32 in.
- /Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- /Annular space: point contact to max. 7-7/8 in.
- /ZZ<sup>®</sup> 365 Fire Protection Sealant to be filled between cables, in voids between cables/ pipes and ZZ<sup>®</sup> 260 Fire Protection Block and between periphery of opening and ZZ<sup>®</sup> 260 Fire Protection Block



### Cable tray with cables in combination with ZZ<sup>®</sup> 360 Fire Protection Foam in solid wall or floor (C-AJ-4104)

- /Up to 6 in. by 24 in. steel or aluminum cable tray with max. 45% cable fill
- /F-Rating: 2 h; T-Rating: 1 h
- /Maximum opening size: 384 in.<sup>2</sup> with a max dimension of 32 in.
- /Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- /Annular space: point contact to max. 3-1/2 in. (vertical) and 8 in. (horizontal) to periphery of opening or foam/block interface, rest of the opening has to be sealed with ZZ<sup>®</sup> 260 Fire Protection Block



### Mixed penetration seal in combination with ZZ<sup>®</sup> 360 Fire Protection Foam in solid wall or floor (C-AJ-8233)

- /Cable bundle up to 4 in. diameter, metal pipes up to 4 in. diameter optionally glass fiber insulated
- /F-Rating: 2 h; T-Rating: 1/4 h, 1-1/4 h and 1-3/4 h
- /Max. opening size: 384 in.<sup>2</sup> with a max. dimension of 32 in.
- /Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- /Annular space: point contact to max. 3-1/2 in. (vertical) and 8 in. (horizontal) to periphery of opening or foam/block interface, rest of the opening has to be sealed with ZZ<sup>®</sup> 260 Fire Protection Block



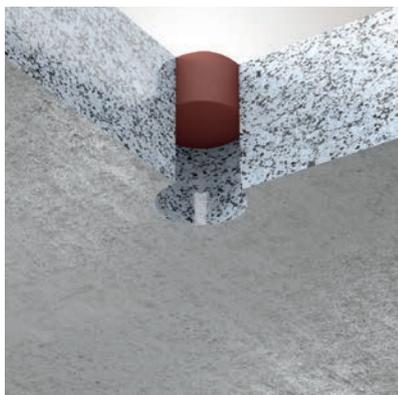
**Blank opening in combination with **ZZ**<sup>®</sup> 360 Fire Protection Foam in drywall (W-L-0046)**

- / F-Rating: 2 h; T-Rating: 2 h
- / Maximum opening size: 384 in.<sup>2</sup> with a max. dimension of 32 in.
- / Fire rated gypsum board/ steel stud wall according to U400, V400 or W400 Series with minimum 2-1/2 in. wide studs
- / **ZZ**<sup>®</sup> 360 Fire Protection Foam to be filled between **ZZ**<sup>®</sup> 260 Fire Protection Block and periphery of opening



**Cable tray with cables in combination with **ZZ**<sup>®</sup> 360 Fire Protection Foam in drywall (W-L-4085)**

- / Up to 6 in. by 24 in. steel or aluminum cable tray with max. 45% cable fill
- / F-Rating: 2 h; T-Rating: 1 h
- / Maximum opening size: 384 in.<sup>2</sup> with a max. dimension of 32 in.
- / Fire rated gypsum board/ steel stud wall according to U400, V400 or W400 Series with minimum 2-1/2 in. wide studs
- / Annular space: point contact to max. 3-1/2 in. (vertical) and 8 in. (horizontal) to periphery of opening or foam/block interface, rest of the opening has to be sealed with **ZZ**<sup>®</sup> 260 Fire Protection Block



## ZZ<sup>®</sup> 160 FIRE PROTECTION PLUG

### Application information

#### System No. C-AJ-0151; C-AJ-3329

Blank penetration seal or cable penetration seal. Through penetration firestop system for electrical cables, telecommunication cables, optical fibre cables. Max dimension of through penetration firestop system up to Ø 5 in. diameter.

### Specific details

- ✓ Very fast and easy installation in circular openings
- ✓ Blank openings are sealed by pressing ZZ<sup>®</sup> 160 Fire Protection Plug from top surface in the opening, no sealant required
- ✓ Easy retroactive installation of cables, interstices between cables sealed with ZZ<sup>®</sup> 365 Fire Protection Sealant
- ✓ Through penetration firestop systems with frequently changing penetrating elements
- ✓ Blank openings

### Approved penetrating elements

		Systems	
		C-AJ-0151	C-AJ-3329
cables	Blank opening	•	
	Max 300 pair No. 24 AWG (or smaller) copper conductor telecommunication cables		•
	Max 1/C 750 kcmil (or smaller) copper conductor cables		•
	Max 3/C No. 2 AWG copper or aluminum conductor cables		•
	Max 7/C No. 12 AWG copper conductor power and control cables		•
	Multiple fiber optic communication cables		•
	Max 3/C copper conductor No. 10 AWG (or smaller) with bare aluminum ground, PVC insulated steel metal-clad cables		•

**System components**

Product	Designation	Art. no.	PU
	<b>ZZ® 160 Fire Protection Plug</b>	see variants	
	<b>ZZ® 365 Fire Protection Sealant</b> 310 ml cartridge	B15N00-0016	12

Variants	Designation	Art. no.	PU
	<b>ZZ® 160-2.5 Fire Protection Plug</b> nominal-Ø 2.5 in.	B02N00-0077	4
	<b>ZZ® 160-3 Fire Protection Plug</b> nominal-Ø 3 in.	B02N00-0078	4
	<b>ZZ® 160-4 Fire Protection Plug</b> nominal-Ø 4 in.	B02N00-0075	4
	<b>ZZ® 160-4.5 Fire Protection Plug</b> nominal-Ø 4.5 in.	B02N00-0079	4
	<b>ZZ® 160-5 Fire Protection Plug</b> nominal-Ø 5 in.	B02N00-0080	4

Accessories see chapter System components &amp; Accessories

## Application examples



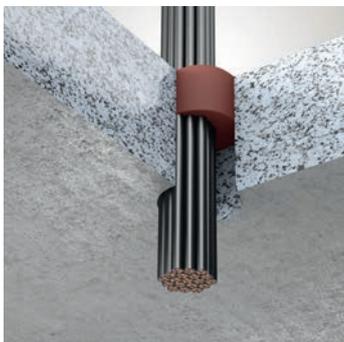
### Blank opening in solid wall or floor (C-AJ-0151)

- / F-Rating: 2 h; T-Rating: 2 h
- / Maximum opening size: 5 in. diameter
- / Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- / Optional: Steel sleeve grouted into floor or wall



### Cables in solid wall or floor (C-AJ-3329)

- / Power and control cables, telecommunication cables, optical fibre cables
- / F-Rating: 2 h; T-Rating: 1/2 h
- / Maximum 60% cable fill in opening of max. 5 in. diameter
- / Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- / Optional: Steel sleeve grouted into floor or wall





BRANDSCHUTZ

ZZ 330



Brandschutzschaum ZZ 330  
ZZ Brandschutzschaum 7% NE  
300ml 1+  
CE

BRANDSCHUTZ



## ZZ<sup>®</sup> 365 FIRE PROTECTION SEALANT

### Application information

#### System No. C-AJ-1642; C-AJ-3330

Cable penetration seal or pipe penetration seal. Through penetration firestop system for electrical cables, telecommunication cables, optical fibre cables and non-combustible pipes. Max dimension of through penetration firestop system up to Ø 5 in. diameter.

### Specific details

- ✓ The affordable and quick firestop solution for metallic cables
- ✓ Fast and easy installation in circular openings
- ✓ Suitable for small penetration seals, openings with many penetrating elements and openings that are difficult to access or that are irregular

### Approved penetrating elements

		Systems	
		C-AJ-1642	C-AJ-3330
cables	Max 300 pair No. 24 AWG (or smaller) copper conductor telecommunication cables		•
	Max 1/C 500 kcmil (or smaller) copper conductor cables		•
	Max 3/C No. 2 AWG copper or aluminum conductor cables		•
	Max 7/C No. 12 AWG copper conductor power and control cables		•
	Multiple fiber optic communication cables		•
pipes	Non-combustible pipes of steel, iron or copper and steel conduits up to nom. 4 in. diameter.	•	

### System components

Product	Designation	Art. no.	PU
	<b>ZZ® 365 Fire Protection Sealant</b> 310 ml cartridge	B15N00-0016	12

Accessories see chapter System components & Accessories

### Application examples



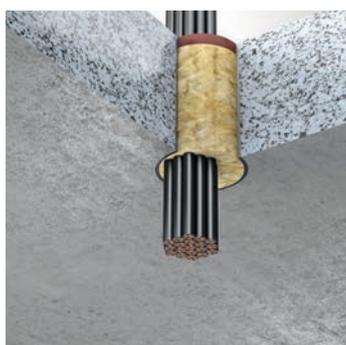
#### Metallic pipe in solid wall or floor (C-AJ-1642)

- / Metal pipes up to 4 in. diameter
- / F-Rating: 2 h; T-Rating: 1/4 h
- / Maximum diameter of opening is 5 in.
- / Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- / Annular space: Point contact to max. 2-1/4 in.
- / Optional: Steel sleeve grouted into floor or wall



#### Cables in solid wall or floor (C-AJ-3330)

- / Power and control cables, telecommunication cables, optical fibre cables
- / F-Rating: 2 h; T-Rating: 1/2 h
- / Maximum 45% cable fill in opening of max. 4 in. diameter
- / Floor or wall of min. 4-1/2 in. thick reinforced concrete or any UL Classified Concrete Blocks
- / Annular space: Point contact to max. 1-1/4 in.
- / Optional: Steel sleeve grouted into floor or wall





**Brandenschutzschaum ZZ 330**  
ZZ-Brandenschutzschaum 2K NE  
Art. no.: B15N01-0005  
380ml

**Brandenschutzschaum ZZ 330**  
ZZ-Brandenschutzschaum 2K NE  
Art. no.: B15N01-0005  
380ml

**Brandenschutzschaum ZZ 330**  
ZZ-Brandenschutzschaum 2K NE  
Art. no.: B15N01-0005  
380ml



SYSTEM COMPONENTS & ACCESSORIES  
ETA / UL

## ZZ® 330 Fire Protection Foam



**ZZ® 330 Fire Protection Foam** is particularly characterised by its easy processing and its outstanding technical fire safety properties. It can be used as a mixed penetration seal, as well as a pure cable penetration seal. The optimal match between the beginning of the reaction and hardening enables sufficiently long work interruptions for the user, as well as fast work progress. Thanks to the high viscosity, the user does not have to deal with foam running out of the penetration seal. After hardening, the permanently elastic structure of the penetration seal enables easy retroactive-installation.

Designation	Art. no.	PU
<b>ZZ® 330 Fire Protection Foam</b> 380 ml cartridge, 2 x Mixing Nozzle 2K	B15V01-0001	1
<b>ZZ® 330 Fire Protection Foam Starter-Kit</b> 1 x 380 ml cartridge, 1 x Cartridge Gun EasyMax 2K, incl. accessories, 2 x Mixing Nozzle 2K, 1 x Identification Plate ETA	B16N00-0125	1
<b>ZZ® 330 Fire Protection Foam, 6pc.-set</b> 6 x 380 ml cartridge, incl. accessories, 12 x Mixing Nozzle 2K, 1 x Duct Tape, 6 x pairs of gloves	B15N01-0106	1
	B15VP1-0106	60

<b>Approval</b>	ETA-11/0206
<b>Reaction to fire in accordance with DIN EN 13501-1</b>	Class E
<b>Testing the fire protection properties under environmental influences</b>	Use category Z <sub>1</sub> (use in areas with high humidity and temperatures ≥ 0 °C)
<b>Work interruption</b>	Approx. 50 seconds (at 22 °C material temperature and ambient temperature)
<b>Foam yield</b>	Up to 2.1 litres (at 22 °C material temperature and ambient temperature)
<b>Cutability</b>	After approx. 90 seconds (at 22 °C material temperature and ambient temperature)
<b>Transport/storage</b>	5 °C to 30 °C (dry in original containers)
<b>Application temperature</b>	15 °C to 30 °C, optimal: 20 °C – 25 °C
<b>Air permeability</b>	<p><math>Q_{600} \leq 0.08 \text{ m}^3/(\text{h m}^2)</math> (at 600 Pa differential pressure, with a measuring accuracy of 0.01 m<sup>3</sup>/h, no air permeability was measurable) test standard: EN 1026 (test specimen dimensions 350 x 350 x <u>200</u> mm, tested without penetrating elements)</p> <p><math>Q_{50} = 0.39 \text{ m}^3/(\text{h m}^2) / Q_{600} = 4.09 \text{ m}^3/(\text{h m}^2)</math>, test standard: EN 1026 (test specimen dimensions 360 x 360 x <u>144</u> mm, tested without penetrating elements)</p>
<b>Resistance to static differential pressure</b>	No visible changes up to the maximum test pressure of the test device ( $P_{\max} = 10000 \text{ Pa}$ ). Test standard: In accordance with EN 12211 (test specimen dimensions 350 x 350 x <u>200</u> mm, tested without penetrating elements)
	No visible changes up to the maximum test pressure ( $P_{\max} = 8800 \text{ Pa}$ ). Test standard: In accordance with EN 12211 (test specimen dimensions 360 x 360 x <u>144</u> mm, tested without penetrating elements)
<b>Thermal conductivity/ Wärmedurchlasswiderstand</b>	$\lambda = 0,088 \text{ W}/(\text{m K}) / R = 0,279 \text{ m}^2 \cdot \text{K}/\text{W}$ , Test standard: DIN EN 12667
<b>Airborne sound insulation</b>	$D_{n,e,w} (C;Ctr) = 66 (-1; -6) \text{ dB}$ Test standard: EN ISO 717-1 (test specimen dimensions 360 x 360 x 200 mm, tested without penetrating elements)

**ZZ® 333 Fire Protection Mastic**

**ZZ® 333 Fire Protection Mastic** is characterised by excellent processing qualities and a high level of stability. It can be used for production of cable penetration seals up to EI 120.

Designation	Art. no.	PU
<b>ZZ® 333 Fire Protection Mastic</b> 310 ml cartridge	B15N00-0013	1
	B15VP1-0013	900

<b>Approval</b>	ETA-13/0093 (system component in ETA-10/0431, ETA-12/0088)
<b>Reaction to fire in accordance with DIN EN 13501-1</b>	Class E
<b>Air permeability</b>	No air passage measurable up to $\Delta$ 600 Pa, test standard: EN 1026 (test specimen dimensions 100 x 100 mm, 2 x 15 mm fill on both sides, tested without penetrating elements)
<b>Resistance to static differential pressure</b>	No visible changes up to the maximum test pressure ( $P_{max} = 9800$ Pa). Test standard: In accordance with EN 12211 (test specimen dimensions 100 x 100 mm, 2 x 15 mm fill on both sides, tested without penetrating elements)
<b>Testing the fire protection properties under environmental influences</b>	Use category $Z_1$ (use in indoor areas with high humidity and temperatures $\geq 0^\circ\text{C}$ )
<b>Colour</b>	Brown
<b>Content</b>	310 ml cartridge
<b>Storage</b>	+5°C to +30°C (store dry and only in the original containers)
<b>Application temperature</b>	+10°C to +30°C, recommended: +20°C to +25°C
<b>Storage stability</b>	12 months at 23°C/50% rel. humidity, shelf life, see imprint on the container

## ZZ® 345 Fire Protection Silicone



**ZZ® 345 Fire Protection Silicone** can be used as cable penetration seal and for fire protection sealing of joints with minor and significant movement capability. It is characterised by excellent processing qualities and a high level of stability.

Designation	Art. no.	PU
<b>ZZ® 345-C Fire Protection Silicone</b> 310 ml cartridge	B15H00-0001	1
<b>ZZ® 345-TB Fire Protection Silicone</b> 580 ml tubular bag	B15H00-0002	1

<b>Approval</b>	ETA-12/0118 and ETA-13/0123
<b>Reaction to fire in accordance with DIN EN 13501-1</b>	Class E
<b>Reaction to fire</b>	DIN 4102-B1 in accordance with P-BWU03-I-16.5.352
<b>Classification in accordance with DIN EN ISO 11600</b>	ISO 11600-F-20 LM
<b>Testing the fire protection properties under environmental influences</b>	Use category x (product for use in outdoor areas, as well as indoor areas, also in areas with exposure to weather)
<b>Colour</b>	Cement grey
<b>Content</b>	310 ml cartridge, 580 ml tubular bag
<b>Application temperature</b>	+5 °C to +30 °C
<b>Storage</b>	+5 °C to +30 °C (store dry and only in the original containers)
<b>Skin formation time</b>	Approx. 10 minutes (at 23 °C and 50 % rel. humidity)
<b>Viscosity</b>	Pasty, non-sag
<b>Hardening</b>	Approx. 2 mm in 24 hours (at 23 °C and 50 % rel. humidity)
<b>Chemical basis</b>	RTV-1 silicone (oxime system) with halogen-free fire protection agents
<b>Storage stability</b>	12 months at 23 °C/50 % rel. humidity, shelf life, see imprint on the container

## ZZ® 360 Fire Protection Foam



**ZZ® 360 Fire Protection Foam** can be used as cable penetration seal, pipe penetration seal or mixed penetration seal. Through penetration firestop system for electrical cables, telecommunication cables, optical fibre cables, cable support systems, insulated and non-insulated non-combustible pipes as well as combustible pipes.

Designation	Art. no.	PU
<b>ZZ® 360 Fire Protection Foam, 6 pc.-set</b> 6 x 380 ml cartridge, incl. accessories, 12 Mixing Nozzle 2K, 1 Duct Tape, 6 pairs of gloves	B15N01-0134	1

## ZZ® 365 Fire Protection Sealant



**ZZ® 365 Fire Protection Sealant** can be used as cable penetration seal or pipe penetration seal. Through penetration firestop system for electrical cables, telecommunication cables, optical fibre cables and non-combustible pipes.

Designation	Art. no.	PU
<b>ZZ® 365 Fire Protection Sealant</b> 310 ml cartridge	B15N00-0016	12

**ZZ® 230-144 Fire Protection Block**

**ZZ® 230-144 Fire Protection Block** is a soft, flexible moulded foam part that is used in **ZZ® M20**, and as a filling block for free areas without penetrating installations in **ZZ® M30** mixed penetration sealing systems.

Designation	Art. no.	PU
<b>ZZ® 230-144 Fire Protection Block</b> 200 x 144 x 60 mm	B01V01-0004	1
	B01V04-0003	4
	B01V18-0001	18

<b>Approval</b>	ETA-11/0206
<b>Reaction to fire in accordance with DIN EN 13501-1</b>	Class E
<b>Testing the fire protection properties under environmental influences</b>	Use category Z <sub>1</sub> (use in indoor areas with high humidity and temperatures ≥ 0°C)
<b>Air permeability</b>	Q <sub>50</sub> = 0.82 m³/(h m²) / 6.61 m³/(h m²), test standard: EN 1026 (test specimen dimensions 550 x 355 x <u>200</u> mm, tested without penetrating elements)  Q <sub>50</sub> = 1.12 m³/(h m²) / Q <sub>600</sub> = 7.65 m³/(h m²), test standard: EN 1026 (test specimen dimensions 560 x 360 x <u>144</u> mm, tested without penetrating elements)
<b>Resistance to static differential pressure</b>	P <sub>max</sub> = 3700 Pa. Test standard: In accordance with EN 12211 (test specimen dimensions 550 x 355 x <u>200</u> mm, tested without penetrating elements)  P <sub>max</sub> = 2100 Pa. Test standard: in accordance with EN 12211 (test specimen dimensions 560 x 360 x <u>144</u> mm, tested without penetrating elements)
<b>Thermal conductivity</b>	λ = 0.103 W/(m K), <u>Test standard:</u> DIN EN 12667
<b>Airborne sound insulation</b>	D <sub>n,e,w</sub> (C;Ctr) = 68 (- 4; -11) dB <u>Test standard:</u> EN ISO 717-1 (test specimen dimensions 360 x 360 x 200 mm, tested without penetrating elements)

**ZZ® 230-144-V Fire Protection Block**

**ZZ® 230-144-V Fire Protection Block**, vacuum-packed can be used for easier sealing of narrow residual openings. After opening the foil, the vacuum-packed Block expands to standard size. The foil can remain in the bulkhead after expansion.

Designation	Art. no.	PU
<b>ZZ® 230-144-V Fire Protection Block</b> 200 x 144 x 60 mm, vacuum-packed	B01V02-0003	2
	B01V07-0001	7

**ZZ® 230-144-S Fire Protection Block**

**ZZ® 230-144-S Fire Protection Block** can be used as additional protection against moisture. The moulded parts can be coated on-site with off-the-shelf silicone, or alternatively they can be purchased as components that are already silicone-coated.

Designation	Art. no.	PU
<b>ZZ® 230-144-S Fire Protection Block</b> 200 x 144 x 60 mm, silicone-coated	B01V04-0007	4
	B01V18-0003	18

## ZZ® 260 Fire Protection Block



**ZZ® 260 Fire Protection Block** can be used as blank penetration seal, cable penetration seal, pipe penetration seal or mixed penetration seal. Through penetration firestop system for electrical cables, telecommunication cables, optical fibre cables, cable support systems, insulated and non-insulated non-combustible pipes.

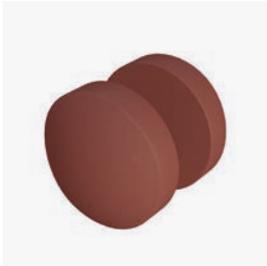
Designation	Art. no.	PU
<b>ZZ® 260-8 Fire Protection Block</b> 8 x 5 x 2-1/3 in.	B01V12-0001	12
<b>ZZ® 260-40 Fire Protection Block</b> 40 x 5 x 2-1/3 in.	B06N00-0018	2

## ZZ® 160 Fire Protection Plug



**ZZ® 160 Fire Protection Plug** can be used as blank penetration seal or cable penetration seal. Through penetration firestop system for electrical cables, telecommunication cables, optical fibre cables.

Designation	Art. no.	PU
<b>ZZ® 160-2.5 Fire Protection Plug</b> nominal-Ø 2.5 in.	B02N00-0077	4
<b>ZZ® 160-3 Fire Protection Plug</b> nominal-Ø 3 in.	B02N00-0078	4
<b>ZZ® 160-4 Fire Protection Plug</b> nominal-Ø 4 in.	B02N00-0075	4
<b>ZZ® 160-4.5 Fire Protection Plug</b> nominal-Ø 4.5 in.	B02N00-0079	4
<b>ZZ® 160-5 Fire Protection Plug</b> nominal-Ø 5 in.	B02N00-0080	4

**ZZ<sup>®</sup> 130 Fire Protection Plug**

**ZZ<sup>®</sup> 130 Fire Protection Plug** is a soft, flexible, moulded foam part, that is used in the system **ZZ<sup>®</sup> C10**.

Variants	Max. opening diameter [mm]	Art. no.	PU
<b>ZZ<sup>®</sup> 130-65 Fire Protection Plug</b> nominal-Ø 65 mm	65	B02V02-0009	2
		B02V04-0006	4
		B02V20-0008	20
<b>ZZ<sup>®</sup> 130-78 Fire Protection Plug</b> nominal-Ø 78 mm	78	B02V02-0010	2
		B02V04-0007	4
		B02V20-0009	20
<b>ZZ<sup>®</sup> 130-107 Fire Protection Plug</b> nominal-Ø 107 mm	104	B02V02-0011	2
		B02V04-0008	4
		B02V20-0010	20
<b>ZZ<sup>®</sup> 130-122 Fire Protection Plug</b> nominal-Ø 122 mm	118	B02V02-0012	2
		B02V04-0009	4
		B02V20-0011	20
<b>ZZ<sup>®</sup> 130-134 Fire Protection Plug</b> nominal-Ø 134 mm	128	B02V02-0013	2
		B02V04-0010	4
		B02V20-0012	20
<b>ZZ<sup>®</sup> 130-165 Fire Protection Plug</b> nominal-Ø 165 mm	160	B02V02-0014	2
		B02V20-0013	20
<b>ZZ<sup>®</sup> 130-200 Fire Protection Plug</b> nominal-Ø 200 mm	194	B02V02-0015	2
		B02V10-0004	10
<b>ZZ<sup>®</sup> 130-250 Fire Protection Plug</b> nominal-Ø 250 mm	240	B02V02-0016	2
		B02V10-0002	10

<b>Approval</b>	ETA-12/0088
<b>Reaction to fire in accordance with DIN EN 13501-1</b>	Class E
<b>Air permeability</b>	$Q_{600} \leq 0.2 \text{ m}^3/(\text{h} \cdot \text{m}^2)$ (at 600 Pa differential pressure) <u>Test standard:</u> EN 1026 (test specimen dimensions Ø 240 mm, seal thickness 150 mm, tested without penetrating elements)
<b>Resistance to static differential pressure</b>	$P_{\text{max}} = 6500 \text{ Pa}$ <u>Test standard:</u> in accordance with EN 12211 (test specimen dimensions Ø 240 mm, seal thickness 150 mm, tested without penetrating elements)
<b>Thermal conductivity</b>	$\lambda = 0.103 \text{ W}/(\text{m K})$ <u>Test standard:</u> DIN EN 12667
<b>Airborne sound insulation</b>	$D_{n,e,w} (C;Ctr) = 68 (-2; -7) \text{ dB}$ <u>Test standard:</u> EN ISO 717-1 (test specimen dimensions Ø 240 mm, seal thickness 150 mm, tested without penetrating elements)
<b>Surface resistance</b>	$R_0 = 2.39 \times 10^9 \Omega$ , test standards: DIN EN 60079-0 (VDE 0170-1) and TRGS 727:2016 (For inquiries concerning installation in explosive zones, please contact ZAPP-ZIMMERMANN GmbH)

## ZZ<sup>®</sup> 430 Fire Protection Collar



**ZZ<sup>®</sup> 430 Fire Protection Collar** consists of a sheet metal body and an intumescent inlay. The sound insulation is included in the scope of delivery.

Variants	Art. no.	PU
<b>ZZ<sup>®</sup> 430-32 Fire Protection Collar</b> for pipe-Ø 32 mm	B16N01-0001	1
<b>ZZ<sup>®</sup> 430-40 Fire Protection Collar</b> for pipe-Ø 40 mm	B16N01-0002	1
<b>ZZ<sup>®</sup> 430-110 Fire Protection Collar</b> for pipe-Ø 50, 75, 90 and 110 mm	B16N01-0003	1
<b>ZZ<sup>®</sup> 430-160 Fire Protection Collar</b> for pipe-Ø 125, 140, 150 and 160 mm	B16N01-0004	1

<b>Approval:</b>	ETA-13/0117
<b>Reaction to fire in accordance with DIN EN 13501-1</b>	Class E (specification refers to the intumescent lining)
<b>Testing the fire protection properties under environmental influences</b>	Use category Z <sub>1</sub> (use in indoor areas with high humidity and temperatures ≥ 0 °C)
<b>Sheet metal</b>	Non-rusting austenitic steel (stainless steel)

## Collar accessories

Accessories for installing **ZZ<sup>®</sup> 430 Fire Protection Collar**



	Designation	Art. no.	PU
1	<b>Bold Set Concrete M6</b> 10 pc.-set, Content: 10 x bolts M6, 10 x washer	B99H00-0254	1
2	<b>Threaded Rod Set M6</b> 5 pc.-set, Content: 5 x threaded rod M6, 10 x bolt nuts, 10 x washer	B99H00-0255	1
3	<b>Sound Insulation 430</b> 615 x 300 x 5 mm	B99H00-0137	1

**ZZ® 530 Fire Protection Joint Seal**

**ZZ® 530 Fire Protection Joint Seal** is simply pushed into the joint from both sides with the prescribed excess dimensions. Through its elastic structure it can compensate elongation movements up to 25%. Alternatively, as closure, in addition a sealant can be applied (e.g. silicone OTTOSEAL S 115 or acrylic OTTOSEAL A 207).

Variants	Max. joint width * [mm]	Art. no.	PU
<b>ZZ® 530-16 Fire Protection Joint Seal</b> nominal-Ø 16 mm, length 1m	13	B08V20-0001	20
<b>ZZ® 530-24 Fire Protection Joint Seal</b> nominal-Ø 24 mm, length 1m	21	B08V20-0002	20
<b>ZZ® 530-30 Fire Protection Joint Seal</b> nominal-Ø 30 mm, length 1m	27	B08V20-0003	20
<b>ZZ® 530-39 Fire Protection Joint Seal</b> nominal-Ø 39 mm, length 1m	35	B08V20-0004	20
<b>ZZ® 530-49 Fire Protection Joint Seal</b> nominal-Ø 49 mm, length 1m	45	B08V10-0001	10
<b>ZZ® 530-60 Fire Protection Joint Seal</b> nominal-Ø 60 mm, length 1m	55	B08V08-0001	8
<b>ZZ® 530-70 Fire Protection Joint Seal</b> nominal-Ø 70 mm, length 1m	65	B08V06-0001	6
<b>ZZ® 530-80 Fire Protection Joint Seal</b> nominal-Ø 80 mm, length 1m	75	B08V04-0001	4

\* incl. the permissible elongation (25%)

<b>Approval</b>	ETA-12/0119
<b>Reaction to fire in accordance with DIN EN 13501-1</b>	Class E
<b>Testing the fire protection properties under environmental influences</b>	Use category Z <sub>1</sub> (use in indoor areas with high humidity and temperatures ≥ 0°C)

## Glass Fibre Strips



**Glass Fibre Strips** may be required in penetration seals made of **ZZ® 230 Fire Protection Block**.  
For insertion in horizontal joints between fire protection blocks in large exposed areas.

Designation	Art. no.	PU
<b>Glass Fibre Strip 200</b> width 200 mm, 5 m roll	B99H00-0175	1
<b>Glass Fibre Strip 144</b> width 144 mm, 5 m roll	B99H00-0206	1

## ZZ® 451-150 Fire Protection Wrap



**ZZ® 451-150 Fire Protection Wrap** is a non-shrinking, solvent-free, self-adhesive, plastic butyl sealing tape that is intumescent in the event of fire. It is used as a cable wrap for fire resistance class EI 120 in the system **ZZ® M30**.

Designation	Art. no.	PU
<b>ZZ® 451-150 Fire Protection Wrap</b> width 150 mm, 5 m roll	B04N00-0004	1

<b>Approval</b>	ETA-11/0206, ETA-10/0431 und ETA-12/0088
<b>Reaction to fire in accordance with DIN EN 13501-1</b>	Class E
<b>Testing the fire protection properties under environmental influences</b>	Use category Z <sub>1</sub> (use in indoor areas with high humidity and temperatures ≥ 0 °C)
<b>Storage</b>	5 °C to 30 °C (store rolls standing, in dry area protected against dust)
<b>Application temperature</b>	Approx. 5 °C to 30 °C

## Identification Plate ETA



**Identification Plate ETA** for designation of approval-compliant through penetration firestop systems.  
An identification plate must be permanently affixed next to the penetration seal systems.

Designation	Art. no.	PU
<b>Identification Plate ETA</b> for European Technical Assessment Systems	B16H00-0051	1

## Cartridge Guns



**Cartridge Guns** are optimally suited for dispensing the contents of cartridges and tubular bags. Use of the Cartridge Gun PowerMax Accu TB and Cartridge Gun PowerMax Accu 2K, allows convenient processing of multiple cartridges and tubular bags in quick succession.

	Designation	Art. no	PU
1	<b>Cartridge Gun Professional 1K</b> for 1K cartridges, e.g. 310 ml	B16H00-0024	1
2	<b>Cartridge Gun EconoMax TB</b> for tubular bags and 1K cartridges, e.g. 580 ml and 310 ml	B16H00-0052	1
3	<b>Cartridge Gun PowerMax Accu TB</b> for tubular bags and 1K cartridges, e.g. 580 ml and 310 ml, incl. Accu	B16H00-0053	1
4	<b>Cartridge Gun EasyMax 2K</b> for 2K coaxial cartridges (5:1) e.g. 380 ml	B16N00-0124	1
5	<b>Cartridge Gun HandyMax 2K</b> for 2K coaxial cartridges (5:1) e.g. 380 ml	B16H00-0044	1
6	<b>Cartridge Gun PowerMax Accu 2K</b> for 2K coaxial cartridges (5:1), e.g. 380 ml, incl. Accu	B16H00-0060	1
7	<b>Exchange Accu 2K</b> for Cartridge Gun PowerMax Accu 2K, Li-Ion 14,4 V / 3.0 Ah	B16H00-0063	1
8	<b>Exchange Accu TB</b> for Cartridge Gun PowerMax Accu TB, Li-Ion 3.6 V / 1.5 Ah	B16H00-0087	1

## Mixing Nozzle 2K



**Mixing Nozzle 2K** for **ZZ® 330 Fire Protection Foam** can be ordered separately.

Designation	Art. no.	PU
<b>Mixing Nozzle 2K</b> for 2K coaxial cartridges (5:1), 12 pc.-set	B99H00-0112	1

## Spare Nozzle Tubular Bag



**Spare Nozzle Tubular Bag** for Cartridge Guns can be ordered separately.

Designation	Art. no.	PU
<b>Spare Nozzle Tubular Bag</b> for Cartridge Gun EconoMax TB and PowerMax TB	B99H00-0160	1

## Extension Nozzle 2K



**Extension Nozzle 2K** can be fitted onto the Mixing Nozzle 2K and is used for openings that are difficult to access.

Designation	Art. no.	PU
<b>Extension Nozzle 2K</b> for Mixing Nozzle 2K, length 200 mm, 12 pc.-set	B99H00-0172	1

## Knives



**Knives** with serrated blade are suitable for production of precisely fitting moulded parts and openings for retroactive-installation of elements.

Designation	Art. no.	PU
<b>Knife with serrated blade, narrow</b> for cutting of fire protection foams	B16H00-0042	1
<b>Knife with serrated blade, wide</b> for cutting of fire protection foams	B16H00-0043	1

## Smoothing Towel



**Smoothing Trowel** of plastic for professional joint formation.

Designation	Art. no.	PU
<b>Smoothing Trowel</b> approx. 90 x 85 mm	B99H00-0161	1

## Duct Tape



**Duct Tape** is outstandingly suited for **ZZ® 330 Fire Protection Foam**. The high-quality tape consists of high-transparency PP with a watertight coated fabric and tears easily by hand.

Designation	Art. no.	PU
<b>Duct Tape</b> width 50 mm, 20 m roll, transparent	B99V01-0008	1

## DOMETIC Temperate Box



**DOMETIC Temperate Box** can be used to comply with the recommended material temperature of the **ZZ® 330 Fire Protection Foam** to enable optimal processing of the product. The Box is also suitable for **ZZ® 333 Fire Protection Mastic** and **ZZ® 345 Fire Protection Silicone**.

Designation	Art. no.	PU
<b>DOMETIC Temperate Box</b> Temperature regulated fix 20 °C, digital temperature display, voltage monitor	B99H00-0163	1

## OTTO PE-Round Cord B2

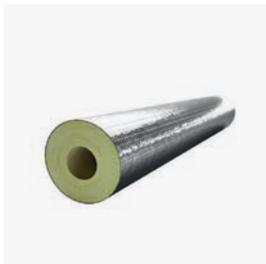


**OTTO PE Round Cord B2** is used for backfilling of joints (also suitable for building construction joints in accordance with DIN 18540 and ISO 11600) for the **ZZ® G30** linear fire protection joint seal.

Designation	Art. no	PU
<b>OTTO PE-Round Cord B2, 6</b> Ø 6 mm, 100 m endless	B99H00-0098	1
<b>OTTO PE-Round Cord B2, 8</b> Ø 8 mm, 100 m endless	B99H00-0099	1
<b>OTTO PE-Round Cord B2, 10</b> Ø 10 mm, 100 m endless	B99H00-0100	1
<b>OTTO PE-Round Cord B2,13</b> Ø 13 mm, 100 m endless	B99H00-0101	1
<b>OTTO PE-Round Cord B2, 15</b> Ø 15 mm, 100 m endless	B99H00-0102	1
<b>OTTO PE-Round Cord B2, 20</b> Ø 20 mm, 50 m endless	B99H00-0103	1
<b>OTTO PE-Round Cord B2, 25</b> Ø 25 mm, 50 m endless	B99H00-0104	1
<b>OTTO PE-Round Cord B2, 30</b> Ø 30 mm, 25 m endless	B99H00-0105	1
<b>OTTO PE-Round Cord B2, 40</b> Ø 40 mm, 1 m endless	B99H00-0106	1

<b>Reaction to fire</b>	DIN 4102-B2
<b>Bulk density</b>	20 to 35 kg/m <sup>3</sup>
<b>Tensile strength</b>	200 to 300 kPa
<b>Temperature resistance</b>	-40 °C to 60 °C

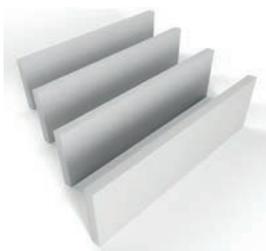
## Section insulation



**Section insulation** of mineral wool for metal pipes.

Designation	Art. no.	PU
<b>ROCKWOOL 800 Pipe Section 18/30</b> Section insulation for pipe-Ø 18 mm, length 1m	B99H00-0270	1
<b>ROCKWOOL 800 Pipe Section 28/30</b> Section insulation for pipe-Ø 28 mm, length 1m	B99H00-0271	1
<b>ROCKWOOL 800 Pipe Section 35/30</b> Section insulation for pipe-Ø 35 mm, length 1m	B99H00-0272	1
<b>ROCKWOOL 800 Pipe Section 54/30</b> Section insulation for pipe-Ø 54 mm, length 1m	B99H00-0273	1
<b>ROCKWOOL 800 Pipe Section 64/40</b> Section insulation for pipe-Ø 64 mm, length 1m	B99H00-0275	1
<b>ROCKWOOL 800 Pipe Section 89/40</b> Section insulation for pipe-Ø 89 mm, length 1m	B99H00-0277	1
<b>ROCKWOOL 800 Pipe Section 102/40</b> Section insulation for pipe-Ø 102 mm, length 1m	B99H00-0279	1
<b>ROCKWOOL 800 Pipe Section 114/40</b> Section insulation for pipe-Ø 114 mm, length 1m	B99H00-0281	1
<b>ROCKWOOL 800 Pipe Section 133/40</b> Section insulation for pipe-Ø 133 mm, length 1m	B99H00-0283	1
<b>ROCKWOOL 800 Pipe Section 169/50</b> Section insulation for pipe-Ø 169 mm, length 1m	B99H00-0284	1

## PROMATECT blanks



**PROMATECT blanks** of cement-bonded calcium silicate boards for cladding of component openings in flexible walls and as a board frame for upgrading components to the required minimum dimensions.

Designation	Art. no.	PU
<b>PROMATECT Lining Set 200/25</b> 600 x 200 x 25 mm, 4 pc.-set	B99H00-0263	1
<b>PROMATECT Lining Set 170/25</b> 600 x 170 x 25 mm, 4 pc.-set	B99H00-0265	1
<b>PROMATECT Frame Set 100/25</b> 600 x 100 x 25 mm, 4 pc.-set	B99H00-0267	1
<b>PROMATECT Frame Set 100/45</b> 600 x 100 x 45 mm, 4 pc.-set	B99H00-0269	1

## OTTOPUR Cleaner



**OTTOPUR Cleaner** is suitable for easy removal of fresh, unhardened PUR foams.

Designation	Art. no.	PU
<b>OTTOPUR Cleaner</b> Remover for fresh PUR foams, 500 ml	B99H00-0165	1

**OTTOSEAL S 115, cement grey**

**OTTOSEAL S 115** is a neutral cross-linking silicone sealant that can be used as additional permanently elastic sealing in the **ZZ® G50** linear fire protection joint seal. It is compatible with paint in accordance with DIN 52452 (cannot be coated over), non-corrosive and has excellent weather resistance, ageing resistance and UV resistance. In addition it contains a fungicide. Satisfies the requirements of DIN 18540-F.

Designation	Art. no.	PU
<b>OTTOSEAL S 115, cement grey</b> elastic sealing, 310 ml cartridge	B99H00-0110	1

<b>Colour</b>	Cement grey
<b>Skin formation time to 23 °C / 50 %</b>	Approx. 8 to 12 min
<b>Hardening in 24 hours at 23 °C / 50 % rel. humidity</b>	Approx. 2 mm
<b>Application temperature:</b>	5 °C to 35 °C
<b>Density at 23 °C</b>	Approx. 1.2 g/cm <sup>3</sup>
<b>Viscosity (23 °C)</b>	Pasty, non-sag
<b>Shore-A hardness (ISO 868)</b>	Approx. 28
<b>Permissible total deformation</b>	25 %
<b>Tensile strength value at 100 % (ISO 37, S3A)</b>	a. 0.4 N/mm <sup>2</sup>
<b>Elongation of break (DIN ISO 37, S3A)</b>	Approx. 550 %
<b>Tensile strength (DIN ISO 37, S3A)</b>	Approx. 1.4 N/mm <sup>2</sup>
<b>Temperature resistance</b>	-40 °C to 180 °C
<b>Storage stability</b>	12 months at 23 °C / 50 % rel. humidity

**OTTO Primer 1105**

**OTTO Primer 1105** is used for pre-treatment of joint flanks for use of **ZZ® 345 Fire Protection Silicone**. It improves the adhesion of the silicon on mineral materials (e.g. concrete, render, aerated concrete) and on absorbent substrates (e.g. plaster, fibre cement).

Designation	Art. no.	PU
<b>OTTO Primer 1105</b> pre-treatment, 250 ml	B99H00-0108	1

<b>Content</b>	250 ml
<b>Flash-off time</b>	At least 30 min (at 23 °C/50 % rel. humidity)
<b>Consumption</b>	Depending on the absorption capacity of the substrate, approx. 100 to 300 g/m <sup>2</sup>
<b>Density at 23 °C</b>	Approx. 0.9 g/cm <sup>3</sup>
<b>Storage stability</b>	12 months (at 23 °C/50 % rel. humidity, dry, in original containers)

## OTTOSEAL A 207, cement grey



**OTTOSEAL A 207** is a one component acrylic sealant that can be used as additional sealing in the system **ZZ® G50**. It is odourless, paintable, in accordance with DIN 52452 and has good UV-resistance. For joints subject to high stress, we recommend the silicone sealant OTTOSEAL S 115.

Designation	Art. no.	PU
<b>OTTOSEAL A 207, cement grey</b> elastic sealing, 300 ml cartridge	B99H00-0109	1

<b>Colour</b>	Cement grey
<b>Skin formation time to 23 °C / 50%</b>	Approx. 10 min
<b>Hardening in 24 hours at 23 °C / 50% rel. humidity</b>	Approx. 2 mm
<b>Application temperature:</b>	5 °C to 35 °C
<b>Density at 23 °C</b>	Approx. 1.7 g/cm <sup>3</sup>
<b>Viscosity (23 °C)</b>	Pasty, non-sag
<b>Shore-A hardness</b>	Approx. 10 to 12
<b>Permissible total deformation</b>	15 %
<b>Tensile strength value at 100% (ISO 37, S3A)</b>	a. 0.40 N/mm <sup>2</sup>
<b>Elongation of break (DIN ISO 37, S3A)</b>	Approx. 500 %
<b>Tensile strength (DIN ISO 37, S3A)</b>	Approx. 7.0 N/mm <sup>2</sup>
<b>Temperature resistance</b>	20 °C to 80 °C
<b>Joint width</b>	Max. 25 mm
<b>Volume shrinkage</b>	Approx. 25 %
<b>Storage stability</b>	12 months from date of manufacture with frost-free storage (interim storage to -10 °C but not longer than 48 hours)

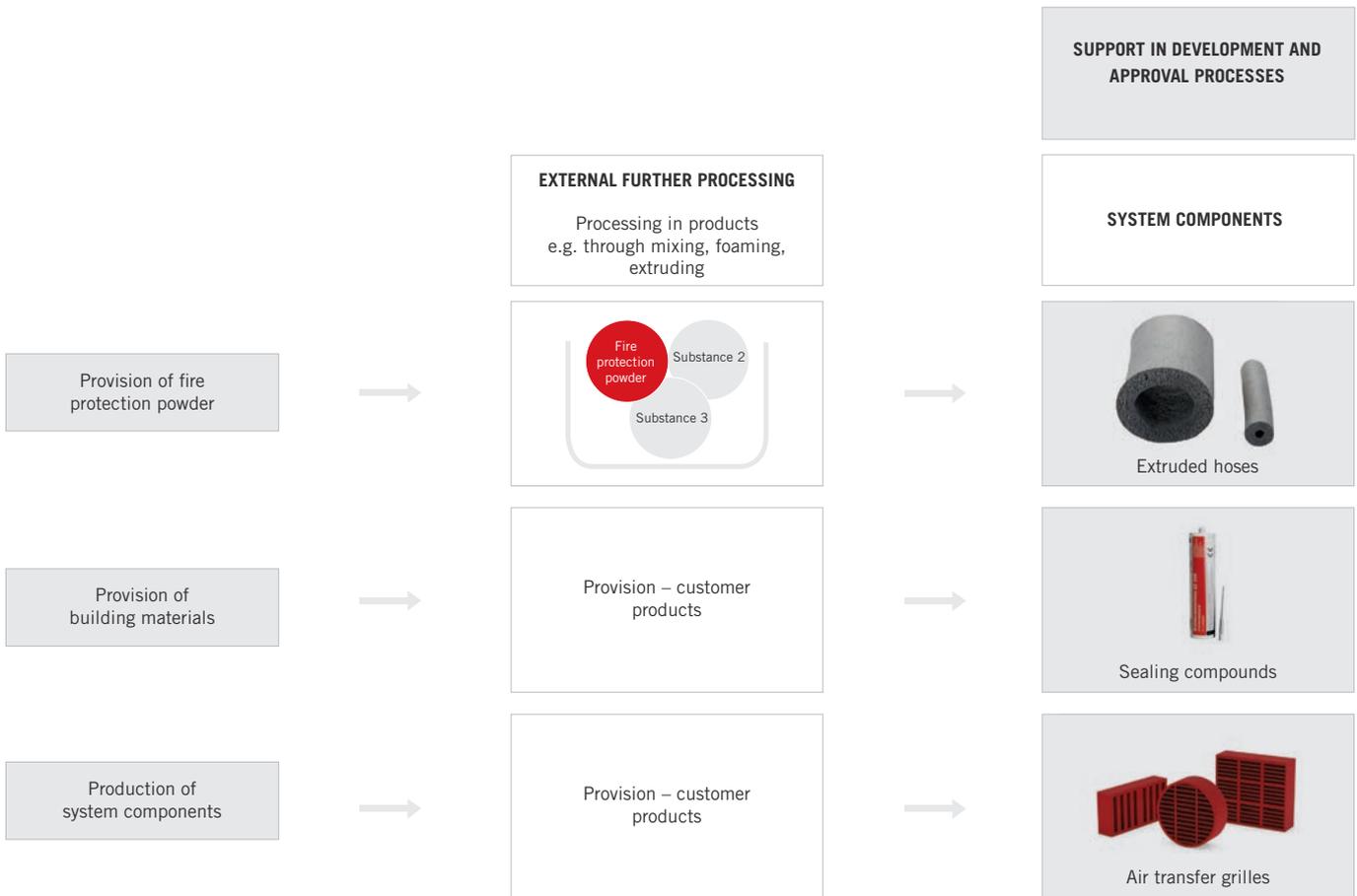
INDUSTRIAL SOLUTIONS

# SERVICES OF ZAPP-ZIMMERMANN

ZAPP-ZIMMERMANN GmbH also views itself as a supplier of intumescent building materials and fire protection components for further processing in industrial and building construction applications.

In addition to the approved fire protection products in its own product line, ZAPP-ZIMMERMANN offers the industry its experience in developing new fire protection products or upgrading building materials and building products, and in obtaining verifications of usability in compliance with building law, (general technical approval, general test certificate).

In these cases, the verifications of usability in accordance with building law are usually obtained by the user/customer himself. For development and preliminary testing of the special fire resistance property, tests can be offered in the company's own fire test rig.



## SUPPORT IN DEVELOPMENT AND APPROVAL PROCESSES

ZAPP-ZIMMERMANN GmbH specialises in the development of intumescent building materials. The term intumescence means expansion or swelling and is used in the fire protection industry for substances that increase their volume under the effect of heat.

If an intumescent building material is charged with heat, a physiochemical reaction starts, which in parallel with decomposition of the building material and formation of an insulating layer, results in an increase of the volume. For the most part, intumescent building materials are based on organic substances.

### Effect of intumescent building materials



#### Development of intumescence

1. Softening/decomposition of the base polymer (e.g. PUR, rubber, acrylic, silicone)
2. Release of the inorganic acid
3. Carbonisation
4. Gas formation through activation of the expanding agent
5. Intumescence through foaming of the system
6. Solidification of the intumescence through cross-linking reactions of the fire protection powder and its synergists

- a** Intumescence/carbon layer
- b** Softening area/decomposition area
- c** Base polymer

Depending on the application area and required purpose of the building material or component, it is possible to influence the intumescence with reference to many parameters:

- / Level of intumescence
- / Temperature-dependent start of intumescence
- / Direction of intumescence
- / Stability of the insulating layer
- / Expansion pressure (i.e. the force with which the intumescence develops)

This is achieved by adding specific flame-retardants and additives to the building material. For this ZAPP-ZIMMERMANN does not use any flame retardants that contain halogens.

# APPLICATION EXAMPLES FOR THE INTUMESCENT BEHAVIOUR

Depending on the application, ZAPP-ZIMMERMANN can influence and optimise the intumescent behaviour of a component with reference to multiple parameters.

## Level of intumescence for cable and pipe penetration seals

For cable and pipe penetration seals it is important that the level of intumescence be as high as possible so that cables and pipes are protected against the encroaching fire over a distance that is as long as possible, and so that temperature transmission via the copper conductors of the cables or the copper and steel pipes is limited.



Intumescent effect – building material  
**ZZ 10-A Fire Protection Foam**

System **ZZ M20** after fire

**ZZ 230-144 Fire Protection Block**

## Expansion pressure for pipe penetration seals

Collar systems that are used as a penetration seal for combustible pipes must, in the event of fire, develop an expansion pressure that is as strong as possible and a very high level of intumescence, so that the opening that occurs due to the burned or softened pipes is quickly and impermeably sealed.



Intumescent effect – building material  
**ZZ 10-F Fire Protection Foam**

System **ZZ P40** after fire

**ZZ 430 Fire Protection Collar**

## Stability of the insulating layer with fire protection joint seals

The level of intumescence is less critical for fire protection joint seals because joints are not penetrated by elements through which temperature could be transmitted. For the function of joint seals, it is necessary that a stable and permanent insulating layer is formed.



Intumescent effect – building material  
**ZZ 345 Fire Protection Silicone**

System **ZZ G30** after fire

**ZZ 345 Fire Protection Silicone**

## POSITIVE MATERIAL PROPERTIES COMBINED WITH FIRE RESISTANCE

A great advantage when using the fire protection powder is that the positive properties of building materials remain intact.



ZZ® 345 Fire Protection Silicone

### Elasticity and water impermeability – sealing compounds

Due to its special properties (high mechanical strength, for example in the form of elongation, water impermeability), silicone is highly significant in building construction for the sealing of building joints. For joints with fire protection requirements that the silicone cannot satisfy without additional measures, a common solution is to arrange mineral wool in the space between the silicone sealings. This solution helps fulfil the requirements, however there are several disadvantages associated with this solution:

- /Dust and fibre accumulate when mineral wool is processed
- /Additional material costs are incurred
- /In particular, the costs for installation of a running meter of fire protection joint increase

Through the combination of the fire protection powder with a building construction joint silicone, ZAPP-ZIMMERMANN was able to develop a fire protection silicone that is suitable for fire-resistant joints up to EI 120. It is installed in the same manner that an off-the-shelf silicone is installed, i.e. with PE round cords as backfill. The fact that the mechanical properties satisfy the requirements imposed on expansion and movement joints specified in DIN EN ISO 11600 is worthy of particular mention.



Silicone tubes

### Insulation – extruded foams as insulating tubes

Due to the high resistance to water vapour diffusion and the low thermal conductivity, insulating tubes made of synthetic rubber are outstanding for insulating refrigeration pipelines. If the insulated pipelines penetrate fire-resistant walls and floors, pipe penetration seals must be produced in the wall or floor area, and this in turn has a negative effect on costs.

ZAPP-ZIMMERMANN has developed a special powder mixture that can be homogeneously worked into the material of the insulating tubes directly in the manufacturing process. Through the fire protection upgrade, additional pipe penetration seals can be dispensed with in the future, because pipe tubes embedded in mortar achieve a fire resistance up to EI 120. On the other hand, we succeeded in maintaining the product properties, particularly the technical insulating properties in a manner that is more than satisfactory.

### Chemical resistance – extruded profiles

Due to the excellent elasticity, high level of weather resistance and good chemical properties, extruded profiles of synthetic rubber are frequently used as a sealing system. In this area as well, ZAPP-ZIMMERMANN succeeded in developing an intumescent fire protection powder that can be homogeneously worked into the rubber directly in the manufacturing process, and which subsequently can be extruded into a wide variety of profiles. Thus, in combination with the intumescent fire protection powder, the synthetic rubber sealing profile has a fire protection property and can be used in systems with fire resistance (e.g. as a window or door seal).



Silicone profiles



Fire protection powder



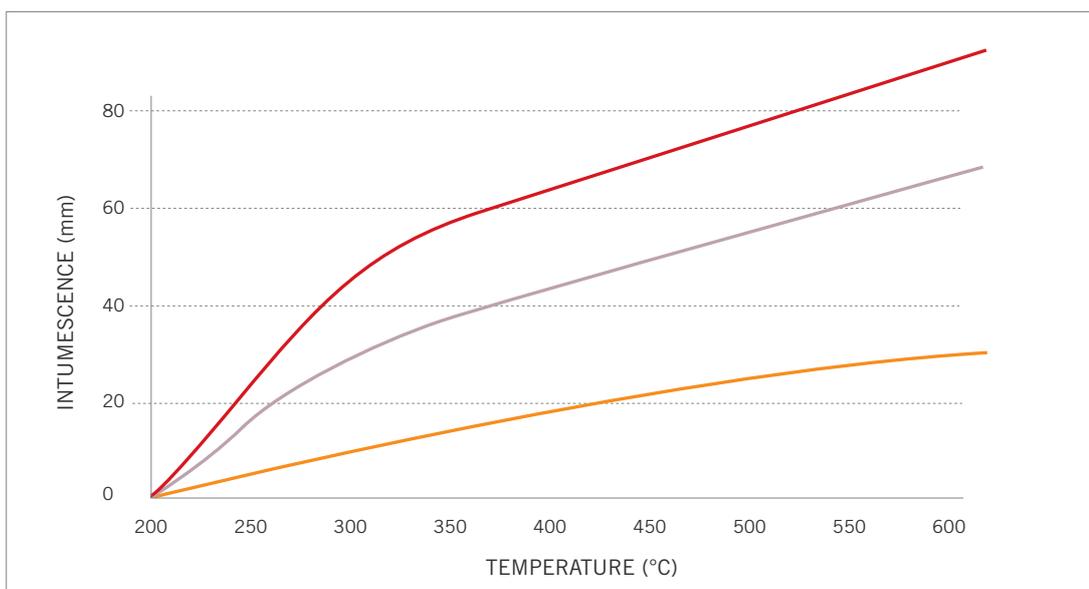
Intumescent fire protection powder

## MANUFACTURING OF FIRE PROTECTION POWDER

For several years ZAPP-ZIMMERMANN has been manufacturing fire protection powder to upgrade the intumescent property.

The fire protection powder can be used in virtually any building material, and can be worked into the building material as part of the manufacturing process. Depending on the application and the building material, the intumescent fire protection powder can be individually adapted to achieve the desired fire resistance behaviour of the building material in the event of fire

### Foaming behaviour of three intumescent fire protection powder variants



## ZAPP-ZIMMERMANN uses custom-developed fire protection powders for enhancing materials, such as polyurethane, acrylic, silicone, and butyl rubber

### Material: Polyurethane

Polyurethanes are particularly versatile plastics that can be foamed or cast in a wide variety of moulds. Polyurethanes are encountered in all areas of daily life, (mattresses, sponges, clothing, paints, adhesives, etc.). Polyurethane products can be manufactured in various gradations, from soft and elastic, to hard, as well as with different densities. In addition to these day-to-day applications, ZAPP-ZIMMERMANN uses polyurethanes in the area of fire protection. For many years ZAPP-ZIMMERMANN has been manufacturing most of the standard products, as well as a number of special components, of PU foams.

**Properties:** A wide variety of geometries and shapes can be cast or foamed.

/Casting compounds: rubber-like to hard, medium density to high density, 500–1300 g/dm<sup>3</sup>

/Foams: soft to hard, low to medium density, 200–400 g/dm<sup>3</sup>

**Examples:** In addition to the standard products for cable and pipe penetration seals, ZAPP-ZIMMERMANN produces a wide range of polyurethane moulded parts with fire protection properties: Air transfer grilles, sealing rings, sealing strips, mats, and many other items.

### Material: acrylic

Acrylics are elastic plastics, which in the construction area are primarily used for the sealing of joints and stress cracking. In addition, acrylic is used for paints and lacquers, as well as adhesives.

**Properties:** Unlike silicone, acrylic is odourless. In addition, after hardening, acrylic can be coated over and can be built up in multiple layers.

**Examples:** **ZZ<sup>®</sup> 333 Fire Protection Mastic** is an acrylic-based joint sealing compound that is used for sealing of joints and small openings in ZZ through penetration firestop systems, or also individually for small through penetration seals.

### Material: silicone, silicone foam

Silicone is an elastomer with versatile implementation possibilities; in the construction industry it is primarily used as a sealant, casting compound or coating material.

**Properties:** As an elastomer, silicone is extremely ductile and is capable of strong elastic deformation. Consequently, it is primarily used in areas where it accommodates elongation or deformation and then must return to its original shape. In addition, it is highly resistant to weathering; thus it is often used in outdoor areas or wet-duty areas, e.g. for joints in bathrooms.

**Examples:** **ZZ<sup>®</sup> 345 Fire Protection Silicone** offers these advantages of an elastic joint sealant, and in the event of fire simultaneously forms an extremely stable, hard carbon layer for fire resistance up to EI 180. **ZZ<sup>®</sup> 345 Fire Protection Silicone**, satisfies the requirements specified in the EN ISO 11600 standard for building construction joints, and in other standards.

### Material: Butyl rubber

Butyl rubber is a polymer with plastic properties. Among other applications it is used in tapes, sealing compounds and adhesives.

**Properties:** Butyl rubber is plastic, kneadable and mouldable, and in this regard self-adhesive, so that it can be very effectively shaped. Moreover, excellent resistance to ageing and weathering and compatibility with most building materials are additional advantages of this material.

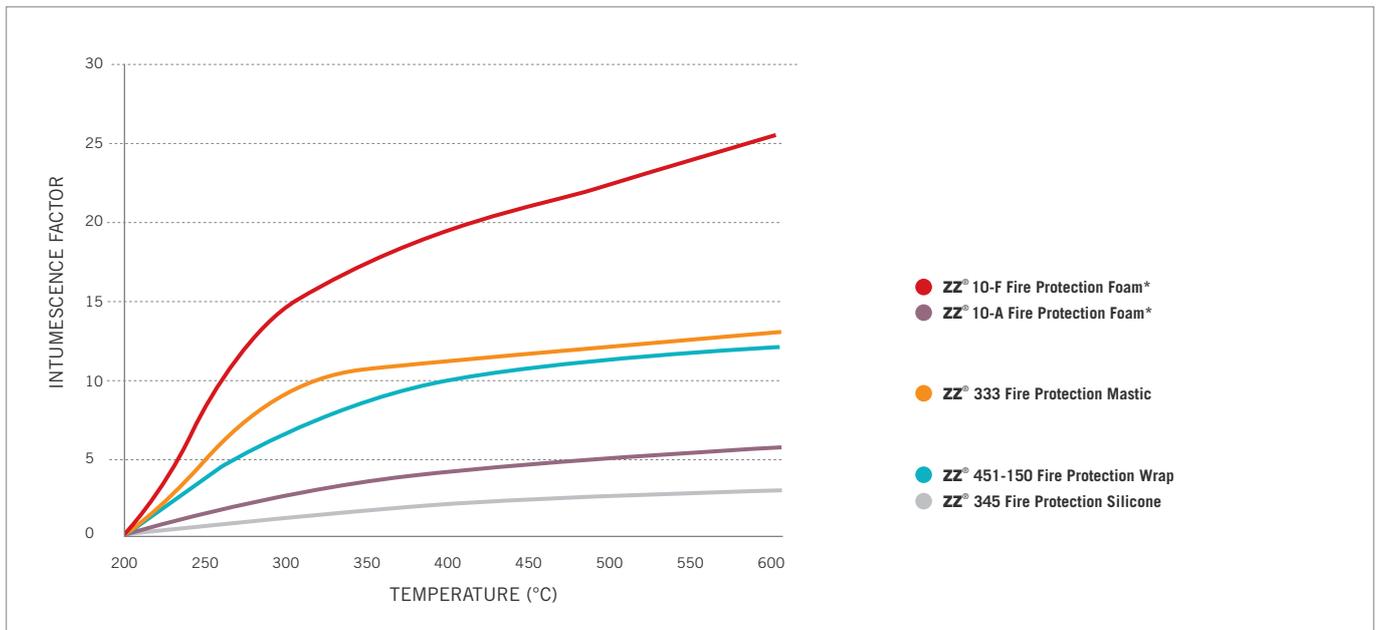
**Examples:** ZAPP-ZIMMERMANN primarily uses butyl rubber for **ZZ<sup>®</sup> 451-150 Fire Protection Wrap**.

# OVERVIEW: BUILDING MATERIALS

In addition to upgrading external materials, ZAPP-ZIMMERMANN GmbH has developed its own approved building materials.

Building material	ZZ <sup>®</sup> 10 Fire Protection Foam*	ZZ <sup>®</sup> 333 Fire Protection Mastic	ZZ <sup>®</sup> 345 Fire Protection Silicone	ZZ <sup>®</sup> 451-150 Fire Protection Wrap
Material	Polyurethane with intumescent additives	Acrylic with intumescent additives	Silicone with intumescent additives	Butyl rubber with intumescent additives
Use category in accordance with ETAG 026-1	Z1	Z1	X	Z1
Reaction to fire in accordance with EN 13501-1	Class E	Class E	Class E	Class E
Density (g/l)	240-1410	1300-1450	Approx. 1150	1215-1485
Consistency	Adjustable from soft, rubber-like to hard	Pasty	Pasty	Soft, ductile
Application	Fire protection moulded parts	Fire protection sealing mastic	Fire protection sealing mastic	Fire protection wrap

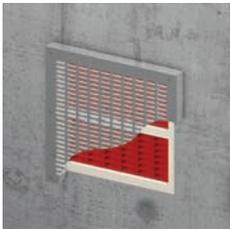
## Comparison of the intumescence of the building materials cited above



\* ZZ<sup>®</sup> 10 Fire Protection Foam is offered in various types (10-A to 10-F)

## OVERVIEW: SYSTEM COMPONENTS

### Air transfer grilles

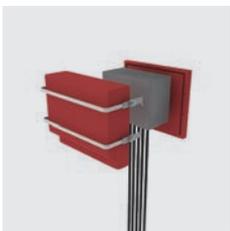
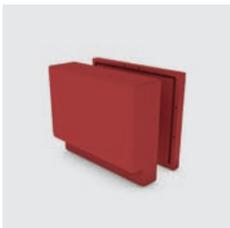


Designation	Length [mm]	Width [mm]
Air transfer grille	93	93
Air transfer grille	93	186
Air transfer grille	150	150
Air transfer grille	150	200
Air transfer grille	150	300

Other formats available on request.

<b>Building material</b>	<b>ZZ® 10-C Fire Protection Foam</b>
<b>Properties</b>	Hard, density approx. 1150–1410 g/dm <sup>3</sup>
<b>Function</b>	Closure of the ventilation slots in the event of fire
<b>Install locations:</b> Fire protection safe closure of air vent openings	

### Fire protection boxes



<b>Building material</b>	<b>ZZ® 10-C Fire Protection Foam</b>
<b>Properties</b>	Hard, dimensionally stable, with coated surface for improving the resistance to weathering
<b>Function</b>	Assuring that function is maintained in the event of fire
<b>Install locations:</b> Fire protection enclosure of a distributor box	

### Intumescent silicone sealing compounds



Designation	Art. no.	PU
<b>ZZ® 345-C Fire Protection Silicone</b> 310 ml cartridge	B15H00-0001	1
<b>ZZ® 345-TB Fire Protection Silicone</b> 580 ml tubular bag	B15H00-0002	1

Building material	<b>ZZ® 345 Fire Protection Silicone</b>
Use category in accordance with ETAG 026-1	X
Reaction to fire in accordance with EN 13501-1	Class E
Properties	Pasty, smoothable
Function	Protection against fire and smoke propagation via building construction joints
<b>Install locations:</b> Fire protection joint seal	

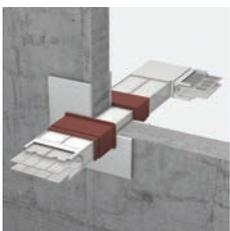
### Intumescent acrylic sealing compounds



Designation	Art. no.	PU
<b>ZZ® 333 Fire Protection Mastic</b> 310 ml cartridge	B15N00-0013	1
	B15VP1-0013	900

Building material	<b>ZZ® 333 Fire Protection Mastic</b>
Use category in accordance with ETAG 026-1	Z <sub>1</sub>
Reaction to fire in accordance with EN 13501-1	Class E
Properties	Pasty, can be smoothed and coated over
Function	Sealing of single-cable penetration seals and joints
<b>Install locations:</b> Cable penetration seals	

### Intumescent and self-adhesive wrap

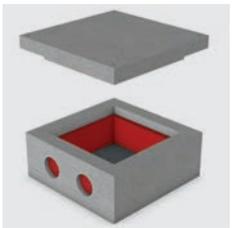


Designation	Art. no.	PU
<b>ZZ® 451-150 Fire Protection Wrap</b> width 150 mm, 5 m roll	BO4N00-0004	1

Building material	<b>ZZ® 451-150 Fire Protection Wrap</b>
Use category in accordance with ETAG 026-1	Z <sub>1</sub>
Reaction to fire in accordance with EN 13501-1	Class E
Install locations	Busbars, cable and mixed penetration seals
Properties	Rubber-like, can be plastically formed, self-adhesive
Function	Sheathing of cables, cable support systems and busbar systems
<b>Install locations:</b> Prevents heat conductance in the event of fire, e.g. on busbar systems	

## OVERVIEW: COMPONENTS FOR FURTHER PROCESSING

### Intumescent profiles



Designation	Length [mm]	Width [mm]	Height [mm]
Profile cut to size	1000	10	10
Profile cut to size	1000	20	20
Profile cut to size	1000	30	30
Profile cut to size	1000	40	40
Profile cut to size	1000	50	50

Other formats available on request.

Building material	<b>ZZ® 10-A Fire Protection Foam</b>
Use category in accordance with ETAG 026-1	Z <sub>1</sub>
Reaction to fire in accordance with EN 13501-1	Class E
Install locations	Penetration seals, seals, inlays, etc.
Properties	Soft, flexible
Function	Sealing of cable penetration seals, e.g. in control cabinets
<b>Install locations: Inner through penetration firestop system in boxes</b>	

### Fire protection composite elements



Building material	<b>ZZ® 10-A Fire Protection Foam</b> with silicone outer skin
Properties	Soft, flexible, tear-resistant, resistant to weathering
Function	In the event of fire, it protects the EPDM joint seal and the concrete flanks in tunnel structures
Dimensions	Length: up to 20 m (with end-to-end connections) Diameter: 20 to 50 mm (Delivery on request)
<b>Install locations: Fire protection joint seals in building construction or in tunnels</b>	

## Fire protection seals



Designation	Ø [mm]	Height [mm]
Ring	100	12-27
Ring	125	12-27
Ring	150	12-27
Ring	160	12-27
Ring	200	12-27

Other formats available on request.

<b>Building material</b>	<b>ZZ® 10-A Fire Protection Foam</b>
<b>Properties</b>	Soft, flexible, dense approx. 250 g/dm <sup>3</sup>
<b>Function</b>	Sealing of valves
<b>Install locations:</b> Seals for fire disc valves	

## Fire protection special parts (comb-shaped)



Designation	W x H x D [mm]
Busbar protection	135x120x27
Busbar protection	135x120x55

Other formats available on request.

<b>Building material</b>	<b>ZZ® 10-A Fire Protection Foam</b>
<b>Install locations</b>	Busbar penetration seal
<b>Properties</b>	Soft, flexible, dense approx. 250 g/dm <sup>3</sup>
<b>Function</b>	Prevention of heat conductance via the busbar system
<b>Install locations:</b> Busbar penetration seal	

## Intumescent cast parts



<b>Building material</b>	<b>ZZ® 10-C Fire Protection Foam</b>
<b>Properties</b>	Hard, dimensionally stable, density approx. 1150–1410 g/dm <sup>3</sup>
<b>Function</b>	Cable penetration seal
<b>Install locations:</b> Cable penetration seal in control cabinets	

## Intumescent linings



Designation	Length [mm]	Width [mm]
Inlay 1	395	70
Inlay 2	570	80

Other formats available on request.

<b>Building material</b>	<b>ZZ® 10-F Fire Protection Foam</b>
<b>Use category in accordance with ETAG 026-1</b>	Z <sub>1</sub>
<b>Reaction to fire in accordance with EN 13501-1</b>	Class E
<b>Properties</b>	Flexible, density approx. 1000 g/dm <sup>3</sup>
<b>Function</b>	Closure of the plastic pipe in the event of fire
<b>Install locations:</b> Intumescent inlay in fire protection collars for through penetration firestop systems for combustible pipes	



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