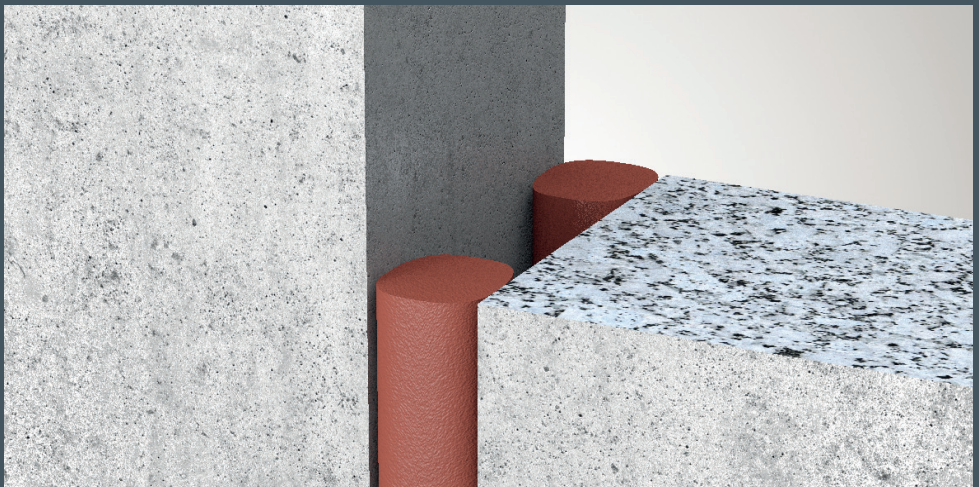


System ZZ-Fire-protection joint seal NE ETA-12/0119

INSTALLATION MANUAL



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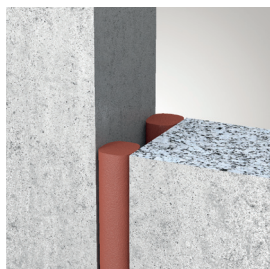
System ZZ-Fire-protection joint seal NE

for firestop joint seals up to EI 120

System ZZ-Fire protection joint seal NE restores the fire resistance classification in areas of walls and floors.

System ZZ-Fire-protection joint seal NE ETA-12/0119

ZZ-Fire protection joint seal NE is used to seal firestop joints in rigid walls and rigid floors to satisfy the requirements for the fire resistance classification up to EI 120 in accordance with ETA-12/0119.



System ZZ-Fire protection joint seal NE
in rigid wall

Specially suited for: Expansion and movement joints with fire resistance requirements up to EI 120 (up to 25 % lateral expansion and 7.5 % shear)

Fundamentals

- / For execution of the firestop joint seal, System ZZ-Fire protection joint seal NE, the European technical approval ETA-12/0119 issued by the Austrian Institute for Building Technology (Österreichisches Institut für Bautechnik) is authoritative.
- / All technical specifications, such as permissible joint widths, wall types/floor types, fire resistance classes, etc. are provided in the approval.
- / It must be ensured that the stability of the adjacent component is not impaired through installation of the firestop joint seal even in the event of fire. The information specified in the usability certification of the component must be complied with.
- / All applicable directives and technical rules of other trades must be complied with.
- / In accordance with ETAG 026-3, the firestop joint seal can be assigned to use category Z₁. This means that the permissible ambient conditions for use of the product are indoor areas with humidity and temperatures above 0°C.

Permissible install locations of the firestop joint seal

Components	Construction type	Classification of the component	Minimum component density
Rigid wall	Aerated concrete, concrete, reinforced concrete, masonry	The component must be classified for the required fire resistance class in accordance with EN 13501-2	600 kg/m ³
Rigid floor	Aerated concrete, concrete, reinforced concrete		600 kg/m ³

System components



Designation			Art. no.	PU
1. ZZ-Joint seal NE			see variants	
Variants	Max. joint width [mm] *)	L [mm]	Art. no.	PU
1. ZZ-Joint seal NE Ø 16	13	1000	B08N02-0016	20
1. ZZ-Joint seal NE Ø 24	21	1000	B08N02-0017	20
1. ZZ-Joint seal NE Ø 30	27	1000	B08N02-0018	20
1. ZZ-Joint seal NE Ø 39	35	1000	B08N02-0019	20
1. ZZ-Joint seal NE Ø 49	45	1000	B08N02-0020	10
1. ZZ-Joint seal NE Ø 60	55	1000	B08N02-0021	8
1. ZZ-Joint seal NE Ø 70	65	1000	B08N02-0022	6
1. ZZ-Joint seal NE Ø 80	75	1000	B08N02-0023	4

*) The information includes the max. lateral expansion of 25 %.

Accessories



Designation	Art. no.	PU
2. Knife with serrated blade, wide & magnetic blade guard	B16H00-0043	1
3. OTTOSEAL A 207, 300 ml (cement grey)	B99H00-0109	20
4. OTTOSEAL S 115, 310 ml (cement grey)	B99H00-0110	20
5. Professional dispensing gun 310 ml	B16H00-0024	1
6. EconoMax dispensing gun (310 ml cartridge & 580 ml tubular bag)	B16H00-0052	1
7. PowerMax dispensing gun (310 ml cartridge & 580 ml tubular bag)	B16H00-0053	1
8. Smoothing trowel	B99H00-0161	1

System ZZ-Fire-protection joint seal NE ETA-12/0119

Movement capacity of the firestop joint seal

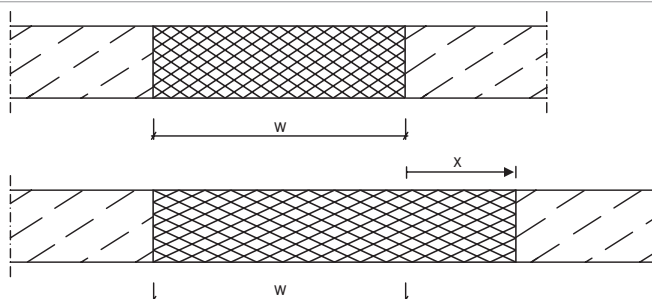
The movement capacity of the firestop joint seal is limited to specific values in accordance with ETA-12/0119. The movement capacity is defined as an absolute amount, starting from the tension free zero position.

Example: A movement capacity of 20% permits movements of the joint of +/- 10% or -5% (compression) and +15% (expansion).

Calculation of the permissible lateral displacement of two joint flanks

Formula:

$$x = \frac{mc + 100}{100} \cdot w - w$$



Example: Joint width 60 mm, movement capacity System ZZ-Fire protection joint seal NE mc = 25%

$$x = \frac{25 + 100}{100} \cdot 60 - 60 = 15 \text{ mm}$$

x = Permissible lateral displacement (expansion/compression) of two joint flanks [mm]

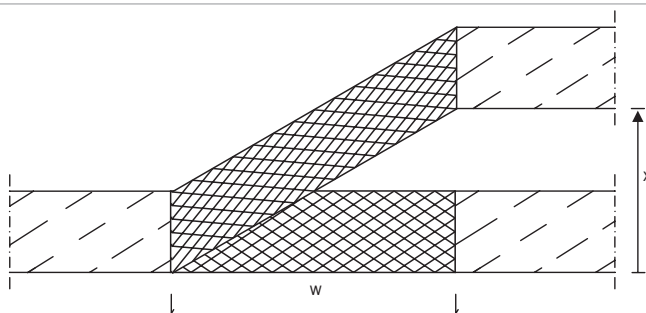
w = Nominal joint width [mm]

mc = Movement capacity (lateral expansion) of the joint seal [%]

Calculation of the permissible vertical displacement of two joint flanks

Formula:

$$x = w \sqrt{\frac{mc}{100} \cdot \left(2 + \frac{mc}{100}\right)}$$



Example: Joint width 60 mm, movement capacity System ZZ-Fire protection joint seal NE mc = 7.5%

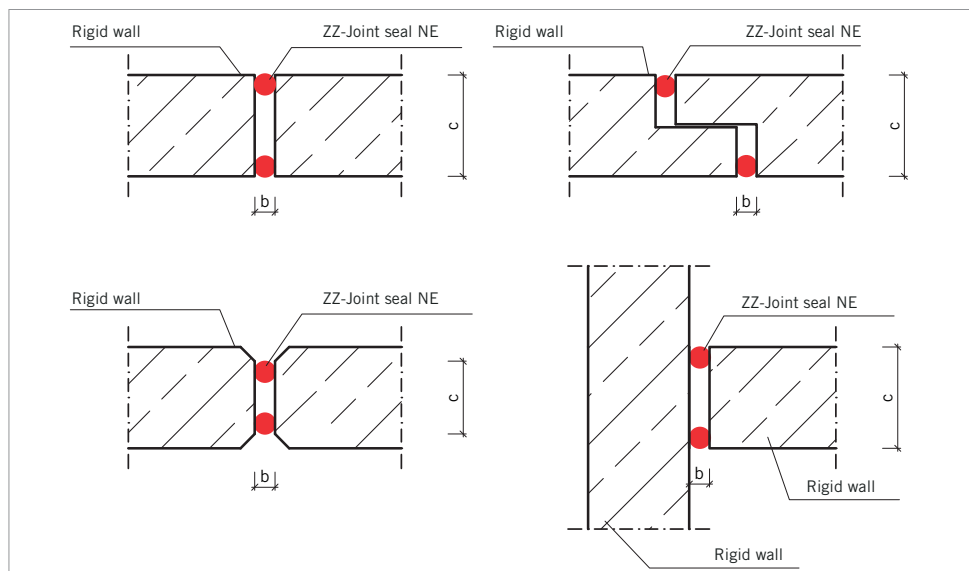
$$x = 60 \cdot \sqrt{\frac{7.5}{100} \cdot \left(2 + \frac{7.5}{100}\right)} = 23.7 \text{ mm}$$

x = Permissible vertical displacement (shear) of two joint flanks [mm]

w = Nominal joint width [mm]

mc = Movement capacity (shear) of the joint seal [%]

Application: Vertical firestop joints in/between rigid walls



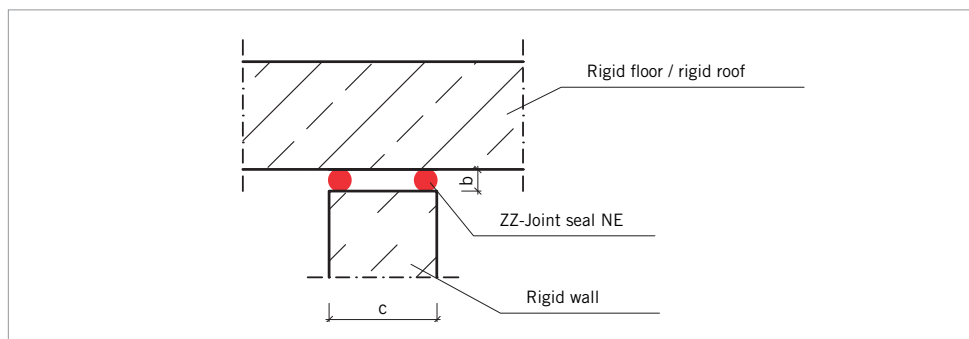
- / Movement capacity 25% (lateral expansion) or 7.5% (shear)
- / Maximum joint width 60 mm (i.e. max. joint width 75 mm incl. 25% lateral expansion)
- / Minimum joint width 10 mm
- / Minimum wall thickness 150 mm
- / The joint seal consists of two ZZ-Joint seals NE

System ZZ-Fire-protection joint seal NE ETA-12/0119

Overview of the fire resistance classification and the maximum joint widths in rigid walls (vertical firestop joint)

Components	Wall thickness/ total joint thickness c [mm]	Variants ZZ-Joint seal NE	Max. joint width b (incl. 25 % expansion)	Fire resistance classification
Rigid wall	≥ 150	ZZ-Joint seal NE Ø 16	13 mm	EI15 to EI120-V-M025-F-W 10 to 60
		ZZ-Joint seal NE Ø 24	21 mm	
		ZZ-Joint seal NE Ø 30	27 mm	
		ZZ-Joint seal NE Ø 39	35 mm	
		ZZ-Joint seal NE Ø 49	45 mm	
		ZZ-Joint seal NE Ø 60	55 mm	
		ZZ-Joint seal NE Ø 70	65 mm	
		ZZ-Joint seal NE Ø 80	75 mm	

Application: Horizontal firestop joints in rigid walls adjacent to rigid floors or rigid roofs



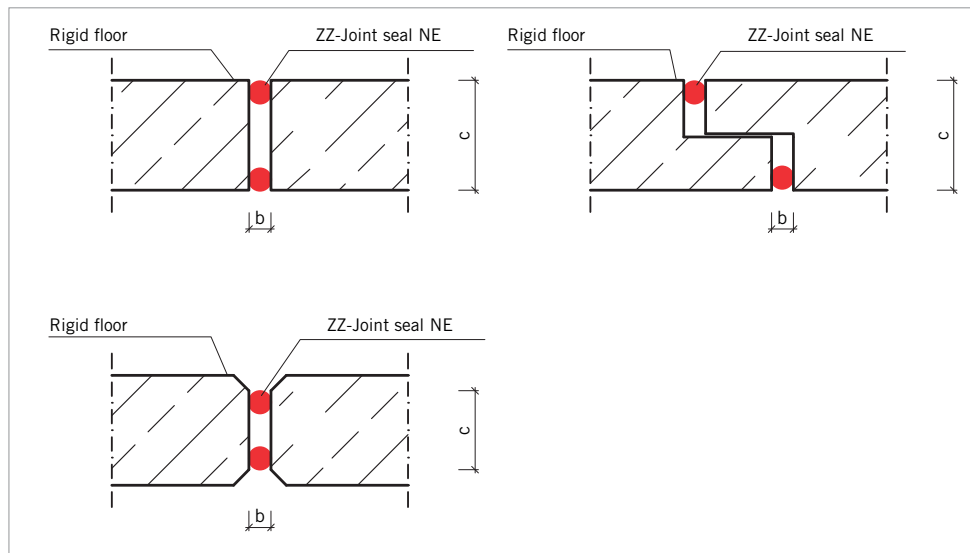
- / Movement capacity 25 % (lateral expansion) or 7.5 % (shear)
- / Maximum joint width 60 mm (i.e. max. joint width 75 mm incl. 25 % lateral expansion)
- / Minimum joint width 10 mm
- / Minimum wall thickness from 150 mm
- / The joint seal consists of two ZZ-Joint seals NE

Overview of the fire resistance classification and the maximum joint widths in rigid walls
(horizontal firestop joint adjacent to rigid floors or rigid roofs)

Components	Wall thickness/ total joint thickness c [mm]	Variants ZZ-Joint seal NE	Max. joint width b (incl. 25 % expansion)	Fire resistance classification
Rigid wall	≥ 150	ZZ-Joint seal NE Ø 16	13 mm	EI15 to EI120-H-M025-F-W 10 to 60
		ZZ-Joint seal NE Ø 24	21 mm	
		ZZ-Joint seal NE Ø 30	27 mm	
		ZZ-Joint seal NE Ø 39	35 mm	
		ZZ-Joint seal NE Ø 49	45 mm	
		ZZ-Joint seal NE Ø 60	55 mm	
		ZZ-Joint seal NE Ø 70	65 mm	
		ZZ-Joint seal NE Ø 80	75 mm	

System ZZ-Fire-protection joint seal NE ETA-12/0119

Application: Horizontal firestop joints in/between rigid floors



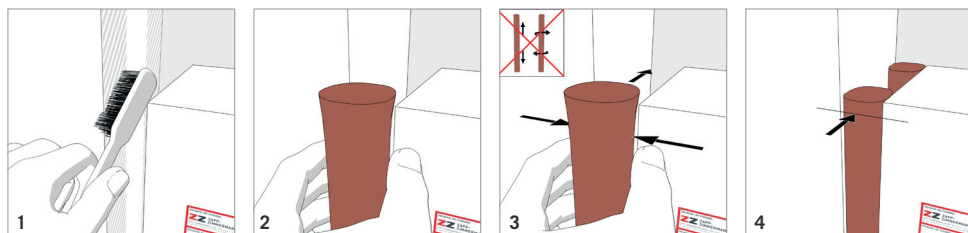
- / Movement capacity 25% (lateral expansion) or 7.5% (shear)
- / Maximum joint width 60 mm (i.e. max. joint width 75 mm incl. 25% lateral expansion)
- / Minimum joint width 10 mm
- / Minimum thickness 150 mm
- / The joint seal consists of two ZZ-Joint seals NE

Overview of the fire resistance classification and the maximum joint widths in rigid floors (horizontal arrangement)

Components	Floor thickness/ total joint thickness c [mm]	Variants ZZ-Joint seal NE	Max. joint width b (incl. 25% expansion)	Fire resistance classification
Rigid floor	≥ 150	ZZ-Joint seal NE Ø 16	13 mm	EI15 to EI120-H-M025-F-W 10 to 60
		ZZ-Joint seal NE Ø 24	21 mm	
		ZZ-Joint seal NE Ø 30	27 mm	
		ZZ-Joint seal NE Ø 39	35 mm	
		ZZ-Joint seal NE Ø 49	45 mm	
		ZZ-Joint seal NE Ø 60	55 mm	
		ZZ-Joint seal NE Ø 70	65 mm	
		ZZ-Joint seal NE Ø 80	75 mm	

Explanation of the fire resistance classification

EI 120	Compliance with the criterion for integrity and temperature insulation over a period of at least 120 minutes
V/H	Vertical or horizontal (adjacent to floors) joint in walls or horizontal joint in floors
M025	Movement capacity 25%
F	Produced on site
W 10 to 60	Range of the joint widths in mm

System ZZ-Fire-protection joint seal NE ETA-12/0119**Installation steps**

The approval, ETA-12/0119, and the respective national regulations are authoritative for execution of the firestop joint seal.

1. Before installation, clean the joint flanks.
Material that is located in the joint can remain, with the prerequisite that the ZZ-Joint seal NE can be inserted into the component completely and as prescribed from both sides.
2. Use the ZZ-Joint seal NE that is suitable for the joint width. It must be checked whether the movements of the joint flanks can be absorbed by the ZZ-Joint seal NE (see above).
3. The ZZ-Joint seal NE must be compressed in width and pushed into the component joint. In this process, the ZZ-joint seal NE must not be twisted or overstretched. ZZ-Joint seals NE have to be butt-jointed together, bonding is not necessary.
4. Mount one ZZ-Joint seal NE flush with the component surface on each side. If the total joint thickness (≥ 150 mm) is complied with, the ZZ-Joint seal NE can also be pushed into the interior of the component joint.

Additional protection of the firestop joint through use of a sealant

For protection against contamination or moisture, or for aesthetic reasons, firestop joints of ZZ-Joint seals NE can be additionally sealed with sealants (e.g. silicone, acrylic), and thus upgraded to a construction joint (in accordance with DIN 18540 or ISO 11600) (see below).

Reasons for an additional seal include:

- / Irregular joint flanks
- / Different colour scheme of the joint
- / For protection against moisture or dust

As suitable sealants we recommend:

- / OTTOSEAL S 115 (silicone)
- / OTTOSEAL A 207 (acrylic)

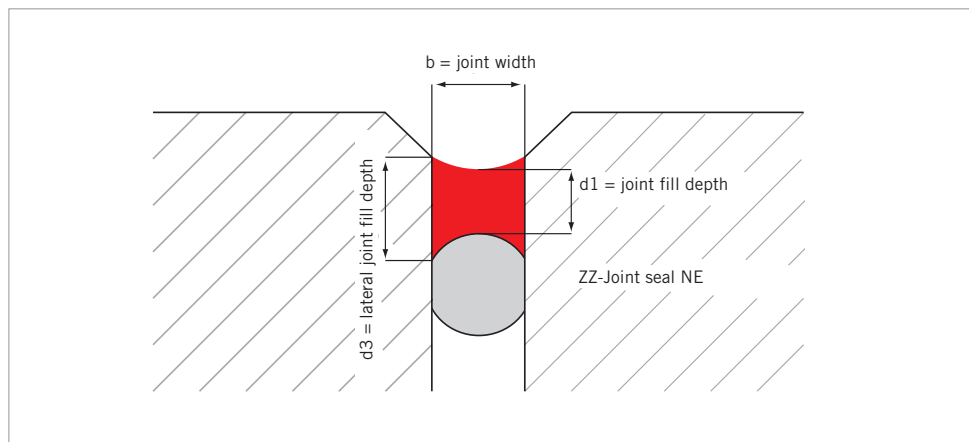
Upgrade to construction joint in accordance with DIN 18540-F

- / The firestop joint seal can additionally be upgraded with OTTOSEAL S 115 (silicone sealant) to a construction joint in accordance with DIN 18540-F. OTTOSEAL S 115 is additionally tested in accordance with EN 15651-1: F EXT-INT CC 25 LM and EN 15651-3: XS 1

For use, also comply with the product instructions provided by the manufacturer and with following execution instructions.

System ZZ-Fire-protection joint seal NE ETA-12/0119

Correctly dimensioning and producing joints



Collectively the following rules should be complied with as a rule of thumb for proper dimensioning of the joint:

Joint fill depth $d1 = 0.5 \cdot \text{joint width } b$
 Minimum fill depth $d1 \geq 6 \text{ mm}$
 Maximum joint fill depth $d1 \leq 15 \text{ mm}$

If the selected fill depth of the sealant is insufficient, its mechanical stability is reduced. If possible, expansion joints should not be narrower than 10 mm. The thickness of the joint sealant should be greater on the joint flank than it is in the middle of the joint. Thus the forces that occur in the event of expansion, can be introduced into the joint flank over a larger contact surface. Therefore adhesion cracks on the joint flank are prevented.

Lateral joint fill depth $d3 = 2/3 \cdot \text{joint width } b$

(Source: German Sealant Manufacturers Association)
 (Industrieverband Dichtstoffe e.V.)

It must be ensured that the substrate on which the silicone should adhere, has sufficient load-bearing capacity and can absorb the forces that can occur with expansion movements and shear movements. The surface of the joint flanks must be free of dust, sand, grease, oil, (e.g. formwork oil), cement laitance and paint residues.

To improve the adhesion of ZZ-Fire protection silicone NE on mineral materials, (e.g. concrete, aerated concrete) and on absorbent materials (e.g. gypsum, fibre cement), the joint flanks must be pre-treated with a primer (e.g. Otto Primer 1105). Thorough preparation of the joint flanks is important particularly in the case of high mechanical stress of the joint seal in the form of lateral movements and shear movements.

Calculation scheme: Running metre per cartridge, each 310 ml

Joint depth [mm]	Joint width [mm]											
	5	6	7	8	10	12	15	20	25	30	35	40
5	12.4	10.3	8.8	7.7	6.2	5.1	4.1	3.1	2.4	2.0	1.7	1.5
6	10.3	8.6	17.3	6.4	5.1	4.3	3.4	2.5	2.0	1.7	1.4	1.2
7	8.8	7.3	6.3	5.5	4.4	3.6	2.9	2.2	1.7	1.4	1.2	1.1
8	7.7	6.4	5.5	4.6	3.8	3.2	2.5	1.9	1.5	1.2	1.1	0.9
10	6.2	5.1	4.4	3.8	3.1	2.5	2.0	1.5	1.2	1.0	0.8	0.7
12	5.1	4.3	3.6	3.2	2.5	2.1	1.7	1.2	1.0	0.8	0.7	0.6
15	4.1	3.4	2.9	2.5	2.0	1.7	1.3	1.0	0.8	0.6	0.5	0.5

This calculation scheme does not take any fluctuations of the joint geometry into account or any material loss that occurs when smoothing the joint. Consequently, we always recommend that you plan with material requirements that are higher than shown in the calculation.

Product data – ZZ-Joint seal NE

Reaction to fire in accordance with DIN EN 13501-1:	Class E
Transport/storage:	Dry, protected against dust and only in the original packaging
Thermal conductivity:	$\lambda = 0.103 \text{ W/(m}\cdot\text{K)}$, <u>Test standard:</u> DIN EN 12667

Supplemental national requirements**Germany**

/ After the tasks have been concluded a written confirmation of conformance must be given to the client.

Testing the fire safety properties under environmental influences**Permissible ambient conditions:****In accordance with ETAG 026-3:**

Use category Z₁
Products for use in indoor areas with humidity and temperatures above 0 °C.

Declaration of Performance

Link to the Declaration of Performance

System component	Link
ZZ-Joint seal NE	www.z-z.eu/dop-12-08

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