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European Technical Assessment

ETA-13/0123 of 23.08.2018

General part

Technical Assessment Body issuing the European Technical Assessment	Österreichisches Institut für Bautechnik (OIB) Austrian Institute of Construction Engineering
Trade name of the construction product	ZZ C31
Product family to which the construction product belongs	Fire Stopping and Fire Sealing Products: Penetration Seals
Manufacturer	Karl Zimmermann GmbH Marconistraße 7-9 50769 Köln GERMANY
Manufacturing plant	Karl Zimmermann GmbH Marconistraße 7-9 50769 Köln GERMANY
This European Technical Assessment contains	17 pages including Annexes A-1 to D-1 which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	European Assessment Document EAD 350454-00-1104 „Fire stopping and fire sealing products – Penetration seals”
This European Technical Assessment replaces	European technical approval ETA-13/0123 with validity from 28.06.2013 to 27.06.2018

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Specific parts

1 Technical description of the product

"ZZ C31" is a product to be used as cable penetration seal based on the intumescent fire protection sealant "ZZ 345".

Component of "ZZ C31"	Characteristics
ZZ 345	Product in cartridges on the basis of silicone with intumescent fire protection additives

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

2.1 Intended use

"ZZ C31" is intended to be used as a cable penetration seal to temporarily or permanently reinstate the fire resistance performance of flexible wall constructions, rigid wall constructions and rigid floor constructions where they have been provided with apertures which are penetrated by various cables.

The thickness of the penetration seal in has to be minimum 150 mm consisting of one layer of at least 15 mm "ZZ 345" on both sides of the separating element.

The maximum opening size of the penetration seal has to comply with the dimensions as specified in the following table.

Blank penetration seals with maximum opening sizes as specified in the following table have been tested.

"ZZ C31" can be installed only in the types of separating elements as specified in the following table.

Separating element	Construction	a) Maximum opening size of the penetration seal (width x height) b) Minimum thickness of the penetration seal
Flexible walls	> Steel studs or timber studs lined on both faces with minimum 2 layer of boards (minimum thickness 12,5 mm) with classification A2-s1,d0 or A1 according to EN 13501-1 > For timber stud walls there shall be a minimum distance of 100 mm of the penetration seal to any timber stud. The cavity between the penetration seal and the timber stud has to be closed with minimum 100 mm of insulation with classification A1 or A2 according to EN 13501-1 > Minimum thickness 94 mm > Classification according to EN 13501-2: ≥ EI 60 > This European Technical Assessment does not cover sandwich panel constructions and flexible walls were the lining does not cover studs on both sides. Penetrations in such constructions shall be tested on a case by case basis	See Annex B-1 of the ETA): a) 100 x 100 [mm] / Ø 113 mm b) 150 mm
Rigid walls	> Aerated concrete, concrete, reinforced concrete, masonry > Minimum density 450 kg/m³ > Minimum thickness 100 mm > The rigid wall shall be classified in accordance with EN 13501-2 for the required fire resistance period	See Annex B-2 and B-3 of the ETA): a) 100 x 100 [mm] / Ø 113 mm b) 150 mm
Rigid floors	> Aerated concrete, concrete, reinforced concrete > Minimum density 450 kg/m³ > Minimum thickness 150 mm > The rigid floor shall be classified in accordance with EN 13501-2 for the required fire resistance period	See Annex C-1 of the ETA): a) 100 x 100 [mm] / Ø 113 mm b) 150 mm

"ZZ C31" can only be configured as specified in the following tables. Other parts or service support constructions shall not penetrate the penetration seal.

Penetrating element	Construction characteristics of the penetrating element in "ZZ C31" in flexible walls, rigid walls and rigid floors
Cables	> All types of sheathed cables[1] (except waveguides) currently and commonly used in building practice in Europe (e.g. electrical / telecommunication / data / optical fibre cables) with a diameter ≤ 21 mm

[1] Single or multicore cable with individual insulation of the cores and an additional protective covering of the assembly

2.2 Use condition

"ZZ C31" is intended for use in conditions exposed to weathering, and can therefore – according to EAD 350454-00-1104 clause 2.2.9.3.1 – be categorized as Type X. Since the requirements for Type X are met, also the requirements for TypeY_1, Y_2, Z_1 and Z_2 are fulfilled.

2.3 Working life

The provisions made in this European Technical Assessment are based on an assumed working life of "ZZ C31" of 10 years, provided the conditions laid down in the technical literature of the manufacturer relating to packaging, transport, storage, installation, use and repair are met.

The indications given on the intended working life cannot be interpreted as a guarantee given by the producer or the Technical Assessment Body, but are to be regarded only as a means for selecting the appropriate product in relation to the expected economically reasonable working life of the works.

The real working life might be, in normal use conditions, considerably longer without major degradation affecting the Basic requirements for construction works.

2.4 General assumptions

2.4.1 It is assumed that

- damages to the penetration seal are repaired accordingly,
- the installation of the penetration seal does not affect the stability of the adjacent building element – even in case of fire,
- the lintel or floor above the penetration seal is designed structurally and in terms of fire protection such that no additional mechanical load (other than its own weight) is imposed on the penetration seal,
- the installations are fixed to the adjacent building element (not to the penetration seal) in accordance with the relevant regulations in such a way that, in case of fire, no additional mechanical load is imposed to the penetration seal,
- the support of the installations is maintained for the required period of fire resistance.

2.5 Manufacturing

The European Technical Assessment is issued for the product on the basis of agreed data / information, deposited with the Österreichisches Institut für Bautechnik, which identifies the product that has been assessed and judged. Changes to the product or production process, which could result in this deposited data / information being incorrect, should be notified to the Österreichisches Institut für Bautechnik before the changes are introduced.

The Österreichisches Institut für Bautechnik will decide whether or not such changes affect the European Technical Assessment and consequently the validity of the CE marking on the basis of the European Technical Assessment and if so whether further assessment or alterations to the European Technical Assessment, shall be necessary.

3 Performance of the product and references to the methods used for its assessment

Basic requirements for construction works	Essential characteristic	Method of verification	Performance
BWR 2	Reaction to fire	EN 13501-1: 2007+A1:2009	Clause 3.1.1 of the ETA
	Resistance to fire	EN 13501-2: 2007+A1:2009	Clause 3.1.2 of the ETA and Annex D-1 of the ETA
BWR 3	Air permeability	EN 1026:2016	Clause 3.2.1 of the ETA
	Water permeability	No performance assessed	
	Content, emission and/or release of dangerous substances	No performance assessed	
BWR 4	Mechanical resistance and stability	No performance assessed	
	Resistance to impact / movement	No performance assessed	
	Adhesion	No performance assessed	
	Durability	EAD 350454-00-1104 clause 2.2.9	Clause 3.3.4 of the ETA
BWR 5	Airborne sound insulation	No performance assessed	
BWR 6	Thermal properties	No performance assessed	
	Water vapour permeability	No performance assessed	

3.1 Safety in case of fire (BWR 2)

3.1.1 Reaction to fire

The components of “ZZ C31” were assessed according to EAD 350454-00-1104 clause 2.2.1 and classified according to EN 13501-1:2007+A1:2009.

Component	Class according to EN 13501-1:2007+A1:2009
ZZ 345	**E**

3.1.2 Resistance to fire

“ZZ C31” was tested according to EAD 350454-00-1104 clause 2.2.2 and EN 1366-3:2009 in conjunction with EN 1363-1:1999.

Based upon the gained test results and the field of application specified within EN 1366-3:2009 “ZZ C31” has been classified according to EN 13501-2:2007+A1:2009. The individual fire resistance classes are listed in Annex D-1 of the ETA.

The resistance to fire classification listed in Annex D-1 of the ETA is only valid if “ZZ C31” is installed according to Annex A-1 to A-4 of the ETA.

3.2 Hygiene, health and the environment (BWR 3)

3.2.1 Air permeability

The air permeability of "ZZ 345" with a thickness of 150 mm was tested according to EN 1026:2016 in a flexible wall with a thickness of 100 mm. The aperture was lined with 1 layer of ≥ 20 mm thick type calcium silicate boards (classification A1 according to EN 13501-1) with a width of 150 mm. The opening was filled on both sides of the flexible wall with "ZZ 345" with a thickness of 15 mm to 25 mm flush to the surface of the flexible wall. The opening size was 100 mm x 100 mm (width x height), resp. 0,01 m².

"ZZ C31" was tested as blank penetration seal according to EAD 350454-00-1104 clause 2.2.3.

Up to a pressure difference of 600 Pa no air permeability was measured.

3.2.2 Water permeability

No performance assessed.

3.2.3 Content, emission and/or release of dangerous substances

No performance assessed.

3.3 Safety and accessibility in use (BWR 4)

3.3.1 Mechanical resistance and stability

No performance assessed.

3.3.2 Resistance to impact / movement

No performance assessed.

3.3.3 Adhesion

No performance assessed.

3.3.4 Durability

All components of "ZZ C31" fulfil the requirements for the intended use condition.

"ZZ C31" is therefore appropriate for use in conditions exposed to weathering, and can – according to EAD 350454-00-1104 clause 2.2.9.3.1 – be categorized as Type X. Since the requirements for Type X are met, also the requirements for TypeY_1, Y_2, Z_1 and Z_2 are fulfilled.

3.4 Protection against noise (BWR 5)

3.4.1 Airborne sound insulation

No performance assessed.

3.5 Energy economy and heat retention (BWR 6)

3.5.1 Thermal properties

No performance assessed.

3.5.2 Water vapour permeability

No performance assessed.

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

4.1 AVCP system

According to the Decision 1999/454/EC[2], amended by Decision 2001/596/EC[3] of the European Commission the system of assessment and verification of constancy of performance (see Annex V of Regulation (EU) No 305/2011) is given in the following table.

Product(s)	**Intended use(s)**	**Level(s) or class(es)** (resistance to fire)	**System** of assessment and verification of constancy of performance
Fire Stopping and Fire Sealing Products	for fire compartmentation and/or fire protection or fire performance	any	1

In addition, according to the Decision 1999/454/EC, amended by Decision 2001/596/EC of the European Commission the system(s) of assessment and verification of constancy of performance, with regard to reaction to fire, is given in the following table.

Product(s)	**Intended use(s)**	**Level(s) or class(es)** (reaction to fire)	**System** of assessment and verification of constancy of performance
Fire Stopping and Fire Sealing Products	for uses subject to regulations on reaction to fire	A1*, A2*, B*, C*	1
		A1**, A2**, B**, C**, D, E	3
		(A1 to E)***, F	4

* Products/materials for which a clearly identifiable stage in the production process results in an improvement of the reaction to fire classification (e.g. an addition of fire retardants or a limiting of organic material)

** Products/materials not covered by footnote (*)

*** Products/materials that do not require to be tested for reaction to fire (e.g. products/materials of class A1 according to Commission Decision 96/603/EC, as amended)

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with the Technical Assessment Body Österreichisches Institut für Bautechnik.

The notified product certification body shall visit the factory at least twice a year for surveillance of the manufacturer.

Issued in Vienna on 23.08.2018
by Österreichisches Institut für Bautechnik

The original document is signed by:

Rainer Mikulits
Managing Director

[2] Official Journal of the European Communities no. L 178, 14.7.1999, p. 52
[3] Official Journal of the European Communities no. L 209, 2.8.2001, p. 33

1 General

> "ZZ C31" can be used in apertures in walls (vertical separating element) and floors (horizontal separating element) according to clause 2.1 of the ETA.

> The penetration of cables according to clause 2.1 of the ETA is permitted.

> The total cross section of the installations must not be more than 60 % of the opening size of the penetration seal.

1.1 Service support constructions

> All types of cables – in flexible walls and rigid walls – have to be supported on both side of the separating element by steel cable trays (perforated or non-perforated), steel ladders or alternative service support constructions (e.g. pipe hangers) made of metal with a melting or decomposition point greater or equal than 1006 °C for EI 90 (e.g. stainless steel or galvanized steel) according to the ETA-holder's installation instructions.

> All types of cables – in rigid floors – have to be supported at least on the top side of the separating element by steel cable trays (perforated or non-perforated), steel ladders or alternative service support constructions (e.g. pipe hangers) made of metal with a melting or decomposition point greater or equal than 1049 °C for EI 120 (e.g. stainless steel or galvanized steel) according to the ETA-holder's installation instructions.

> Steel cable trays (perforated or non-perforated), steel ladders and lidded cable trays / trunkings must not pass through the penetration seal.

> The first support (service support construction) for cables in flexible walls and rigid walls has to be at maximum 200 mm (measured from the surface of the penetration seal).

> The first support (service support construction) for cables in rigid floors has to be at maximum 250 mm (measured from the surface of the penetration seal).

> All types of cables have to be fixed according to the ETA-holder's installation instructions to the service support construction.

ZZ C31 **- Details for installation -**	**ANNEX A-1**

2 Details for installation of "ZZ C31" (see Annex B-1 to D-1 of the ETA)

> "ZZ C31" has to be installed according to the ETA-holder's installation instructions.

> "ZZ C31" will be formed by filling "ZZ 345" on both sides in the opening of the separating element so that all interstices and voids are carefully sealed.

> It is possible to use formwork for the installation of "ZZ C31" in walls and floors. If the formwork consists of cardboard (thickness 3 mm), adhesive tape or PE round cord, it may remain within the cable penetration seal.

2.1 Details for installation in flexible wall constructions (see Annex B-1 of the ETA)

> For walls thinner than the minimum thickness of the penetration seal (150 mm; see Annex B-1 of the ETA) the aperture within the wall shall be lined with minimum 2 layers of ≥ 12,5 mm thick type F gypsum boards according to EN 520 (classification A2-s1,d0 according to EN 13501-1) or silicate- or calcium silicate boards (classification A1 according to EN 13501-1) with a minimum density of 450 kg/m³ and a minimum thickness of 25 mm. The boards shall be at least 150 mm (see Annex B-1 of the ETA) wide. The boards have to be installed and fixed according to the ETA-holder's installation instructions.

> Alternatively the thickness of the wall can be increased to at least 150 mm by fitting a board frame, minimum 50 mm wide, around the opening (see Annex B-1 of the ETA). Minimum 1 layer of ≥ 12,5 mm thick type F gypsum boards according to EN 520 (classification A2-s1,d0 according to EN 13501-1) or silicate- or calcium silicate boards (classification A1 according to EN 13501-1) with a minimum density of 450 kg/m³ can be used. The board frame has to be installed and fixed according to the ETA-holder's installation instructions.

> When no aperture lining is necessary (in case the thickness of the wall is equal to the thickness of penetration seal) or a board frame is used, the whole cavity within the wall has to be filled with material wool (stone wool with classification A1 according to EN 13501-1, a minimum apparent density of 40 kg/m³ and a melting point ≥ 1000 °C according to DIN 4102-17) minimum 100 mm around the aperture.

> Joints between the aperture lining and the aperture have to be filled with "ZZ 345" or gypsum joint filler (non-combustible material with classification A2-s1,d0 or A1 according to EN 13501-1 which is dimensionally stable) on both sides of the penetration seal according to the ETA-holder's installation instructions.

ZZ C31 **- Details for installation -**	**ANNEX A-2**

2.2 Details for installation in rigid walls (see Annex B-2 and B-3 of the ETA)

> For walls thinner than the minimum thickness of the penetration seal (150 mm; see Annex B-3 of the ETA) the aperture within the wall shall be lined with minimum 2 layers of ≥ 12,5 mm thick type F gypsum boards according to EN 520 (classification A2-s1,d0 according to EN 13501-1) or silicate- or calcium silicate boards (classification A1 according to EN 13501-1) with a minimum density of 450 kg/m³ and a minimum thickness of 25 mm. The boards shall be at least 150 mm (see Annex B-3 of the ETA) wide. The boards have to be installed and fixed according to the ETA-holder's installation instructions.

> Alternatively the thickness of the wall can be increased to at least 150 mm by fitting a board frame, minimum 50 mm wide, around the opening (see Annex B-3 of the ETA). Minimum 1 layer of ≥ 12,5 mm thick type F gypsum boards according to EN 520 (classification A2-s1,d0 according to EN 13501-1) or silicate- or calcium silicate boards (classification A1 according to EN 13501-1) with a minimum density of 450 kg/m³ can be used. The board frame has to be installed and fixed according to the ETA-holder's installation instructions.

> Joints between the aperture lining and the aperture have to be filled with "ZZ 345", or gypsum joint filler or mineral mortar (non-combustible material with classification A2-s1,d0 or A1 according to EN 13501-1 which is dimensionally stable) on both sides of the penetration seal according to the ETA-holder's installation instructions.

2.3 Details for installation in rigid floors (see Annex C-1 of the ETA)

> No additional information required.

ZZ C31 **- Details for installation -**	**ANNEX A-3**

3 Minimum working clearances

> The minimum working clearances (a1) and the minimum clearance between the penetration seals are specified in Annex B-1 to C-1 of the ETA.

4 Subsequent addition (retrofitting) and removal

> Subsequent addition (retrofitting) and removal of cables according to the ETA holder's installation instructions is permitted.

> Retrofitting and removal without addition of cables shall be done according to the ETA holder's installation instructions and the regulations of Annex A-2, clause 2 of the ETA.

> After removal without addition of cables the remaining opening (hole) has to be closed with "ZZ 345" according to the ETA-holder's installation instructions.

5 Transport and storage

> The indications of the manufacturer regarding transport and storage (minimum and maximum storing temperature, maximum duration of storage) have to be followed.

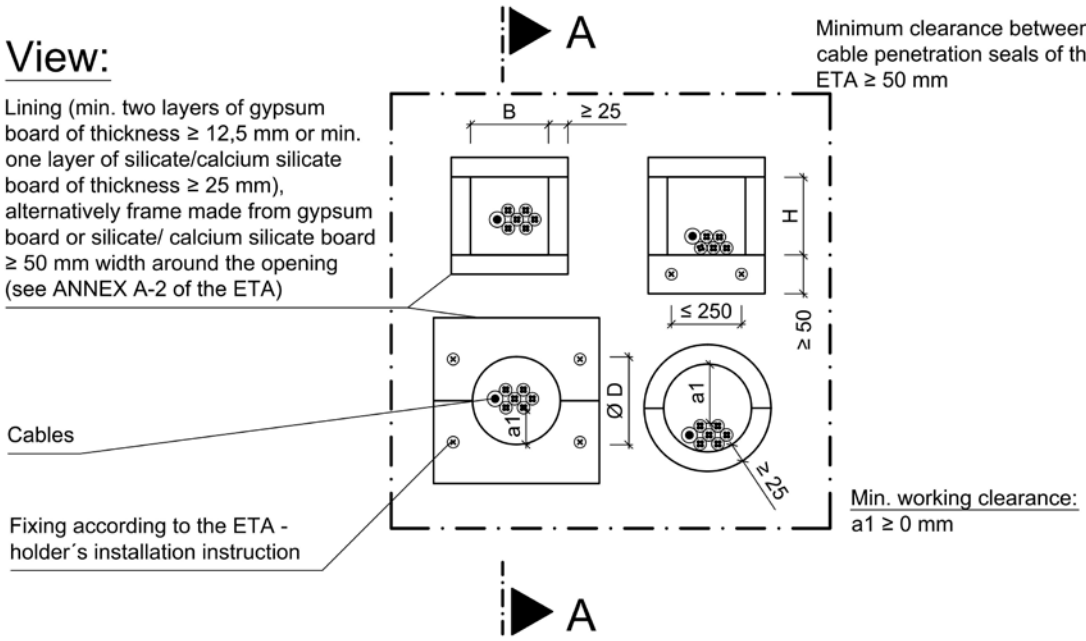
6 Use, maintenance and repair

> The fire resistance of the penetration seal shall not be negatively affected by future changes to buildings or building elements.

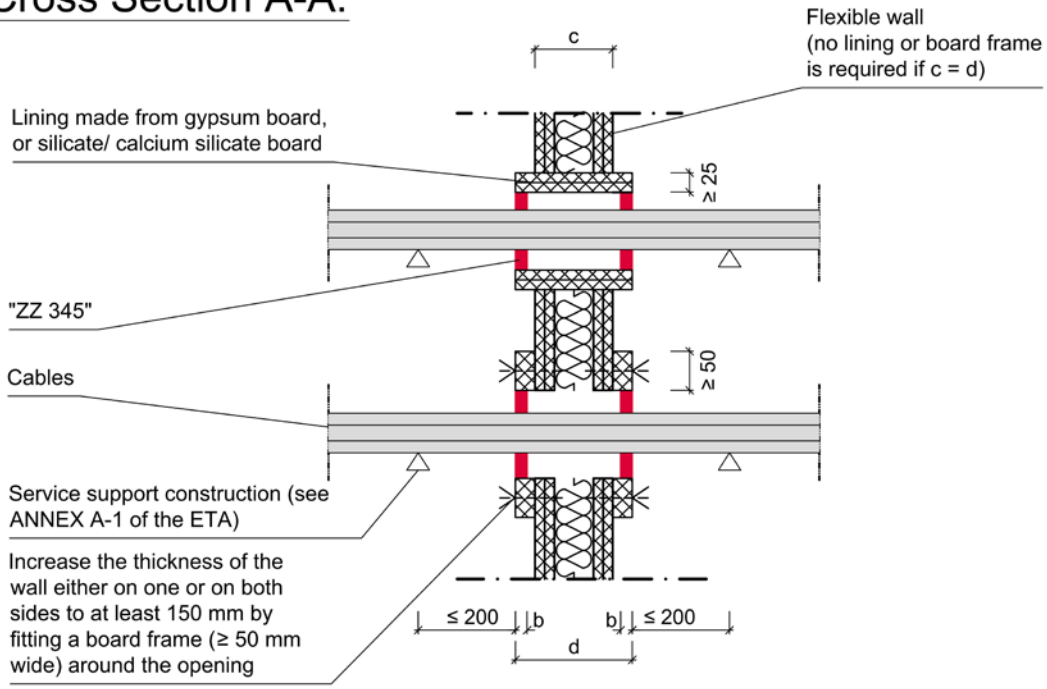
> The assessment of the fitness for use is based on the assumption that necessary maintenance and repair if required is carried out in accordance with the manufacturer's instructions during the assumed intended working life.

ZZ C31 **- Details for installation -**	**ANNEX A-4**

View:



Cross Section A-A:



All dimensions in mm

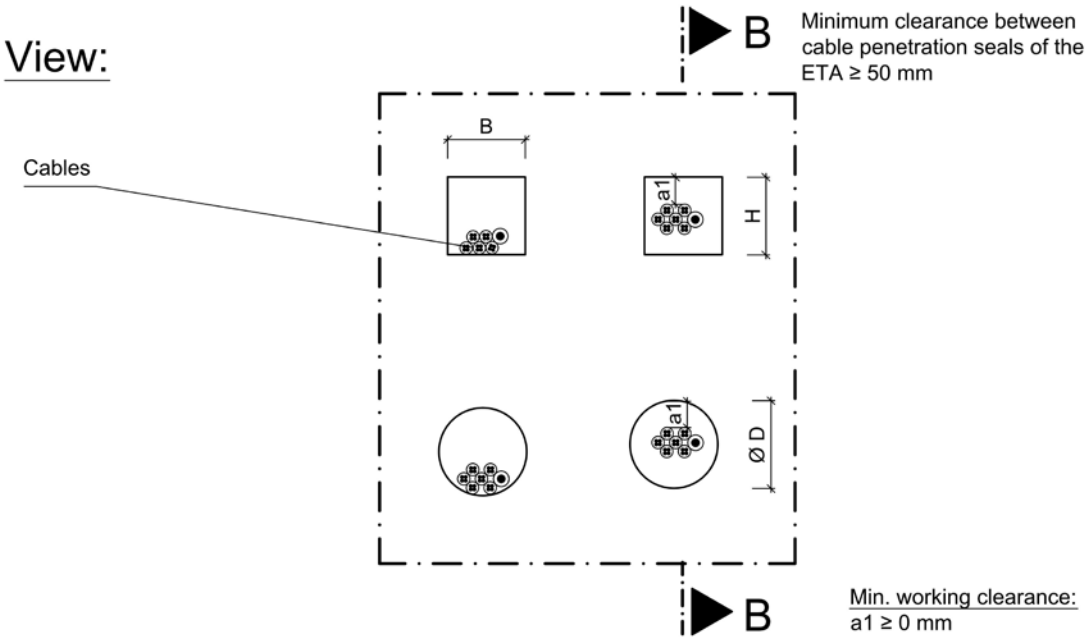
Separating element	Fire resistance classification	Wall thickness c [mm]	Max. opening size H [mm] x B [mm] / Ø D [mm]	Thickness of penetration seal d [mm]
Flexible wall	see ANNEX D-1 of the ETA	≥ 94	≤ 100 x ≤ 100 / Ø ≤ 113	≥ 150 b ≥ 15

ZZ C31

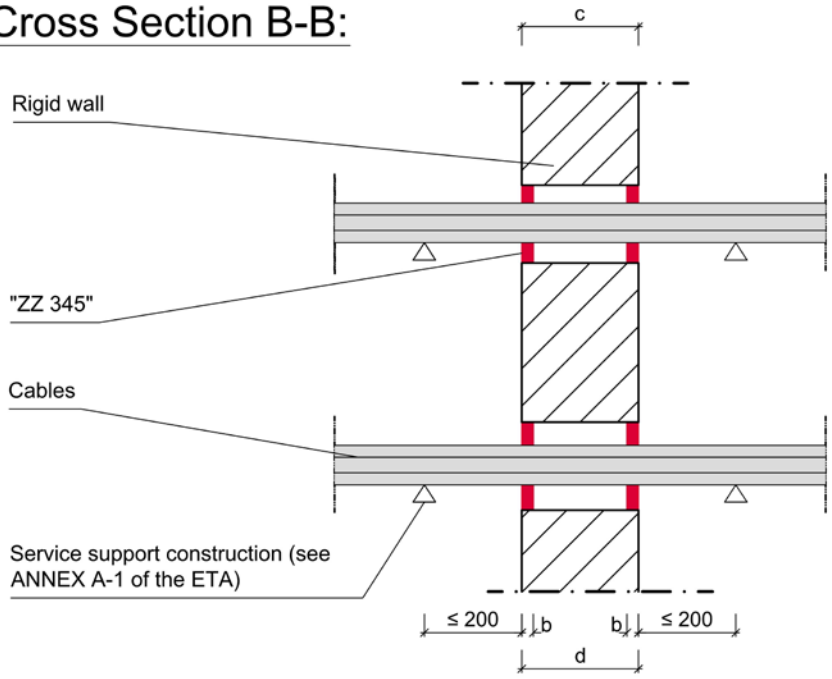
- Installation in flexible wall, thickness c ≥ 94 mm -

ANNEX B-1

View:



Cross Section B-B:



All dimensions in mm

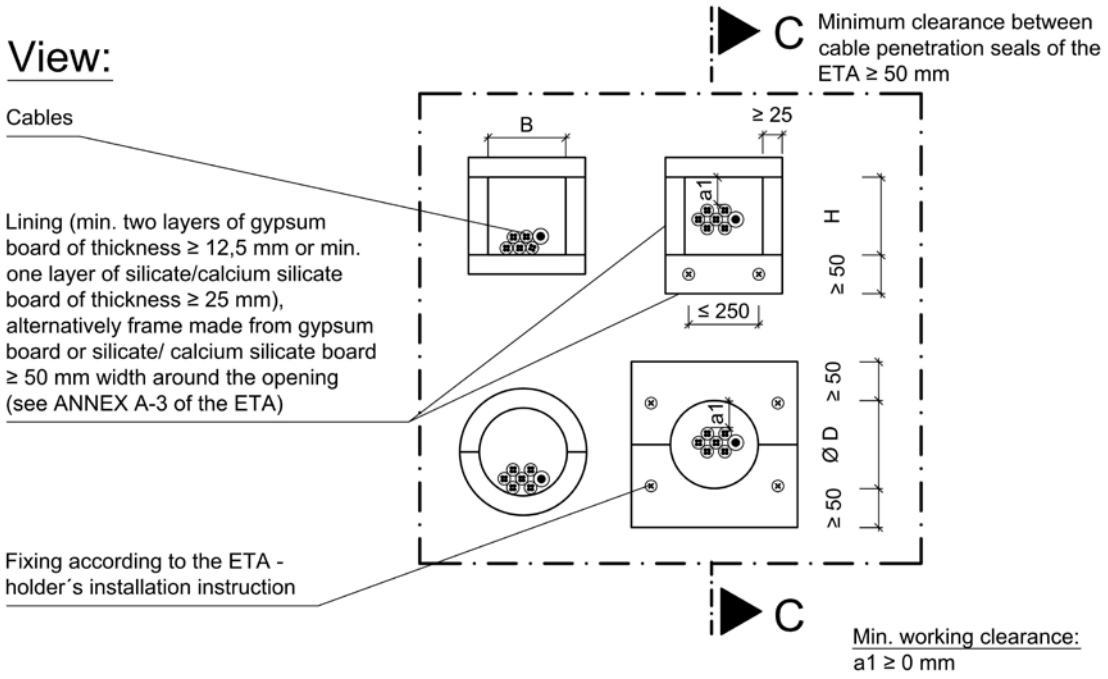
Separating element	Fire resistance classification	Wall thickness c [mm]	Max. opening size H [mm] x B [mm] / Ø D [mm]	Thickness of penetration seal d [mm]
Rigid wall	see ANNEX D-1 of the ETA	≥ 150	≤ 100 x ≤ 100 / Ø ≤ 113	≥ 150 b ≥ 15

ZZ C31

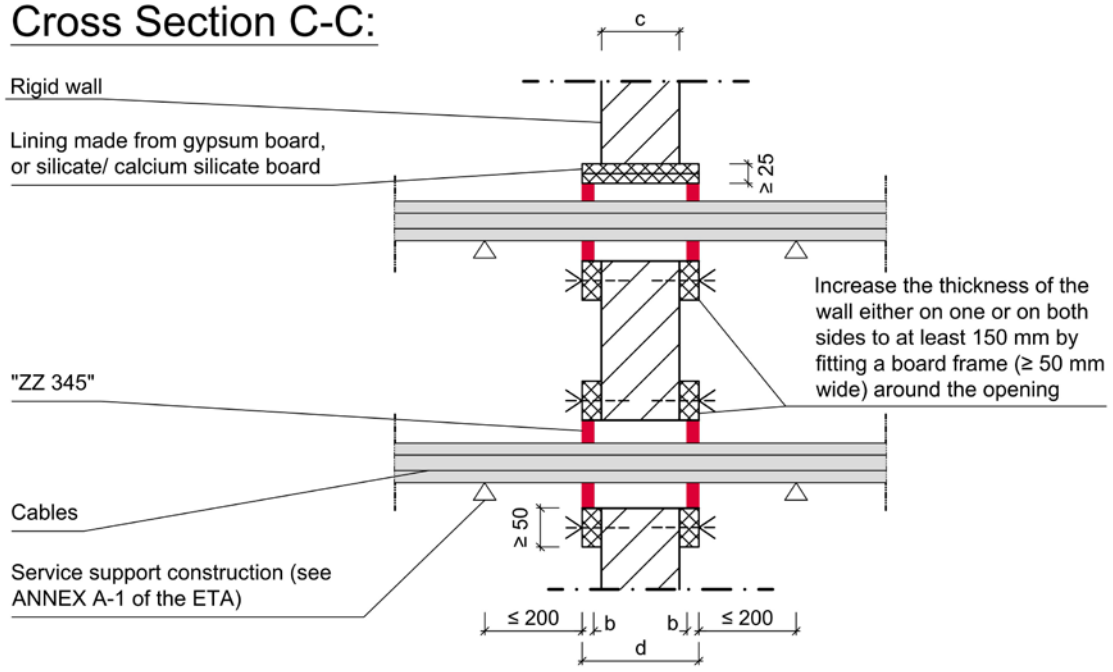
- Installation in rigid wall, thickness c ≥ 150 mm -

ANNEX B-2

View:



Cross Section C-C:



All dimensions in mm

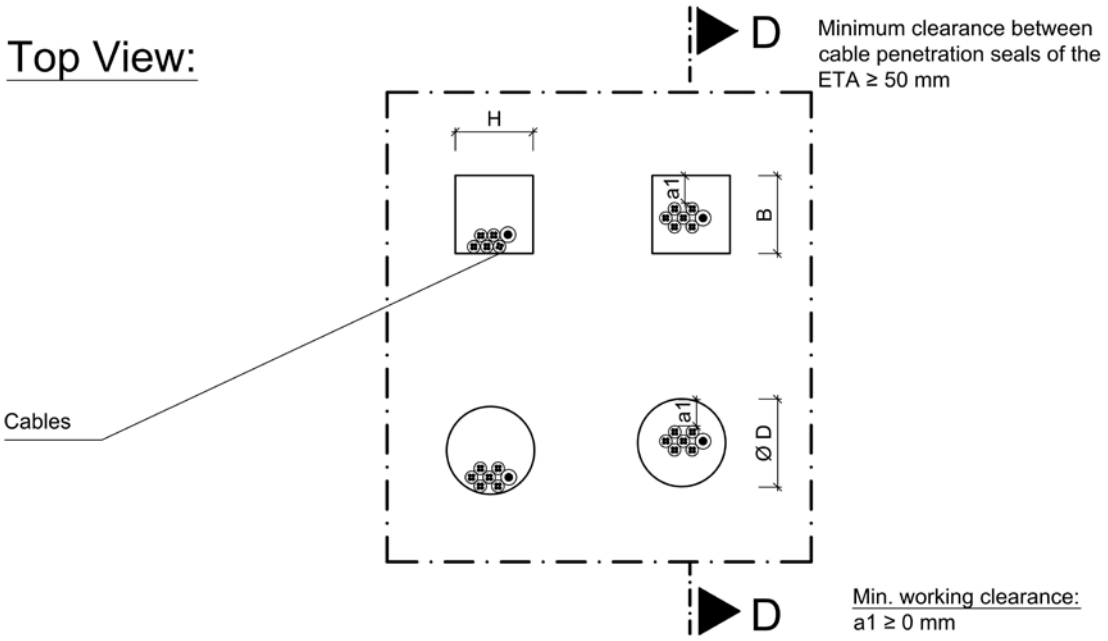
Separating element	Fire resistance classification	Wall thickness c [mm]	Max. opening size H [mm] x B [mm] / Ø D [mm]	Thickness of penetration seal d [mm]
Rigid wall	see ANNEX D-1 of the ETA	100 ≤ c < 150	≤ 100 x ≤ 100 / Ø ≤ 113	≥ 150 b ≥ 15

ZZ C31

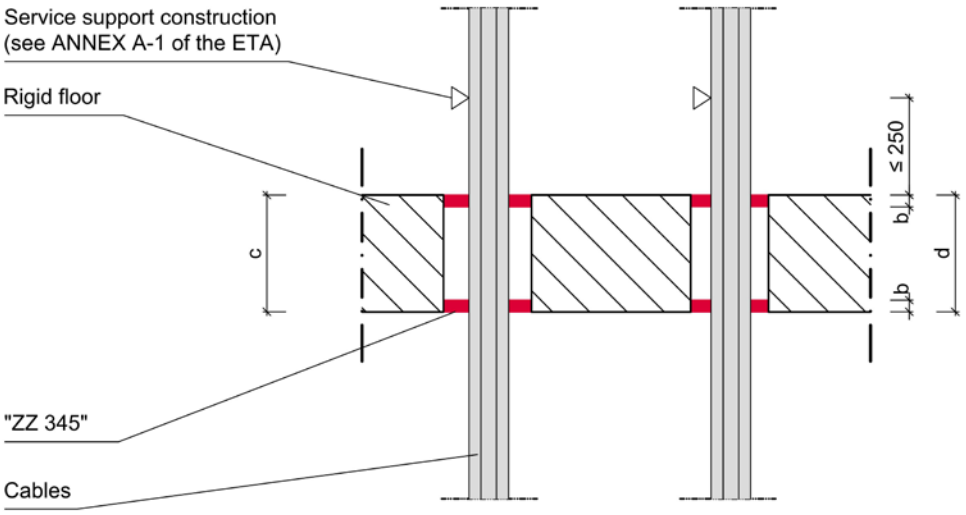
- Installation in rigid wall, thickness 100 mm ≤ c < 150 mm -

ANNEX B-3

Top View:



Cross Section D-D:



All dimensions in mm

Separating element	Fire resistance classification	Floor thickness c [mm]	Max. opening size H [mm] x B [mm] / Ø D [mm]	Thickness of penetration seal d [mm]
Rigid floor	see ANNEX D-1 of the ETA	≥ 150	≤ 100 x ≤ 100 / Ø ≤ 113	≥ 150 b ≥ 15

ZZ C31

- Installation in rigid floor, thickness c ≥ 150 mm -

ANNEX C-1

Fire resistance classification:

Installation in flexible walls of at least 94 mm, rigid walls of at least 100 mm or rigid floors of at least 150 mm thickness (maximum opening size of 100 mm x 100 mm or Ø 113 mm)

Penetrating element	**Min. thickness of the cable penetration seal 150 mm (with a filling depth of ≥ 15 mm on both sides of the separating element)**
Sheathed electrical / telecommunication / data / optical fibre cables up to a maximum outer diameter of 21 mm	wall: E 120 / EI 90 floor: E 120 / EI 120