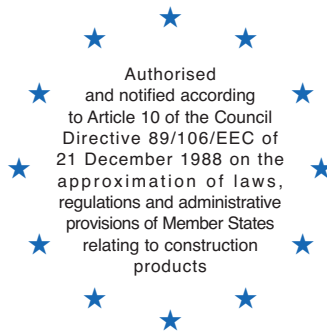


**ÖSTERREICHISCHES
INSTITUT FÜR
BAUTECHNIK**

A-1010 Vienna, Schenkenstrasse 4
Tel.: + 4 3 (0) 1 - 5 3 3 6 5 5 0
Fax: + 4 3 (0) 1 - 5 3 3 6 4 2 3
E-mail: mail@oib.or.at



Member of EOTA

European technical approval **ETA-10/0291**

(English language translation, the original version is in German language)

Handelsbezeichnung: <i>Trade name:</i>
Zulassungsinhaber: <i>Holder of approval:</i>
Zulassungsgegenstand und Verwendungszweck: <i>Generic type and use of construction product:</i>
Geltungsdauer vom: <i>Validity from:</i> bis: <i>to:</i>
Herstellwerk: <i>Manufacturing plant:</i>

Hilti Firestop Silicone Sealant CFS-S SIL

**Hilti AG
Feldkircherstrasse 100
9494 Schaan
Liechtenstein**

Linienförmige Fugenabdichtungen und Brandsperren

Linear Joint and Gap Seals

22.11.2010

21.11.2015

Hilti Werk CP 601S

Diese Europäische technische Zulassung umfasst: <i>This European technical approval contains:</i>

16 Seiten inklusive 3 Anhängen

16 pages including 3 Annexes



European Organisation for Technical Approvals
Europäische Organisation für Technische Zulassungen
Organisation Européenne pour l'Agrément technique

II SPECIFIC CONDITIONS OF THE EUROPEAN TECHNICAL APPROVAL

1 Definition of product(s) and intended use

1.1 Definition of the construction product

Hilti Firestop Silicone Sealant CFS-S SIL is a sealant used to form a linear joint or gap seal with mineral wool or Hilti Firestop Round Cord CFS-CO as backfilling material.

In wall constructions the sealant is used on both sides, in floor constructions normally only on the top side. The joint edges are treated with Hilti Primer CSP 264 / Hilti Firestop Primer CFS-PRIM to achieve the necessary adhesion. For details of the seal design depending on orientation, building elements forming the joint/gap or backfilling material and the related classifications see Annex C.

For further details on Hilti Firestop Silicone Sealant CFS-S SIL, Hilti Firestop Round Cord CFS-CO and Hilti Primer CSP 264 / Hilti Firestop Primer CFS-PRIM see Annex B. For a specification of suitable mineral wool as backfilling material see Annex C.1.3.

For a description of the installation procedure see 4.2.

1.2 Intended use and use category

1.2.1 Intended use

The intended use of Hilti Firestop Silicone Sealant CFS-S SIL is to reinstate the fire resistance performance of rigid wall constructions, rigid floor constructions and horizontal or vertical steel constructions at linear gaps/joints within those constructions or where they are abutting another wall or floor/ceiling/roof construction.

The specific elements of construction between which Hilti Firestop Silicone Sealant CFS-S SIL may be used to provide a linear joint seal, are as follows:

Rigid walls: The wall must have a minimum thickness of 150 mm and comprise concrete or masonry with a minimum density of 2400 kg/m³.

Rigid floors: The floor must have a minimum thickness of 150 mm and comprise concrete with a minimum density of 2400 kg/m³.

Steel constructions: The constructions, e.g. columns, beams or joint edges protected by steel angles, must form a minimum joint depth of 150 mm.

The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

1.2.2 Working life

The provisions made in this European technical approval are based on an assumed working life of Hilti Firestop Silicone Sealant CFS-S SIL of 10 years, provided that the conditions laid down in sections 4.2/5.1/5.2 for the packaging / transport / storage / installation / use / repair are met. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

1.2.3 Use Category

The use category of Hilti Firestop Silicone Sealant CFS-S SIL is Type X_{(-20/+70)°C}: intended for use at conditions exposed to weathering.

Products that meet requirements for type X, meet the requirements for all other types:

Type Y₁: Products intended for use at temperatures below 0°C with exposure to UV but no exposure to rain.

Type Y₂: Products intended for use at temperatures below 0°C, but with no exposure to rain or UV.

- Type Z₁: Products intended for internal conditions with high humidity excluding temperatures below 0°C.⁵
 Type Z₂: Products intended for internal conditions with humidity classes other than Z₁ excluding temperatures below 0°C.

2 Characteristics of the product and methods of verification

The identification tests and the assessment of the fitness for use according to the Essential Requirements were carried out in compliance with the “ETA Guidance no. 026-Part 3” concerning Linear Joint and Gap Seals – edition February 2008 (called ETAG 026-3 in this ETA) and with the “EOTA technical Report no. 024” concerning Characterisation, Aspects of Durability and Factory Production Control for Reactive Materials, Components and Products – edition November 2006 as amended July 2009 (called EOTA TR 024 in this ETA).

ETAG Clause No.	ETA Clause No.	Characteristic	Assessment of characteristic
Mechanical resistance and stability			
		None	Not relevant
Safety in case of fire			
2.4.1	2.1	Reaction to fire	Class B – s2 d1 according to EN 13501-1:2007
2.4.2	2.2	Resistance to fire	see clause 2.2
Hygiene, health and environment			
2.4.3	2.3	Air permeability (material property)	Flow rate per area
2.4.4	2.4	Water permeability (material property)	Water tight to 1000 mm head of water
2.4.5	2.4	Release of dangerous substances	Declaration of manufacturer
Safety in use			
2.4.6	2.6	Mechanical resistance and stability	No performance determined
2.4.7	2.7	Resistance to impact/movement	No performance determined
2.4.8	2.8	Adhesion	No Performance Determined
Protection against noise			
2.4.9	2.9	Airborne sound insulation	R _{w(C,Ctr)} , D _{n,e,w}
Energy economy and heat retention			
2.4.10	2.10	Thermal properties	No performance determined
2.4.11	2.11	Water vapour permeability	No performance determined
General aspects relating to fitness for use			
2.4.12	2.12	Durability and serviceability	X _{(-20/+70)°C} Movement capability class ISO 11600-F-25LM-M ₁ up Surface and volume resistivity

⁵ These uses apply for internal humidity class 5 in accordance with EN ISO 13788.

2.6 Mechanical resistance and stability

Due to the maximum joint width of 100 mm impact tests are not necessary according to ETAG 026-3 and therefore no performance has been determined.

2.7 Resistance to impact/movement

See 2.6

2.8 Adhesion

Adhesion is covered by tests for determining movement capability according to ISO 11600. For the resulting classification see 2.12.2.2.

2.9 Airborne sound insulation

Test reports from noise reduction according to EN ISO 140-3, EN ISO 140-10 and EN ISO 717-1 have been provided.

The acoustic tests were performed in a rigid wall and the results transferred to the flexible wall construction described below. The acoustic characteristics of the wall itself have not been measured. According to these tests reports the single number ratings are:

Weighted element-normalized level difference: $D_{n,w} = 58$ dB

From this $D_{n,w}$ the weighted sound reduction index calculates to: $R_w = 51$ dB

Structure of the rigid wall: 200 mm thick concrete wall with a density of 2000 kg/m³ which was plastered on both sides.

Structure of the flexible wall: 2 x 12,5 mm plasterboard on both sides of a 50 mm metal stud frame. The void was filled with a 50 mm mineral wool slab.

Hilti Firestop Silicone Sealant CFS-S SIL was tested as seal around a steel pipe, filled with concrete, in the centre of a 350 x 490 x 200 mm (w x h x d) concrete block which was inserted in the wall. The seal was 50 mm wide (annular space) and consisted of a mineral wool core of 160 mm, covered by 20 mm Hilti Firestop Silicone Sealant CFS-S SIL on both sides. This set up simulates a linear joint as well as a single penetration seal. The area of Hilti Firestop Silicone Sealant CFS-S SIL was 0,0236 m².

It should be noticed that both above mentioned results apply to the total wall construction of the size $S = 1,25$ m x $1,50$ m (= 1,88 m²), i.e. the given wall with 0,0236 m² Hilti Firestop Silicone Sealant CFS-S SIL.

2.10 Thermal properties

No performance determined.

2.11 Water vapour permeability

No performance determined.

2.12 Durability and serviceability

2.12.1 Durability

Hilti Firestop Silicone Sealant CFS-S SIL has been tested in accordance with EOTA TR 024, Table 4.1 for the X use category specified in ETAG 026-3 and the results of the test have demonstrated suitability for linear joint and gap seals intended for use at temperatures between -20°C and $+70^{\circ}\text{C}$ ($X_{(-20/+70)^{\circ}\text{C}}$).

2.12.2 Serviceability

2.12.2.1 Movement capability

Classification ISO 11600-F-25LM-M₁up

2.12.2.2 Electrical properties

- Volume resistivity (according to DIN IEC 60093 (VDE 0303 Part 30):
 $9,8\text{E}+14 \pm 6,0\text{E}+14 \Omega\cdot\text{cm}$
- Surface resistivity (according to DIN IEC 60093 (VDE 0303 Part 30):
 $8,0\text{E}+15 \pm 2,1\text{E}+15 \Omega$

3 Evaluation of Conformity and CE marking

3.1 Attestation of Conformity system

According to the decision 1999/454/EC of the European Commission⁶ the system 1 of attestation of conformity applies.

This system of attestation of conformity is defined as follows:

System 1: Certification of the conformity of the product by a notified certification body on the basis of:

- (a) Tasks for the manufacturer:
 - (1) factory production control
 - (2) further testing of samples taken at the factory by the manufacturer in accordance with a prescribed test plan
- (b) Tasks for the notified body:
 - (3) initial type-testing of the product;
 - (4) initial inspection of factory and of factory production control;
 - (5) continuous surveillance, assessment and approval of factory production control.

3.2 Responsibilities

3.2.1 Tasks of the Manufacturer

3.2.1.1 Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall insure that the product is in conformity with this European technical approval.

⁶ Official Journal of the European Communities N° L 178, 14.7.1999, p. 52

3.2.2 Tasks of Notified Bodies

The Notified Body (Bodies) shall perform the

- initial type-testing of the product (for system 1),
The results of the tests performed as part of the assessment for the European technical approval may be used unless there are changes in the production line or plant. In such cases, the necessary initial type testing has to be agreed between the Österreichisches Institut für Bautechnik and the Notified Bodies involved.
- initial inspection of factory and of factory production control,
The Notified Body (Bodies) shall ascertain that, in accordance with the control plan, the factory (in particular the employees and the equipment) and the factory production control are suitable to ensure continuous and orderly manufacturing of the components according to the specifications mentioned in clause 2 of this ETA.
- continuous surveillance, assessment and approval of factory production control,
The Notified Body (Bodies) shall visit the factory at least twice a year or once a year for surveillance of this manufacturer having a FPC system complying with a quality management system covering the manufacturing of the approval product components. It has to be verified that the system of factory production control and the specified automated manufacturing process are maintained taking into account the control plan.

These tasks shall be performed in accordance with the provisions laid down in the control plan of this European technical approval.

The Notified Body (Bodies) shall retain the essential points of its (their) actions referred to above and state the results obtained and conclusions drawn in a written report.

The Notified Body involved by the manufacturer shall issue an EC certificate of conformity of the product stating the conformity with the provisions of this European technical approval.

In cases where the provisions of the European technical approval and its control plan are no longer fulfilled the certification body shall withdraw the certificate of conformity and inform the Österreichisches Institut für Bautechnik without delay.

3.3 CE marking

The CE marking shall be affixed on the product itself, on a label attached to it, on its packaging or on the commercial documents accompanying the components of the product. The letters „CE“ shall be followed by the identification number of the Notified Body involved and be accompanied by the following additional information:

- the name or identifying mark and address of the ETA holder,
- the last two digits of the year in which the CE marking was affixed,
- the number of the EC certificate of conformity for the product,
- the number of the European technical approval,
- the number of the ETAG (ETAG N° 026 part 3)
- the designation of the product (trade name)
- the use category in accordance with the ETA section 1 and 2
- “see ETA-10/0291 for other relevant characteristics (e.g. resistance to fire)”

4 Assumptions under which the fitness of the product(s) for the intended use was favourably assessed

4.1 Manufacturing

The European technical approval is issued for the product on the basis of agreed data/information, deposited with 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 Österreichisches Institut für Bautechnik before the changes are introduced. Österreichisches Institut für Bautechnik will decide whether or not such changes affect the ETA and consequently the validity of the CE marking on the basis of the ETA and if so whether further assessment or alterations to the ETA, shall be necessary.

4.2 Installation

Installation of the Hilti Firestop Silicone Sealant CFS-S SIL should be conducted as follows:

- Clean joint faces. Surfaces to which Hilti Firestop Silicone Sealant CFS-S SIL will be applied should be cleaned of loose debris, dirt, oil, wax and grease.
- Insert backing material. Leave sufficient gap/joint depth for application of the sealant.
- Apply Hilti Primer CSP 264 / Hilti Firestop Primer CFS-PRIM uniformly to the joint faces using a paint brush. Evaporation time minimum 15 minutes and maximum 180 minutes.
- Apply Hilti Firestop Silicone Sealant CFS-S SIL using a manual dispenser (for 310 ml cartridges Hilti CB 200-P1, for 600 ml foil packs Hilti CS 270-P1).
- Smooth the sealant. Use either a diluted liquid soap or smoothing agent and carefully smooth using a finger or narrow spatula.
- Movement joints should never be designed smaller than 6 mm nominal width.
- Application temperature: +5°C to +40°C.
- Expiry date: See date printed on the cartridge / foil pack (month/year). Use of the cartridge / foil pack after this date is not permissible!

5 Indications to the manufacturer

5.1 Packaging, transport and storage

In the accompanying document and/or on the packaging the manufacturer shall give information as to transport and storage.

At least the following shall be indicated: storing temperature, type of storage, maximum duration of storage and required data related to minimum temperature for transport and storage.

5.2 Use, maintenance, repair

The Hilti Firestop Silicone Sealant CFS-S SIL should be installed and used as described earlier in this document.

The assessment of the fitness for use is based on the assumption that damage, for example caused by accidental impact, is repaired. The relevant manufacturer instructions shall be followed.

On behalf of Österreichisches Institut für Bautechnik

Original document is signed by

Rainer Mikulits
Managing Director

ANNEX A

REFERENCE DOCUMENTS and LIST OF ABBREVIATIONS

A.1 References to standards mentioned in the ETA:

DIN IEC 60093 (VDE 0303 Part 30):	Methods of test for insulating materials for electrical purposes: Volume resistivity and surface resistivity of solid electrical insulating materials
EN 1026	Windows and doors – Air permeability – Test method
EN 1366-4:2006	Fire resistance tests for service installations - Part 4: Linear joint seals
EN 13501-1	Fire classification of construction products and building elements – Part 1: Classification using test data from reaction to fire tests
EN 13501-2	Fire classification of construction products and building elements – Part 2: Classification using test data from fire resistance tests
EN ISO 140-3	Acoustics – Measurement of sound insulation in buildings and of building elements – Part 3: Laboratory measurements of airborne sound insulation of building elements
EN ISO 140-10	Acoustics – Measurements of sound insulation in buildings and of building elements – Part 10: Laboratory measurement of airborne sound insulation of small building elements
EN ISO 717-1	Acoustics – Rating of sound insulation of buildings and of building elements – Part 1: Airborne sound insulation
ISO 11600	Building construction — Jointing products — Classification and requirements for sealants

A.2 Other reference documents:

EOTA TR 024	Characterisation, Aspects of Durability and Factory Production Control for Reactive Materials, Components and Products
Material Safety Data Sheet according to 1907/2006/EC for Hilti Firestop Silicone Sealant CFS-S SIL	

A.3 Abbreviations used in drawings

Abbreviation	Description
A, A ₁ , A ₂ ,..	Firestop product
B	Backfilling material
E, E ₁	Building element (wall, floor)
t _A	Thickness of Hilti Firestop Silicone Sealant CFS-S SIL
t _B	Thickness of backfilling material
t _E	Thickness of the building element

ANNEX B

DESCRIPTION OF PRODUCT(S) & PRODUCT LITERATURE

Hilti Firestop Silicone Sealant CFS-S SIL

Hilti Firestop Silicone Sealant CFS-S SIL is a neutral cross-linking silicone (polydimethyl siloxane) with elastic properties. It is delivered in various colours (grey, red, white, anthracite).

Hilti Firestop Silicone Sealant CFS-S SIL is supplied in 310 ml cartridges and 600 ml foil packs.

A detailed specification of the product is contained in document "Identification / Product Specification relating to the European technical approval ETA-10/0291- Hilti Firestop Silicone Sealant CFS-S SIL" which is a non-public part of this ETA.

The Control Plan is defined in document "Control Plan relating to the European technical approval ETA-10/0291 - Hilti Firestop Silicone Sealant CFS-S SIL" which is a non-public part of this ETA.

Hilti Firestop Round Cord CFS-CO

Hilti Firestop Round Cord CFS-CO is a rod made from stone wool weaved in glass fibre. It is provided in diameters of 20, 30, 40, 50 and 60 mm to accommodate various joint widths.

A detailed specification of the product is contained in document "Identification / Product Specification relating to the European technical approval ETA-10/0291 and ETA-10/0389 - Hilti Firestop Round Cord CFS-CO" which is a non-public part of this ETA.

The Control Plan is defined in document "Control Plan relating to the European technical approval ETA-10/0291 and ETA-10/0389 - Hilti Firestop Round Cord CFS-CO" which is a non-public part of this ETA.

Hilti Primer CSP 264 / Hilti Firestop Primer CFS-PRIM

Hilti Primer CSP 264 / Hilti Firestop Primer CFS-PRIM is a 1-component toluene-free solution of silicone resins intended to improve adhesion of sealants to mineral or porous building material surfaces.

A detailed specification of the product is contained in document "Identification / Product Specification relating to the European technical approval ETA-10/0291 - Hilti Primer CSP 264 / Hilti Firestop Primer CFS-PRIM" which is a non-public part of this ETA.

technical product literature:

- "technical Data Sheet Hilti Firestop Silicone Sealant CFS-S SIL" (including Hilti Primer CSP 264 / Hilti Firestop Primer CFS-PRIM and Hilti Firestop Round Cord CFS-CO)

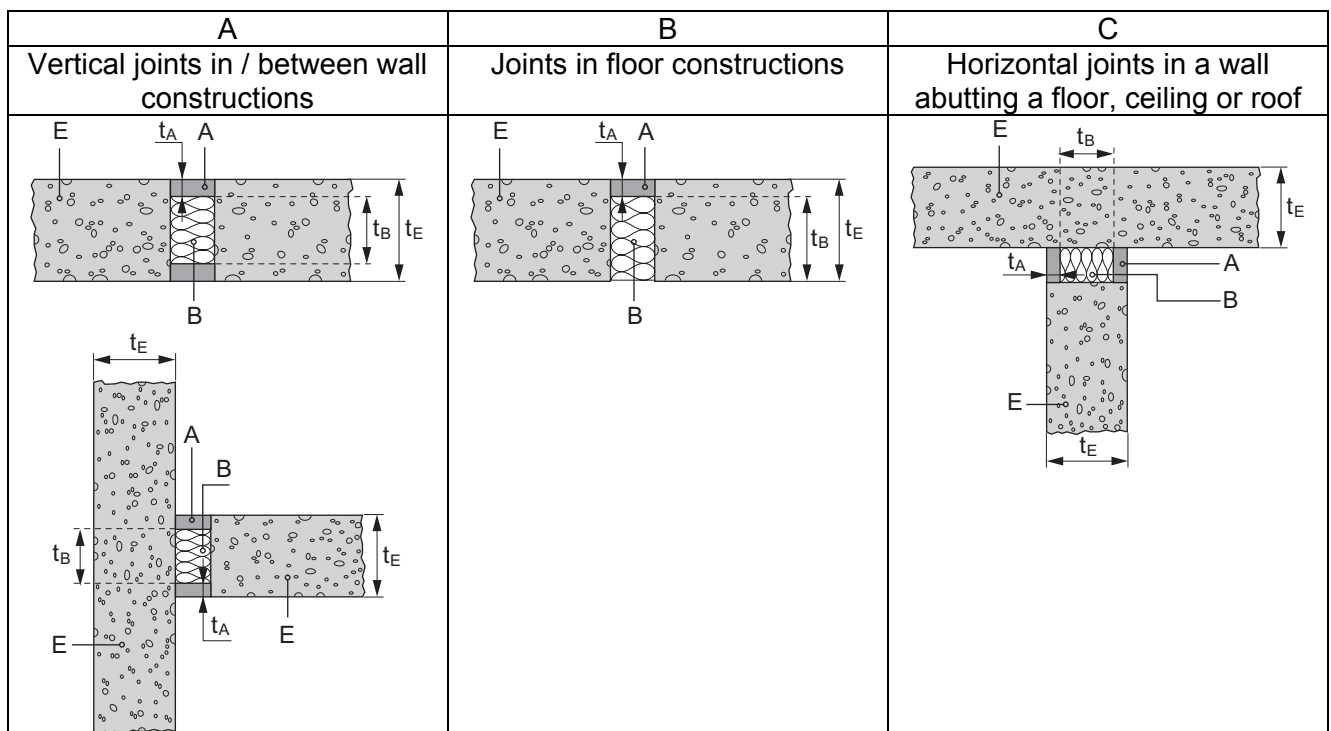
ANNEX C

RESISTANCE TO FIRE CLASSIFICATION OF LINEAR JOINT AND GAP SEALS MADE FROM HILTI FIRESTOP SILICONE SEALANT CFS-S SIL

C.1 Hilti Firestop Silicone Sealant CFS-S SIL (A) together with **mineral wool products** (B) as specified in C.1.3 as backfilling material:

- Vertical joints in / between rigid wall constructions: $t_B \geq 150$ mm / gap filled completely
- Joints in rigid floor constructions: $t_B \geq 100$ mm
- Horizontal joints in a rigid wall abutting a rigid floor, ceiling or roof: $t_B \geq 100$ mm / gap filled completely

C.1.1 Within or between **rigid constructions** (E) according to 1.2.1 of $t_E \geq 150$ mm in linear joints with maximum $\pm 12,5\%$ movement, splice distance minimum 1250 mm:

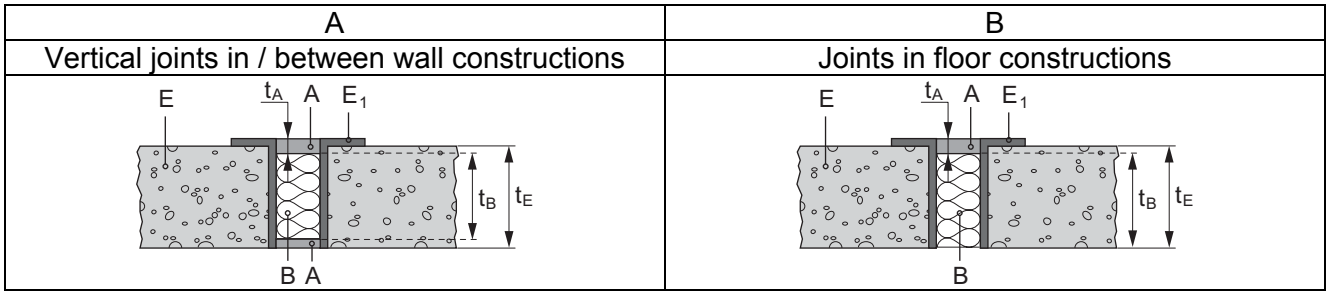


Orientation	Joint width (mm)	Classification
Vertical joints in / between wall constructions (A)	6 to 20 ^{a)}	EI 180-V-M 25,0-F-W 6 to 20 E 240-V-M 25,0-F-W 6 to 20
Joints in floor constructions (B) and Horizontal joints in a wall abutting a floor, ceiling or roof (C)		EI 180-H-M 25,0-F-W 6 to 20 E 240-H-M 25,0-F-W 6 to 20
Vertical joints in / between wall constructions (A)	20 to 100 ^{b)}	EI 180-V-M 25,0-F-W 20 to 100 E 240-V-M 25,0-F-W 20 to 100
Joints in floor constructions (B) and Horizontal joints in a wall abutting a floor, ceiling or roof (C)		EI 120-H-M 25,0-F-W 20 to 100

^{a)} $t_A = 6$ mm, compression of mineral wool minimum 60%

^{b)} $t_A = 10$ mm, compression of mineral wool minimum 50%

C.1.2 Between **steel construction elements** or in rigid constructions with steel elements as joint faces in linear joints with maximum $\pm 7,5\%$ movement (non-movement joints), splice distance minimum 1250 mm, $t_E \geq 150$ mm, $t_B \geq 150$ mm / gap filled completely:



Orientation	Joint width (mm)	Classification
Vertical joints in / between wall constructions (A)	6 to 30 ^{a)}	EI 60-V-X-F-W 6 to 30 E 240-V-X-F-W 6 to 30
Joints in floor constructions (B) and Horizontal joints in a wall abutting a floor, ceiling or roof		EI 60-H-X-F-W 6 to 30 E 240-H-X-F-W 6 to 30

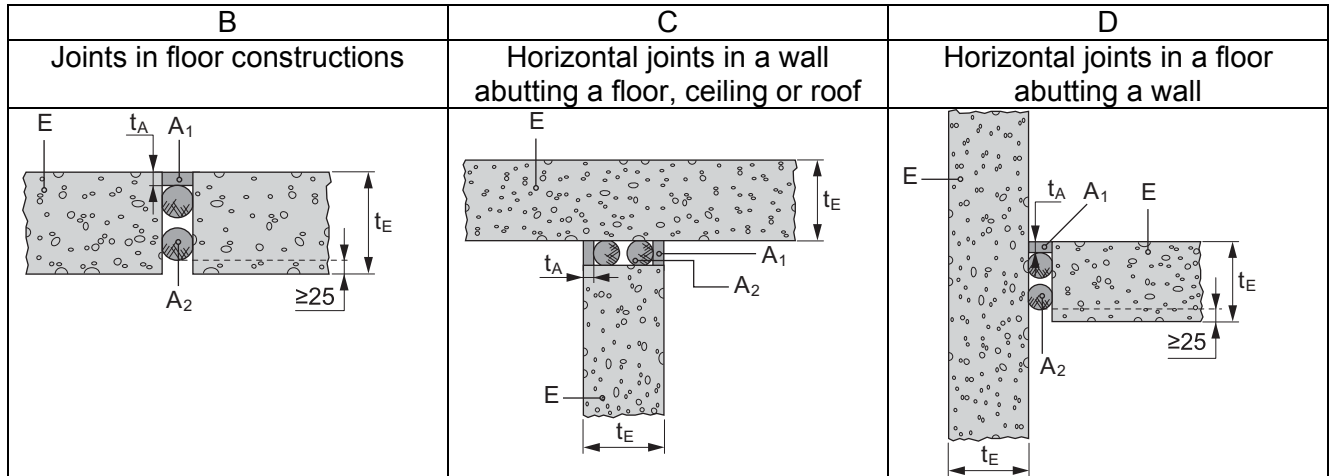
^{a)} $t_A = 10$ mm, compression of mineral wool minimum 40%

C.1.3 Mineral wool products suitable for being used as backfilling material

The mineral wool shall be stone wool without Al-facing, CE marked according to EN 13162 or EN 14303 with a minimum density of 40 kg/m^3 . A maximum density of 75 kg/m^3 is recommended to allow the required compression.

C.2 Together with Hilti Firestop Round Cord CFS-CO:

Within rigid floor constructions (E) according to 1.2.1.1, $t_E \geq 150$ mm, in linear joints with maximum $\pm 25,0\%$ movement (only shear movement). Minimum two rod layers with an air gap between the rods and a minimum distance of 25 mm from the surfaces of the floor construction. Distance between splices in the two rod layers minimum 100 mm (if joint width ≤ 30 mm).



Orientation	Joint width W (mm)	Size of Hilti Firestop Round Cord CFS-CO	Classification
Joints in floor constructions (B) and Horizontal joints in a wall abutting a floor, ceiling or roof (C)	12 to 17 ^{a)}	20	EI 90-H-M 25,0-F
	17 to 27 ^{b)}	30	
	27 to 37 ^{b)}	40	
	37 to 47 ^{b)}	50	
Horizontal joints in a floor abutting a wall (D)	47 to 50 ^{b)}	60	

^{a)} $t_A = 6$ mm

^{b)} $t_A = 10$ mm