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European Technical Assessment

ETA 18/1024
of 25/01/2019

General Part

Technical Assessment Body issuing the ETA:	RISE Research Institutes of Sweden AB
Trade name of the construction product	Hilti Firestop Block CFS-BL P
Product family to which the construction product belongs	Fire resistant penetrations when incorporated in timber floors and walls
Manufacturer	Hilti AG, Feldkircherstrasse 100, LI-9494 Schaan, Liechtenstein, www.hilti.se
Manufacturing plant	Hilti Production Plant 4a
This European Technical Assessment contains	15 pages including 3 Annexes 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 350454-00-1104, edition September 2017.

Translations

of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

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Specific parts

1 Technical description of the product

The Hilti Firestop Block CFS-BL P is intended to provide solutions to maintain the fire resistance of a separating timber element (wall or floor) when and where services pass through.

Hilti Firestop Block CFS-BL P is a brick-shaped block based on a pre-cured, pre-formed PU-based firestop material.

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

2.1 Intended use

The Hilti Firestop Block CFS-BL P is intended to form or form part of a penetration seal which is used to maintain the fire resistance of a separating element (wall or floor) when and where services pass through.

Hilti Firestop Block CFS-BL P can be installed in walls and floors as further detailed in Annex C.

Hilti Firestop Block CFS-BL P can only be used as penetration seal for cables. Further details are given in Annex C of the ETA. Other parts or service support constructions shall not penetrate the penetration seal.

2.2 Use condition

The different use categories as described in European Assessment Document 350454-00-1104, edition September 2017, are the following:

Type X: intended for use in conditions exposed to weathering

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

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

Type Z₁: intended for use in internal conditions with humidity equal to or higher than 85% RH excluding temperatures below 0 °C, without exposure to rain or UV

Type Z₂: intended for use in internal conditions with humidity lower than 85% RH excluding temperatures below 0 °C, without exposure to rain or UV

Hilti Firestop Block CFS-BL P meets the requirements for type Y₁

Products that meet requirements for type Y₁ also meet the requirements for type Y₂, Z₁ and Z₂.

2.3 Working life

The provisions made in this European Technical Assessment are based on an assumed working life of Hilti Firestop Block CFS-BL P 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

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 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 and
- > pneumatic dispatch systems, compressed air systems etc are switched off by additional means in case of fire.

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

3.1 Essential characteristics and their performance

Basic requirement		Characteristic	Performance	
BWR 2	Safety in case of fire	Reaction to fire	EN 13501-1: 2007+A1:2009	See 3.1.1 of the ETA
		Resistance to fire	EN 13501-2: 2007+A1:2016	See 3.1.1. of the ETA and Annex C.1
BWR 3	Hygiene, health and the environment	Air permeability (material property)	EN 1026:2000	No performance assessed
		Water permeability (material property)	Annex C of EAD 350454-00-1104	No performance assessed
		Content, emission and/or release of dangerous substances	EN 16516:2017	See 3.1.2 of the ETA

Basic requirement		Characteristic	Performance	
BWR 4	Safety and accessibility in use	Mechanical resistance and stability	EOTA TR 001	No performance assessed
		Resistance to impact / movement	EOTA TR 001	No performance assessed
		Adhesion	EOTA TR 001	No performance assessed
		Durability	EOTA TR 024	Use category: Type Y ₁
BWR 5	Protection against noise	Airborne sound insulation	EN ISO 140-3 and EN ISO 140-10, EN ISO 717-1	No performance assessed
BWR 6	Energy economy and heat retention	Thermal properties	EN 12667:2001	See 3.1.3 of the ETA
		Water vapour permeability	EN ISO 12572:2016	No performance assessed

3.1.1 Safety in case of fire

Reaction to fire	Classification in accordance with EN 13501-1: 2007+A1:2009
Hilti Firestop Block CFS-BL P	Class E
Resistance to fire	Classification in accordance with EN 13501-2: 2016
<p>Hilti Firestop Block CFS-BL P was tested according to EAD 350454-00-1104 clause 2.2.2, EN 1363-1:2012 and EN 1366-3:2009.</p> <p>Based upon the achieved test results and the field of application specified within EN 1363-1:2012 and EN 1366-3:2009 the penetration seals Hilti Firestop Block CFS-BL P have been classified according to EN 13501-2:2016. The individual fire resistance classes are listed in Annex C.1.3 of the ETA.</p> <p>The maximum fire resistance class of the penetration seal in vertical or horizontal separating element depends on the fire resistance class of the penetrated elements. The fire resistance class of the penetration seal is reduced to the fire resistance class of the penetrated element with the lowest fire resistance classification.</p>	

3.1.2 Hygiene, health and the environment

Essential characteristic	Performance
Content, emission and/or release of dangerous substances	EN 16516:2017
<p>The release of semi-volatile organic compounds (SVOC) and volatile organic compounds (VOC) has been determined according to EAD 350454-00-1104 clause 2.2.5.1 and EN 16516:2017. The loading factor used for emission testing was 0.007 m²/m³.</p>	
Hilti Firestop Block CFS-BL P	The total emission of SVOC after 3 days is <5 µg/m ³ .
	The total emission of SVOC after 28 days is <5 µg/m ³ .
	The total emission of VOC after 3 days is 43 µg/m ³ .
	The total emission of VOC after 28 days is 5.3 µg/m ³ .

3.1.3 Energy economy and heat retention

Essential characteristic	Performance
Thermal properties	EN 12667:2001
Hilti Firestop Block CFS-BL P	λ ₁₀ = 0.089 W/(m ² K)

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

According to the decision 1999/454/EC - Commission decision of date 22 June 1999, published in the Official Journal of the European Union (OJEU) L178 of 14/07/1999, amended by decision 2001/596/EC – Commission decision of date 8 January 2001, published in the Official Journal of the European Union (OJEU) L209 of 02/08/2001, of the European Commission the systems of assessment and verification of constancy of performance (see Annex V to the regulation (EU) No 305/2011) given in the following table apply:

Product(s)	Intended use(s)	Level(s) or class(es)	System(s)
Fire Stopping and Fire Sealing Products	For fire compartmentation and/or fire protection or fire performance	any	1
	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 RISE Research Institutes of Sweden AB.

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

Issued in Borås on 25.01.2019
 By RISE Research Institutes of Sweden AB

Johan Åkesson
 Certification Manager

ANNEX A

REFERENCE DOCUMENTS and LIST OF ABBREVIATIONS

A.1 References to standards mentioned in the ETA

EN 300	Oriented Strand Boards (OSB) - Definitions, classification and specifications
EN 520	Gypsum plasterboards - Definitions, requirements and test methods
EN ISO 717-1	Acoustics - Rating of sound insulation in buildings and of building elements - Part 1: Airborne sound insulation (ISO 717-1:2013)
EN 1026	Windows and doors - Air permeability - Test method
EN 1366-3	Fire resistance tests for service installations - Part 3: Penetration seals
EN ISO 10140-1	Acoustics - Laboratory measurement of sound insulation of building elements - Part 1: Application rules for specific products (ISO 10140-1:2016, IDT)
EN ISO 10140-2	Acoustics - Laboratory measurement of sound insulation of building elements - Part 2: Measurement of airborne sound insulation (ISO 10140-1:2010)
EN ISO 12572	Hygrothermal performance of building materials and products - Determination of water vapour transmission properties - Cup method (ISO 12572:2016, IDT)
EN 12667	Thermal performance of building materials and products - Determination of thermal resistance by means of guarded hot plate and heat flow meter methods - Products of high and medium thermal resistance
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 data from fire resistance tests - excluding ventilation services
EN 13986	Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking
EN 14081-1	Timber structures - Strength graded structural timber with rectangular cross section - Part 1: General requirements
EN 16516	Construction products - Assessment of release of dangerous substances - Determination of emissions into indoor air
A.2 Other reference documents	
EOTA TR 001	Determination of impact resistance of panels and panel assemblies
EOTA TR 024	Characterisation, Aspects of Durability and Factory Production Control for Reactive Materials, Components and Products
ETA-10/0241	Leno Cross Laminated Timber
ETA-13/0099	Hilti Firestop Block CFS-BL

ANNEX B

DESCRIPTION OF PRODUCT(S) & PRODUCT LITERATURE

B.1 Hilti Firestop Block CFS-BL P

Blocks are brick-like shaped with dimensions (l x w x t) of 200 x 130 x 50 mm. A detailed specification of the product is contained in document "Identification / Product Specification" relating to this European Technical Assessment, which is a non-public part of this ETA.

The Control Plan is defined in document "Control Plan" relating to this European Technical Assessment, which is a non-public part of this ETA.

B.2 Hilti Firestop Filler CFS-FIL

Hilti Firestop Filler CFS-FIL is an acrylic based firestop filler mastic. The filler is available as a cartridge of 310 ml or as a foil pack of 580 ml.

The Control Plan is defined in document "Control Plan relating to the European Technical Assessment ETA-13/0099 – Hilti Firestop Block CFS-BL", which is a non-public part of the ETA.

B.3 Technical product literature

Technical data sheets for the individual solutions (including all ancillary products).

ANNEX C

RESISTANCE TO FIRE CLASSIFICATION OF PENETRATION SEALS "HILTI FIRESTOP BLOCK CFS-BL P"

C.1 General information

C.1.1 Wall/floor constructions

a) Cross laminated timber floor:

Floor type A: The floor construction is a cross laminated timber (type "Leno Brettsperrholz", manufactured by the firm Timber GmbH, D-Aichbach in accordance with ETA-10/0241) element with thickness 220 mm.

The pre-fabricated timber element consisted of seven layers of softwood which were cross-wise adhesively laminated. The exterior layers and the middle layers have a thickness of 34 mm, the remaining two layers have a thickness of 24 mm. The nominal density of the timber element is 410 kg/m³. Each layer had milled grooves with a width of 2.5 mm and a depth of 18 mm.

b) Closed timber beam floor construction:

Floor type B: the closed timber beam floor construction was a pre-fabricated timber element with thickness 236 mm. The element was constructed from timber beams (w x h 80 x 160 mm, density 440 kg/m³) in the long span direction of the element at a mutual distance of 1280 mm. Between the beams in the short span direction of the element timber crossbeams (b x h 80 x 160 mm, density 440 kg/m³) were screw-fixed onto the longitudinal beams, with a distance of 400 mm between the crossbeams.

The underside of the element was covered with a double layer of 18 mm gypsum plasterboards, type F in accordance with EN 520. The boards were fixed onto the main beams and crossbeams with steel screws.

The upper side of the timber element was covered with 22 mm thick „OSB-3“ wood-based panels (in accordance with EN 300), and an additional layer of 18 mm gypsum plasterboards, type F in accordance with EN 520. The boards were fixed onto the main beams and crossbeams with steel screws.

The cavity between upper and lower facings was filled with a 160 mm thick insulation layer of mineral wool (Class A1 in accordance with EN 13501-1, melting point > 1000 °C), consisting of two layers of 80 mm, nominal density 35 kg/m³.

c) Cross laminated timber wall:

Wall type C: The wall construction is a cross laminated timber (type "Leno Brettsperrholz", manufactured by the firm Timber GmbH, D-Aichbach in accordance with ETA-10/0241) element, thickness 148 mm.

The pre-fabricated timber element consisted of six layers of softwood which were cross-wise adhesively laminated. The construction is schematically represented in the drawing. The nominal density of the timber element is 410 kg/m³. Each layer had milled grooves with a width of 2.5 mm and a depth of 18 mm.

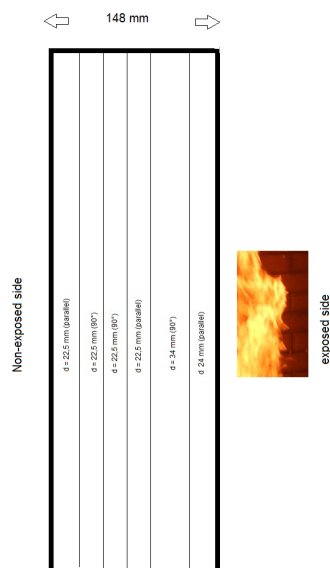


Figure 1. Cross laminated timber wall construction.

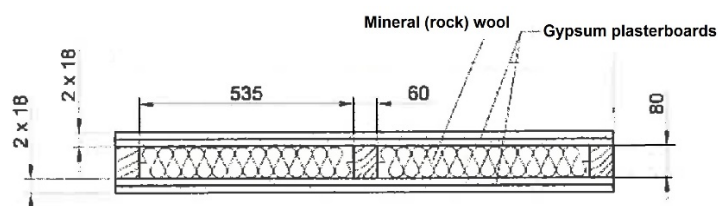
d) Timber stud partition:

Wall type D: The wall construction is a timber frame flexible wall construction with mineral wool insulation between the timber studs and a lining of gypsum plasterboards, thickness 152 mm.

The timber studs were solid timber (in accordance with EN 15497, S10 or better), strength class C24 in accordance with EN 338 (density 440 kg/m³), dimensions 80 mm x 60 mm, center-to-center distance 595 mm.

Each side was lined with a double layer of gypsum plasterboards, class F in accordance with EN 520, thickness 18 mm. The joints and fixing points were finished with a suitable gypsum plaster finish.

The cavity was filled with rock wool insulation, density ca. 44 kg/m³.



e) Acceptable variations:

The following variations are acceptable for the elements without a negative effect on the fire resistance performance:

- For the cross laminated timber elements (floor type A and wall type C): the cross laminated timber must be manufactured in accordance with the applicable ETA; the CLT elements (walls / floors) must be classified in accordance with EN 13501-2 for the required fire resistance period or fulfil the requirements of the relevant Eurocode:

- increase in element thickness;
- increase in the thickness of the layers;
- For the timber beam floor construction (floor type B); the floor must be classified in accordance with EN 13501-2 for the required fire resistance period or fulfil the requirements of the relevant Eurocode;
- increase in the cross section of the timber beams (to EN 14081-1);
- increase in the thickness of the floor;
- decrease of the span;
- increase in the thickness of the applied boards (gypsum plasterboards (to EN 570) and/or OSB (OSB 3 to EN 13986)).
- For the timber stud partition (wall type D); the wall must be classified in accordance with EN 13501-2 for the required fire resistance period or fulfil the requirements of the relevant Eurocode;
- increase in the cross section of the timber studs;
- use of suitable metal studs
- increase in the thickness of the wall;
- increase in the thickness of the applied boards.
- the test results will also apply to concrete or masonry wall elements of an overall thickness of 152 mm or more.

C.1.2 Penetration seal type

The construction of the penetration seal type “CFS-BL P” is schematically represented in Figures 2 to 5. After fixing the penetrants through the (rectangular) opening the remainder of the opening is filled with Hilti Firestop CFS-BL P blocks. The thickness of the penetration seal is 200 mm (the blocks are used lengthwise). Where necessary parts of the blocks are cut off to make them fitting the opening. Any remaining openings or gaps (up to maximum 10 mm) must be filled with Hilti Firestop Filler CFS-FIL.

In the timber beam floor, the opening was framed with 18 mm thick gypsum plasterboard.

The distance between this penetration and other penetrations needs to be 200 mm or more.

The first support for the cables is at 300 mm (or less) distance from the wall or 500 mm (or less) from the floor.

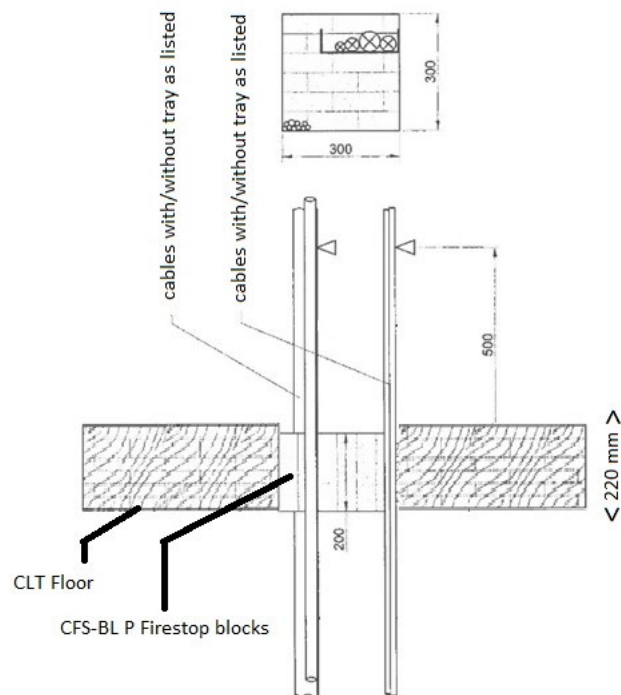


Figure 2. Schematic representation of penetration seal type CFS-BL P in a CLT floor (type A))

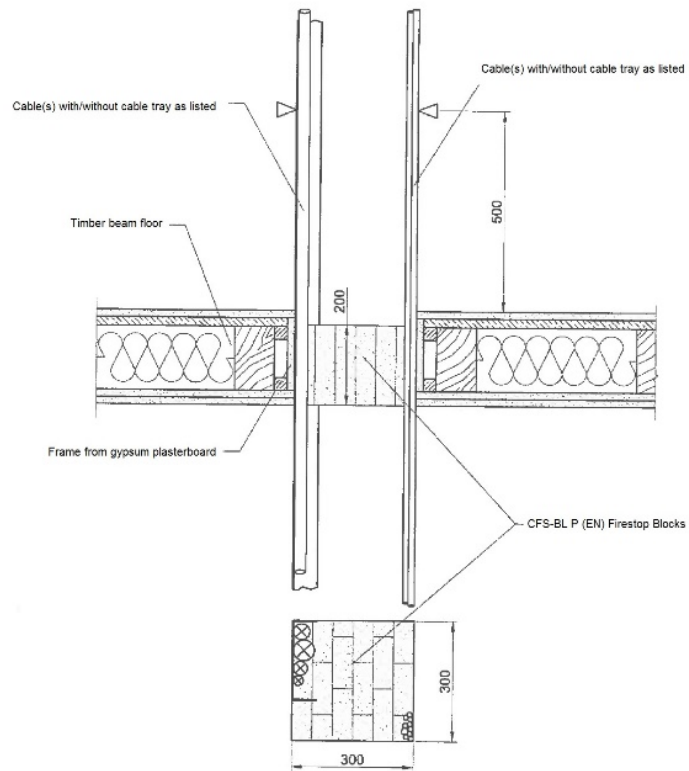


Figure 3. Schematic representation of penetration seal type CFS-BL P in a timber beam floor

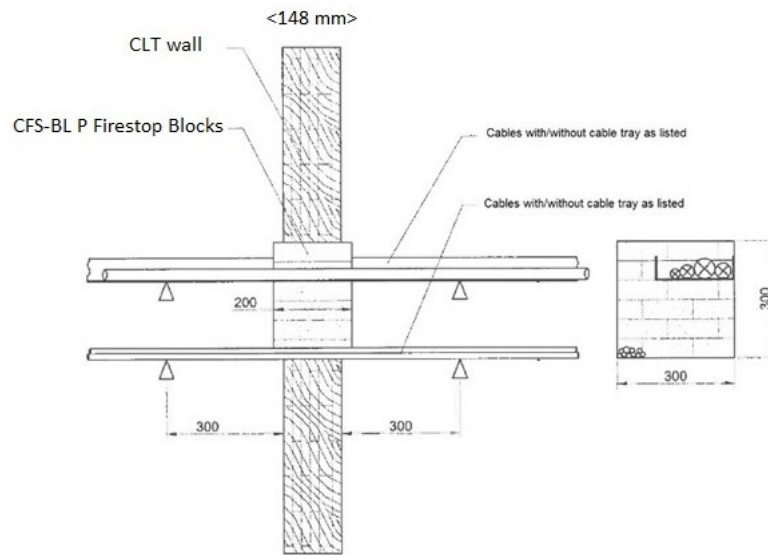


Figure 4. Schematic representation of penetration seal type CFS-BL P in a CLT wall (type C)

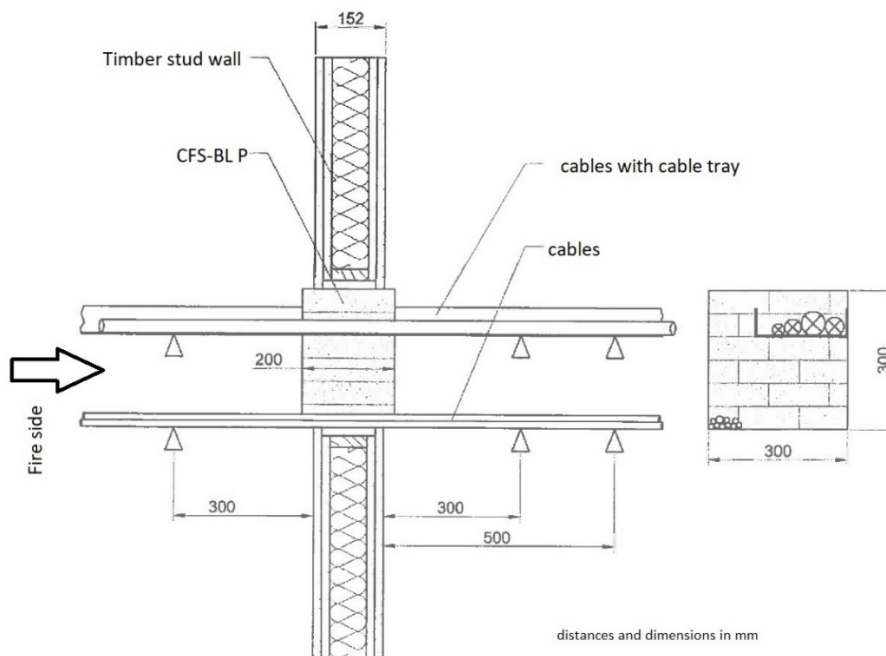


Figure 5. Schematic representation of penetration seal type CFS-BL P in a timber stud partition (type D)

C.1.3 Penetration services and classifications - cables

Function	Construction type	Classification
All sheathed cable types currently and commonly used in building practice in Europe with a diameter of maximum Ø21 mm, without cable tray	CLT floor (Type A) Timber beam floor (Type B) CLT wall (Type C)	EI 90
	Flexible wall (Type D)	EI 60 / E 90
All sheathed cable types currently and commonly used in building practice in Europe with a diameter of maximum Ø50 mm, with or without cable tray	CLT floor (Type A) Timber beam floor (Type B)	EI 90
All sheathed cable types currently and commonly used in building practice in Europe with a diameter of maximum Ø50 mm, with or without cable tray	CLT wall (Type C) Flexible wall (Type D)	EI 60 / E 90