

**Hilti Cable Transit
System CFS-T**

European technical
approval
ETA N° 13/0516



Hilti Cable Transit System CFS-T

An expert sealing and firestop solution for the most demanding applications

Applications:

Sealing and fire stop solutions e.g. in

- Building and construction (waste water plants, office buildings, high-rise buildings, power substations, transformer stations, airport, bridges, tunnels, hospitals, clean rooms, control rooms, data center, cabinets, etc.)
- Industrial applications for downstream (oil and gas) and petrochemical plants
- Telecom applications (outdoor centers, switch stations, communication centers, etc.) and transmission towers

Features and benefits

- Low inventory requirements – only 7 different modules are needed to cover all cable diameters from 3 to 99mm
- Versatile adapter modules for quick, easy accommodation of each cable diameter
- Big savings thanks to module interlinking, especially where cables run vertically through deck penetrations.
- Easy to install using anchor plates and the CFS-T SQU module squeezer
- Wedge seals with only one bolt for quick installation
- Easy inspection – visual inspection of correct installation within seconds due to color-coded adapter system



Technical Data

	CFS-T cable and filler modules
Approvals	ETA – 13/0516 UL, FM MED, ABS, Germanischer Lloyd's Register, DNV, CCS, RMRS, Transport Canada, US Coast Guard ATEX
Chemical basis	Halogen free EPDM rubber
Density	approx. 1650 kg/m ³
Shore A hardness	70 – 88
Re-penetration	Possible
Reaction to fire class	E (according to EN 13501-1:2007)
Storage Temperature	+5 to +25° C
Application Temperature	-20 to +50° C
Temperature resistance	-40 to +50° C at constant load, short-term load up to 120° C

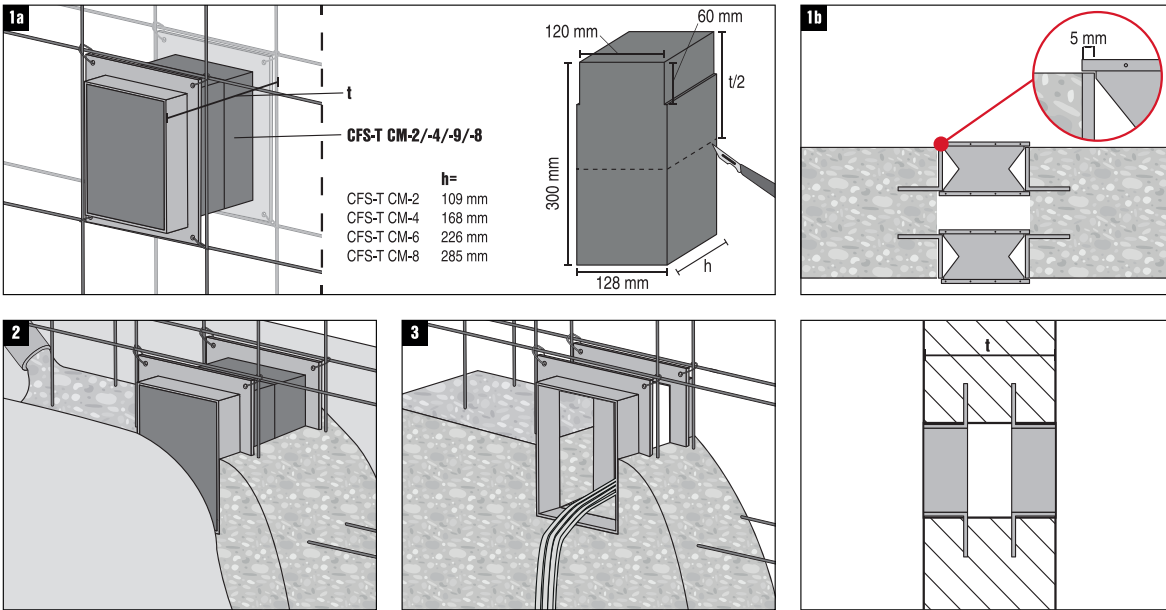


Ordering

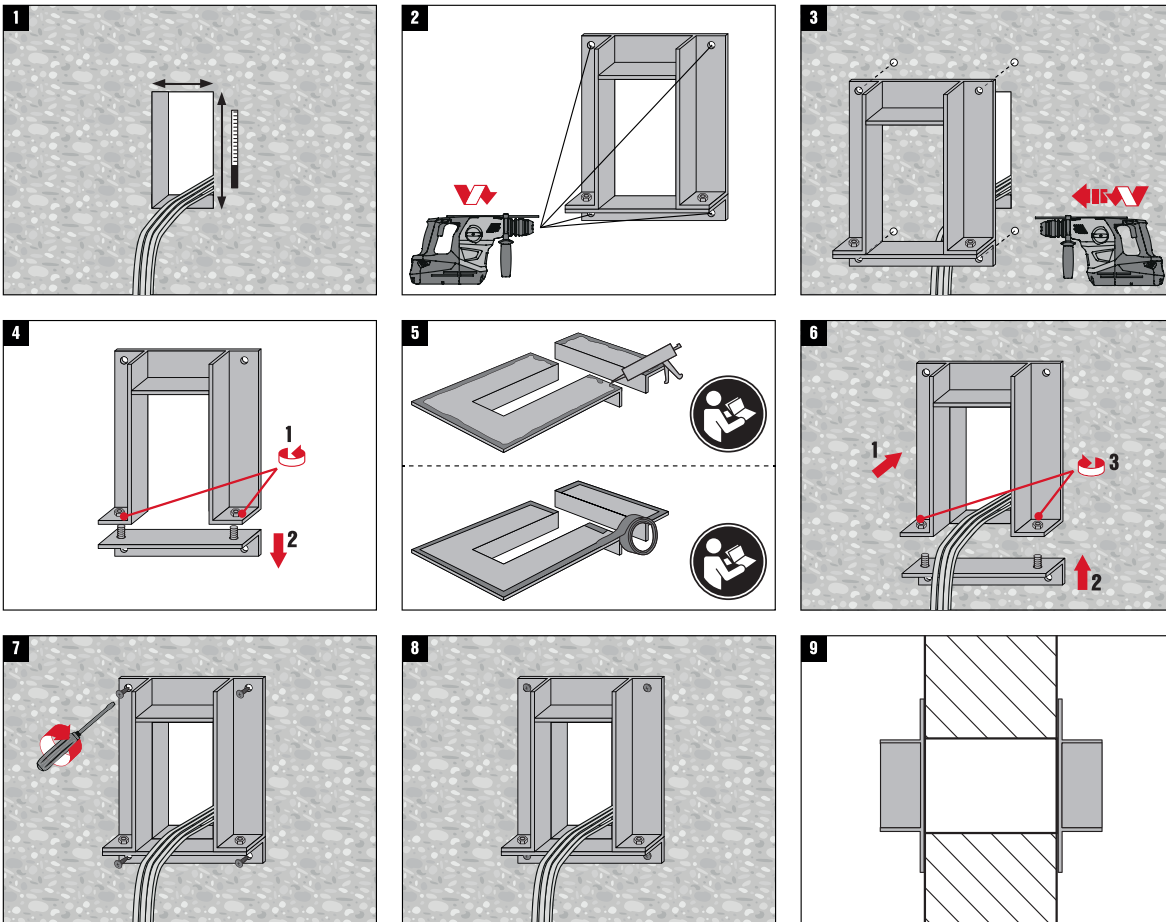
For detailed order designations refer to Product Brochure
“Hilti Cable Transit System”

Installation instructions

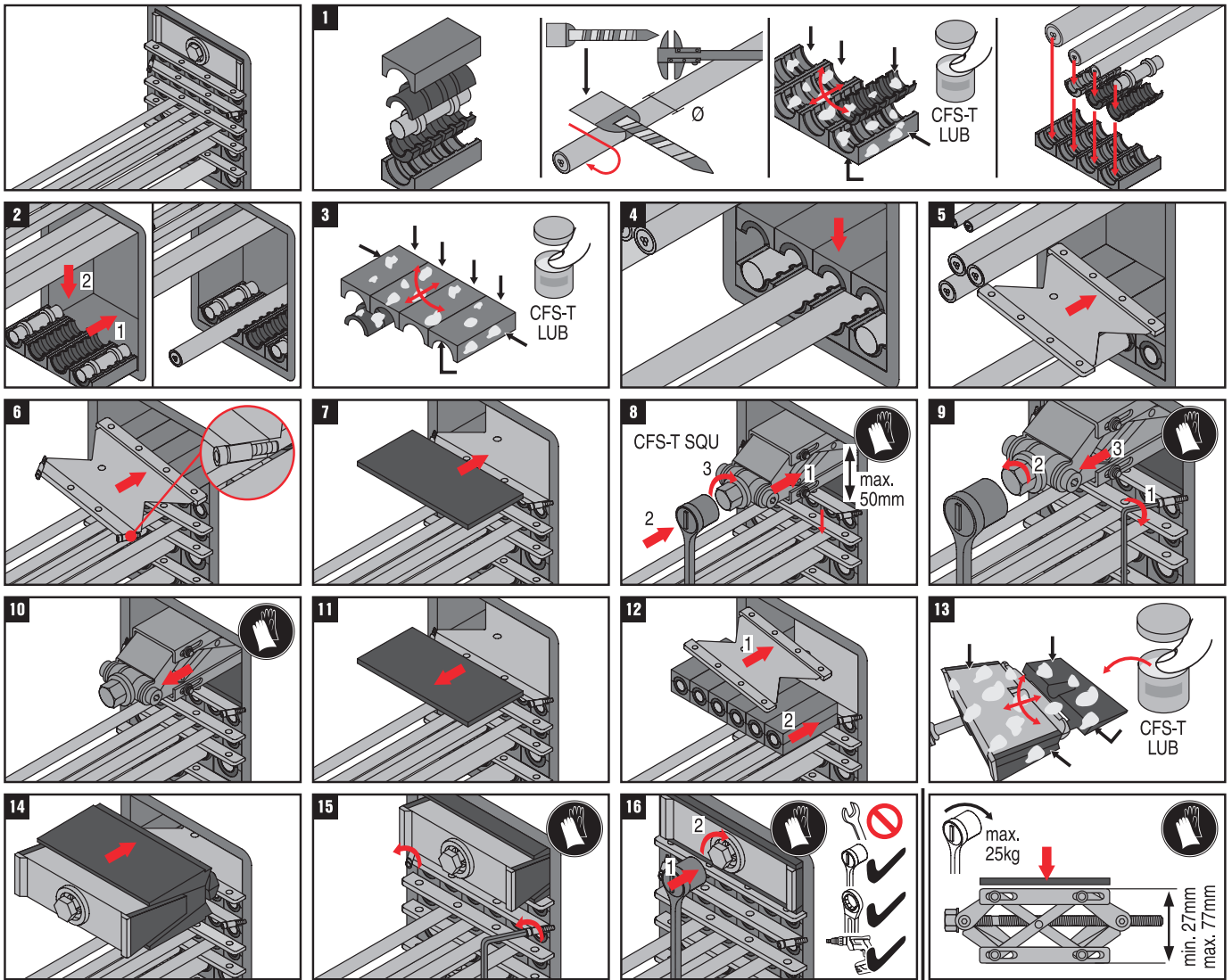
Installations of CFS-T SB transit frames



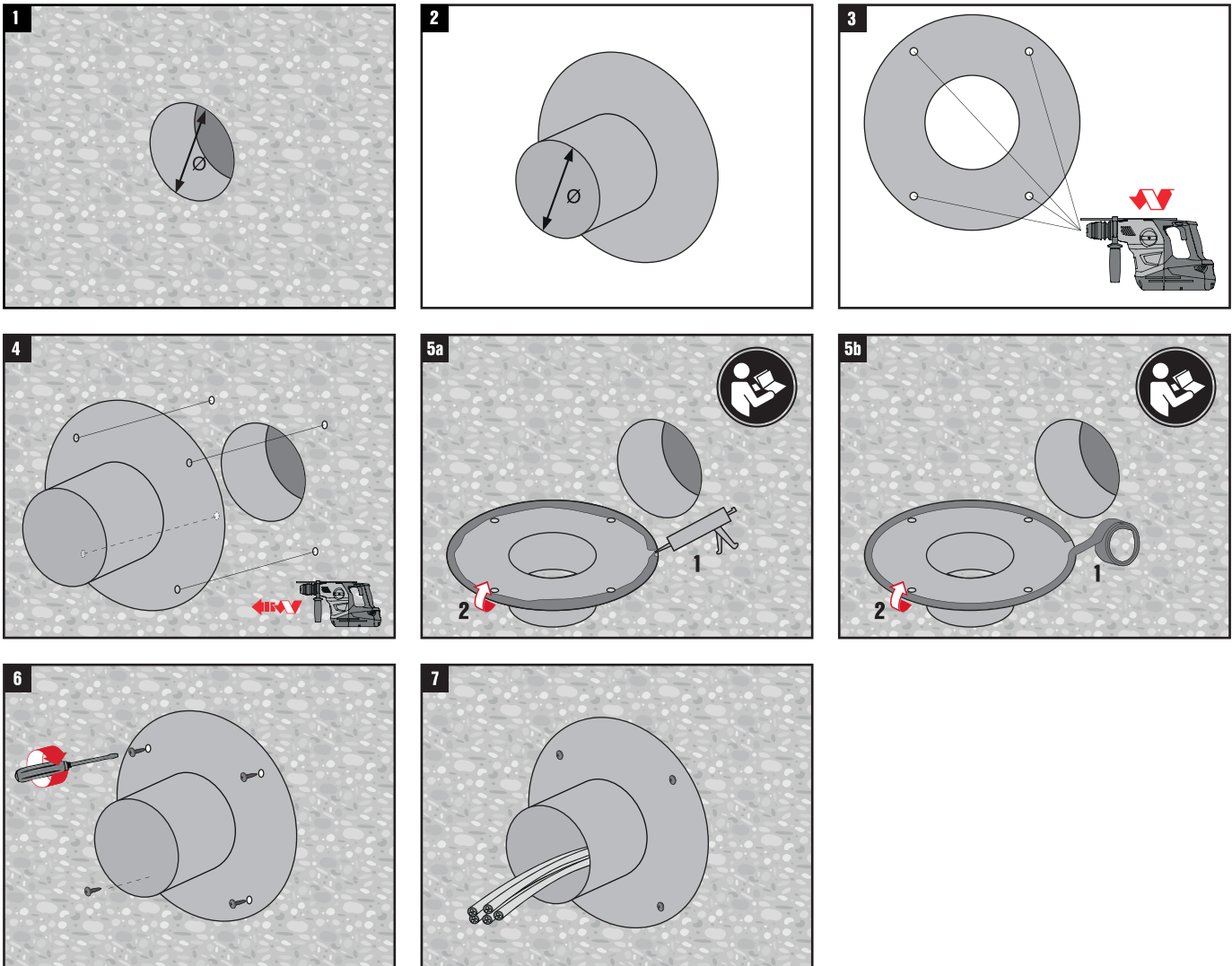
Installations to CFS-T SBO transit frames



Installation of CFS-T cable modules

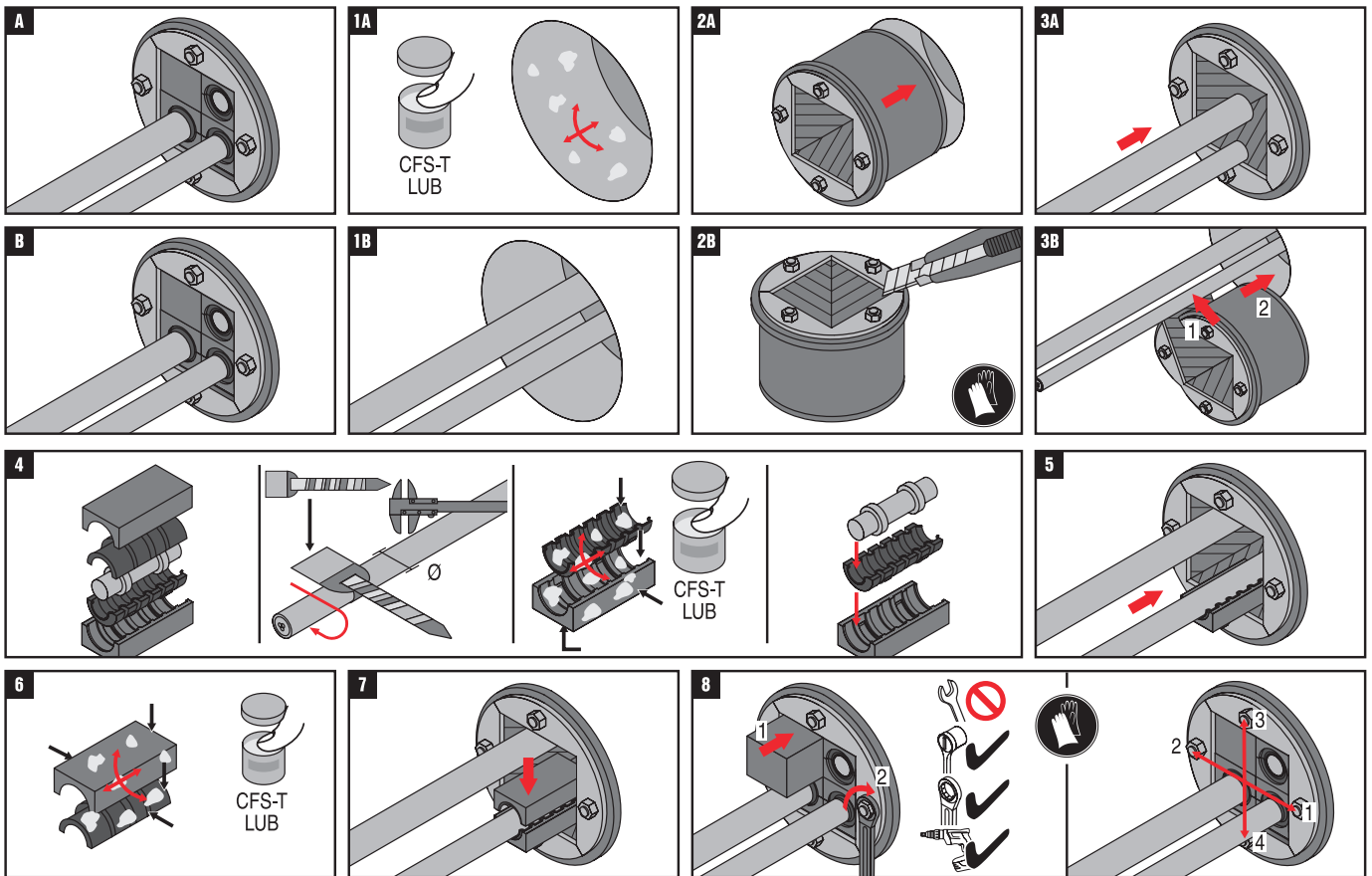


Installation of CFS-T SLF sleeve

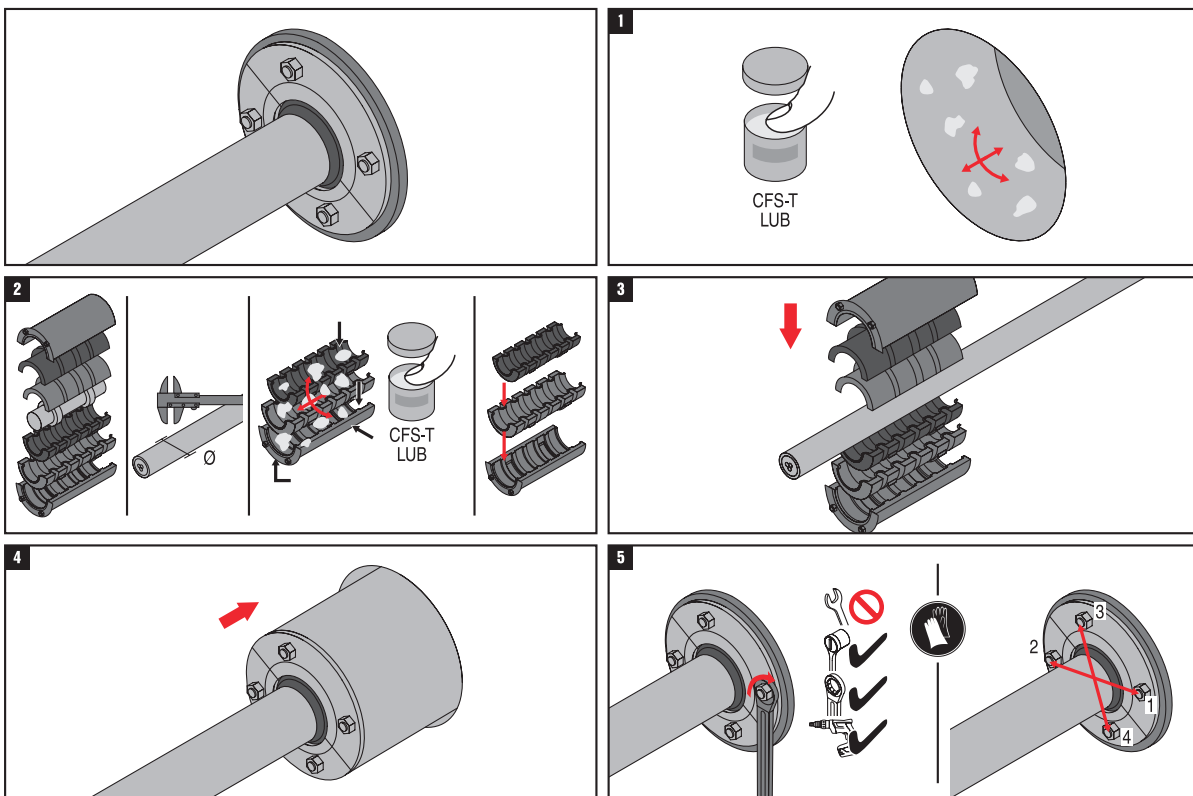


Follow installation of CFS-T RR or CFS-T RRS plug seals

Installation of CFS-T RR plug seals



Installation of CFS-T RRS plug seals



Cable penetrations, non-combustible pipe penetrations and mixed penetrations

Hilti Firestop Cable Transit System CFS-T SB

The modular system type “Hilti Firestop Cable Transit CFS-T SB” consists of two cast in flanged steel combination frame installed flush to surface, stone wool insulation, elastomeric rubber modules, wedge compression kit and lubricant. Maximum seal size for single opening is 277 mm x 120 mm x 60 mm (type CFS-T SB 8 x 1), maximum seal size for multiple opening is 504 mm x 562 mm x 60 mm (type CFS-T SB 8 + 8 x 4).

Rigid walls

Rigid concrete wall with minimum thickness ≥ 150 mm.

	Penetration seal / service	Classification E = integrity I = insulation	Cable and pipe insulation	Other criteria description, distances
Blank opening	Blank seal, no service	EI 180		
Cable	Small cable group max. \varnothing 21 mm ¹⁾	EI 180	Cable insulation thickness: 30 mm	Minimum distances in mm cable and metal pipe penetration seal: Min. 5 mm (distance between cables and the side seal edge) Min. 5 mm (distance between cables and upper seal edge) Min. 0 mm (distance between the insulation of metal pipes and the seal edge)
	Medium cable group max. \varnothing 50 mm ¹⁾		Cable insulation length: 250 mm	
	Large cable group max. \varnothing 80 mm ¹⁾	EI 120		
Metal pipe	Metal pipes 15 mm diameter, pipe wall thickness 1.0 – 14.2 mm ²⁾	EI 180	Thickness of pipe insulation: ≥ 30 mm, Length of pipe insulation: ≥ 500 mm Arrangement of pipe insulation: LI (local interruption)	Min. 0 mm (distance between the insulation of metal pipes) Min. 90 mm (distance between cables and metal pipes)
	Metal pipes 15–28 mm diameter, pipe wall thickness 1.0 – 14.2 mm ²⁾	EI 120-C/U, EI 180-C/U		
	Metal pipes 28–54 mm diameter, pipe wall thickness 1.0/1.5 – 14.2 mm ²⁾			
	Metal pipes 15–28 mm diameter, pipe wall thickness 1.0 – 14.2 mm ²⁾		EI 180	
	Metal pipes 28–54 mm diameter, pipe wall thickness 1.0/1.5 – 14.2 mm ²⁾	Arrangement of pipe insulation: CI (continuous interruption)		

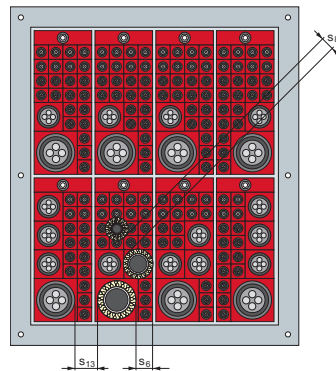
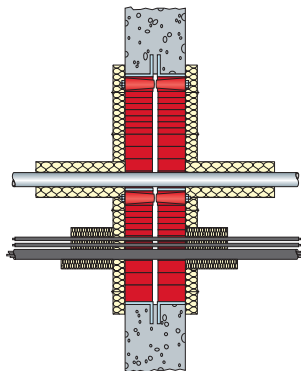
¹⁾ All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables), except waveguide and non-sheathed cables.

²⁾ Non-combustible pipes made from steel, cast iron, stainless steel, Ni alloys (NiCu, NiCr, NiMO alloys).

Blank opening



Cable, non-combustible pipe and mixed penetrations



Rigid Floors

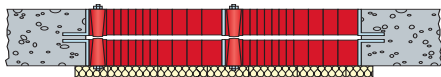
Rigid concrete floor with minimum thickness ≥ 200 mm.

	Penetration seal/service	Classification E = integrity I = insulation	Cable and pipe insulation	Other criteria description, distances
Blank opening	Blank seal, no service	EI 180		
Cable	Small cable group max. $\varnothing 21$ mm ¹⁾	EI 180	Cable insulation thickness: 30 mm	Minimum distances in mm cable and metal pipe penetration seal: Min. 5 mm (distance between cables and the side seal edge) Min. 5 mm (distance between cables and upper seal edge) Min. 0 mm (distance between the insulation of metal pipes and the seal edge) Min. 0 mm (distance between the insulation of metal pipes) Min. 90 mm (distance between cables and metal pipes)
	Medium cable group max. $\varnothing 50$ mm ¹⁾		Cable insulation length: 300 mm	
	Large cable group max. $\varnothing 80$ mm ¹⁾	EI 120		
Metal pipe	Metal pipes 15–28 mm diameter, pipe wall thickness 1.0–14.2 mm ²⁾	EI 120-C/U, EI 180-C/U	Thickness of pipe insulation: ≥ 30 mm, Length of pipe insulation: ≥ 400 mm Arrangement of pipe insulation: LI (local interruption)	
	Metal pipes 28–54 mm diameter, pipe wall thickness 1.0/1.5–14.2 mm ²⁾		Thickness of pipe insulation: ≥ 30 mm, Length of pipe insulation: ≥ 500 mm Arrangement of pipe insulation: LI (local interruption)	
	Metal pipes 15–28 mm diameter, pipe wall thickness 1.0–14.2 mm ²⁾	EI 180	Thickness of pipe insulation: ≥ 30 mm Arrangement of pipe insulation: CI (continuous interruption)	
	Metal pipes 28–54 mm diameter, pipe wall thickness 1.0/1.5–14.2 mm ²⁾			

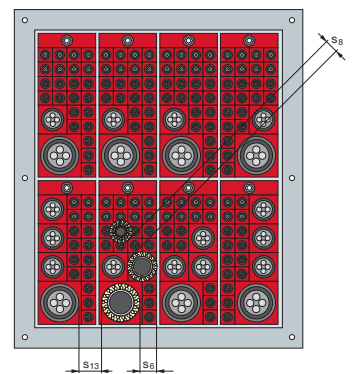
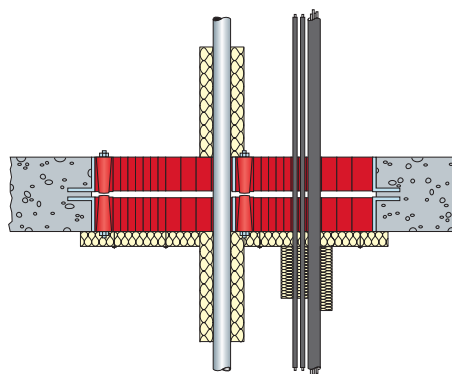
¹⁾ All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables), except waveguide and non-sheathed cables.

²⁾ Non-combustible pipes made from steel, cast iron, stainless steel, Ni alloys (NiCu, NiCr, NiMO alloys).

Blank opening



Cable, non-combustible pipe and mixed penetration



Hilti Firestop Cable Transit System CFS-T SBO

The modular system type “Hilti Firestop Cable Transit CFS-T SBO” consists of two surface mounted flanged steel combination frame, stone wool insulation, elastomeric rubber modules, wedge compression kit and lubricant. Maximum seal size for single opening is 277 mm x 120 mm x 60 mm (type CFS-T SBO 8 x 1), maximum seal size for multiple opening is 504 mm x 562 mm x 60 mm (type CFS-T SBO 8 + 8 x 4).

For smoke tightness sealing of CFS-T SBO transits frames Hilti Firestop Acrylic Sealant CFS-S ACR have to be used.

Rigid Walls

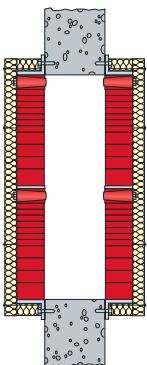
Rigid concrete wall with minimum thickness ≥ 150 mm.

	Penetration seal/service	Classification E = integrity I = insulation	Cable and pipe insulation	Other criteria description, distances
Blank opening	Blank seal, no service	EI 180		
Cable	Small cable group max. \varnothing 21 mm ¹⁾	EI 180	Cable insulation thickness: 30 mm	Minimum distances in mm cable and metal pipe penetration seal: Min. 5 mm (distance between cables and the side seal edge) Min. 5 mm (distance between cables and upper seal edge) Min. 0 mm (distance between the insulation of metal pipes and the seal edge) Min. 0 mm (distance between the insulation of metal pipes) Min. 90 mm (distance between cables and metal pipes)
	Medium cable group max. \varnothing 50 mm ¹⁾		Cable insulation length: 150 mm	
	Large cable group max. \varnothing 80 mm ¹⁾	EI 120		
Metal pipe	Metal pipes 15 mm diameter, pipe wall thickness 1.0 – 14.2 mm ²⁾	EI 180	Thickness of pipe insulation: ≥ 30 mm, Length of pipe insulation: ≥ 250 mm Arrangement of pipe insulation: LI (local interruption)	
	Metal pipes 15 – 28 mm diameter, pipe wall thickness 1.0 – 14.2 mm ²⁾		EI 120-C/U, EI 180-C/U	
	Metal pipes 28 – 54 mm diameter, pipe wall thickness 1.0/1.5 – 14.2 mm ²⁾	EI 180		
	Metal pipes 15 – 28 mm diameter, pipe wall thickness 1.0 – 14.2 mm ²⁾			
	Metal pipes 28 – 54 mm diameter, pipe wall thickness 1.0/1.5 – 14.2 mm ²⁾			

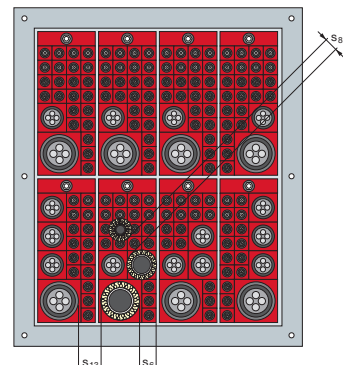
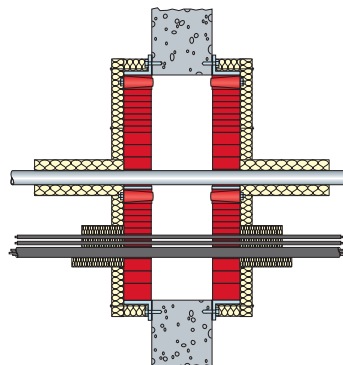
¹⁾ All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables), except waveguide and non-sheathed cables.

²⁾ Non-combustible pipes made from steel, cast iron, stainless steel, Ni alloys (NiCu, NiCr, NiMo alloys).

Blank opening



Cable, non-combustible pipe and mixed penetration



Rigid Floors

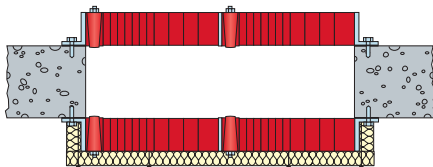
Rigid concrete floor with minimum thickness ≥ 200 mm.

	Penetration seal/service	Classification E = integrity I = insulation	Cable and pipe insulation	Other criteria description, distances
Blank opening	Blank seal, no service	EI 180		
Cable	Small cable group max. $\varnothing 21$ mm ¹⁾	EI 180	Cable insulation thickness: 30 mm	Minimum distances in mm cable and metal pipe penetration seal: Min. 5 mm (distance between cables and the side seal edge) Min. 5 mm (distance between cables and upper seal edge)
	Medium cable group max. $\varnothing 50$ mm ¹⁾		Cable insulation length: 250 mm	
	Large cable group max. $\varnothing 80$ mm ¹⁾			
Metal pipe	Metal pipes 15–28 mm diameter, pipe wall thickness 1.0–14.2 mm ²⁾	EI 120-C/U, E 180-C/U	Thickness of pipe insulation: ≥ 30 mm, Length of pipe insulation: ≥ 300 mm Arrangement of pipe insulation: LI (local interruption)	Min. 0 mm (distance between the insulation of metal pipes and the seal edge) Min. 0 mm (distance between the insulation of metal pipes)
	Metal pipes 28–54 mm diameter, pipe wall thickness 1.0/1.5–14.2 mm ²⁾		Thickness of pipe insulation: ≥ 30 mm, Length of pipe insulation: ≥ 500 mm Arrangement of pipe insulation: LI (local interruption)	Min. 90 mm (distance between cables and metal pipes)
	Metal pipes 15–28 mm diameter, pipe wall thickness 1.0–14.2 mm ²⁾	EI 180	Thickness of pipe insulation: ≥ 30 mm	
	Metal pipes 28–54 mm diameter, pipe wall thickness 1.0/1.5–14.2 mm ²⁾		Arrangement of pipe insulation: CI (continuous interruption)	

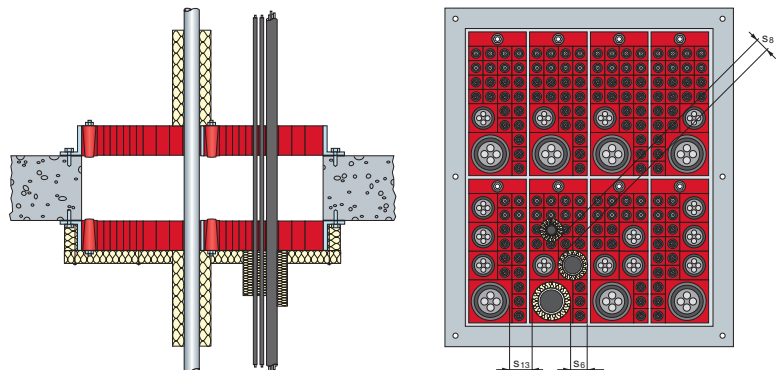
¹⁾ All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables), except waveguide and non-sheathed cables.

²⁾ Non-combustible pipes made from steel, cast iron, stainless steel, Ni alloys (NiCu, NrCr, NiMO alloys).

Blank opening



Cable, non-combustible pipe and mixed penetration



Hilti Firestop Cable Transit System CFS-T RR(S)

The modular system type “Hilti Firestop Cable Transit CFS-T RR(S)” consists of a flanged steel sleeve installed both sides, an elastic plug seal, stone wool insulation, elastomeric rubber modules and lubricant. Seal size for CFS-T RR is Ø50 to Ø205 mm. Seal size for CFS-T RRS is Ø43 to Ø103 mm.

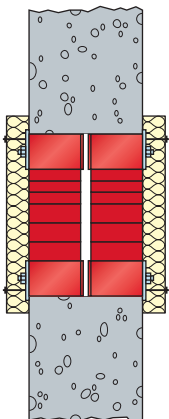
Rigid Walls

Rigid concrete wall with minimum thickness ≥ 150 mm.

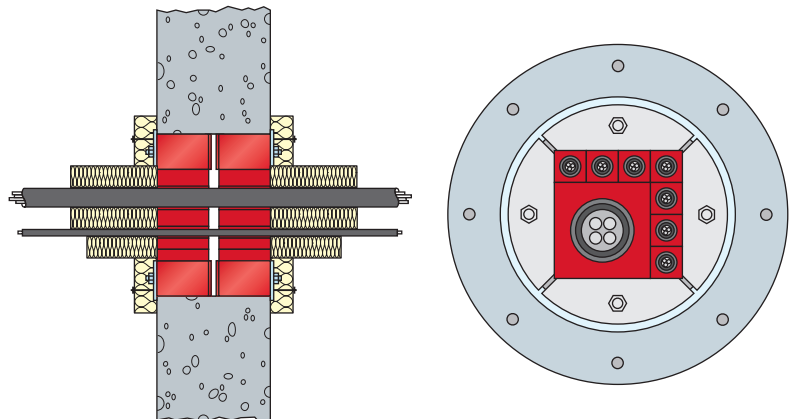
	Penetration seal/service	Classification E = integrity I = insulation	Cable and pipe insulation	Other criteria description, distances
Blank opening	Blank seal, no service	EI 180		
Cable	Small cable group max. Ø 21 mm ¹⁾	EI 180	Cable insulation thickness: 30 mm Cable insulation length: 250 mm	Minimum distances in mm cable and metal pipe penetration seal: Min. 5 mm (distance between cables and the side seal edge) Min. 5 mm (distance between cables and upper seal edge)
	Medium cable group max. Ø 50 mm ¹⁾			Min. 0 mm (distance between the insulation of metal pipes and the seal edge) Min. 0 mm (distance between the insulation of metal pipes)
	Large cable group max. Ø 80 mm ¹⁾	EI 120	Min. 90 mm (distance between cables and metal pipes)	

¹⁾ All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables), except waveguide and non-sheathed cables.

Blank opening



Cable penetration



Rigid Floors

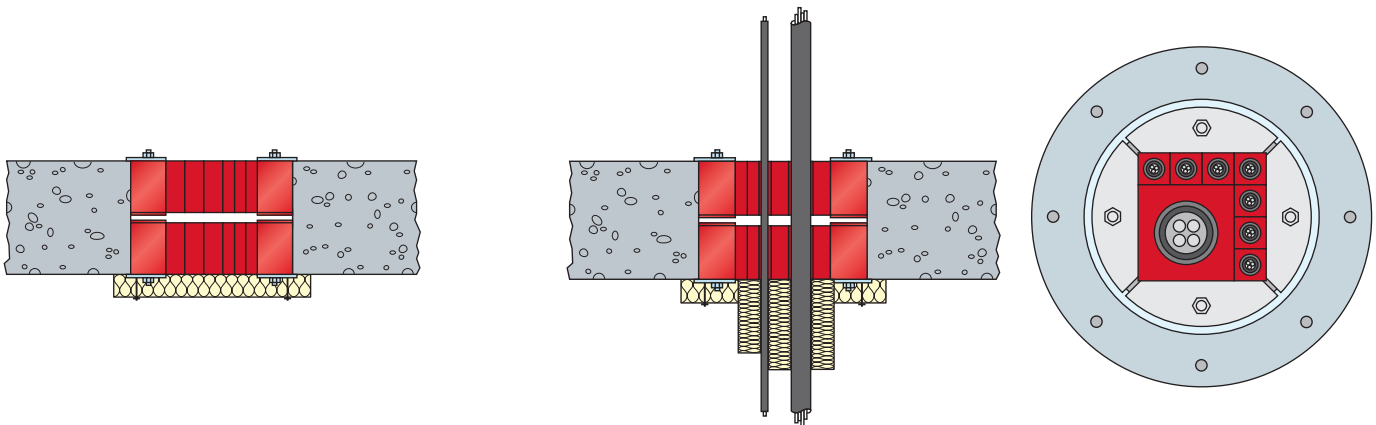
Rigid concrete floor with minimum thickness ≥ 200 mm.

	Penetration seal/service	Classification E = integrity I = insulation	Cable and pipe insulation	Other criteria description, distances
Blank opening	Blank seal, no service	EI 180		
Cable	Small cable group max. $\varnothing 21$ mm ¹⁾	EI 180	Cable insulation thickness: 30 mm Cable insulation length: 300 mm	Minimum distances in mm cable and metal pipe penetration seal: Min. 5 mm (distance between cables and the side seal edge) Min. 5 mm (distance between cables and upper seal edge) Min. 0 mm (distance between the insulation of metal pipes and the seal edge) Min. 0 mm (distance between the insulation of metal pipes)
	Medium cable group max. $\varnothing 50$ mm ¹⁾			Min. 90 mm (distance between cables and metal pipes)
	Large cable group max. $\varnothing 80$ mm ¹⁾			

¹⁾ All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables), except waveguide and non-sheathed cables.

Blank opening

Cable penetration



Hilti Firestop Cable Transit System CFS-T RR(S) with Sleeve CFS-T SLF

The modular system type “Hilti Firestop Cable Transit CFS-T RRS” consists of a flanged steel sleeve installed both sides, an elastic plug seal, stone wool insulation, elastomeric rubber modules and lubricant. Seal size for CFS-T RR is Ø50 to Ø205 mm. Seal size for CFS-T RRS is Ø43 to Ø103 mm.

For smoke tightness sealing of CFS-T SLF sleeves Hilti Firestop Acrylic Sealant CFS-S ACR have to be used.

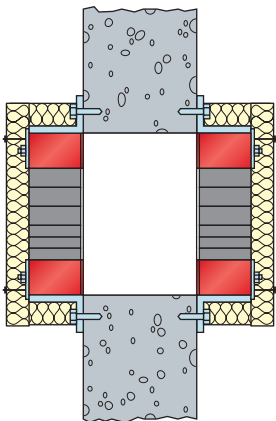
Rigid Walls

Rigid concrete wall with minimum thickness ≥ 200 mm.

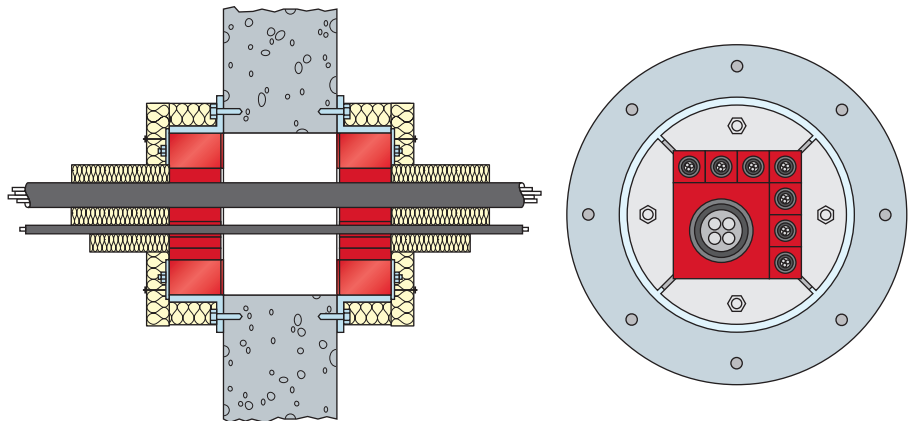
	Penetration seal/service	Classification E = integrity I = insulation	Cable and pipe insulation	Other criteria description, distances
Blank opening	Blank seal, no service	EI 180		
	Small cable group max. Ø 21mm ¹⁾	EI 180	Cable insulation thickness: 30 mm Cable insulation length: 150 mm	Minimum distances in mm cable and metal pipe penetration seal: Min. 5 mm (distance between cables and the side seal edge) Min. 5 mm (distance between cables and upper seal edge) Min. 0 mm (distance between the insulation of metal pipes and the seal edge) Min. 0 mm (distance between the insulation of metal pipes)
Medium cable group max. Ø 50 mm ¹⁾	Min. 90 mm (distance between cables and metal pipes)			
Large cable group max. Ø 80 mm ¹⁾				
Cable				

¹⁾All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables), except waveguide and non-sheathed cables.

Blank opening



Cable penetration



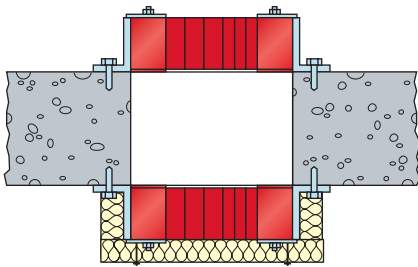
Rigid Floors

Rigid concrete floor with minimum thickness ≥ 200 mm.

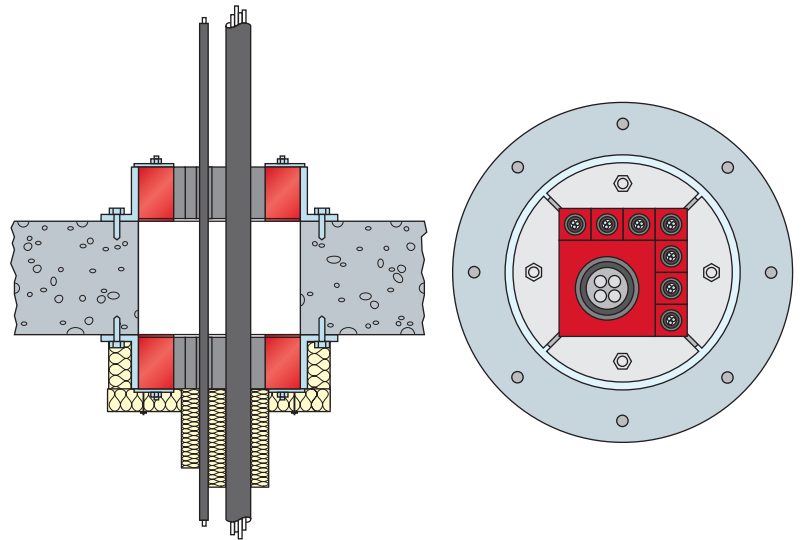
	Penetration seal/service	Classification E = integrity I = insulation	Cable and pipe insulation	Other criteria description, distances
Blank opening	Blank seal, no service	EI 180		
Cable	Small cable group max. $\varnothing 21$ mm ¹⁾	EI 180	Cable insulation thickness: 30 mm Cable insulation length: 250 mm	Minimum distances in mm cable and metal pipe penetration seal: Min. 5 mm (distance between cables and the side seal edge) Min. 5 mm (distance between cables and upper seal edge) Min. 0 mm (distance between the insulation of metal pipes and the seal edge) Min. 0 mm (distance between the insulation of metal pipes) Min. 90 mm (distance between cables and metal pipes)
	Medium cable group max. $\varnothing 50$ mm ¹⁾			
	Large cable group max. $\varnothing 80$ mm ¹⁾			

¹⁾ All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables), except waveguide and non-sheathed cables.

Blank opening



Cable penetration



Specification for mineral wool products for additional cable, plug and metal frame insulation:

Stone wool according to EN 14303, reaction to fire class according to EN 13501-1 A1 thermal conductivity at 20° C ≤ 0.040 W/mK, density 80 kg/m³.

The following list contains suitable products but may not be exhaustive:

Isover MD 100

Isover MD 2

Isover ULTIMATE TECH WIRED MAT 5.0 N

Rockwool ProRox WM 80

Rockwool RTD Plus

Fixing of mineral wool for cable insulation: fixed with steel gauze (thickness 0.7 mm)

Fixing of mineral wool for pipe insulation: wrapped around the pipe

Fixing of mineral wool as additional protection for transit frames, sleeves and plug seals fixing with pins (diameter 4 mm) and washers

Specification for mineral wool products for additional pipe insulation:

Interrupted insulation: Stone wool according to EN 14303, reaction to fire class according to EN 13501-2 A2 or A1, Al-faced

Additional insulation:

- Isover Coquilla AT-LR
- Isover Protect BSR 90 alu
- Paroc Section AluCoat T
- Rockwool Klimarock
- Rockwool RS 800 pipe sections

Characteristics of Hilti Firestop Cable Transit System CFS-T

Additional attributes

Hilti Firestop products are comprehensively tested and individually tailored to the technical requirements of a building's electric installations. In addition to their superior behaviour in passive fire protection, Hilti Firestop products also meet the requirements in building technology that continue to gain significance and also help the designer and installer in meeting these additional requirements. The assessment of fitness for use has been made in accordance with EOTA ETAG No 026 – Part 2.



Characteristics	Assessment of characteristics	Norm, standard, test
Health and the environment Air permeability (gas tightness)	The air permeability of the CFS-T System, has been tested subjected to an overpressure of 7 bar for type CFS-T SS/SB. Test result: No air leakage over a test duration of 24 hours has been determined.	Air pressure test
Water permeability (water tightness)	Water tightness for a multiple penetration of cables fire stopped with Hilti Firestop Cable Transit CFS-T. The water permeability of the CFS-T System, has been tested subjected to an overpressure of 11 bar for type CFS-T-RR 200 and type CFS-T SS/SB. Test result: No water leakage over a test duration of 24 hours has been determined.	Water pressure test
Dangerous substances	According to the manufacturer's declaration, the product specification has been compared with the list of dangerous substances of the European Commission to verify that that it does not contain such substances above the acceptable limits. CFS-T is in compliance concerning the registration, evaluation, authorization and restriction of Chemicals (REACH).	Material safety data sheet
Safety in use Resistance to impact/movement Mechanical resistance and stability/adhesion	In impact tests according to EOTA TR001 the requirements for the highest risk zone type (Type IV) have been fulfilled as defined for internal walls in EOTA TR 001 A.1	EOTA TR001
Durability and serviceability	Hilti Firestop Cable Transit CFS-T fulfils the requirements of use category X, Z ₂ in accordance with ETAG 026-2, Section 1.2. Type X: Products for penetration seals intended for uses at conditions exposed to weathering Type Z ₂ : Products for penetration seals intended for uses at internal conditions with humidity classes other than Z ₁	ETAG 026-2
Reaction to fire	Class E	EN 13501-1

Additional testing for the Hilti Cable Transit System CFS-T

Characteristics	Assessment of characteristics	Norm, standard, test
Blast test ¹⁾	Blast loaded tests with peak overpressure of 42 bar and pressure impulse of 83 bar ms	Blast test
Emission test ¹⁾	Complies with the requirements of DIBt (October 2010) in combination with the NIK values from AgBB (May 2010) for use in the indoor environment AgBB: Committee for Health-related Evaluation of Building Products DIBt: German Institute for Building Technology	guidelines of the DIBt
Smoke density and toxicity ¹⁾	Fulfills the requirement for the smoke density and toxicity tests	NBS smoke chamber test
Resistance to fire ¹⁾	Fire ratings up to 4 hours Listings available from: – UL – FM	ANSI/UL 1479 (ASTM E814)
A-60 ¹⁾	A-60 approvals for marine or offshore applications in steel/aluminum bulkheads and decks Approvals available from – MED – American Bureau of Shipping (ABS) – Det Norske Veritas (DNV) – Germanischer Lloyd – Lloyd Register – US Coast Guard – Transport Canada – Chinese Classification Society (CCS) – Russian Maritime Register of Shipping (RMRS)	IMO 754(18)
H-120 ¹⁾	H-120 approvals for marine or offshore applications in steel bulkheads and decks Approvals available from – American Bureau of Shipping (ABS) – Lloyd Register	IMO 754(18)

¹⁾Not content of the European technical approval

Service

With more than 20 years of experience worldwide, Hilti is one of the leading suppliers of firestop systems.

We actively help you manage your firestop projects better by providing:

- Quick engineering judgments
- Extensive technical literature
- On-site training and demonstration
- Sophisticated jobsite logistics
- Assurance of conformity with specific application requirements
- International network of Hilti firestop specialists

Our network of experienced sales representatives, field engineers, firestop specialists and customer service representatives is just a phone call away (use the local toll-free Hilti number).

Hilti. Outperform. Outlast.

Hilti Corporation | 9494 Schaan | Liechtenstein | P +423-234 2111 | F +423-234 2965 | www.hilti.com