

**Hilti CFS-S ACR  
Firestop  
Acrylic Sealant**

European  
Technical Approval  
ETA N° 10/0389  
(linear joint seals)  
ETA N° 10/0292  
(penetration seals)



## Firestop acrylic sealant CFS-S ACR

An acrylic based firestop sealant that provides movement capability in fire rated linear joint seals and penetration seals



### Applications

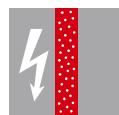
- Within or between flexible wall constructions
- Vertical joints in / between wall constructions
- Horizontal joints in a wall abutting a floor, ceiling or roof
- Joints in floor construction
- Penetration seals (steel and copper pipes)

### Advantages

- Easy to dispense, apply and tool
- Strong adhesion to various base materials
- Low shrinkage after curing
- Excellent airborne sound insulation property
- Broad application temperature range

### Technical data

CFS-S ACR	
<b>Chemical basis</b>	Water-based acrylic dispersion
<b>Volume shrinkage</b>	< 20 %
<b>Movement</b>	12.5 % (ISO 11600)
<b>Cure Time (at 23°C/50 % r.H.)</b>	~ 3 mm/72 h
<b>Application temperature range</b>	5°C – 40°C
<b>Storage and transportation temperature - range</b>	5°C – 25°C
<b>Shelf life (@73°F/23°C and 50 % relative humidity)</b>	24 month(s)
<b>Reaction to fire class</b>	D-s1d0 (EN13501-1)
<b>Approvals*</b>	ETA 10 / 0292, ETA 10 / 0389

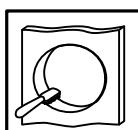
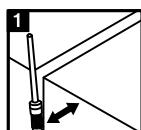


\* The European Technical Approval (ETA) can be obtained via your local Hilti contact or [www.hilti.com](http://www.hilti.com)

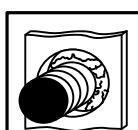
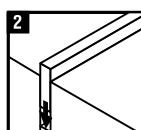


Package	Volume	Color	Order designation	Sales Quantity	Item Number
Cartridge	310 ml	white	<b>Firestop acrylic sealant CFS-S ACR</b>	1 pc	<b>435859</b>
Cartridge	310 ml	white	<b>Firestop acrylic sealant CFS-S ACR</b>	1 pc	<b>435860</b>
Cartridge	310 ml	grey	<b>Firestop acrylic sealant CFS-S ACR</b>	1 pc	<b>435862</b>
Foil pack	580 ml	white	<b>Firestop acrylic sealant CFS-S ACR</b>	20 pc	<b>435863</b>
Pail	5 l	white	<b>Firestop acrylic sealant CFS-S ACR</b>	1 pc	<b>435864</b>
Pail	10 l	white	<b>Firestop acrylic sealant CFS-S ACR</b>	1 pc	<b>2046766</b>

## Installation instructions

**Joint****Penetration**

Clean opening. Surfaces to which CFS-S ACR will be applied should be dry, cleaned of loose debris, dirt, oil, wax and grease. Use wire brushing for cleaning.

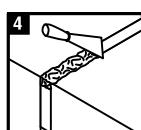


Insert backing material if required. Make sure proper backing material is used and compressed according European Technical Approval (see ETA Annex)



Apply CFS-S ACR using a dispenser.

CFS-S ACR adheres to most substrates (concrete, masonry, drywall, plaster, etc.) without using a primer. For best adhesion on porous substrates, use CFS-S ACR diluted with water as primer. Other primers are not necessary.



Smooth joint with water using a narrow spatula or finger.

**Notes on Cleaning:**

- Surfaces with cured acrylic sealant can only be cleaned mechanically e.g. using a knife, but not with a solvent.
- Remove uncured sealant first mechanically then clean with water.
- CFS-S ACR cannot be completely cleaned off porous surfaces – joints may be taped off to avoid staining.
- Dispenser equipment and tools have to be cleaned if a work break lasts longer than approximately 20 minutes.

**Linear joint seals****Rigid walls | floors**

Hilti CFS-S ACR Firestop Acrylic Sealant may be used to form linear joint seals in rigid walls or floors (E), minimum thickness 150 mm ( $t_E$ ), minimum density 2400 kg/m<sup>3</sup>.

Backfilling material (B): Stone wool, CE marked in accordance with EN 13162 or EN 14303 with a density of 30 to 70 kg/m<sup>3</sup>.

Joint orientation	Classification E = integrity I = insulation	Joint width W (mm)	Thickness of sealant $t_A$ (mm)	Movement capability	Other criteria Description
Vertical joints (A) in or between wall constructions**	EI 180-V-M 12,5-F-W 6 to 20 (E 240-V-M 12,5-F-W 6 to 20)	6 to 20	6	± 12.5 %	Stone wool backfilling ( $\geq 100$ mm thickness $t_B$ ) compression of mineral wool min. 60 %
Joints (A) in floor constructions* Horizontal joints (A) in a wall abutting a floor, ceiling or roof (head of wall)**	EI 180-H-M 12,5-F-W 6 to 20	6 to 20	6	± 12.5 %	Stone wool backfilling ( $\geq 100$ mm thickness $t_B$ ) compression of mineral wool min. 60 %
	EI 120-H-M 12,5-F-W 20 to 100 (E 180-H-M 12,5-F-W 20 to 100)	20 to 100	10	± 12.5 %	Stone wool backfilling ( $\geq 100$ mm thickness $t_B$ ) compression of mineral wool min. 50 %

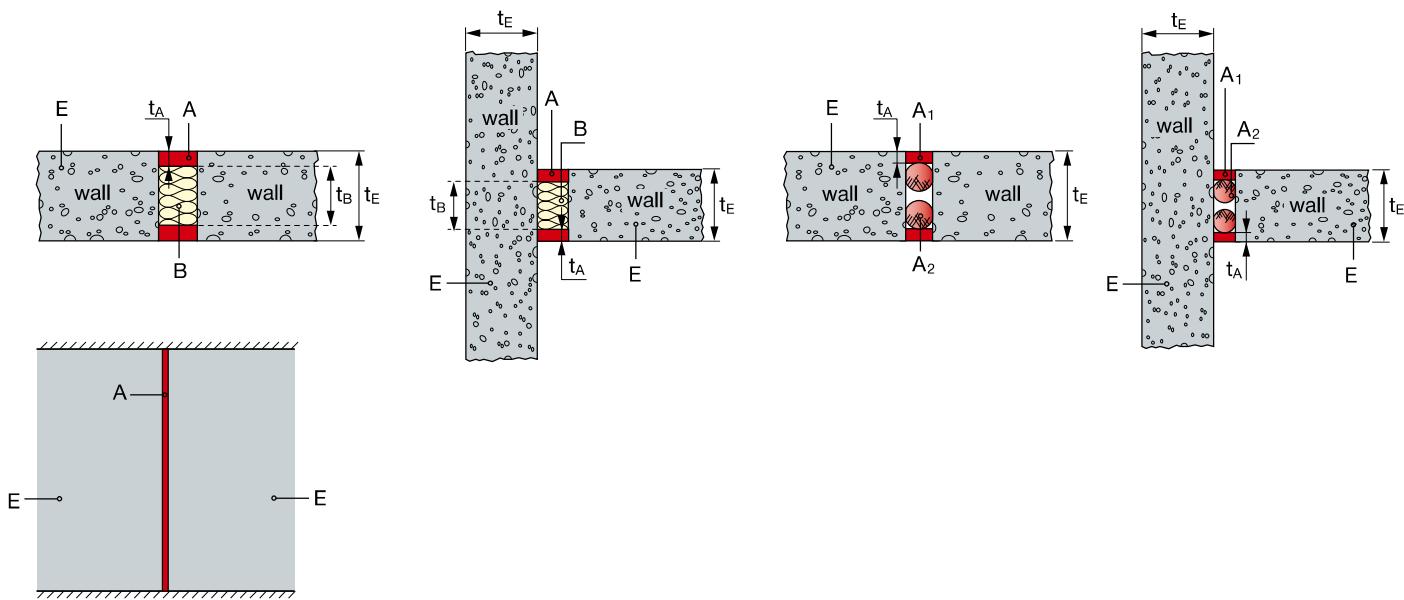
Backfilling material (B): Hilti Firestop Round Cord CFS-CO

Joint orientation	Classification E = integrity I = insulation	Joint width W (mm)	Round Cord size (mm)	Thickness of sealant $t_A$ (mm)	Movement capability	Other criteria Description
Vertical joints (A) in or between wall constructions**	EI 180-V-X-F-W 12 to 17 (E 240-V-X-F-W 12 to 17) EI 180-V-X-F-W 17 to 27 (E 240-V-X-F-W 17 to 27) EI 180-V-X-F-W 27 to 37 (E 240-V-X-F-W 27 to 37) EI 180-V-X-F-W 37 to 47 (E 240-V-X-F-W 37 to 47) EI 180-V-X-F-W 47 to 55 (E 240-V-X-F-W 47 to 55)	12 to 17 17 to 27 27 to 37 37 to 47 47 to 55	20 30 40 50 60	6 10 10 10 10	± 7.5 %	In case of two round cord layers: air gap between rods Splice distance: $\geq 140$ mm (joint width $\leq 17$ mm), $\geq 450$ mm (joint width $> 17$ mm)
Joints (A) in floor constructions* Horizontal joints (A) in a wall abutting a floor, ceiling or roof (head of wall)**	EI 180-H-X-F-W 12 to 17 EI 180-H-X-F-W 17 to 27 EI 180-H-X-F-W 27 to 37 EI 180-H-X-F-W 37 to 47 EI 180-H-X-F-W 47 to 55	12 to 17 17 to 27 27 to 37 37 to 47 47 to 55	20 30 40 50 60	6 10 10 10 10	± 7.5 %	In case of two round cord layers: air gap between rods Splice distance: $\geq 645$ mm
	EI 90-H-M 12.5-F-W 12 to 17 EI 90-H-M 12.5-F-W 17 to 27 EI 90-H-M 12.5-F-W 27 to 37 EI 90-H-M 12.5-F-W 37 to 47 EI 90-H-M 12.5-F-W 47 to 55	12 to 17 17 to 27 27 to 37 37 to 47 47 to 55	20 30 40 50 60	6 10 10 10 10	± 12.5 %	Minimum two round cords with an air gap in between, minimum 25 mm distance from surfaces of the floor. Minimum distance of splices in the two rod layers: 100 mm (joint width $\leq 30$ mm)

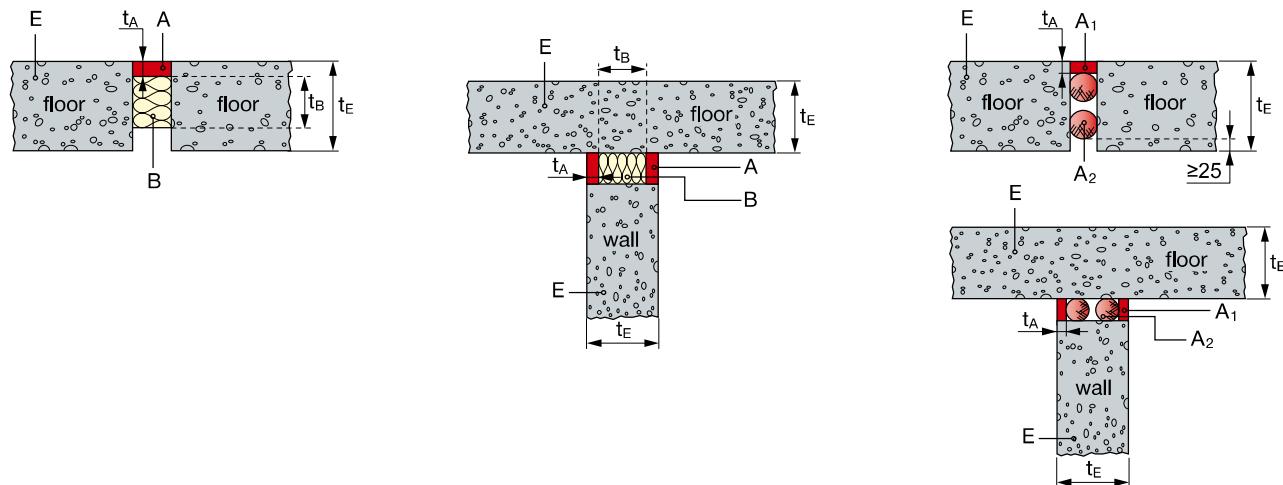
\* sealant on upper side, \*\* sealant on both sides

V = vertical, M = movement, F = splice, field, W = joint width, H = horizontal, X = non-movement joint ( $\pm 7.5\%$ )

### Vertical joints in or between wall constructions



### Joints in floor constructions and horizontal (head of wall) joints



## Linear joint seals

### Flexible walls | rigid walls

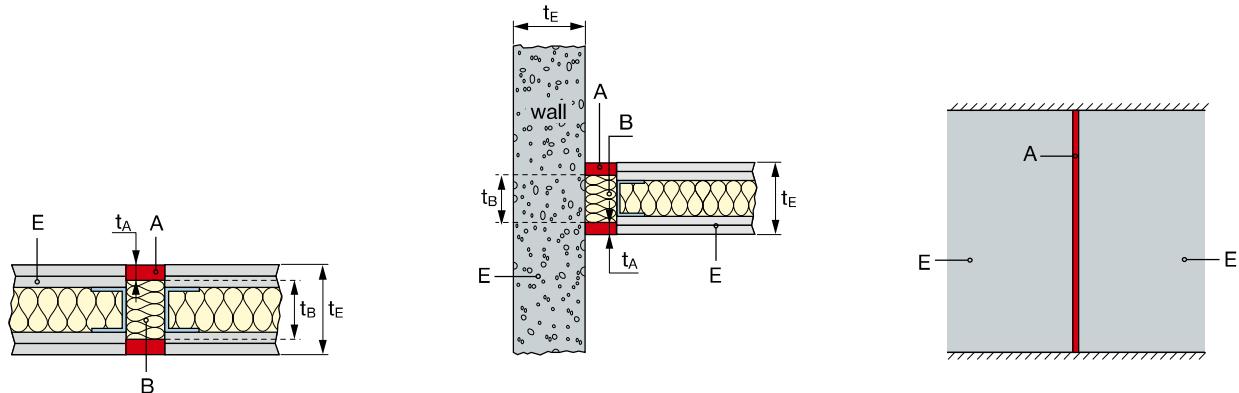
Hilti CFS-S ACR Firestop Acrylic Sealant may be used to form linear joint seals (A) in flexible walls/drywall (E) and rigid walls (minimum density 650 kg/m<sup>3</sup>) with a minimum thickness of 100 mm ( $t_E$ ) with stone wool backfilling material CE marked in accordance with EN 13162 or EN 14303 with a density of 30 to 70 kg/m<sup>3</sup>.

Joint orientation	Classification E = integrity I = insulation	Joint width W (mm)	Thickness of sealant $t_A$ (mm)	Movement capability	Other criteria Description
Vertical joints (A) in or between wall constructions**	EI120-V-X-F-W 10 to 30	10 to 30	10	± 7.5 %	Stone wool backfilling ( $\geq 100$ mm thickness $t_B$ ) compression of mineral wool min. 60 %, splice distance minimum 1250 mm
Vertical joints (A) between flexible and rigid wall constructions**	EI120-V-X-F-W 10 to 20	10 to 20	10	± 7.5 %	Stone wool backfilling ( $\geq 100$ mm thickness $t_B$ ) compression of mineral wool min. 60 %, splice distance minimum 1250 mm

\* sealant on upper side, \*\* sealant on both sides

V = vertical, F = splice, field, W = joint width, X = non-movement joint ( $\pm 7.5$  %)

### Vertical joints in or between wall constructions



## Linear joint seals

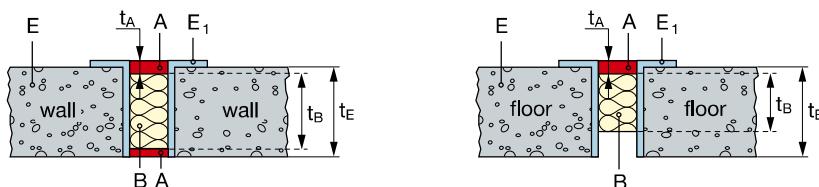
### Steel constructions/elements

Hilti CFS-S ACR Firestop Acrylic Sealant may be used to form linear joint seals (A) between steel structural elements forming a joint depth of minimum 150 mm or between steel elements as joint faces in rigid constructions (E) with minimum thickness of 150 mm ( $t_E$ ) with stone wool backfilling material CE marked in accordance with EN 13162 or EN 14303 with a density of 30 to 70 kg/m<sup>3</sup>.

Joint orientation	Classification E = integrity I = insulation	Joint width W (mm)	Thickness of sealant $t_A$ (mm)	Movement capability	Other criteria Description
Vertical joints (A)**	EI 60-V-X-F-W 6 to 20 (E 240-V-X-F-W 6 to 20)	6 to 20	6	± 7.5 %	Stone wool backfilling ( $\geq 100$ mm thickness $t_B$ ) compression of mineral wool min. 60%, splice distance minimum 1250 mm
	EI 60-V-X-F-W 20 to 100 (E 240-V-X-F-W 20 to 100)	20 to 100	10	± 7.5 %	Stone wool backfilling ( $\geq 100$ mm thickness $t_B$ ) compression of mineral wool min. 50%, splice distance minimum 1250 mm
Joints (A) in floor constructions* Horizontal joints (A) in a wall abutting a floor, ceiling or roof (head of wall)**	EI 120-H-X-F-W 6 to 20	6 to 20	6	± 7.5 %	Stone wool backfilling ( $\geq 100$ mm thickness $t_B$ ) compression of mineral wool min. 60%, splice distance minimum 1250 mm
	EI 60-H-X-F-W 20 to 100 (E 120-H-X-F-W 20 to 100)	20 to 100	10	± 7.5 %	Stone wool backfilling ( $\geq 100$ mm thickness $t_B$ ) compression of mineral wool min. 50%, splice distance minimum 1250 mm

\* sealant on upper side, \*\* sealant on both sides  
V = vertical, F = splice, field, W = joint width, H = horizontal, X = non-movement joint ( $\pm 7.5$  %)

### Steel constructions/elements



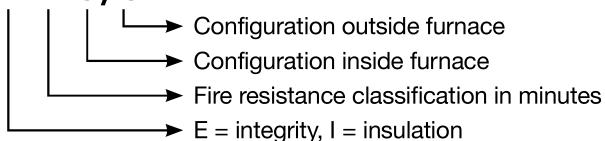
## Metal pipe penetrations

Hilti CFS-S ACR Firestop Acrylic Sealant may be used for different insulation types and mineral wool products readily suitable being used as pipe insulation.

### Pipe end configurations

All pipes tested according to EN 1366-3 have been tested with a specific pipe end configuration. In the fire classification, the first letter of the end configuration refers to the end conditions within the furnace (fire-side), the second letter to the end conditions outside the furnace (non-fire-side).

**EI 90 U/U**



Test condition	Pipe end configuration	
	Inside furnace	Outside furnace
U/U	Uncapped	Uncapped
C/U	Capped	Uncapped
U/C	Uncapped	Capped
C/C	Capped	Capped

As the EN test standard EN 1366-3 states, “it is important to ensure that sealing systems have been tested with appropriate pipe end conditions.” The conditions the pipe and sealing system must endure in a fire situation depend on whether one or both ends of the pipe are sealed in practice, as pressures and the flow of hot gases will vary depending on whether the pipe is ventilated or not.

There are rules that determine which tested end configurations are valid for additional pipe end situations.

Metal pipes	Tested		
	U/C	C/U	C/C
Covered	U/C	Y	N
	C/U	Y	Y
	C/C	Y	Y

Y = acceptable, N = not acceptable

So, for example, a (metal) pipe tested with the end configuration U/C will cover all possible end conditions. But a (metal) pipe tested C/U will only cover the conditions C/U or C/C.

## Pipe end configurations according to intended use

As previously stated, it is important to ensure that the tested pipe configuration corresponds to the intended use of the pipe.

The table below outlines recommended end configurations for various intended pipe uses as per suggestions laid out in EN 1366-3 2009 H.4.2.2. In the event that a national regulation conflicts with this table, the national regulation takes precedence.

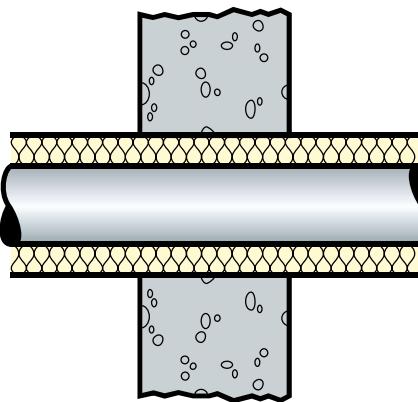
Intended use of penetrations (list not exhaustive, other pipes uses possible)			
Application	Penetration material	Manufacturer, product (examples)	Recommended pipe end classification
Heating pipes	Copper		U/C
	Steel, Stainless steel		
	Al-Composite	Geberit: Mepla	
Potable water pipes	Copper		U/C
	Stainless steel		
	Al-Composite pipes	Geberit: Mepla	
Refrigeration pipes	Copper		U/C
	Steel, Stainless steel		
Ventilated waste water/ Storm water / Roof drainage pipes	Cast iron, SML		U/U
Pneumatic pipes	Steel		U/C
Industry pipes	Copper		Varies depending upon application, i.e. consider whether pipe is pressurized (U/C), ventilated (U/U) or unventilated (U/C)
	Steel, stainless steel		
	Al-Composite pipes	Geberit: Mepla	

## Pipe end configurations

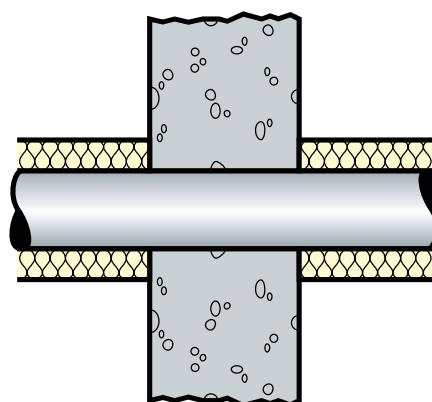
When sealing pipes, the insulation configuration must be considered. The following configurations are possible:

### Insulation over the entire length of the pipe (i.e. thermal insulation)

#### Continued sustained

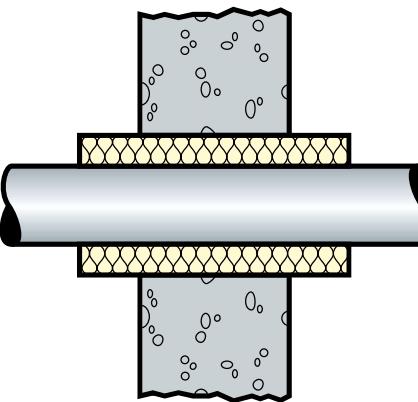


#### Continued interrupted

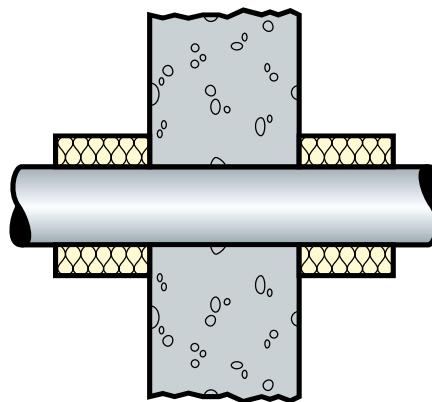


### Insulation only required in the area of the penetration seal

#### Local insulation, sustained



#### Local insulation, interrupted



## Pipe insulation products

Isover (Protect BSR 90 alu), Paroc (Section AluCoat T), Rockwool (Conlit 150P, Klimarock, 800 pipe sections).

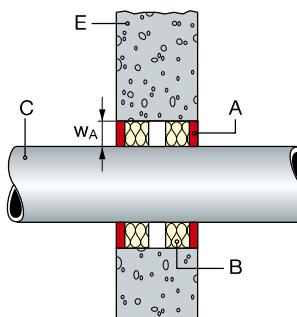
## Non-insulated metal pipe penetrations

### Rigid walls | rigid floor

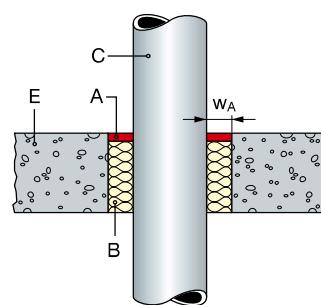
Hilti CFS-S ACR Firestop Acrylic Sealant may be used to form single penetration seals (A) (minimum distance between seals 200 mm). Stone wool with density  $\geq 45 \text{ kg/m}^3$  must be used as backfilling material (B).

- Rigid walls (E) concrete, masonry, minimum density of  $2400 \text{ kg/m}^3$ , minimum thickness 150 mm.
- Rigid floor (E) concrete minimum density of  $2400 \text{ kg/m}^3$ , minimum thickness 150 mm.

#### Non-insulated pipes, rigid walls



#### Non-insulated pipes, rigid floor



Substrate (E)	Pipe (C) diameter (mm)	Pipe wall thickness (mm)	Classification E = integrity I = insulation	Other criteria description
<b>Steel pipes</b> Also valid for cast iron, stainless steel, Ni alloys (NiCu, NrCr, NiMO alloys)				
Non-insulated	Rigid wall	32–159	1.8/4.5–14.2	E 180-C/U Annular space ( $W_A$ ) 10.5 – 35.5 mm, $\geq 50$ mm of stone wool on each side, 15 mm of sealant (A) thickness on each side
	Rigid floor	32–159	1.8/4.5–14.2	E 180-C/U Seal diameter $\leq 260$ mm, gap completely filled with stone wool, 15 mm of sealant (A) thickness on upper side

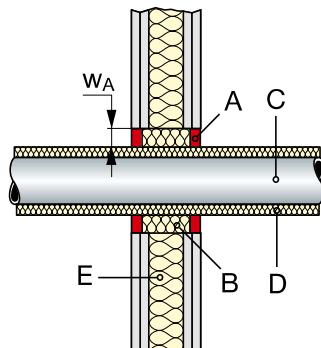
## Insulated metal pipe penetrations

### Flexible walls | rigid walls

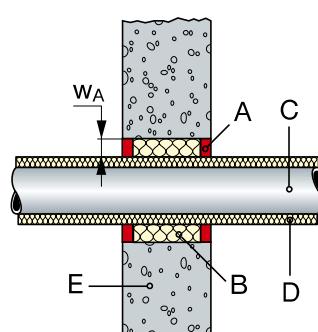
Hilti CFS-S ACR Firestop Acrylic Sealant may be used to form single penetration seals (A) up to a maximum seal diameter of 300 mm with annular space ( $w_A$ ) depending on Pipe (C) diameter (minimum distance between seals 200 mm). Openings must be completely filled with stone wool backfilling (B), and with 10 mm of sealant (A) on both sides.

- Rigid walls (E) concrete, aerated concrete or masonry, minimum density of 650 kg/m<sup>3</sup>, minimum thickness 100 mm.
- Flexible walls / drywall (E), minimum thickness 100 mm with timber or steel studs lined on both faces with a minimum of two layers of 12.5 mm thick boards. For timber stud walls there must be a minimum distance of 100 mm between the seal and any stud, and the cavity must be filled with a minimum of 100 mm insulation Class A1 or A2 insulation in accordance with EN 13501-1.

#### Insulated metal pipes, rigid walls



#### Insulated metal pipes, flexible walls



	Pipe (C) diameter (mm)	Pipe wall thickness (mm)	Insulation (D) thickness (mm)	Classification E = integrity I = insulation	Other criteria description
<b>Copper pipes</b> Also valid for steel, cast iron, stainless steel, Ni alloys (NiCu, NrCr, NiMO alloys)					
Continued	28-42	1.0/1.5-14.2	≥20	EI 120-C/U	Interrupted or sustained insulation
	42-88.9	1.5/2.0-14.2	≥40	EI 120-C/U	Interrupted
				EI 90-C/U	Sustained insulation
Local insulation	28-42	1.0/1.5-14.2	20	EI 120-C/U	Sustained insulation, length on each side ≥450 mm
			20	EI 120-C/U	Interrupted insulation, length on each side ≥500 mm
	42	1.5-14.2	20-40	EI 120-C/U	Sustained or Interrupted insulation, length on each side ≥500 mm
	42-88.9	1.5/2.0-14.2	40	EI 120-C/U	Interrupted insulation, length on each side ≥500 mm
				EI 90-C/U	Sustained insulation, length on each side ≥500 mm
	88.9	2.0-14.2	40	EI 120-C/U	Interrupted insulation, length on each side ≥700 mm

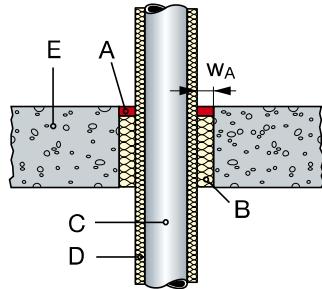
	Pipe (C) diameter (mm)	Pipe wall thickness (mm)	Insulation (D) thickness (mm)	Classification E = integrity I = insulation	Other criteria description
<b>Steel pipes</b> Also valid for cast iron, stainless steel, Ni alloys (NiCu, NrCr, NiMO alloys)					
Continued insul.  Local insulation	26.9–48.3	1.4/1.6–14.2	≥20	EI 120-C/U	Interrupted or sustained
	26.9–168.3	1.4/2.6–14.2	≥40	EI 120-C/U	Interrupted or sustained
	26.9–48.3	1.4/1.6–14.2	20	EI 120-C/U	Sustained insulation, length on each side ≥450 mm
			20	EI 120-C/U	Interrupted insulation, length on each side ≥500 mm
	48.3	1.6–14.2	20–40	EI 120-C/U	Sustained insulation, length on each side ≥500 mm
	48.3–168.3	1.6/2.6–14.2	40	EI 90-C/U	Sustained insulation, length on each side ≥450 mm
			40	EI 120-C/U	Sustained insulation, length on each side ≥700 mm
			40	EI 90-C/U	Interrupted insulation, length on each side ≥700 mm
	168.3	2.6–4.5	40	EI 90-C/U	Interrupted insulation, length on each side ≥500 mm
	168.3	4.5–14.2	40	EI 120-C/U	Interrupted insulation, length on each side ≥500 mm
	168.3	2.6–14.2	40	EI 120-C/U	Interrupted insulation, length on each side ≥700 mm

## Insulated metal pipe penetrations

### Floor

Hilti CFS-S ACR Firestop Acrylic Sealant may be used to form single penetration seals (A) in rigid floors (E). Gap must be filled completely with stone wool backfilling (B) of density  $\geq 45 \text{ kg/m}^3$ , and covered on the upper side with 10 mm of sealant (A).

### Insulated metal pipes, floor



- Floor (E): Concrete or aerated concrete, minimum density of  $550 \text{ kg/m}^3$ , minimum thickness 150 mm.

	Pipe (C) diameter (mm)	Pipe wall thickness (mm)	Insulation (D) thickness (mm)	Classification E = integrity I = insulation	Other criteria description
<b>Copper pipes</b> Also valid for steel, cast iron, stainless steel, Ni alloys (NiCu, NrCr, NiMO alloys)					
Continued insulation	28-42	1.0/1.5-14.2	$\geq 20$	EI 120-C/U	Seal diameter $\leq 300 \text{ mm}$ , interrupted insulation
	42	1.5-14.2	$\geq 20$	EI 120-C/U	Seal diameter $\leq 300 \text{ mm}$ , sustained insulation
Local insulation	42-88.9	1.5/2.0-14.2	$\geq 40$	EI 120-C/U	Seal diameter $\leq 300 \text{ mm}$ , interrupted insulation
			20-40	EI 120-C/U	Seal diameter $\leq 300 \text{ mm}$ , interrupted insulation, length on each side $\geq 600 \text{ mm}$
			40	EI 120-C/U	Seal diameter $\leq 300 \text{ mm}$ , interrupted insulation, length on each side $\geq 500 \text{ mm}$
Local insulation	42	1.5-14.2	20	EI 120-C/U	Seal diameter $\leq 300 \text{ mm}$ , sustained insulation, length on each side $\geq 450 \text{ mm}$
			20-40	EI 120-C/U	Seal diameter $\leq 300 \text{ mm}$ , sustained insulation, length on each side $\geq 700 \text{ mm}$
			20-40	EI 120-C/U	Seal diameter $\leq 300 \text{ mm}$ , interrupted insulation, length on each side $\geq 500 \text{ mm}$
Local insulation	42-88.9	1.5/2.0-14.2	40	EI 120-C/U	Seal diameter $\leq 300 \text{ mm}$ , sustained insulation, length on each side $\geq 700 \text{ mm}$
	88.9	2.0-14.2	40	EI 90-C/U	Seal diameter $\leq 300 \text{ mm}$ , sustained insulation, length on each side $\geq 500 \text{ mm}$
Local insulation	88.9	2.0-14.2	40	EI 180-C/U	Annular space ( $w_A$ ) 13-48 mm, sustained insulation, length on each side $\geq 700 \text{ mm}$

	Pipe (C) diameter (mm)	Pipe wall thickness (mm)	Insulation (D) thickness (mm)	Classification E = integrity I = insulation	Other criteria description
<b>Steel pipes</b> Also valid for cast iron, stainless steel, Ni alloys (NiCu, NrCr, NiMO alloys)					
Continued insul.	26.9–48.3	1.4/1.6–14.2	≥20	EI 180-C/U	Annular space ( $w_A$ ) 13–48 mm, sustained or interrupted insulation.
	26.9–168.3	1.4/2.6–14.2	≥40	EI 120-C/U	Seal diameter ≤300 mm, sustained or interrupted insulation.
Local insulation	26.9–48.3	1.4/1.6–14.2	20	EI 180-C/U	Annular space ( $w_A$ ) 13–48 mm, sustained insulation, length on each side ≥450 mm
			20	EI 180-C/U	Annular space ( $w_A$ ) 13–48 mm, interrupted insulation, length on each side ≥450 mm
	168.3	2.6–4.5	40	EI 90-C/U	Seal diameter ≤300 mm, sustained insulation, length on each side ≥500 mm
	168.3	2.6–4.5	40	EI 120-C/U	Seal diameter ≤300 mm, sustained insulation, length on each side ≥700 mm
	168.3	2.6–4.5	40	EI 120-C/U	Seal diameter ≤300 mm, interrupted insulation, length on each side ≥500 mm

- Floor (E): Concrete, minimum density of 2400 kg/m<sup>3</sup>, minimum thickness 150 mm.

Pipe (C) diameter (mm)	Pipe wall thickness (mm)	Insulation (D) thickness (mm)	Classification E = integrity I = insulation	Other criteria description
<b>Copper pipes</b> Also valid for steel, cast iron, stainless steel, Ni alloys (NiCu, NrCr, NiMO alloys)				
Continued insulation	28	1.0-14.2	≥20	EI 180-C/U Seal diameter ≤ 260 mm, sustained insulation
	28-42	1.0/1.5-14.2	≥20	EI 120-C/U Seal diameter ≤ 300 mm, sustained or interrupted insulation
	42-88.9	1.5/2.0-14.2	≥40	EI 120-C/U Seal diameter ≤ 300 mm, interrupted insulation
				EI 90-C/U Seal diameter ≤ 300 mm, sustained insulation
	88.9	2.0-14.2	≥40	EI 180-C/U Seal diameter ≤ 260 mm, interrupted insulation
	28	1.0-14.2	20	EI 180-C/U Seal diameter ≤ 260 mm, sustained insulation, length on each side ≥425 mm
	28-42	1.0/1.5-14.2	20	EI 120-C/U Seal diameter ≤ 300 mm, sustained insulation, length on each side ≥450 mm
			20-40	EI 120-C/U Seal diameter ≤ 300 mm, interrupted insulation, length on each side ≥500 mm, or Sustained insulation, length on each side ≥700 mm
	42 mm	1.5-14.2	20-40	EI 120-C/U Seal diameter ≤ 300 mm, sustained insulation, length on each side ≥700 mm
	42-88.9	1.5/2.0-14.2	40	EI 120-C/U Seal diameter ≤ 300 mm, sustained insulation, length on each side ≥700 mm
			40	EI 120-C/U Seal diameter ≤ 300 mm, interrupted insulation, length on each side ≥500 mm
			40	EI 90-C/U Seal diameter ≤ 300 mm, sustained insulation, length on each side ≥500 mm
	88.9	2.0-14.2	40	EI 180-C/U Seal diameter ≤ 260 mm, sustained insulation, length on each side ≥700 mm
			40	EI 180-C/U Seal diameter ≤ 260 mm, interrupted insulation, length on each side ≥500 mm

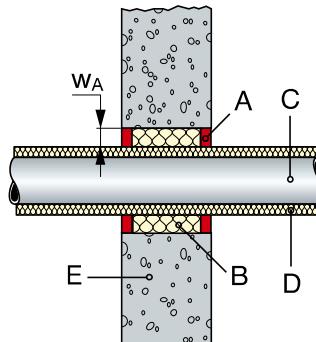
## Insulated composite pipe penetrations

### Flexible walls | rigid walls | rigid floor

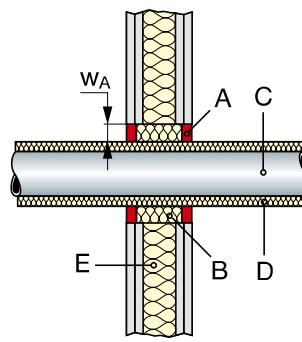
Hilti CFS-S ACR Firestop Acrylic Sealant may be used to form single penetration seals (A) up to a maximum seal diameter of 300 mm with annular space ( $w_A$ ) depending on Pipe (C) diameter (minimum distance between seals 200 mm). Openings must be completely filled with stone wool backfilling (B) with density  $\geq 45 \text{ kg/m}^3$ . Wall openings must be covered with 10 mm of sealant (A) on both sides, whereas floor openings require 15 mm of sealant (A) on upper side only.

- Rigid walls (E) concrete, aerated concrete or masonry, minimum density of  $650 \text{ kg/m}^3$ , minimum thickness 100 mm.
- Flexible walls / drywall (E), minimum thickness 100 mm with timber or steel studs lined on both faces with a minimum of two layers of 12.5 mm thick boards. For timber stud walls there must be a minimum distance of 100 mm between the seal and any stud, and the cavity must be filled with a minimum of 100 mm insulation Class A1 or A2 insulation in accordance with EN 13501-1.
- Floor (E): Concrete or aerated concrete, minimum density of  $550 \text{ kg/m}^3$ , minimum thickness 150 mm.

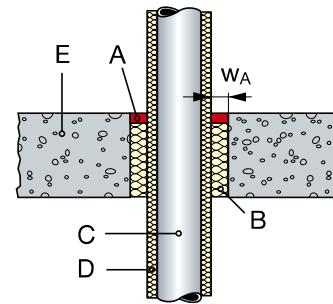
#### Insulated composite pipes, rigid walls



#### Insulated composite pipes, flexible walls



#### Insulated composite pipes, floor



Wall/Floor (E)	Pipe (C) diameter (mm)	Pipe wall thickness (mm)	Insulation (D) thickness (mm)	Classification E = integrity I = insulation	Other criteria description
<b>Geberit Mepla pipes</b> produced by Geberit Int., Jona, CH					
Continued insulation	Flexible/Rigid wall	16	2.25	$\geq 20$	EI 120-U/C
		20	2.50		
		26	3.00		
		32	3.50		
Local insulation	Rigid floor	16	2.25	$\geq 20$	EI 90-U/C
		20	2.50		
		26	3.00		
		32	3.50		
	Flexible/Rigid wall	16	2.25	20	EI 120-U/C
		20	2.50		
		26	3.00		
		32	3.50		
	Rigid floor	16	2.25	20	EI 90-U/C
		20	2.50		
		26	3.00		
		32	3.50		

## Form-work pipe penetrations

### Rigid walls

Hilti CFS-S ACR Firestop Acrylic Sealant may be used on both sides of the opening of the formwork tie system and/or distance pipe through rigid walls (E) concrete, aerated concrete or masonry, with a minimum density of 550 kg/m<sup>3</sup>, minimum thickness 200 mm.

Completely fill the gap with stone wool backfilling (B), density  $\geq 45$  kg/m<sup>3</sup> and covered with 15 mm of sealant on both sides.

#### Manufacturer:

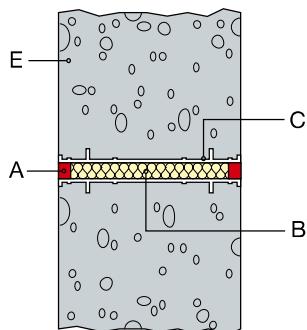
Nevoga Gmbh

#### Manufacturer:

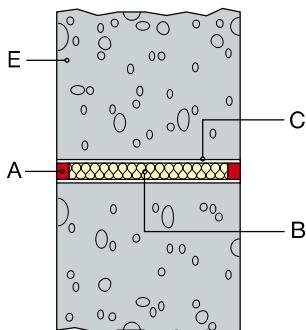
Nevoga Gmbh



**OKTAGON**  
formwork tie rod



Formwork distance  
pipe

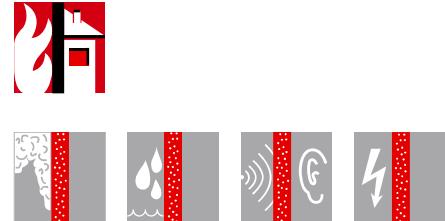


Pipe type	Pipe (C) inner diameter (mm)	Pipe wall thick-ness (mm)	Classification E = integrity I = insulation	Other criteria description
<b>OKTAGON</b> Produced by Nevoga Gmbh, Germany	22	-	EI 120	-
<b>Formwork distance pipe</b> Produced by Nevoga Gmbh, Germany	26	6	EI 120	

## Characteristics of CFS-S ACR

### Additional Attributes

Hilti firestop products are comprehensively tested and individually matched to the technical requirements of a building's mechanical and electric installations. In addition to their superior passive fire protection behaviour, Hilti firestop products also meet increasingly significant requirements in building technology and also help designers and installers to meet these additional requirements. The assessment of fitness for use has been made in accordance with EOTA ETAG N° 026 – Part 2 and Part 3.



Characteristics	Assessment of characteristics	Norm, standard, test
<b>Health and the environment</b> Air/gas permeability	q/A [ $\text{m}^3/(\text{h} \times \text{m}^2)$ ] at $\Delta p50$ Pa: Air: $1.9 \times 10^{-6}$ Nitrogen ( $\text{N}_2$ ): $1.1 \times 10^{-6}$ $\text{CO}_2$ : $6.4 \times 10^{-5}$ Methane ( $\text{CH}_4$ ): $4.3 \times 10^{-5}$ q/A [ $\text{m}^3/(\text{h} \times \text{m}^2)$ ] at $\Delta p250$ Pa: Air: $9.7 \times 10^{-6}$ Nitrogen ( $\text{N}_2$ ): $5.5 \times 10^{-6}$ $\text{CO}_2$ : $3.2 \times 10^{-4}$ Methane ( $\text{CH}_4$ ): $2.1 \times 10^{-4}$ (10mm thickness of CFS-S ACR)	EN 1026
Water permeability	Water tight to 1m head of water or 9806 Pa	ETAG 026-2
Dangerous substances	CFS-ACR is in compliance concerning the registration, evaluation, authorization and restriction of chemicals (REACH) Toxic, carcinogenic, toxic for reproduction and mutagenic chemical substances of category 1 and 2 $\geq 0.1\%$ are not used.	Material safety datasheet
<b>Protection against noise</b> (Air borne sound insulation)	Flexible wall $R_w = 53$ dB $D_{n,w} = 60$ dB  Rigid wall $R_w = 51$ dB $D_{n,w} = 58$ dB	EN ISO 140-3 EN ISO 20140-10 EN ISO 717-1
<b>Durability and serviceability</b>	Category $Y_{2, (-5/+70)^\circ\text{C}}$ (suitable for intended use at temperatures between $-5^\circ\text{C}$ and $+70^\circ\text{C}$ ) no exposure to rain or UV	ETAG 026-2 and 3
<b>Movement capability (linear joints)</b>	Class ISO 11600-F-12.5P	ISO 11600
<b>Electrical properties</b>	Volume resistivity $11.3 \times 10^{11} \pm 3.6 \times 10^{11}$ Ohm Surface resistivity $8.5 \times 10^6 \pm 2.4 \times 10^6$ Ohm	DIN IEC 60093 (VDE 0303 Part 30)
<b>Reaction to fire</b>	Class D-s1 d0	EN 13501-1

## 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 judgements
- 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.**

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