ES

DECLARACIÓN DE PRESTACIONES

Según el Anexo III de la Norma Europea n.º 305/2011 (Reglamento Europeo de Productos de Construcción)

Sellador cortafuego Hilti CFS-IS

N.° Hilti CFS-IS "0761-CPD-0173"

1. Código de identificación único del tipo de producto:
Sellador cortafuego Hilti CFS-IS

2. Usos previstos:
Producto intumescente y de sellado para sellados de atravesamientos, véase la ETA-10/0406 (28-06-2018)

Atraesamientos para cables, tuberías y mixtos	Tuberías metálicas aisladas y sin aislamiento Tuberías compuestas aisladas	**El campo de aplicación debe ajustarse al contenido de la ETA-10/0406 correspondiente**

3. Fabricante:
HILTI Corporation, Feldkircherstrasse 100, 9494 Schaan, Principado de Liechtenstein

4. Sistemas de evaluación y verificación de la constancia de las prestaciones (EVCP):
Sistema 1

5. Documento de evaluación europeo:
EAD 350454-00-1104 "Productos intumescente y de sellado para atravesamientos"
Evaluación técnica europea:
ETA-10/0406 (28-06-2018)
Organismo de Evaluación Técnica:
OIB Austrian Institute of Construction Engineering (Instituto Austriaco de Ingeniería Civil)
Organismos notificados:
MPA Braunschweig, N.° 0761

6. Prestaciones declaradas:

Características básicas	Prestaciones declaradas/especificación técnica armonizada
Reacción en caso de incendio	Clase E conforme a EN 13501-1
Resistencia en caso de incendio	Prestaciones de resistencia al fuego y campo de aplicación de conformidad con la norma EN 13501-2. Consulte el Anexo
Permeabilidad al aire	Probada según el documento EAD 350454-00-1104. Consulte el Anexo
Protección acústica	Consulte el Anexo
Durabilidad y operatividad	Y_2, conforme al documento EAD 350454-00-1104. Consulte el Anexo

Las prestaciones del producto identificado anteriormente son conformes con el conjunto de prestaciones declaradas. La presente declaración de prestaciones se emite, de conformidad con el Reglamento (UE) n.º 305/2011, bajo la responsabilidad del fabricante arriba identificado.

Firmado en nombre del fabricante por:

Jessica Bello Salguero
Jefe de producto
Unidad empresarial de Protección contra incendios
Hilti Corporation

Martin Althof
Presidente de Calidad
Unidad empresarial de Protección contra incendios
Hilti Corporation

Schaan, 2018-07-30

Intended use

"Hilti Firestop Intumescent Sealant CFS-IS" is intended to be used as a mixed penetration seal to temporarily or permanently reinstate the fire resistance performance of flexible wall constructions, rigid wall constructions or rigid floor constructions where they have been provided with apertures which are penetrated by various cables, conduits, metal pipes and / or plastic pipes. For more details see Annex C of the ETA.

The maximum opening size of the penetration seal is w x h = 150 mm x 150 mm or circular openings of an equivalent maximum area in walls and floors.

"Hilti Firestop Intumescent Sealant CFS-IS" can be installed only in the types of separating elements as specified in the following table.

Separating element	Construction
Flexible walls	> Steel studs or timber studs lined on both faces with minimum 2 layers of boards (minimum thickness 12,5 mm) according to EN 520 type F > For steel stud walls the space between lining must not be completely filled with insulation material, especially in the adjacent area of the penetration seal > For timber studs walls there must be a minimum distance of 100 mm of the penetration seal to any timber stud. The cavity between the penetration seal and stud has to be closed with minimum of 100 mm of insulation with classification A1 or A2 according to EN 13501-1 > Minimum thickness 100 mm
Rigid walls	> Aerated concrete, concrete, masonry > Minimum density 550 kg/m³ > Minimum thickness 100 mm > The rigid wall shall be classified in accordance with EN 13501-2 for the required fire resistance period
Rigid floors	> Aerated concrete, concrete > Minimum density 650 kg/m³ > Minimum thickness 150 mm > The rigid floor shall be classified in accordance with EN 13501-2 for the required fire resistance period

The first support of the cables / conduits shall be located at maximum 250 mm away from both faces of wall constructions and maximum 250 mm from the upper face of floor constructions.

Other parts or service support constructions shall not penetrate the penetration seal. This European Technical Assessment does not cover sandwich panel constructions.

Air permeability

The air permeability of "Hilti Firestop Intumescent Sealant CFS-IS" with a thickness of 50 mm and a Ø 94 mm was tested as blank penetration seal according to EAD 350454-00-1104 clause 2.2.3 under application of the test principles of EN 1026. Any other components were not included in these tests.

Pressure [Pa]	50	250
q/A air [$m^3/(h \cdot m^2)$]	impermeable	impermeable

Protection against noise (BWR 5)

Airborne sound insulation

The airborne sound insulation of "Hilti Firestop Intumescent Sealant CFS-IS" was tested according to EN ISO 10140-1 and EN ISO 10140-2. The rating of the sound insulation properties has been calculated in accordance with EN ISO 717-1.

The acoustic testing was performed in a joint configuration, 1200 mm long, 25 mm wide and 100 mm deep. The joint was backfilled with mineral wool and closed on both sides with Intumescent "Hilti Firestop Intumescent Sealant CFS-IS" to a thickness of 25 mm. The joint was constructed in accordance with EN 10140-1:2016, Annex J. "Hilti Firestop Intumescent Sealant CFS-IS" was tested as a blank seal without services.

The reached values for the airborne sound insulation in accordance with EN ISO 717-1:2013 are as follows:

Component	R (C; Ctr)
Hilti Firestop Intumescent Sealant CFS-IS	64 (-2; -5)

Abbreviations used in drawings

Abbreviation	Description
A	Hilti Firestop Intumescent Sealant CFS-IS
B	Backfilling material
E	Building element (wall, floor)
h	Height/length of penetration seal
L_A	Length of additional "Hilti Firestop Intumescent Sealant CFS-IS" in front of the wall/floor
s_1, s_2	Distances
t_A, t_{1A}	Thickness (depth) of penetration seal
t_{2A}	Thickness of additional "Hilti Firestop Intumescent Sealant CFS-IS" in front of the wall/floor
t_B	Thickness (depth) of backfilling material
t_E	Thickness of the building element
w	Width of penetration seal

RESISTANCE TO FIRE CLASSIFICATION OF PENETRATION SEALS MADE OF "HILTI FIRESTOP INTUMESCENT SEALANT CFS-IS"

C.1 General Information

C.1.1 Wall/floor constructions

a) Flexible wall:

The wall must have a minimum thickness of 100 mm and comprise timber or steel studs lined on both faces with minimum 2 layers of 12.5 mm thick boards according to EN 520 type F.

For timber stud walls there must be a minimum distance of 100 mm of the seal to any stud and the cavity between stud and seal must be closed and a minimum of 50 mm insulation of Class A1 or A2 (in accordance with EN 13501-1) in the cavity between stud and seal is necessary.

b) Rigid wall:

The wall must have a minimum thickness of 110 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 550 kg/m³.

c) Rigid floor:

The floor must have a minimum thickness of 150 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m³.

The first support of the cables / conduits shall be located at maximum 250 mm away from both faces of wall constructions and maximum 250 mm from the upper face of floor constructions.

The 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. This ETA does not cover use of the product as a penetration seal in sandwich panel constructions.

C.2 Flexible walls according to Annex C.1.1 of the ETA

Penetration seal:

Hilti Firestop Intumescent Sealant CFS-IS (A) on both sides, thickness (t_A) 25 mm, mineral wool (B) tightly compressed as backfilling material, thickness (t_B) ≥ 50 mm (gap filled completely).

For suitable products for mineral wool backfilling material see Annex B of the ETA.

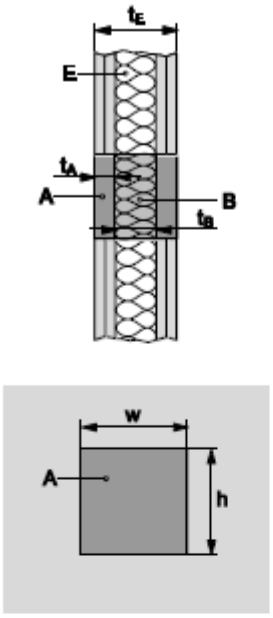
Maximum seal size: 150 x 150 mm or circular openings of equivalent area.

Minimum distances (mm):

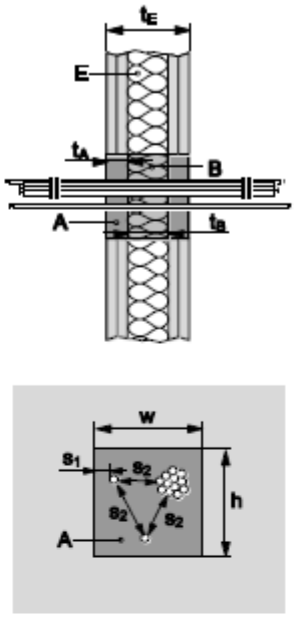
Cables to edge of seal	s_1 =	0
Cable to other cables/services	s_2 =	0
Tied cable bundle to seal edge	s_1 =	10
Tied cable bundle to other services	s_2 =	0
Small conduits/tubes to edge of seal	s_1 =	10
Small conduits/tubes to other services	s_2 =	0
Conduits 16 ≤ Ø ≤ 32 mm to edge of seal	s_1 =	10
Conduits 16 ≤ Ø ≤ 32 mm to other services	s_2 =	10

Construction details:

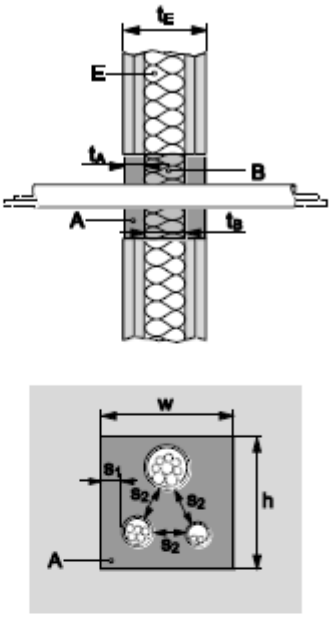
Blank seal:



Cables:



Conduits:



For abbreviations see the related text and Annex A of the ETA.

C.2.1 Blank seal (no services) *

	Classification
*) If cables are added later only cables with a diameter < 21 mm, small conduits/tubes according to and conduits according to Annex C.2.3 of the ETA may be added if the required classification is EI 120. If the seal is used in a wall with a requirement of EI 90 tied cable bundles as described in Annex C.2.2 of the ETA may be added later. If the seal is used in a wall with a requirement of EI 60 or EI 30 all types of cables listed in Annex C.2.2 of the ETA may be added later.	EI 120 *)

C.2.2 Cables

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

All sheathed cables:	Classification
Maximum Ø 21 mm	EI 120
21 ≤ Ø ≤ 80 mm	EI 60
Tied cable bundle[3], maximum diameter of 100 mm, maximum diameter of single cable 21 mm	EI 90

3 Several cables running in the same direction and bound closely together by mechanical means

C.2.3 Conduits	Classification
Small steel conduits and tubes, diameter ≤ 16 mm, arranged linear, with or without cables	EI 120-C/U
Small plastic conduits and tubes, diameter ≤ 16 mm, arranged linear, with or without cables	EI 120-U/C
Plastic conduits, diameter 16 ≤ Ø ≤ 32 mm, wall thickness 1 – 3 mm, arranged linear or in a cluster, with or without cables	EI 120-U/C

C.2.4 Single conduit and pipe penetrations

The width of the annular sealant is between 5 and 25 mm

– PVC pipes (EN 1451-1), not insulated	Classification
diameter ≥ 16 to 20 mm, wall thickness 1,8 to 2,2 mm	EI 120 U/U
diameter 32 mm, wall thickness 1,8 to 3,6 mm	EI 60 U/U E 120 U/U
diameter ≥ 32 to 40 mm, wall thickness 1,9 to 3,6 mm	EI 90 U/U
diameter ≥ 40 to 50 mm, wall thickness 1,8 to 3,7 mm	EI 90 U/C E120 U/C

– Geberit Mepla, Aluminium composite pipes PE-XD/Al/PE-HD, not or local insulated with Armaflex AF pipe insulation	Classification
diameter ≥ 16 to 50 mm, wall thickness 2,25 to 4,0 mm	EI 60 U/C E 120 U/C
diameter ≥ 16 to 50 mm, wall thickness 2,25 to 4,0 mm; insulation Armaflex AF1 to AF4, thickness 8 - 21 mm, length 250 mm	EI 90 U/C

– Geberit Silent, PP pipes PP-C/PP-MD/PP-C, not insulated	Classification
diameter ≥32 to 40 mm, wall thickness 2,0 mm	EI 90 U/U
diameter 50 mm, wall thickness 2,0 mm	EI 90 U/C E120 U/C

– Kekelit Kelox, Aluminium composite pipes PE-XB/Al/PE-XB, not or local insulated with Armaflex AF pipe insulation	Classification
diameter ≥16 to 50 mm, wall thickness 2,0 to 4,0 mm	EI 90 U/C E120 U/C
diameter ≥16 to 50 mm, wall thickness 2,0 to 4,0 mm; insulation Armaflex AF1 to AF4, thickness 8 - 21 mm, length 250 mm	EI 120 U/C

– LK Schweden, Aluminium composite pipes PE-RT/Al/PE-RT, not or local insulated with Armaflex AF pipe insulation	Classification
diameter ≥16 to 40 mm, wall thickness 2,0 to 3,5 mm	EI 60 U/C E90 U/C
diameter ≥16 to 40 mm, wall thickness 2,0 to 3,5 mm; insulation Armaflex AF1 to AF4, thickness 8 - 21 mm, length 250 mm	EI 90 U/C

– LK Schweden, PEXa pipes, not insulated	Classification
diameter ≥16 to 32 mm, wall thickness 2,2 to 4,0 mm	EI 90 U/C

– LK Schweden, Aluminium composite pipes PE-RT/Al/PE-RT, inside PVC corrugated pipe	Classification
diameter ≥16 to 32 mm, wall thickness 2,0 to 4,0 mm; PVC pipe diameter 25 to 44 mm, thickness 1,0 mm	EI 90 U/C E120 U/C

– LK Schweden, PEXa pipes, inside PVC corrugated pipe	Classification
diameter ≥16 to 25 mm, wall thickness 2,2 to 3,5 mm; PVC pipe diameter 25 to 34 mm, thickness 1,0 mm	EI120 U/C
diameter ≥16 to 40 mm, wall thickness 2,0 to 3,5 mm; insulation Armaflex AF1 to AF4, thickness 8 - 21 mm, length 250 mm	EI 90 U/C

– PP Life Master 3, PP pipes PP-CO/PP-MV/PP-CO (EN 1451-1), not insulated	Classification
diameter ≥32 to 40 mm, wall thickness 1,8 mm	EI 120 U/U
diameter 50 mm, wall thickness 1,8 mm	EI 90 U/C

– Uponor Uni Pipe Plus, Aluminium composite pipes PE-RT/Al/PE-RT, not or local insulated with Armaflex AF pipe insulation	Classification
diameter ≥16 to 32 mm, wall thickness 2,0 to 3,5 mm	EI 60 U/C E120 U/C
diameter ≥16 to 32 mm, wall thickness 2,0 to 3,5 mm; insulation Armaflex AF1 to AF4, thickness 8 – 19,5 mm, length 250 mm	EI 90 U/C E120 U/C

C.2.5 Single conduit and pipe penetrations.

The width of the annular sealant is between 5 and 25 mm. The thickness of the wall is minimum 110 mm. Flexible wall as described in Annex C.1.1 of the ETA.

– Copper pipes, locally insulated with Rockwool RS 800	Classification
Copper pipes, diameter ≥10 to 42 mm, wall thickness 1,0/1,2 to 14,2 mm, with Rockwool RS 800 pipe insulation, thickness 20 mm, length ≥700 mm	EI 120 C/U
Copper pipes, diameter ≥42 to 89 mm, wall thickness 1,0/2,0 to 14,2 mm, with Rockwool RS 800 pipe insulation, thickness 40 mm, length ≥925 mm	EI120 C/U

– Copper pipes, continuously insulated with Armaflex AF Insulation	Classification
Copper pipes, diameter ≥10 to 42 mm, wall thickness 1,0/1,2 to 14,2 mm, with continuous Armaflex AF1 – AF4 pipe insulation, thickness 7,5 to 20,5 mm	EI 120 C/U
Copper pipes, diameter ≥42 to 89 mm, wall thickness 1,0/2,0 to 14,2 mm, with continuous Armaflex AF2 – AF4 pipe insulation, thickness 14,5 to 22,5 mm	EI60 C/U E120 C/U

– Rigid, flexible and pliable plastic conduits	Classification
Rigid, flexible and pliable plastic conduit up to Ø 40 mm with or without cables and conduit bundles up to Ø 80 mm; Flexible PVC conduit – Dietzel VRM- Turbo 7 class: 2221 – with or without cables; Flexible PO conduit – Pipe Life FB-E-LF / class: 22322 – with or without cables	EI120 U/U
Rigid, flexible and pliable plastic conduit up to Ø 40 mm with or without cables and conduit bundles up to Ø 80 mm	EI120 U/U

C.3 Rigid wall constructions according to Annex C.1.1 of the ETA

Penetration seal:

Seal type 1: Hilti Firestop Intumescent Sealant CFS-IS (A) on both sides, thickness (t_A, t_{1A}) 25 mm, mineral wool (B) tightly compressed as backfilling material, thickness (t_B) ≥ 100 mm (gap filled completely).

Seal type 2: additional Hilti Firestop Intumescent Sealant CFS-IS (t_{2A} ≥ 10 mm, L_A ≥ 50 mm) on both sides.

Seal type 3: additional Hilti Firestop Intumescent Sealant CFS-IS (t_{2A} ≥ 10 mm, L_A ≥ 100 mm) on both sides.

For suitable products for mineral wool backfilling material see Annex B of the ETA.

Maximum seal size: 150 x 150 mm or circular openings of equivalent area.

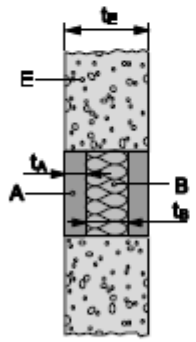
Minimum distances (mm):

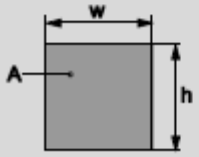
Cables to edge of seal	s_1 =	0
Cable to other cables/services	s_2 =	0
Tied cable bundle to seal edge	s_1 =	10
Tied cable bundle to other services	s_2 =	0
Small conduits/tubes to edge of seal	s_1 =	10
Small conduits/tubes to other services	s_2 =	0
Conduits 16 ≤ Ø ≤ 32 mm to edge of seal	s_1 =	10
Conduits 16 ≤ Ø ≤ 32 mm to other services	s_2 =	10

Construction details:

Blank seal

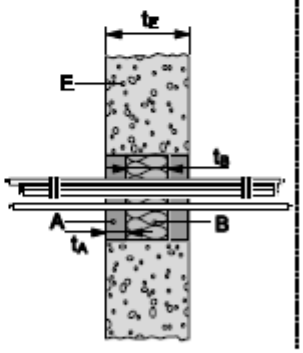
Seal type 1

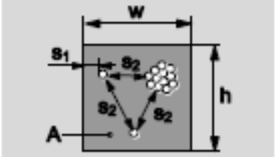




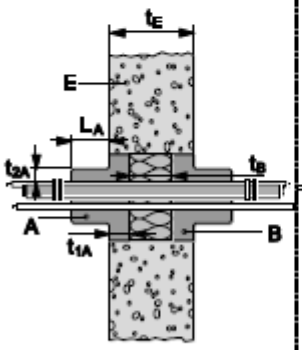
Cables and conduits ≤ 16 mm

Seal type 1



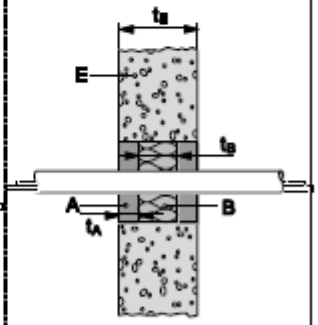


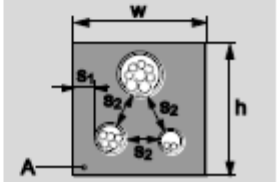
Seal type 2 (L_A ≥ 50 mm)
Seal type 3 (L_A ≥ 100 mm)



Conduits 16 ≤ Ø ≤ 32 mm

Seal type 1





For abbreviations see the related text and Annex A of the ETA.

C.3.1 Blank seal (no services) *	
*) If cables are added later only cables with a diameter < 21 mm, tied cable bundles according to Annex C.3.2 and C.3.3 of the ETA, and conduits/tubes according to Annex C.3.4 and C3.5 of the ETA may be added if the required classification is EI 120. If the penetration seal is used in a wall with a requirement of EI 60 or EI 30 all types of cables according to Annex C.3.2 of the ETA may be added later on. If Hilti Firestop Intumescent Sealant CFS-IS is additionally used with $L_A \geq 50$ mm / $t_{2A} \geq 10$ mm (seal type 2) all cables according to Annex C.3.2 of the ETA may be added for a requirement of EI 90. If Hilti Firestop Intumescent Sealant CFS-IS is additionally used with $L_A \geq 100$ mm / $t_{2A} \geq 10$ mm (seal type 3) all cables according to Annex C.3.2 of the ETA may be added for a requirement of EI 120.	**Classification** EI 120 *)

C.3.2 Cables			
	Classification		
	Seal type 1	Seal type 2	Seal type 3
All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables) with a diameter of:			
Maximum Ø 21 mm	EI 120	EI 120	EI 120
21 ≤ Ø ≤ 80 mm	EI 60 E120	EI 120	EI 120
Tied cable bundle[4], maximum diameter of 100 mm, maximum diameter of single cable 21 mm	EI 90 E120	EI 120	EI 120

C.3.3 Single cable penetration The opening has maximum dimensions Ø100 mm. The wall must comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m3			
All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables) with a diameter of maximum Ø 13,8 mm	EI180	---	---
with a diameter of maximum Ø 58 mm	EI 90 E180	---	---

C.3.4 Conduits			
Small steel conduits and tubes, diameter ≤ 16 mm, arranged linear, with or without cables	EI 120-C/U	EI 120-C/U	EI 120-C/U
Small plastic conduits and tubes, diameter ≤ 16 mm, arranged linear, with or without cables	EI 120-U/C	EI 120-U/C	EI 120-U/C
Plastic conduits, diameter 16 ≤ Ø ≤ 32 mm, wall thickness 1 – 3 mm, arranged linear or in a cluster, with or without cables	EI 120-U/C	EI 120-U/C	EI 120-U/C

C.3.5 Single pipe penetration The opening has maximum dimensions Ø100 mm. The wall must comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m³			
PVC pipes (EN 1451-1), not insulated Ø ≥32 to 50 mm, wall thickness 2,1/2,2 to 6,4 mm	EI180 U/U	---	---

C.4 Rigid floor constructions according to Annex C.1.1 of the ETA

Penetration seal:

Seal type 4: Hilti Firestop Intumescent Sealant CFS-IS (A) on top side, thickness (t_A) 25 mm, mineral wool (B) tightly compressed as backfilling material, thickness (t_B) ≥ 125 mm

Seal type 5: additional Hilti Firestop Intumescent Sealant CFS-IS (t_{2A} ≥ 10 mm, L_A ≥ 50 mm) on top only

Seal type 6: additional Hilti Firestop Intumescent Sealant CFS-IS (t_{2A} ≥ 10 mm, L_A ≥ 100 mm) on top only

Seal type 7: additional Hilti Firestop Intumescent Sealant CFS-IS (t_{2A} ≥ 10 mm, L_A ≥ 50 mm) on both sides.

Seal type 8: additional Hilti Firestop Intumescent Sealant CFS-IS (t_{2A} ≥ 10 mm, L_A ≥ 100 mm) on both sides.

For suitable products for mineral wool backfilling material see Annex B of the ETA.

Maximum seal size: 150 x 150 mm or circular openings of equivalent area.

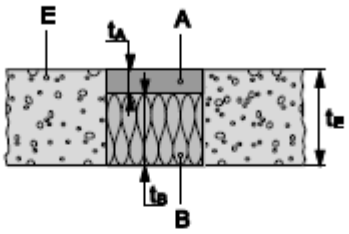
Minimum distances (mm):

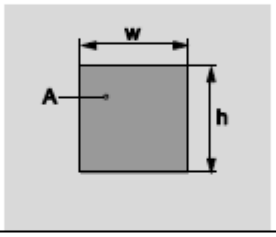
Cables to edge of seal	s_1 = 0
Cable to other cables/services	s_2 = 0
Tied cable bundle to seal edge	s_1 = 10
Tied cable bundle to other services	s_2 = 0
Small conduits/tubes to edge of seal	s_1 = 20
Small conduits/tubes to other services	s_2 = 0
Conduits 16 ≤ Ø ≤ 32 mm to edge of seal	s_1 = 10
Conduits 16 ≤ Ø ≤ 32 mm to other services	s_2 = 10

Construction details:

Blank seal

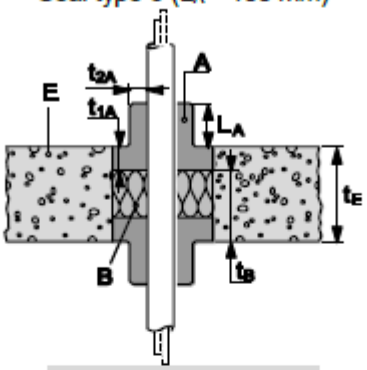
Seal type 4

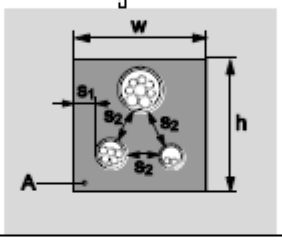




Conduits 16 ≤ Ø ≤ 32 mm

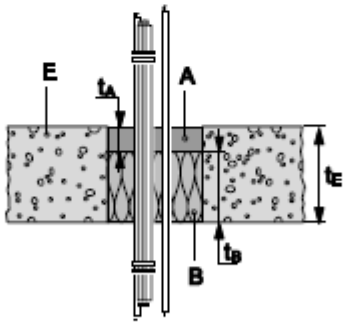
Seal type 7 ($L_A \geq 50$ mm)
Seal type 8 ($L_A \geq 100$ mm)



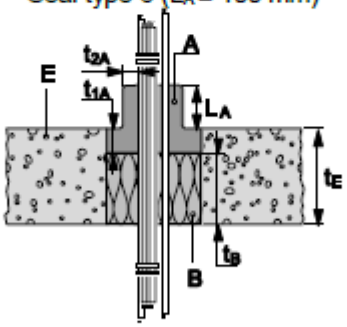


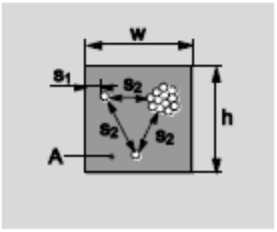
Cables and conduits ≤ 16 mm

Seal type 4



Seal type 5 ($L_A \geq 50$ mm)
Seal type 6 ($L_A \geq 100$ mm)





For abbreviations see the related text and Annex A of the ETA.

C.4.1 Blank seal	
*) If cables are added later only cables with a diameter < 21 mm may be added if the required classification is EI 120. If the seal is used in a floor with a requirement of EI 90 or less all types of cables according to Annex C.4.2, and C.4.3 of the ETA and tied cable bundles according to Annex C.4.2 of the ETA and small conduits/tubes according to Annex C.4.4 and C.4.5 of the ETA may be added later on. If Hilti Firestop Intumescent Sealant CFS-IS is additionally used with $L_A \geq 50$ mm / $t_{2A} \geq 10$ mm on top and bottom (seal type 7), conduits according to Annex C.4.4 of the ETA may be added for a requirement of EI 120. If Hilti Firestop Intumescent Sealant CFS-IS is additionally used with $L_A \geq 100$ mm / $t_{2A} \geq 10$ mm on top only (seal type 6), all cables according to Annex C.4.2 of the ETA may be added for a requirement of EI 120.	Classification EI 120 *)

C.4.2 Cables			
	Classification		
	Seal type 4	Seal type 5	Seal type 6
All sheathed cable types currently and commonly used in building practice in Europe (e.g. power, control, signal, telecommunication, data, optical fibre cables) with a diameter of:			
Maximum Ø 21 mm	EI 120	EI 120	EI 120
21 ≤ Ø ≤ 80 mm	EI 90 E120	EI 90 E120	EI 120
Tied cable bundle[5], maximum diameter of 100 mm, maximum diameter of single cable 21 mm	EI 90 E120	EI 120	EI 120

C.4.3 Conduits	Classification		
	Seal type 4	Seal type 5	Seal type 6
			
Small steel conduits and tubes, diameter ≤ 16 mm, arranged linear, with or without cables	EI 90-C/U	EI 120-C/U	EI 120-C/U
Small plastic conduits and tubes, diameter ≤ 16 mm, arranged linear, with or without cables	EI 90-U/C	EI 120-U/C	EI 120-U/C

5 Several cables running in the same direction and bound closely together by mechanical means

	Seal type 4	Seal type 7	Seal type 8
			
Plastic conduits, diameter 16 ≤ Ø ≤ 32 mm, wall thickness 1 – 3 mm, arranged linear or in a cluster, with or without cables	-	EI 120-U/C	EI 120-U/C

C.4.4 Single conduit and pipe penetrations The width of the annular penetration seal is between 5 and 25 mm	Seal type 4 
– PVC pipes (EN 1451-1), not insulated	**Classification**
diameter ≥ 16 to 20 mm, wall thickness 1,8 to 2,3 mm	EI 120 U/U
diameter 32 mm, wall thickness 1,8 to 3,6 mm	EI 60 U/U E 120 U/U
diameter ≥ 32 to 40 mm, wall thickness 2,0 to 3,0 mm	EI 60 U/U E 120 U/U
diameter 32 mm, wall thickness 1,8 to 3,6 mm	EI 60 U/U E 120 U/U
diameter ≥ 40 to 50 mm, wall thickness 1,8 to 3,7 mm	EI 120 U/C
– Geberit Mepla, Aluminium composite pipes PE-Xd/Al/PE-HD, not or local insulated with Armaflex AF pipe insulation	**Classification**
diameter ≥ 16 to 50 mm, wall thickness 2,25 to 4,0 mm	EI 120 U/C
diameter ≥ 16 to 50 mm, wall thickness 2,25 to 4,0 mm; insulation Armaflex AF1 to AF4, thickness 8 - 21 mm, length 250 mm	EI 120 U/C
– Geberit Silent, PP pipes PP-C/PP-MD/PP-C, not insulated	**Classification**
diameter ≥ 32 to 40 mm, wall thickness 2,0 mm	EI 120 U/U
diameter 50 mm, wall thickness 2,0 mm	EI 120 U/C
– Kekelit Kelox, Aluminium composite pipes PE-XB/Al/PE-XB (EN ISO 21003), not or local insulated with Armaflex AF pipe insulation	**Classification**
diameter ≥ 16 to 50 mm, wall thickness 2,0 to 4,0 mm	EI 120 U/C
diameter ≥ 16 to 50 mm, wall thickness 2,0 to 4,0 mm; insulation Armaflex AF1 to AF4, thickness 8 - 21 mm, length 250 mm	EI 120 U/C
– LK Schweden, Aluminium composite pipes PE-RT/Al/PE-RT, not or local insulated with Armaflex AF pipe insulation	**Classification**
diameter ≥ 16 to 40 mm, wall thickness 2,0 to 3,5 mm	EI 120 U/C
diameter ≥ 16 to 40 mm, wall thickness 2,0 to 3,5 mm; insulation Armaflex AF1 to AF4, thickness 8 - 21 mm, length 250 mm	EI 120 U/C

– LK Schweden, PEXa pipes, not insulated	Classification
diameter ≥ 16 to 32 mm, wall thickness 2,2 to 4,0 mm	EI 120 U/C

– LK Schweden, Aluminium composite pipes PE-RT/Al/PE-RT, inside PVC corrugated pipe	Classification
diameter ≥ 16 to 32 mm, wall thickness 2,0 to 4,0 mm; PVC pipe diameter 25 to 44 mm, thickness 1,0 mm	EI 120 U/C

– LK Schweden, PEXa pipes, inside PVC corrugated pipe	Classification
diameter ≥ 16 to 25 mm, wall thickness 2,2 to 3,5 mm; PVC pipe diameter 25 to 34 mm, thickness 1,0 mm	EI 120 U/C

– PP Life Master 3, PP pipes PP-CO/PP-MV/PP-CO (EN 1451-1), not insulated	Classification
diameter ≥ 32 to 40 mm, wall thickness 1,8 mm	EI 90 U/U
diameter 50 mm, wall thickness 1,8 mm	EI 120 U/C

– Uponor Uni Pipe Plus, Aluminium composite pipes PE-RT/Al/PE-RT, not or local insulated with Armaflex AF pipe insulation	Classification
diameter ≥ 16 to 32 mm, wall thickness 2,0 to 3,5 mm	EI 120 U/C
diameter ≥ 16 to 32 mm, wall thickness 2,0 to 3,5 mm; insulation Armaflex AF1 to AF4, thickness 8 – 19,5 mm, length 250 mm	EI 120 U/C

– Copper pipes, locally insulated with Rockwool RS 800	Classification
Copper pipes, diameter ≥ 10 to 42 mm, wall thickness 1,0/1,2 to 14,2 mm, with Rockwool RS 800 pipe insulation, thickness 20 mm, length ≥ 700 mm	EI 120 C/U
Copper pipes, diameter ≥42 to 89 mm, wall thickness 1,0/2,0 to 14,2 mm, with Rockwool RS 800 pipe insulation, thickness 40 mm, length ≥925 mm	EI 120 C/U

– Copper pipes, continuously insulated with Armaflex AF pipe insulation	Classification
Copper pipes, diameter ≥ 10 to 42 mm, wall thickness 1,0/1,2 to 14,2 mm, with continuous Armaflex AF1 – AF4 pipe insulation, thickness 7,5 to 20,5 mm	EI 120 C/U
Copper pipes, diameter ≥ 42 to 89 mm, wall thickness 1,2/2,0 to 14,2 mm, with continuous Armaflex AF2 – AF4 pipe insulation, thickness 14,5 to 22,5 mm	EI 60 C/U E 120 C/U

– Rigid, flexible and pliable plastic conduits	Classification
Rigid, flexible and pliable plastic conduit up to Ø 40 mm with or without cables and conduit bundles up to Ø 80 mm	EI 120 U/U