

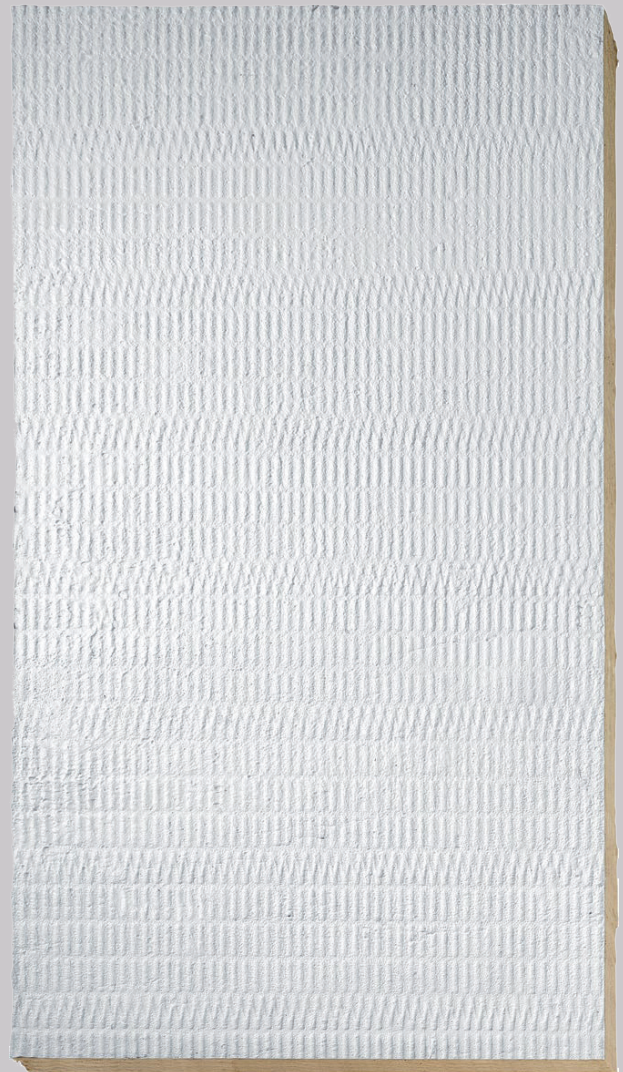


# HIGH-DENSITY COATED BOARD CFS-CT HDB

## Technical Manual

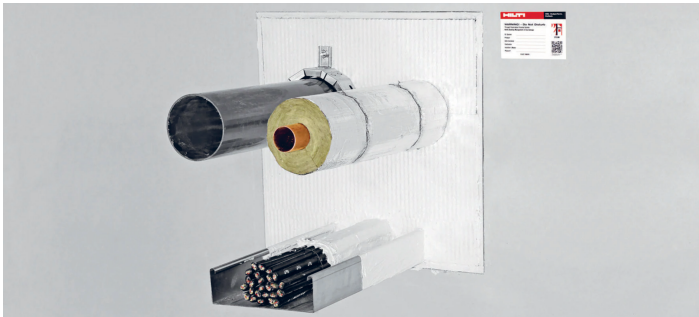
European Technical Assessment

ETA-23/0267



# FIRESTOP BOARD CFS-CT HDB

The all-rounder for combustible pipes and insulation in coated board



## Technical data

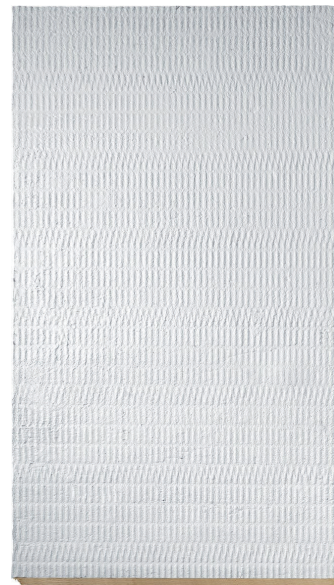
<b>Approx. density</b>	160 kg/m <sup>3</sup>
<b>Dimensions (L x W x H)</b>	1200 x 600 x 60 mm 1000 x 600 x 60 mm
<b>Color</b>	White
<b>Storage &amp; application temp.</b>	-5 - 40°
<b>Base material</b>	Drywall, concrete, aerated concrete, masonry

## Applications

- Single, multiple and mixed penetrations in flexible and rigid walls from 100 mm and rigid floors from 150 mm.
- Openings up to 1200 x 1000 mm in wall and 1000 x 800 mm in floors
- Cables, cable bundles, cable trays and cable conduits
- Non-combustible (metal) pipes with non-combustible insulation
- Non-combustible (metal) and composite pipes with combustible insulation in combination with firestop bandage CFS-B
- Combustible pipes in combination with firestop collars CFS-C P or firestop endless collar CFS-C EL

## Advantages

- 1-board installation for EI 60 applications
- Can be placed in any position within floors and walls
- Extensive EN testing ensures wide range of application
- Board pre-coated for immediate use
- Easy cutting, no fraying of edges and no mineral fiber exposure, thanks to extremely low delamination of elastic firestop surface

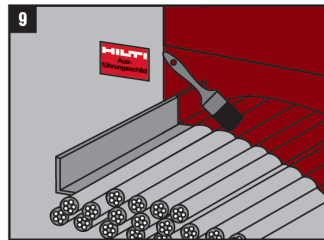
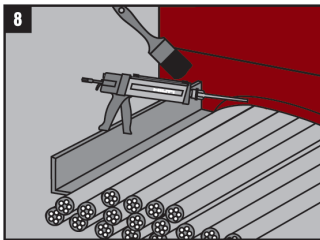
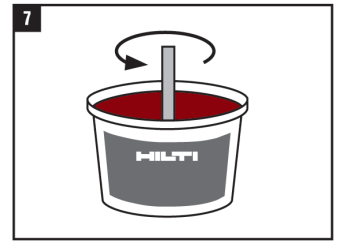
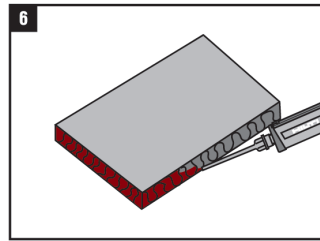
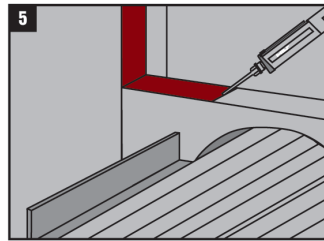
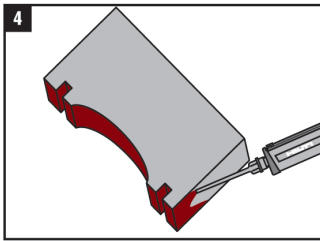
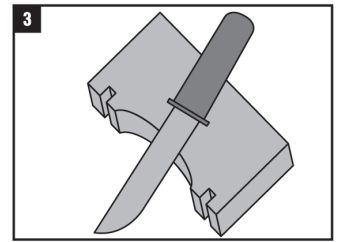
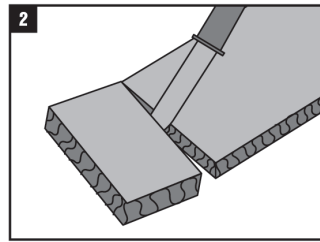
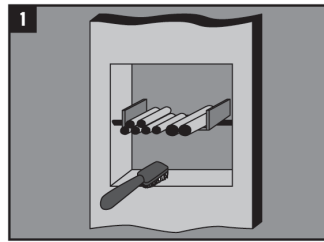


Product	Packaging	Content	Item number
Firestop board CFS-CT HDB	Box & Pallet	4 / 20 / 40	2383609 / 2383608 / 2383607



Product	Packaging	Content	Item number
Firestop bandage CFS-B	Box	10 m	429557
Firestop premium collar CFS-C P	Box	1 pc	From 435406 to 435416
Firestop endless collar CFS-C EL	Box	1 pc	2075120
Firestop coating CFS-CT	Pail	6 kg	2036605
Firestop intumescent sealant CFS-IS	Cartridge	310 ml	2004614
Firestop acrylic sealant CFS-S ACR	Cartridge / Foil	310 / 580 ml	435859 / 435863
Dispenser CFS-DISP	/	1 pc	2005843

# INSTALLATION INSTRUCTIONS



2101516 A1-08.2014



# MAIN APPROVED APPLICATIONS – EI60 SINGLE BOARD

Application	Material	Flexible & rigid wall	Rigid floor
Cables & cable trays	Coaxial sheathed cables	≤ 28 mm	≤ 28 mm
	Cable bundles	≤ 100 mm made of cables ≤ 21 mm	≤ 100 mm made of cables ≤ 21 mm
	All other sheathed cables	≤ 80 mm	≤ 80 mm
Electrical conduits	Rigid	≤ 40 mm bundled up to 100 mm	≤ 40 mm bundled up to 100 mm
	Flexible	≤ 40 mm bundled up to 100 mm	≤ 40 mm bundled up to 100 mm
Cable trunkings	Metal	≤ 105 x 118 mm	
Heating and potable water pipes	Copper	≤ 54 mm	≤ 54 mm
	Steel / stainless steel / Iron	≤ 114.3 mm	≤ 114.3 mm
	Al-composite: Uponor Unipipe Plus	≤ 50 mm	≤ 32 mm
	Geberit Mepla	≤ 50 mm	≤ 40 mm
Chilled water pipes	PE, PE-X, ABS, SAN+PVC:		
	Any	≤ 160 mm	≤ 125 mm
	Geberit Silent db20	≤ 160 mm	≤ 135 mm
	Rehau Rautitan Flex	≤ 32 mm	≤ 32 mm
	PVC-U:		
	Any	≤ 160 mm	≤ 160 mm
	Georg Fischer Dekadur	≤ 125 mm	≤ 125 mm
	PP, PP-RCT		
	PP Regulated	≤ 125 mm	≤ 125 mm
	PP Non-regulated	≤ 160 mm if listed in Table 1 ≤ 110 mm if not listed in Table 1	≤ 160 mm if listed in Table 1
PP-RCT	≤ 50 mm	≤ 50 mm or bundles ≤ 80 mm	
Air conditioning	HVAC supply bundle:		
	Cable	≤ 14 mm	≤ 14 mm
	Metal pipe	≤ 18 mm	≤ 18 mm
	Plastic pipe	≤ 20 mm	≤ 20 mm
Plastic exhaust channels	PVC, rectangular form	≤ 220 x 90 mm	

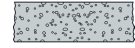
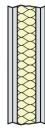
**Table 1: Non-regulated PP pipes**

Manufacturer & type	Material
Aliaxis Poland	dBlue
Coes	Blue Power, PhoNoFire
Conel	Drain Hausabflußrohr
Geberit	Silent PP, Silent Pro
KeKelit	PhonEx AS
Marley	Silent
Ostendorf	Skolan dB, Skolan Safe
Pipelife	Master 3, Master 3 Plus
Poloplast	PoloKal NG, PoloKal XS, PoloKal 3S
Rehau	Raupiano Plus
Silenta	Premium
Uponor	S&W Decibel
Valsir	TriPlus, Silere
Wavin	Sitech, Sitech +, AS

**Table 2: Approved FEF insulation**

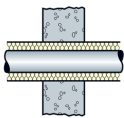
Manufacturer & type	Material
Armacell GmbH	Armaflex AF,SH, Ultima, XG, NH, HT
nmc Insultube	H-Plus
Kaimann GmbH	Kaiflex KK plus, Kaiflex KK, EPDM Plus, HF plus
L'isolante	K-Flex ECO, K-Flex ST Frigo,
Aeroflex	HF
Conel	Flex HT
Eurobatex Union	HF
ISIDEM	Coolflex AF
3i	Isopipe HT
ODE Insulation	R-Flex RPM
Würth	Flexen Kälteschlauch

# GENERAL INFORMATIONS

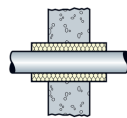


Parameter	Flexible wall	Rigid wall	Rigid floor
Base material thickness	≥ 100 mm		≥ 150 mm
Opening dimensions	≤ 1200 x 1000 mm		≤ 1000 x 800 mm
Distance to first support	≥ 250mm		
Additional info	Opening lined on both faces with minimum 2 layers of 12,5 mm thick boards.	Wall must comprise concrete, aerated concrete, brickwork or masonry Material density ≥ 350 kg/m <sup>3</sup>	Floor made of concrete or masonry Density of support construction ρE > 550 kg/m <sup>3</sup>
Distance between penetrants	See table next page (mm)		

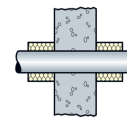
# INSULATION TYPE VISUALS



**Continued Sustained (CS) insulation**



**Local Sustained (LS) insulation**



**Local Interrupted (LI) insulation**

Minimal distance (mm)	Cables	Cable sup-port	Tied cable bundle	Conduit Ø<16mm	Conduit Ø>16mm	Tied conduit bundle	Metal pipe w/ combustible insulation	Metal pipe w/ non-combustible insulation	Plastic pipe	Al-comp. pipe, non-insulated	Al-com-posite pipe w/ combustible insulation	Al-com-posite pipe with non-combustible insulation	Plastic exhaust channels	Cable trunking, metal	HVAC Clima Split bundle	Edge
Cable	0	0	0	0	0	50	50	50	50	50	50	50	100	100	50	0
Cable support		0	0	50	50	50	50	50	50	50	50	50	100	100	50	0
Tied cable bundle			0	0	0	50	50	50	50	50	50	50	100	100	50	0
Conduit Ø<16mm				0	0	50	50	50	50	50	50	50	100	100	50	50
Conduit Ø>16mm					0	50	50	50	50	50	50	50	100	100	50	50
Tied conduit bundle						50	50	50	50	50	50	50	100	100	50	50
Metal pipe w/ combustible insulation							50	50	50	50	50	50	100	100	50	50
Metal pipe w/ non-combustible insulation								50	50	50	50	50	100	100	50	50
Plastic pipe									50	50	50	50	100	100	50	50
Al-comp. pipe, non-insulated										50	50	50	100	100	50	50
Al-combustible pipe w/ combustible insulation											50	50	100	100	50	50
Al-composite pipe with non-combustible insulation												50	100	100	50	50
Plastic exhaust channels													100	100	100	100
Cable trunking, metal														100	100	100
HVAC Clima Split bundle															50	50

## VISUALS OF KEY APPLICATIONS IN WALLS

<b>Annular gap seal + Service seal</b>		CFS-IS 60 mm deep Annular gap ≤ 15 mm + None	CFS-ACR 10/60 mm deep Annular gap ≤ 5 mm + None	CFS-ACR 10/60 mm deep Annular gap ≤ 5 mm + CFS-B 1 or 2 layers	CFS-ACR 10/60 mm deep Annular gap ≤ 5 mm + CFS-C EL or CFS-C P
<b>Combustible &amp; non-combustible pipes</b>	Non insulated				
	Insulated LS				
	Insulated CS				
	Insulated CS + Additional protection (Rockwool DuctWrap LI)				
<b>Cable trays</b>	Insulated LI				
<b>Conduits</b>	Insulated LI				
<b>HVAC Bundles</b>	Insulated CS				

## CLASSIFICATION DETAILS: METAL PIPES IN FLEXIBLE & RIGID WALLS $\geq 100$ MM

	Metal pipes + Insulation	Diameter in mm (Wall thickness in mm)	Insulation type (thickness)	Classi- fication	Sealing solution
<b>MLC pipes</b>	<b>Uponor Unipipe Plus</b>	$16 \leq x \leq 50$ (2.0 - 4.50)		EI 60 U/C	CFS-IS 60 mm deep
	<b>Uponor Unipipe Plus</b> + FEF insulation	$\leq 32$ (2.0 - 3.0) $16 \leq x \leq 50$ (2.0 - 4.50)	CS, AF1 - AF4 (8 - 19 mm) CS, AF1 - AF5 (8.5 - 28.5 mm)	EI 60 U/C See ETA	CFS-IS 60 mm deep
	<b>Uponor Unipipe Plus</b> + PE insulation	$40 \leq x \leq 50$ (4.0 - 4.50)	CS (13 mm)	EI 60 U/C	CFS-IS 60 mm deep
	<b>Geberit Mepla</b> + FEF insulation	$16 \leq x \leq 40$ (2.25 - 3.50) $16 \leq x \leq 50$ (2.25 - 4.50)	CS, AF1 - AF4 (8.0 - 20.5 mm) CS, AF1 - AF6 (9.0 - 28.5 mm)	EI 60 U/C See ETA	CFS-IS 60 mm deep
<b>Cu / Steel / Iron pipes</b>	<b>Metal pipe</b> + Isover Climacover insulation	$\leq 42$ ( $\geq 1.0$ )	LS $\geq 470$ mm (30 mm)	EI 60 C/U	CFS-IS 60 mm deep
	<b>Metal pipe</b> + Rockwool Klimarock insulation	$\leq 54$ ( $\geq 1.0$ )	LS $\geq 970$ mm (20 mm) LS $\geq 470$ mm (30 mm)	EI 45 C/U EI 60 C/U	CFS-S ACR 10 mm deep
	<b>Metal pipe</b> + FEF insulation	$\leq 42$ ( $\geq 1.0$ )	CS, AF1 - AF4 (8.0 - 20.5 mm)	EI 45 C/U	CFS-IS 60 mm deep
		$\leq 28$ ( $\geq 1.0$ ) $\leq 54$ ( $\geq 2.0$ )	CS, AF1 - AF6 (7.5 - 35.5 mm) CS, AF1 - AF6 (17 - 38 mm)	EI 60 C/U	CFS-S ACR 60 mm deep + CFS-B 2 layers
	<b>Metal pipes bundle (zero distance)</b> + FEF insulation + Additional protection (25 mm thick Rockwool DuctWrap of LI $\geq 250$ mm)	$\leq 28$ ( $\geq 0.6$ )	CS, AF1 - AF6 (8.0 - 8.5 mm)	EI 60 U/C	CFS-IS 60 mm deep
	<b>Metal pipe</b> + FEF insulation + Additional protection (25 mm thick Rockwool DuctWrap of LI $\geq 250$ mm)	$0 \leq x \leq 15$ ( $\geq 0.7$ ) $15 \leq x \leq 28$ ( $\geq 0.9$ ) $28 \leq x \leq 54$ ( $\geq 1.2$ )	CS, AF1 - AF5 (8.0 - 31.5 mm)	EI 60 C/U	CFS-IS 60 mm deep
		$\leq 28$ ( $\geq 0.6$ )	CS, AF1 - AF6 (7.5 - 8.5 mm)	EI 60 C/U	CFS-S ACR 60 mm deep + CFS-B 2 layers
	<b>Metal pipe</b> + FEF insulation + Additional protection (30 mm thick Isover ML-3 Glasswool of LI $\geq 30$ mm)	$\leq 28$ ( $\geq 1.0$ ) $\leq 54$ ( $\geq 1.5$ )	CS, AF1 - AF6 (7.5 - 35.0 mm) CS, AF1 - AF6 (17 - 38 mm)	EI 60 C/U	CFS-S ACR 60 mm deep + CFS-B 1 layer
<b>Metal pipe</b> + Kingspan Kooltherm insulation + Additional protection (25 mm thick Rockwool DuctWrap of LI $\geq 250$ mm)	$0 \leq x \leq 15$ ( $\geq 0.7$ ) $15 \leq x \leq 28$ ( $\geq 0.9$ ) $28 \leq x \leq 54$ ( $\geq 1.2$ )	CS, (15 - 25 mm)	EI 60 C/U	CFS-IS 60 mm deep	
<b>Steel / Iron pipes</b>	<b>Metal pipe</b> + Isover ORStech insulation	$\leq 114.3$ ( $\geq 3.2$ )	LS $\geq 700$ mm (30 mm)	EI 60 C/U	CFS-S ACR 10 mm deep
	<b>Metal pipe</b> + Rockwool Klimarock insulation	$\leq 114.3$ ( $\geq 1.8$ )	CS (20mm)	EI 60 C/U	CFS-S ACR 10 mm deep
	<b>Metal pipe</b> + FEF insulation + Additional protection (25 mm thick Rockwool DuctWrap of LI $\geq 250$ mm)	$\leq 114.3$ ( $\geq 2.0$ )	CS, AF3 - AF5 (18.5 - 31.5 mm)	EI 60 C/U	CFS-IS 60 mm deep
	<b>Metal pipe</b> + FEF insulation + Additional protection (30mm thick Isover ML-3 Glasswool of LI $\geq 30$ mm)	$\leq 114.3$ ( $\geq 2.0$ )	CS, AF1 - AF6 (18.5 - 43.0 mm)	EI 60 C/U	CFS-S ACR 60 mm deep + CFS-B 2 layers
	<b>Omegaflex Tracpipe corrugated, sleeved</b>	See ETA	See ETA	See ETA	See ETA

Excerpt of ETA document. Check the exact field of application in the ETA 23/0267 document.



**CLASSIFICATION DETAILS: PLASTIC PIPES IN FLEXIBLE & RIGID WALLS ≥ 100 MM**

	<b>Plastic pipes + Insulation</b>	<b>Diameter in mm (Wall thickness in mm)</b>	<b>Insulation type (thickness)</b>	<b>Classi- fication</b>	<b>Sealing solution</b>
<b>PE pipes</b>	<b>PE, PE-X, ABS, SAN+PVC</b>	≤ 56 (3.0)		EI 60 U/U	CFS-IS 60 mm deep
		32 ≤ x ≤ 110 (1.8 - 10) 110 ≤ x ≤ 125 (2.7 - 4.8)		EI 60 U/U	CFS-S ACR 10 mm deep + CFS-C EL
		125 (4.8) 160 (6.2)		EI 90 U/U EI 60 U/U	CFS-S ACR 10 mm deep + CFS-C P
	<b>PE</b>	≤ 90 (3.0 - 3.5) 90 ≤ x ≤ 125 (3.5 - 4.8)		EI 60 U/C	CFS-S ACR 60 mm deep + CFS-B 2 layers
		<b>PE-S2 Geberit Silent dB20</b>	32 ≤ x ≤ 75 (3.2 - 6) 75 ≤ x ≤ 110 (3.6 - 6.0)		EI 60 U/U
	160 (7.0)			EI 60 U/U	CFS-S ACR 60 mm deep + CFS-C P
	<b>PE-Xa Rehau Rautitan Flex + Rockwool Klimarock insulation</b>	≤ 32 (2.25 - 4.40)	LS ≥ 220 mm (20 mm)	EI 60 U/C	CFS-S ACR 10 mm deep
<b>PVC pipes</b>	<b>PVC-U</b>	≤ 32 (1.6)		EI 30 U/C E 60 U/C	CFS-S ACR 60 mm deep + CFS-B 2 layers
		≤ 50 (1.8 - 2.4)		EI 60 U/U	CFS-S ACR 60 mm deep
		32 ≤ x ≤ 50 (1.8 - 3.2) 50 ≤ x ≤ 110 (1.8 - 3.7) 110 ≤ x ≤ 125 (3.2 - 3.7)		EI 45 U/U EI 60 U/U EI 60 U/U	CFS-S ACR 60 mm deep + CFS-C EL
		160 (3.2)		EI 60 U/U	CFS-S ACR 10 mm deep + CFS-C P
	<b>PVC-U Georg Fischer Dekadur</b>	≤ 110 (1.9 - 6.0) ≤ 125 (2.2 - 6.0)		EI 60 U/C	CFS-S ACR 60 mm deep + CFS-B 2 layers
<b>PP pipes</b>	<b>Single layer PP</b>	32 ≤ x ≤ 75 (1.8 - 7.1) 75 ≤ x ≤ 125 (1.9 - 7.1)		EI 60 U/C	CFS-S ACR 60 mm deep + CFS-B 2 layers
		<b>Single layer PP + Tubex standard insulation</b>	≤ 25 (3.5)	CS (6 - 10 mm)	EI 60 U/C
	<b>Single layer PP-RCT + Tubex standard insulation</b>	≤ 20 (2.3 - 4.6) 20 ≤ x ≤ 50 (2.3 - 4.6)		EI 60 U/C	CFS-IS 60 mm deep
		25 ≤ x ≤ 50 (6.5 - 6.9)	CS (10 - 15 mm)	EI 60 U/C	CFS-S ACR 60 mm deep + CFS-B 2 layers
	<b>Approved non-regulated PP pipe (see list p.4)</b>	32 ≤ x ≤ 75 (1.8 - 5.3) 75 ≤ x ≤ 110 (1.9 - 5.3)		EI 60 U/U	CFS-S ACR 10 mm deep + CFS-C EL
		125 (3.1) 160 (3.9)		EI 90 U/U EI 60 U/U	CFS-S ACR 10 mm deep + CFS-C P
<b>Any non-regulated PP pipe</b>	32 ≤ x ≤ 75 (1.8 - 2.7) 75 ≤ x ≤ 110 (1.9 - 2.7)		EI 60 U/U	CFS-S ACR 10 mm deep + CFS-C EL	

## CLASSIFICATION DETAILS: CABLES IN FLEXIBLE & RIGID WALLS ≥ 100 MM

	Cable types Dimensions	Insulation type (thickness)	Classification	Sealing solution
Cables w/ cable tray (or w/o)	<b>All cable types commonly used in Europe w/ Rockwool Klimarock insulation</b>			
	Coaxial sheathed cables ≤ 28 mm All other sheathed cables ≤ 80 mm Cable bundles ≤ 100 mm made of cables ≤ 21 mm	LI ≥ 200 mm (30 mm) LI ≥ 200 mm (30 mm) LI ≥ 200 mm (30 mm)	EI 60 / E 90 EI 60 / E 90 EI 60 / E 90	CFS-S ACR 10 mm deep CFS-S ACR 10 mm deep CFS-S ACR 10 mm deep
Cables w/ cable tray (or w/o)	<b>All cable types commonly used in Europe w/ CFS-CT protection</b>			
	Coaxial sheathed cables ≤ 28 mm All other sheathed cables ≤ 80 mm Cable bundles ≤ 100mm made of cables ≤ 21 mm Rigid plastic and metal conduits ≤ 16 mm Non-sheathed cables ≤ 24 mm	LI ≥ 200 mm (1 mm) LI ≥ 200 mm (1 mm) LI ≥ 200 mm (1 mm) LI ≥ 200 mm (1 mm) LI ≥ 200 mm (1 mm)	EI 30 / E 60 EI 30 / E 60 EI 30 / E 60 EI 30 / E 60 EI 20 / E 60	CFS-S ACR 60 mm deep CFS-S ACR 60 mm deep CFS-S ACR 60 mm deep CFS-S ACR 60 mm deep CFS-S ACR 60 mm deep
Cables w/o Cable tray	<b>Single cable</b> ≤ 14 mm, ≤ 7.5 mm <sup>2</sup> <b>Single cable</b> ≤ 19 mm, ≤ 95 mm <sup>2</sup>		EI 60 EI 30 / E 60	CFS-D 25 CFS-D 25
Conduits	<b>Rigid conduits w/ Rockwool DuctWrap insulation</b>			
	All Bundles ≤ 100 mm of empty or full conduits ≤ 40 mm containing sheathed cables ≤ 28 mm Wall thickness ≤ 2.0 mm	LI ≥ 250 mm (25 mm)	EI 60 U/U	CFS-S ACR 60 mm deep + CFS-B 2 layers
Conduits	<b>Flexible conduits w/ Rockwool DuctWrap insulation</b>			
	All Bundles ≤ 100 mm of empty or full conduits ≤ 40 mm containing sheathed cables ≤ 28 mm Wave height ≤ 4.25 mm	LI ≥ 150 mm (25 mm)	EI 60 U/U	CFS-S ACR 60 mm deep + CFS-B 1 layer
Metal trunkings	<b>Metal trunking with Rockwool DuctWrap insulation</b>			
	Dimensions ≤ 105 x 118 mm Wall thickness ≤ 1.1 mm All sheathed cables ≤ 80 mm Non-sheathed cables ≤ 24 mm	LI ≥ 420 mm (25 mm)	EI 60	CFS-S ACR 10 mm deep + CFS-FX

**CLASSIFICATION DETAILS: MISCELLANEOUS IN FLEXIBLE & RIGID WALLS ≥ 100 MM**

Others + Insulation	Diameter in mm (Wall thickness in mm)	Insulation type (thickness)	Classification	Sealing solution	
<b>HVAC bundles</b>	Clima Split FEF insulation	Cable ≤ 14 Metal ≤ 10 (≥ 1) Plastic ≤ 20 (≤ 1.5)	CS, AF1 - AF6 (9 mm)	EI60	CFS-S ACR 60mm deep + CFS-B 1 layers
		Cable ≤ 14 Metal ≤ 18 (≥ 1) Plastic ≤ 20 (≤ 1.5)	CS, AF1 - AF6 (8 mm)	EI 30 / E 60	CFS-S ACR 60mm deep + CFS-B 1 layers
	Clima Split FEF insulation + additional protection (25 mm thick Rockwool DuctWrap of LI ≥ 150 mm)	Cable ≤ 14 Metal ≤ 28 (≥ 0.9) Plastic ≤ 20 (≤ 1.5)	CS, AF1 - AF6 (8.5 mm)	EI 60	CFS-S ACR 60mm deep + CFS-B 1 layers
<b>Plastic channels</b>	<b>Empty plastic channel</b>	≤ 220 x 90 mm (≤ 1.9)		EI 60 U/U	CFS-S ACR 10 mm deep CFS-C EL

Excerpt of ETA document. Check the exact field of application in the ETA 23/0267 document.

## VISUALS OF KEY APPLICATIONS IN FLOORS

<b>Annular gap seal + Service seal</b>		CFS-IS 60 mm deep Annular gap ≤ 15 mm + None	CFS-ACR 10/60 mm deep Annular gap ≤ 5 mm + None	CFS-ACR 10/60 mm deep Annular gap ≤ 5 mm + CFS-B 1 or 2 layers	CFS-ACR 10/60 mm deep Annular gap ≤ 5 mm + CFS-C EL or CFS-C P
<b>Combustible &amp; non-combustible pipes</b>	Non insulated				
	Insulated LS				
	Insulated CS				
	Insulated CS + Additional protection (Rockwool DuctWrap LI)				
<b>Cable trays</b>	Insulated LI				
<b>Conduits</b>	Insulated LI				
<b>HVAC Bundles</b>	Insulated CS				

## CLASSIFICATION DETAILS: METAL PIPES IN RIGID FLOORS $\geq 150$ MM

	<b>Metal pipes</b> + Insulation	<b>Diameter in mm</b> (Wall thickness in mm)	<b>Insulation type</b> (thickness)	<b>Classi- fication</b>	<b>Sealing solution</b>
<b>MLC pipes</b>	<b>Geberit Mepla</b> + FEF insulation	$\leq 40$ (2.25 - 3.50)	CS, AF1 - AF4 (8.0 - 20.5mm)	EI 60 U/C	CFS-IS 60 mm deep
	<b>Uponor Unipipe Plus</b> + FEF insulation	$\leq 32$ (2.0 - 3.0)	CS, AF1 - AF4 (8 - 19 mm)	EI 60 U/C	CFS-IS 60 mm deep
<b>Cu / Steel / Iron pipes</b>		$\leq 42$ ( $\geq 1.0$ ) $\leq 42$ (any)	CS, AF1 - AF4 (8.0 - 20.5 mm) CS, AF4 (20.5 mm)	EI 45 C/U EI 60 C/U	CFS-IS 60 mm deep
	<b>Metal pipe</b> + FEF insulation	$\leq 10$ ( $\geq 1.0$ ) $\leq 18$ ( $\geq 1.0$ ) $\leq 28$ ( $\geq 1.0$ ) $\leq 54$ ( $\geq 2.0$ ) $\leq 54$ ( $\geq 1.5$ )	CS, AF1 - AF4 (7.5 - 15.5 mm) CS, AF1 - AF6 (8.5 - 33.5 mm) CS, AF2 - AF6 (12.5 - 35 mm) CS, AF3 - AF6 (17 - 38 mm) CS, AF6 (38 mm)	EI 60 C/U EI 30 C/U EI 30 C/U EI 30 C/U EI 60 C/U	CFS-S ACR 60 mm deep + CFS-B 2 layers
	<b>Metal pipes</b> + FEF insulation + additional protection (30 mm thick ML-3 Glasswool of LI $\geq 30$ mm)	$\leq 10$ ( $\geq 1.0$ ) $\leq 18$ ( $\geq 1.0$ ) $\leq 28$ ( $\geq 1.0$ ) $\leq 54$ ( $\geq 1.5$ )	CS, AF1 - AF4 (7.5 - 15.5 mm) CS, AF1 - AF6 (8.5 - 33.5 mm) CS, AF2 - AF6 (12.5 - 35 mm) CS, AF3 - AF6 (17 - 38 mm)	EI 30 C/U EI 30 C/U EI 60 C/U EI 60 C/U	CFS-S ACR 60 mm deep + CFS-B 1 layers
	<b>Metal pipe</b> + Isover Climacover insulation	$\leq 42$ ( $\geq 1.0$ )	LS $\geq 470$ mm (20 mm)	EI 30 C/U	CFS-IS 60 mm deep
	<b>Metal pipe</b> + Rockwool Klimarock insulation	$\leq 54$ ( $\geq 1.5$ ) $\leq 54$ ( $\geq 1.0$ )	LS $\geq 470$ mm (30 mm) LS $\geq 970$ mm (20 mm)	EI 60 C/U	CFS-S ACR 10 mm deep
	<b>Metal pipe</b> + Isover ORStech LSP40 insulation	$\leq 114.3$ ( $\geq 3.2$ )	LS $\geq 970$ mm (30 mm)	EI 60 C/U	CFS-S ACR 10 mm deep
<b>Steel / Iron pipes</b>	<b>Metal pipe</b> + Rockwool Klimarock insulation	$\leq 114.3$ ( $\geq 1.8$ )	CS (20 mm) LS $\geq 970$ mm (30 mm)	EI45 C/U EI 60 C/U	CFS-S ACR 10 mm deep
	<b>Metal pipe</b> + CFS-CT protection	$\leq 17.2$ (any)	LS $\geq 350$ mm (1 mm)	EI 30 C/U	CFS-S ACR 10 mm deep
	<b>Metal pipe</b> + FEF insulation + additional protection (30 mm thick ML-3 Glasswool of LI $\geq 30$ mm)	$\leq 114.3$ ( $\geq 2.0$ )	CS, AF6 (43 mm)	EI 30 C/U	CFS-S ACR 60 mm deep + CFS-B 2 layers

Excerpt of ETA document. Check the exact field of application in the ETA 23/0267 document.

## CLASSIFICATION DETAILS: PLASTIC PIPES IN RIGID FLOORS $\geq 150$ MM

Plastic pipes + Insulation		Diameter in mm (Wall thickness in mm)	Insulation type (thickness)	Classi- fication	Sealing solution
PE pipes	PE, PE-X, ABS, SAN+PVC	$\leq 40$ (3.0) $\leq 50$ (3.0)		EI 60 U/U EI 60 U/C	CFS-IS 60 mm deep
		$32 \leq x \leq 110$ (3.0 - 4.2)		EI 60 U/U	CFS-S ACR 10 mm deep + CFS-C EL
		110 (4.3) 125 (4.82)		EI 60 U/U EI 30 U/U	CFS-S ACR 10 mm deep + CFS-C P
		$\leq 125$ (3.0 - 4.8)		EI 60 U/C	CFS-S ACR 10 mm deep + CFS-B 2 layers
	PE-S2 Geberit Silent dB20	$32 \leq x \leq 110$ (3.2 - 6) $\leq 135$ (6.0)		EI 60 U/U	CFS-S ACR 10 mm deep + CFS-C EL
PE-Xa Rehau Rautitan Flex + Rockwool Klimarock insulation	$\leq 32$ (2.25 - 4.40)	LS $\geq 220$ mm (20 mm)	EI 60 U/C	CFS-S ACR 60 mm deep	
PVC pipes	PVC-U	$\leq 32$ (1.6)		EI 60 U/C	CFS-S ACR 10 mm deep + CFS-B 2 layers
		$32 \leq x \leq 110$ (1.8 - 5.3)		EI 60 U/U	CFS-S ACR 10 mm deep + CFS-C EL
		160 (3.2)		EI 30 U/U	CFS-S ACR 10 mm deep + CFS-C P
		$\leq 50$ (1.8 - 2.4)		EI 45 U/U	CFS-IS 60 mm deep
PVC-U Georg Fischer Dekadur	$\leq 125$ (2.2 - 6.0)		EI 60 U/C	CFS-S ACR 10 mm deep + CFS-B 2 layers	
PP pipes	Single layer PP	$32 \leq x \leq 110$ (1.8 - 5.3)		EI 60 U/U	CFS-S ACR 60 mm deep + CFS-B 2 layers
		$\leq 125$ (1.8 - 3.1)		EI 60 U/C	CFS-S ACR 10 mm deep + CFS-B 2 layers
	Single layer PP-RCT FV Plast Uni	$\leq 50$ (2.3 - 6.9) Or bundle $\leq 80$ mm		EI 60 U/C	CFS-IS 60 mm deep
	Single layer PP-RCT FV Plast Hot / Uni + Tubex standard insulation	$\leq 50$ (2.3 - 6.9)	LS $\geq 220$ mm (6 - 10 mm)	EI 60 U/U	CFS-S ACR 10 mm deep + CFS-B 2 layers
	Approved non-regulated PP pipe (see list p.4)	$32 \leq x \leq 110$ (1.8 - 2.7)		EI 60 U/U	CFS-S ACR 10 mm deep + CFS-C EL
125 (3.1 - 5.3) 160 (3.9)			EI 60 U/U	CFS-S ACR 10 mm deep + CFS-C P	

Excerpt of ETA document. Check the exact field of application in the ETA 23/0267 document.

### CLASSIFICATION DETAILS: CABLES IN RIGID FLOORS ≥ 150 MM

	Cable types + Insulation	Insulation type (thickness)	Classification	Sealing solution
Cables w/ cable tray (or w/o)	<b>All cable types commonly used in Europe</b> + Rockwool Klimarock insulation			
	Coaxial sheathed cables ≤ 28 mm	LI ≥ 200 mm (30 mm)	EI 60	CFS-S ACR 10 mm deep
	All other sheathed cables ≤ 80 mm	LI ≥ 200 mm (30 mm)	EI 60	CFS-S ACR 10 mm deep
	Cable bundles ≤ 100 mm of sheathed cables ≤ 21 mm	LI ≥ 200 mm (30 mm)	EI 30 / E 60	CFS-S ACR 10 mm deep
	Non-sheathed cables ≤ 24 mm	LI ≥ 200 mm (30 mm)	EI 30 / E 60	CFS-S ACR 10 mm deep
Cables w/ cable tray (or w/o)	<b>All cable types commonly used in Europe</b> + CFS-CT protection			
	All sheathed cables ≤ 21mm	LI ≥ 350 mm (1 mm)	EI 60	CFS-S ACR 60 mm deep
	Coaxial sheathed cables ≤ 28mm	LI ≥ 350 mm (1 mm)	EI 45 / E60	CFS-S ACR 60 mm deep
	All other sheathed cables ≤ 80mm	LI ≥ 350 mm (1 mm)	EI 45 / E60	CFS-S ACR 60 mm deep
	Cable bundles ≤ 100mm made of cables ≤ 21mm	LI ≥ 350 mm (1 mm)	EI 45 / E60	CFS-S ACR 60 mm deep
	Non-sheathed cables ≤ 24mm	LI ≥ 350 mm (1 mm)	EI 45 / E60	CFS-S ACR 60 mm deep
Conduits	<b>Flexible conduits</b> All Bundles ≤ 100 mm of empty or full conduits ≤ 40 mm containing coaxial cables ≤ 28 mm and / or sheathed cable of any diameter Wall thickness ≤ 4.95 mm		EI 60 U/U	CFS-S ACR 60 mm deep + CFS-B 2 layers

### CLASSIFICATION DETAILS: HVAC IN FLEXIBLE & RIGID WALLS ≥ 100 MM

	HVAC bundles + Insulation	Diameter in mm (Wall thickness in mm)	Insulation type (thickness)	Classification	Sealing solution
HVAC	<b>Clima Split</b> FEF insulation	Cable ≤ 14 Metal ≤ 18 (≥ 1) Plastic ≤ 20 (≤ 1.5)	CS, AF1 (7 - 8 mm)	EI 60	CFS-S ACR 60 mm deep + CFS-B 1 layers

## CHARACTERISTICS OF CFS-CT HDB

Characteristics	Assessment of characteristics	Norm, standard, test
<b>Health and environment</b>		
Air permeability (gas tightness)	Tested for gas permeability regarding the gases air, nitrogen (N), carbon dioxide (CO <sub>2</sub> ) and CH <sub>4</sub> (methane). See ETA 11/0429 for detailed results.	EN 1026
Water permeability	Watertight up to 1000mm head of water or 9806 Pa. for 0.7mm dry film thickness on mineral wool	Annex C of EAD 350454-00-1104
<b>Dangerous substances</b>	Below any respective occupational exposure limits as far as such limits exist (compared with the list of dangerous substances of the European commission)	Material safety datasheet
<b>Durability and serviceability</b>	Category Y2 (suitable for penetrations seals intended for use at internal dry conditions with temperatures between -20°C and +70°C with no exposure to rain nor UV.	EOTA Technical Report TR 024 ETAG 026-2
<b>Reaction to Fire</b>	Precoated board: D- s2, d0 Mineral wool: Class A1	EN 13501-1
<b>Acoustics</b>	Rw = 30 dB (Single board) Rw = 35 dB (Double board)	EN ISO 140-3





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