ALFASEAL® GROUP

INTU FR GRAPHITE

Intumescent graphite sealant

TDS TECHNICAL DATA SHEET

CE

EPD

BREEAM

LEED

ETA

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Intumescent graphite sealant

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PRODUCT DESCRIPTION

The **INTU FR GRAPHITE** is graphite fire-retardant mass swells under the influence of fire, closing the opening around the installation and any gaps, creating a barrier that ensures the partition remains tight and insulating up to EI 120.

APPLICATION

The intumescent graphite sealant **INTU FR GRAPHITE** is intended for fire protection of penetration seals, especially:

- combustible pipes diameter of Ø ≤ 110mm
- bundles of copper pipes for air conditioning
- single cables and cable bundles
- cables in casting pipes and AROT type pipes

Flexible walls:	The wall must be minimum 100 mm thickness with a frame structure of steel or wooden sections covered on both sides with a minimum of 2 layers of panels with a thickness of min 12,5 mm.
Rigid walls:	The wall must be minimum 100 mm thickness, made of concrete, reinforced concrete, concrete blocks, cellular concrete, ceramic brick (solid, hollow or lattice) or silicate brick (solid or hollow) with a density of min. 450 kg/m^3.
Rigid floors:	The floor must be at least 150 mm thick made of concrete, reinforced concrete or cellular concrete with a minimum density of 550 kg/m^3.

AVAILABILITY

Contents	Mass colour	Box	Pallet	Article number
310 ml	Black	15	1260	INFRG310
5 L		N/A	60	INFRGR5L

COMPLIANCE

- *Test standard:*
  EN 1366-3 / EAD 350454-00-1104
- *European Technical Assessment:*
  ETA 24/0152 of 28/03/2024
- *Declaration of Performance:*
  DoP 3/2024
- *Certificate of Constancy of Performance*
  1488-CPR-1109/W

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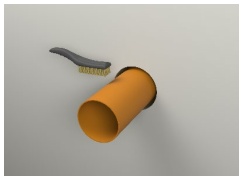
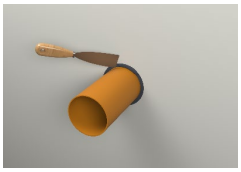
INSTALLATION METHOD

- Clean the opening and installations from grease and other contaminants.
- Place the mineral wool base material in the hole. Fill the gap with **INTU FR GRAPHITE** mass.
- At the end line up the surface of the mass (e.g. using a spatula)
  Curing time: ≈ 1mm / 24h





TRANSPORT AND STORAGE

Store in dry and cool conditions, at a temperature between +5°C to +35°C.

- Usefulness for 310 ml capacity: 18 months from the date of production placed on the package.
- Usefulness for 5 l capacity: 12 months from the date of production placed on the package.

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TECHNICAL DATA

Colour	Black (Graphite)
Usage category	Type Z_2: intended for use in internal conditions with humidity lower than 85% RH, excluding temperatures below 0°C, without exposure to rain or UV.
Reaction to fire	E
Methods used for the assessment	EAD 350454-00-1104 "Fire Stopping and Fire Sealing Products. Penetration Seals"
Approvals	ETA 24/0152 of 28/03/2024
Large gaps	System compatible with INTU FR UNIBOARD based on the ETA 24/1047 of 19/12/2024

Approximate consumption of INTU FR GRAPHITE for CABLE PENETRATIONS

Hole diameter/ hole dimension W x H (mm)	Percentage part of hole area which cables inside			
	0%	20%	40%	60%
	Consumption of 310 ml **INTU FR GRAPHITE** cartridge			
80	0,80	0,64	0,48	0,32
100	1,30	1,04	0,78	0,52
120	1,80	1,44	1,08	0,72
140	2,50	2,00	1,50	1,00
160	3,20	2,56	1,92	1,28
150 x 150	3,60	2,88	2,16	1,44

Approximate consumption of INTU FR GRAPHITE for PIPE PENETRATIONS

Pipe diameter Ø (mm)	Hole diameter Ø (mm)	Consumption of 310 ml **INTU FR GRAPHITE** cartridge
20	40	0,15
32	52	0,21
50	70	0,30
63	83	0,37
75	95	0,43
90	110	0,51
110	130	0,61

FIRE RESISTANCE CLASSIFICATION

Pipe material	Pipe diameter Ø [mm]	INTU FR GRAPHITE depth x width range [mm]	FLEXIBLE / RIGID WALL		RIGID FLOOR	
			Pipe wall thickness [mm]	Configuration C/C and U/C	Pipe wall thickness [mm]	Configuration C/C and U/C
PP	Ø ≤ 50	25,0 x 10,0 – 20.0	1,8 – 18,3	EI 120	1,8 – 18,3	EI 120
	50 < Ø ≤ 75		1,9 – 18,3		1,9 – 18,3	
	75 < Ø ≤ 90		2,3 – 18,3		2,7 – 18,3	
	90 < Ø ≤ 110		2,7 – 18,3		2,7 – 18,3	
PE-X/AL/PE-X	Ø ≤ 20	25,0 x 10,0 – 20.0	2,0 – 6,0	EI 120	2,0 – 6,0	EI 120
	20 < Ø ≤ 32		3,1		3,1	
	32 < Ø ≤ 40		3,9		3,9	
	40 < Ø ≤ 50		4,8		4,8	
	50 < Ø ≤ 63		6,0		6,0	
PE-Xa	Ø ≤ 20	25,0 x 10,0 – 20.0	2,0 – 5,8	EI 120	2,0 – 5,8	EI 120
	20 < Ø ≤ 32		3,0		3,1	
	32 < Ø ≤ 40		3,8		3,9	
	40 < Ø ≤ 50		4,6		4,8	
	50 < Ø ≤ 63		5,8		5,8	
PP-R/PP-R-GF/ PP-R	Ø ≤ 20	25,0 x 10,0 – 20.0	2,8 – 10,0	EI 120	2,8 – 10,0	EI 120
	20 < Ø ≤ 32		4,4 – 16,0		4,4 – 16,0	
	32 < Ø ≤ 50		6,9 – 18,3		6,9 – 18,3	
	50 < Ø ≤ 63		8,6 – 18,3		8,6 – 18,3	
	63 < Ø ≤ 75		10,3 – 18,3		10,3 – 18,3	
	75 < Ø ≤ 90		12,3 – 18,3		12,3 – 18,3	
	90 < Ø ≤ 110		15,1 – 18,3		15,1 – 18,3	

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Pipe material	Pipe diameter Ø [mm]	INTU FR GRAPHITE depth x width range [mm]	FLEXIBLE / RIGID WALL		RIGID FLOOR	
			Pipe wall thickness [mm]	Configuration C/C and U/C	Pipe wall thickness [mm]	Configuration C/C and U/C
PE-RT/AL/PE-RT	Ø ≤ 20	25,0 x 10,0 – 20.0	2,0 – 6,0	EI 120	2,0 – 7,5	EI 120
			6,1 – 7,5	EI 60	3,1	
	20 < Ø ≤ 32		3,1	EI 120	3,9	
	32 < Ø ≤ 40		3,9		3,9	
	40 < Ø ≤ 50		4,8		4,8	
	50 < Ø ≤ 63		6,0		6,0	
	63 < Ø ≤ 75		7,5	EI 60	7,5	
PP-R	Ø ≤ 20	25,0 x 10,0 – 20.0	2,3 – 10,0	EI 120	2,3 – 10,0	EI 120
	20 < Ø ≤ 32		3,3 – 12,5		3,3 – 16,0	
			12,6 – 16,0	EI 90		
	32 < Ø ≤ 50		4,8 – 12,5	EI 120	4,8 – 18,3	
			12,6 – 18,3	EI 90		
	50 < Ø ≤ 63		5,8 – 12,5	EI 120	5,8 – 18,3	
			12,6 – 18,3	EI 90		
	63 < Ø ≤ 75		6,8 – 12,5	EI 120	6,8 – 18,3	
			12,6 – 18,3	EI 90		
	75 < Ø ≤ 90		8,2 – 10,0	EI 120	8,3 – 18,3	
			10,1 – 18,3	EI 90		
	90 < Ø ≤ 110		10,0	EI 120	10,0 – 18,3	
			10,1 – 18,3	EI 90		
PP-R/AL/PP-R	Ø ≤ 20	25,0 x 10,0 – 20.0	2,8 – 10,0	EI 120	2,3 – 10,0	EI 120
	20 < Ø ≤ 32		4,4 – 16,0		4,0 – 16,0	
	32 < Ø ≤ 50		6,9 – 18,3		6,7 – 18,3	
	50 < Ø ≤ 63		8,6 – 18,3		8,6 – 18,3	
	63 < Ø ≤ 75		10,3 – 18,3		10,3 – 18,3	
	75 < Ø ≤ 90		12,3 – 14,9	EI 90	12,3 – 18,3	
			15,0 – 18,3	EI 120		
	90 < Ø ≤ 110		15,1 – 18,2	EI 90	15,1 – 18,3	
			18,3	EI 120		
PVC	Ø ≤ 32	25,0 x 10,0 – 20.0	1,5 – 8,1	EI 120	1,5 – 8,1	EI 120
	32 < Ø ≤ 50		1,6 – 8,1		1,6 – 8,1	
	50 < Ø ≤ 75		1,8 – 8,1		1,8 – 8,1	
	75 < Ø ≤ 110		2,0 – 8,0	EI 90	2,0 – 8,1	
			8,1	EI 120		
PE-HD PE PE – X ABS SAN+PVC	Ø ≤ 32	25,0 x 10,0 – 20.0	1,8 – 6,8	EI 120	1,8 – 10,0	EI 120
			6,9 – 10,0	EI 90		
	32 < Ø ≤ 50		2,3 – 6,8	EI 120	2,3 – 10,0	
			6,9 – 10,0	EI 90		
	50 < Ø ≤ 75		3,0 – 6,8	EI 120	3,0 – 10,0	
			6,9 – 10,0	EI 90		
	75 < Ø ≤ 90		4,2 – 9,9	EI 60	3,5 – 10,0	
			10,0	EI 90		
	90 < Ø ≤ 110		4,2 – 9,9	EI 60	4,2 – 10,0	
			10,0	EI 90		
BlazeMaster CPVC	Ø ≤ 19,0	25,0 x 10,0 – 20.0	2,24 – 3,38	EI 120	-	
	19,0 < Ø ≤ 25,4		2,71 – 3,38			
	25,4 < Ø ≤ 31,8		3,38			
	Ø ≤ 31,8		3,39 – 3,84	EI 90		
	31,8 < Ø ≤ 38,1		3,84			

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Cables

Installation penetration type	Diameter Ø [mm]	INTU FR GRAPHITE depth x width range [mm]	FLEXIBLE / RIGID WALLS Fire resistance class
Single cable	Ø ≤ 21	25,0 x 10,0 – 20.0	EI 120
Bundle of cables	$Ø_{BUNDLE}$ ≤ 100, $Ø_{CABLE}$ ≤ 21		
Single coaxial wireless cable type	Ø ≤ 22,23		
Steel pipes	Ø ≤ 16		

PVC (plastic) conduits with or without small cables

Conduit diameter [mm]	Service inside	2(on both sides) x depth of the graphite mass [mm]	Fire resistance class
Ø ≤ 16	Empty	2 x 25.0	EI 120-U/U
	Small cable: $Ø_{CABLE}$ ≤ $Ø_{CONDUIT}$		
	Cable bundle: $Ø_{BUNDLE}$ ≤ $Ø_{CONDUIT}$		
16 < Ø ≤ 25	Empty		
	Small cable: $Ø_{CABLE}$ ≤ 21mm		
	Cable bundle: $Ø_{BUNDLE}$ ≤ $Ø_{CONDUIT}$, $Ø_{CABLE}$ ≤ 21mm		
25 < Ø ≤ 37	Empty		
	Small cable: $Ø_{CABLE}$ ≤ 21mm		
	Cable bundle: $Ø_{BUNDLE}$ ≤ $Ø_{CONDUIT}$, $Ø_{CABLE}$ ≤ 21mm		

Plastic conduits (AROT DVK) with or without small cables

Conduit diameter [mm]	Services inside	1(one side) x depth of the graphite mass [mm]	Fire resistance class
Ø ≤ 100	Empty	1 x 25.0	EI 90 / E 120-U/C
	$Ø_{CABLE}$ ≤ 21mm		
	$Ø_{BUNDLE}$ ≤ $Ø_{CONDUIT}$ $Ø_{CABLE}$ ≤ 21mm		

Mixed bundles

Mixed bundle consisting of:	Pipe diameter [mm] / Cable size [mm²]	Pipe wall thickness [mm]	Insulation type / thickness [mm]	INTU FR GRAPHITE depth x width range [mm]	FLEXIBLE / RIGID WALLS Fire resistance class
max. 2 x Copper pipe	Ø ≤ 12,7	≥ 0,8	FEF / max. 13	25,0 x 10,0 – 20.0	EI 120
max. 1 x Copper pipe	Ø ≤ 28,6	≥ 1,0			
max. 1 x Plastic pipe	Ø ≤ 25,0	1,0	-		
max. 1 x Cable	4 x 1,5	-			
max. 4 x Copper pipe	Ø ≤ 12,7	≥ 0,8	PE / max. 9	25,0 x 10,0 – 20.0	EI 60
max. 2 x Copper pipe	Ø ≤ 22,3	≥ 1,0			
max. 2 x Copper pipe	Ø ≤ 28,6	≥ 1,0	PE / max. 13		
max. 2 x Plastic pipe	Ø ≤ 25,0	1,0	-		
max. 2 x Cable	4 x 1,5	-			

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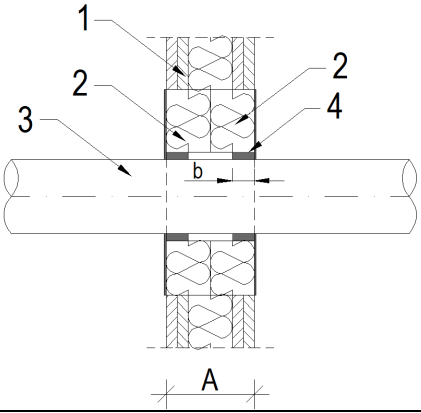
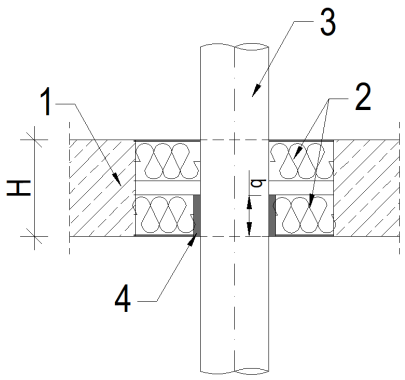
COMBUSTIBLE PIPES WITH **INTU FR GRAPHITE**

Pipe material	Filling the partition	Pipe Ø [mm]	FLEXIBLE / RIGID WALLS		
			Pipe wall thick [mm]	INTU FR GRAPHITE depth x width range [mm]	Fire resistance U/C and C/C
PP	2 x INTU FR UNIBOARD 1S	Ø ≤ 75	1,9 – 12,4	2 x 25 x 10,0 – 20,0	EI 45
			12,5 – 18,3		EI 90
		75 < Ø ≤ 90	2,2 – 14,9		EI 45
			15,0 – 18,3		EI 90
		90 < Ø ≤ 110	2,7 – 18,2		EI 45
			18,3		EI 90

Pipe material	Filling the partition	Pipe diameter Ø [mm]	FLEXIBLE / RIGID WALLS			FLOORS		
			Pipe wall thickness [mm]	INTU FR GRAPHITE depth x width range [mm]	Fire resistance U/C and C/C	Pipe wall thickness [mm]	INTU FR GRAPHITE depth x width range [mm]	Fire resistance U/C and C/C
PP-R	2 x INTU FR UNIBOARD 1S	Ø ≤ 20	≥ 2,8	25,0 x 10,0 – 20.0	EI 45	≥ 2,3	50 x 10,0 – 20,0	EI 90
		20 < Ø ≤ 25	≥ 3,2			≥ 2,7		
		25 < Ø ≤ 32	≥ 3,8			3,3 – 12,5		
		32 < Ø ≤ 40	4,4 – 18,2			3,9 – 12,5		
			18,3		EI 90			
		40 < Ø ≤ 50	5,2 – 18,2		EI 45	4,8 – 12,5		
			18,3		EI 90			
		50 < Ø ≤ 63	6,2 – 18,2		EI 45	5,8 – 12,5		
			18,3		EI 90			
		63 < Ø ≤ 75	7,2 – 18,2		EI 45	6,8 – 12,5		
			18,3		EI 90			
		75 < Ø ≤ 90	8,4 – 18,2		EI 45	8,2 – 15,0		
			18,3		EI 90			
		90 < Ø ≤ 110	10,0 – 18,2		EI 45	10,0 – 18,3		
			18,3		EI 90			
PVC	2 x INTU FR UNIBOARD 1S	Ø ≤ 75	1,5 – 1,9	25,0 x 10,0 – 20.0	EI 45	1,5 – 8,1	50 x 10,0 – 20,0	EI 90
			2,0		EI 60			
			2,1 – 8,1		EI 45			
		75 < Ø ≤ 90	1,7 – 1,9		EI 60	1,7 – 8,1		
			2,0		EI 45			
			2,1 – 8,1		EI 60			
		90 < Ø ≤ 110	2,0		EI 45	2,0 – 8,1		
			2,1 – 8,1		EI 60			

COMBUSTIBLE PIPES WITH **INTU FR GRAPHITE**





Combustible pipe with INTU FR GRAPHITE penetration seal, double mineral wool board

1 – flexible / rigid wall A ≥ 100 mm
or floor H ≥ 150 mm
2 – 2 x board **INTU FR UNIBOARD 1S**
3 – combustible pipe
4 – **INTU FR GRAPHITE** on minimum depth:

- b ≥ 25 mm from both sides of the wall
- b ≥ 50 mm from the bottom of the floor

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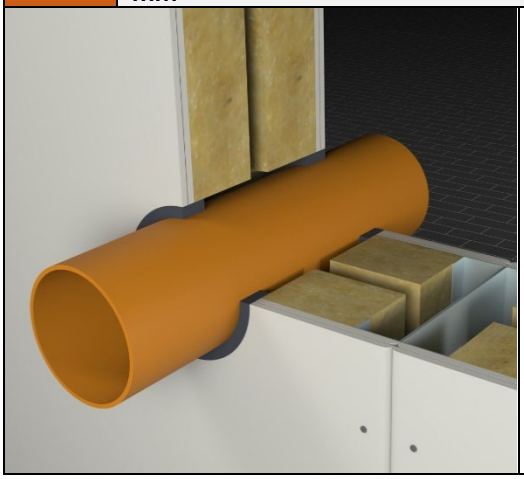
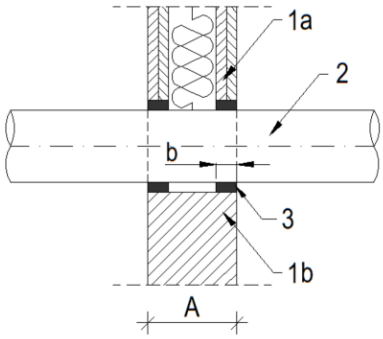
➔ SOLUTION DETAILS

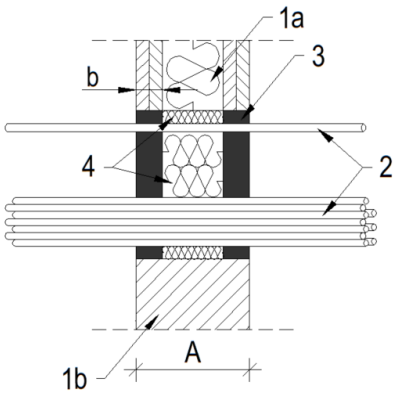
Fig.1 Combustible pipes penetration seals with single row of band in flexible or rigid wall with thickness A ≥ 100 mm





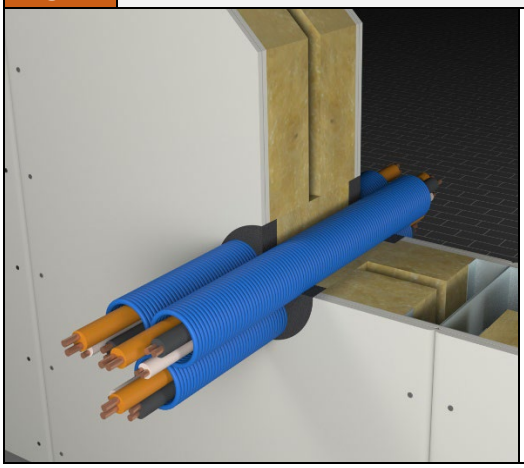
1a - flexible wall, thickn. A ≥ 100 mm
1b - rigid wall, thickness A ≥100 mm
2 - INTU FR GRAPHITE sealant with minimum depth b ≥ 25 mm
3 – combustible pipe Ø ≤ 110 mm

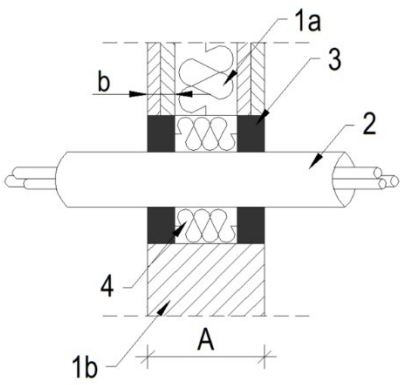
Fig.2 Electrical and mixed penetration seals in flexible or rigid wall with thickness A ≥ 100 mm



1a - flexible wall, thickn. A ≥ 100 mm
1b - rigid wall, thickness A ≥100 mm
2 - single cable $Ø_{CABLE}$ ≤ 21 mm or cables bundle $Ø_{BUNDLE}$ ≤ 100 mm, single type F cable, single coaxial wireless cable type Ø ≤ 22,23 mm
3 - INTU FR GRAPHITE sealant with minimum depth b ≥ 25 mm
4 - empty space filling with mineral wool with density ≥ 35 kg/m³

Fig.3 PVC (plastic) conduits with or without small cables in flexible or rigid wall with thickness A ≥ 100 mm





1a - flexible wall, thickn. A ≥ 100 mm
1b - rigid wall, thickness A ≥100 mm
2 - plastic protective pipe PVC $Ø_{CONDUIT}$ ≤ 37 mm empty or with small cable $Ø_{CABLE}$ ≤ 21 mm / bundle of cables $Ø^{BUNDLE}$ ≤ $Ø_{CONDUIT}$
3 - INTU FR GRAPHITE sealant with minimum depth b ≥ 25 mm
4 - empty space filling with mineral wool with density ≥ 35 kg/m³

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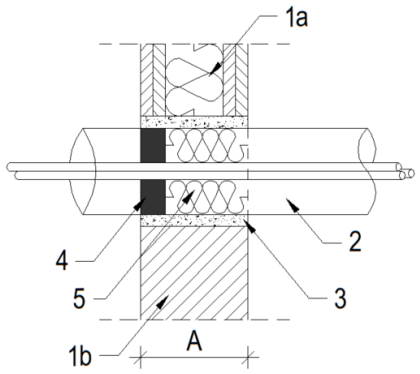
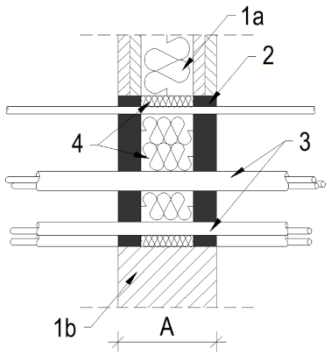
Fig.4 Plastic conduits (AROT DVK) with or without small cables in flexible or rigid wall with thickness A ≥ 100 mm



1a - rigid wall, thickness A ≥ 100 mm
1b - flexible wall, thickness A ≥100 mm
2 - single cable $Ø_{CABLE}$ ≤ 21 mm / bundle of cables in a protective pipe $ØB_{UNDLE}$ ≤ $Ø_{CONDUIT}$ / empty plastic conduit $Ø_{CONDUIT}$ ≤ 100 mm
3 - cement mortar
4 - INTU FR GRAPHITE sealant minimum depth ≥ 25mm, applied on one any side
5 - mineral wool with density ≥ 35 kg/m³

Fig.5 PVC (plastic) conduits with or without small cables

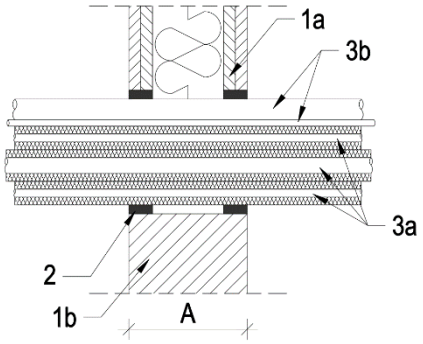


1a - flexible wall, A ≥ 100 mm
1b - rigid wall, A ≥100 mm
2 - INTU FR GRAPHITE sealant min. depth ≥ 25mm, applied on both sides of the partition

3 – cable or bundle of cables in a protective pipe

4 – filling empty space with mineral wool with density ≥ 35 kg/m³

Fig.6 Mixed bundle penetration seals

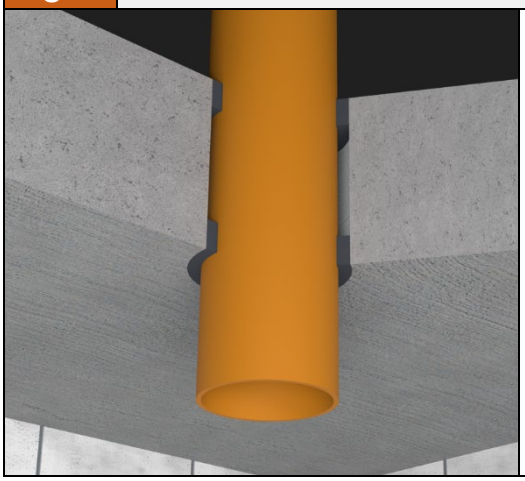


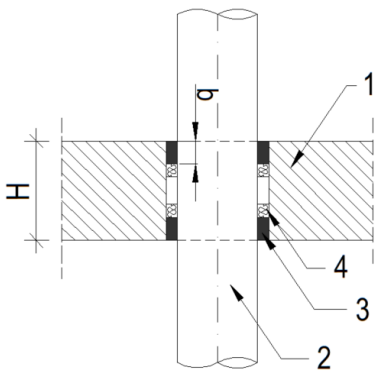
Air conditioning installation bundle:

3a – in FEF insulation: max. 3 x copper pipe, in PE insulation: max. 8 x copper pipe,

3b – with copper in FEF: 1 x PVC pipe and 1 x cable with copper in PE: 2 x PVC pipe and 2 x cable

Fig.7 Combustible pipes penetration seals in rigid floor with thickness A ≥ 150 mm and density ρ ≥ 550 kg/m3





1 – rigid floor H ≥ 150 mm
2 – combustible pipe
3 - INTU FR GRAPHITE sealant with minimum depth b ≥ 25 mm, applied on both sides of the floor
4 – mineral wool (density ≥ 35 kg/m³), material depth ≥ 15 mm.

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