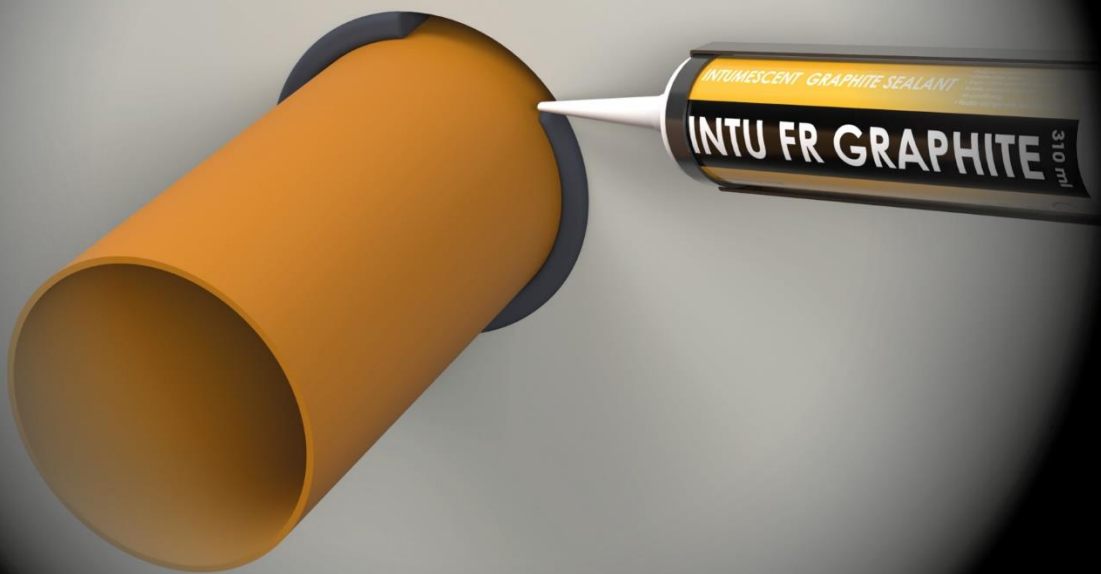


INTU FR GRAPHITE

Intumescent graphite sealant

TDS Technical Data Sheet



INTU FR GRAPHITE

Intumescent graphite sealant

Technical Data Sheet

INTUSEAL®
passive fire protection manufacturer

→ PRODUCT DESCRIPTION

The **INTU FR GRAPHITE** is an insulating and intumescent mass based on graphite, designed for fire resistant sealing of combustible pipes as well as small and medium-sized openings. The types of service penetrations that can be sealed with **INTU FR GRAPHITE** are: electrical cables, coaxial cables, fibre-optic cables, bundles of copper pipes for air conditioning. The mass effectively fills the gaps around the service penetration, ensuring that the partition maintains the integrity and insulation with a fire resistance class up to EI120 (details according to the referential documents). Under a high temperature (about 140°C), the mass swells and closes the opening, preventing the spread of fire.

→ APPLICATION

INTU FR GRAPHITE - an intumescent sealing mass is used for fire protection of penetrations of plastic pipes, electrical cables, coaxial cables, opt fibre cables that are led in casing pipes or without them. Fire protection of:

- combustible pipes diameter of $\varnothing \leq 110\text{mm}$
- steel pipes diameter $\varnothing \leq 16\text{mm}$
- single cables diameter $\varnothing \leq 21\text{mm}$, cable bundles, fibre optics in casing pipes diameter $\varnothing \leq 37\text{mm}$
- cables in AROT type pipes up to $\varnothing 110\text{ mm}$ diameter
- bundles of copper pipes for air conditioning
- perfect for installation in hard -to-reach places
- sealing of irregularly shaped penetrations
- sealing of penetrations without service installations

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. 600 kg/m³.

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/m³.

→ AVAILABILITY

Contents	Mass colour	Box	Pallet	Article number
310 ml	Black	15	1260	INFRG310

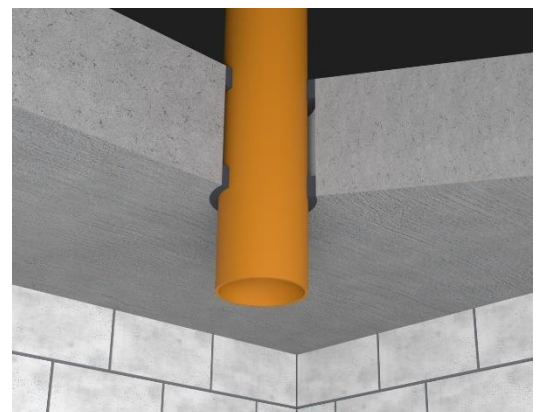
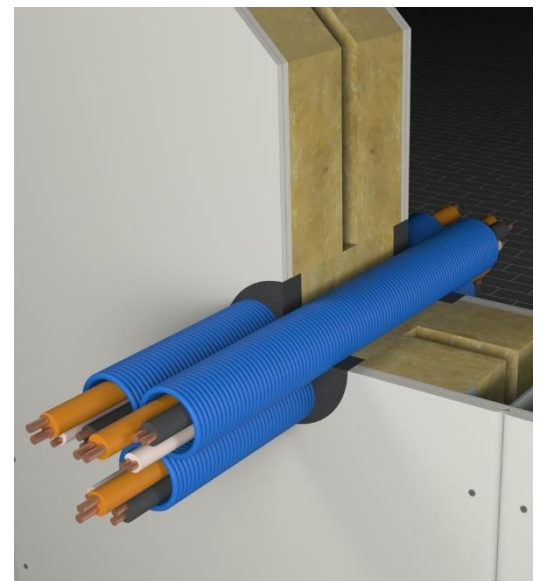
→ APPLICATION CONDITIONS

- Application temperature range: od +5 °C do +40 °C
- Do not use INTU FR GRAPHITE mass if the ambient temperature is below 5°C
- Curing time: ≈ 1mm / 24h

→ TRANSPORT AND STORAGE

Store in dry and cool conditions, at a temperature between +5°C to +25°C.

Usefulness 12 months from the date of production placed on the package.



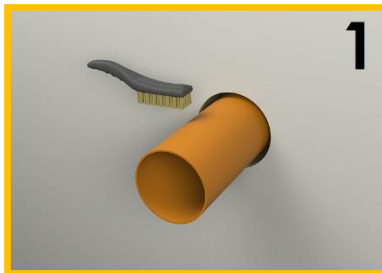
→ COMPLIANCE

- Reference standard: EN 1366-3 / EAD 350454-00-1104
- TDS

→ INSTALLATION METHOD

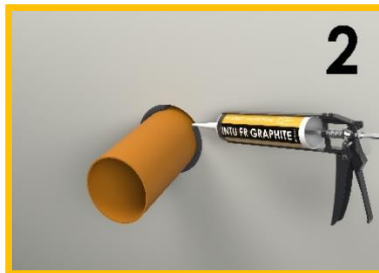
1. PREPARATION

Before applying the mass, clean the surfaces of grease and other contaminants. The mass should not be used on substrates that produce oils, softeners or solvents.



2. APPLICATION

Fill the gap with **INTU FR GRAPHITE** mass on 25 mm depth (according to the technical tables and solution details below).



3. FINISH

At the end line up the surface of the mass.



→ CONSUMPTION

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%
	Mass consumption*			
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		
Ø pipe (mm)	Ø hole (mm)	Mass consumption*
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

* quantity of packages of mass (310 ml) when filled to a depth of 25 mm (on both sides)

→ FIRE RESISTANCE CLASSIFICATION for BUNDLES

Insulation type	Penetration seals in flexible/ rigid WALL	EI class	Depth of mass [mm]	Penetration seals in flexible/ rigid WALL	Max hole dimensions / Max hole	EI class	Depth of mass [mm]
PE 9 mm	Copper pipe in PE insulation (2x1/2" + 1x7/8" + cable 4x1,5mm ² + PVC Ø25 mm)	60	25	1) coaxial cables, optical fibres, single cables: Ø ≤ 21mm 2) bundles of cables: Ø ≤ 100mm 3) steel pipes Ø ≤ 16mm 4) PVC pipes Ø ≤ 37mm (empty or with cables)	15 x 15 cm / 225 cm ²	120	25mm
FEF 13 mm	Copper pipe in FEF insulation (2x1/2" + 1x7/8" + cable 4x1,5mm ² + PVC Ø25mm)	120	25				
				Cables Ø ≤ 21mm or cable bundles in AROT pipe Ø ≤ 110mm	Open around of AROT pipe	90 / 120	25mm*

* mass applied on one side of the wall, inside plastic conduit

➔ FIRE RESISTANCE CLASSIFICATION for COMBUSTIBLE PIPES in WALLS

COMBUSTIBLE PIPES in flexible / rigid WALLS with a minimum thickness of 100mm (mass applied on both sides)					
Type of pipe	Configuration	Diameter	Wall thickness of pipe [mm]		EI class
PP	U/C	50 mm	1,8		EI 120
PP	U/C	75 mm	1,9	12,5	EI 120
PP	U/C	110 mm	2,7	18,3	EI 120
PVC-U	U/C	32 mm	32	1,5	EI 120
PVC-U	U/C	75 mm	1,8	5,6	EI 120
PVC-U	U/C	110 mm	2	8,1	EI 90 EI 120
HDPE	U/C	32 mm	1,8		EI 120
HDPE	U/C	75 mm	3	6,8	EI 120
HDPE	U/C	110 mm	4,2	10,0	EI 60 EI 90
PP-R	U/C	20 mm	2,3	3,4	EI 120
PP-R	U/C	75 mm	6,8	12,5	EI 120
PP-R	U/C	110 mm	10	18,3	EI 120 EI 60
PP-R/Al/PP-R	U/C	20 mm	2,8	3,4	EI 120
PP-R/Al/PP-R	U/C	75 mm	10,3	12,5	EI 120
PP-R/Al/PP-R	U/C	110 mm	15,1	18,3	EI 60 EI 120
PP-R/PP-RGF/PP-R	U/C	20 mm	2,8	3,4	EI 120
PP-R/PP-RGF/PP-R	U/C	75 mm	10,3	12,5	EI 120
PP-R/PP-RGF/PP-R	U/C	110 mm	15,1	18,3	EI 120
PE-X / Al / PE-X	U/C	20 mm	2		EI 120
PE-X / Al / PE-X	U/C	63 mm	6		EI 120
PE-RT/Al/PE-RT	U/C	20 mm	2		EI 120
PE-RT/Al/PE-RT	U/C	63 mm	6		EI 120
PE-RT/Al/PE-RT	U/C	75 mm	7,5		EI 90, E 120
PE-Xa	U/C	20 mm	2		EI 120
PE-Xa	U/C	63 mm	5,8		EI 120
CPVC (NIBCO, VIKING)	U/C	3/4"	2,24		EI 120
CPVC (NIBCO, VIKING)	U/C	1"	2,27		EI 120
CPVC (NIBCO, VIKING)	U/C	1 1/4"	3,38		EI 120
CPVC (NIBCO, VIKING)	U/C	1 1/2"	3,84		EI 90

➔ FIRE RESISTANCE CLASSIFICATION for COMBUSTIBLE PIPES in FLOORS

COMBUSTIBLE PIPES in rigid FLOOR min. 150mm thickness (mass applied on both sides)					
Type of pipe	Configuration	Diameter	Wall thickness of pipe (mm)		EI class
PP	U/C	50 mm	1,8		EI 120
PP	U/C	75 mm	1,9	12,5	EI 120
PP	U/C	110 mm	2,7	18,3	EI 120
PVC-U	U/C	32 mm	32	1,5	EI 120
PVC-U	U/C	75 mm	1,8	5,6	EI 120
PVC-U	U/C	110 mm	2	8,1	EI 120
HDPE	U/C	32 mm	32	1,8	EI 120
HDPE	U/C	75 mm	3	6,8	EI 120
HDPE	U/C	110 mm	4,2	10	EI 120
PP-R	U/C	20 mm	2,3	3,4	EI 120
PP-R	U/C	75 mm	6,8	12,5	EI 120
PP-R	U/C	110 mm	10	18,3	EI 120

COMBUSTIBLE PIPES in rigid FLOOR min. 150mm thickness (mass applied on both sides)					
Type of pipe	Configuration	Diameter	Wall thickness of pipe (mm)		El class
PP-R/Al/PP-R	U/C	20 mm	2,8	3,4	EI 120
PP-R/Al/PP-R	U/C	75 mm	10,3	12,5	EI 120
PP-R/Al/PP-R	U/C	110 mm	15,1	18,3	EI 120
PP-R/PP-RGF/PP-R	U/C	20 mm	2,8	3,4	EI 120
PP-R/PP-RGF/PP-R	U/C	75 mm	10,3	12,5	EI 120
PP-R/PP-RGF/PP-R	U/C	110 mm	15,1	18,3	EI 120
PE-X / Al / PE-X	U/C	20 mm	2		EI 120
PE-X / Al / PE-X	U/C	63 mm	6		EI 120
PE-RT/Al/PE-RT	U/C	20 mm	2		EI 120
PE-RT/Al/PE-RT	U/C	63 mm	6		EI 120
PE-RT/Al/PE-RT	U/C	75 mm	7,5		EI 120
PE-Xa	U/C	20 mm	2		EI 120
PE-Xa	U/C	63 mm	5,8		EI 120

➔ SOLUTION DETAILS

STEEL PIPE penetration seal in wall

Fig.1 Penetration seals in wall A ≥ 100mm

1a - rigid wall, thickness A ≥ 100 mm
1b - flexible wall, thickn. A ≥ 100 mm
2 - INTU FR GRAPHITE sealant
 (width ≥ 10mm, depth ≥ 25mm)
3 - steel pipe Ø ≤ 16 mm
4 - mineral wool with density ≥ 35 kg/m³

COMBUSTIBLE PIPE penetration seal in wall

Fig.2 Penetration seals in wall A ≥ 100mm

1a - rigid wall, thickness A ≥ 100 mm
1b - flexible wall, thickn. A ≥ 100 mm
2 - INTU FR GRAPHITE sealant
 (width ≥ 10mm, depth ≥ 25mm)
3 - combustible pipe Ø ≤ 110 mm

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COMBUSTIBLE PIPE penetration seal in floor

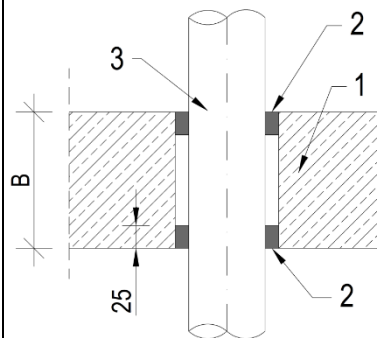
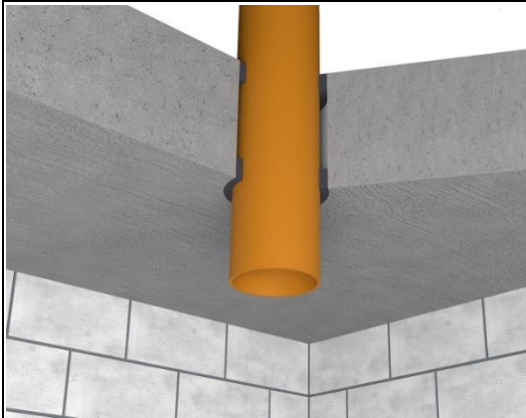


Fig.3 Penetration seals in rigid floor
 $B \geq 150$ mm

- 1 - rigid floor, thickness of $B \geq 150$ mm
- 2 - INTU FR GRAPHITE sealant
(width ≥ 10 mm, depth ≥ 25 mm)
- 3 - combustibile pipe $\varnothing \leq 110$ mm

ELECTRICAL CABLE penetration seal in wall

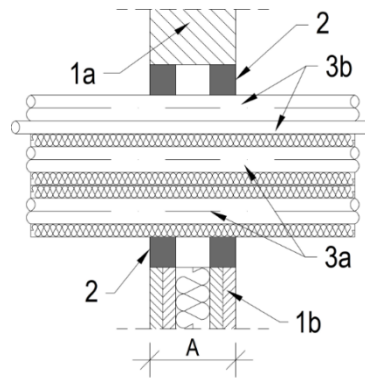


Fig.4 Penetration in wall $A \geq 100$ mm

- 1a - rigid wall, thickness $A \geq 100$ mm
- 1b - flexible wall, thickn. $A \geq 100$ mm
- 2 - INTU FR GRAPHITE sealant
(width ≥ 10 mm, depth ≥ 25 mm)

Air conditioning installation bundle:

3a - 2 x 1/2" x 0,8 mm and 1 x 1-1/8" x 1,0 mm copper pipe in PE or FEF insulation

3b - PVC pipe, 4 x 1,5mm² cable

ELECTRICAL CABLE penetration seal in floor

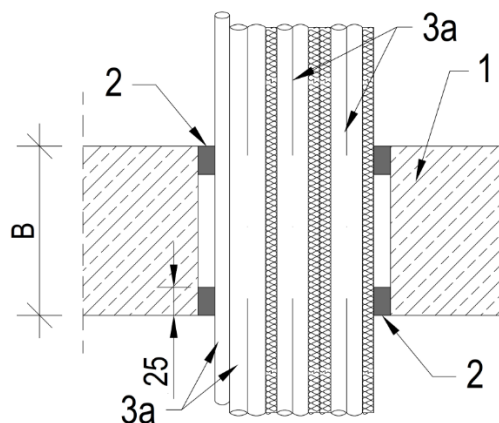


Fig.5 Penetration in rigid floor $B \geq 150$ mm

- 1a - rigid wall, thickness $A \geq 100$ mm
- 1b - flexible wall, thickn. $A \geq 100$ mm
- 1 - rigid floor, thickness of $B \geq 150$ mm
- 2 - INTU FR GRAPHITE sealant
(width ≥ 10 mm, depth ≥ 25 mm)

Air conditioning installation bundle:

3a - 2 x 1/2" x 0,8 mm and 1 x 1-1/8" x 1,0 mm copper pipe in PE or FEF insulation

3b - PVC pipe, 4 x 1,5mm² cable

ELECTRICAL CABLE penetration seal in wall

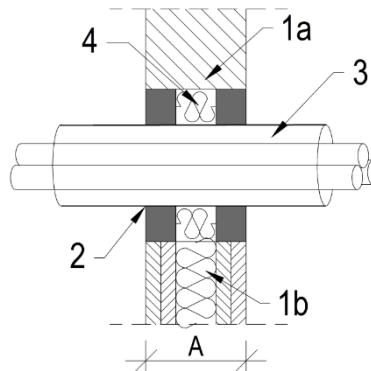
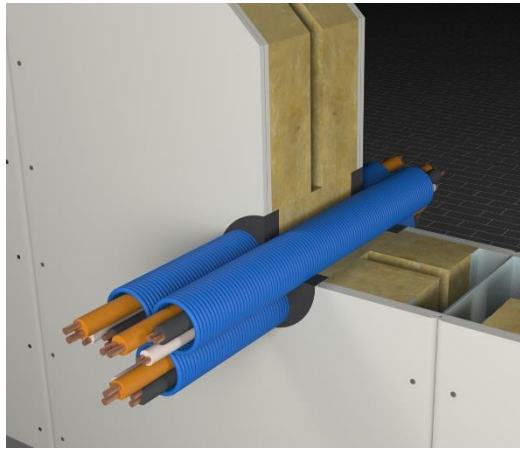


Fig.6 Electrical cable in casting pipe penetration seals in wall $A \geq 100$ mm

- 1a - rigid wall, thickness $A \geq 100$ mm
- 1b - flexible wall, thickn. $A \geq 100$ mm
- 2 - INTU FR GRAPHITE sealant (width ≥ 10 mm, depth ≥ 25 mm)
- 3 - width of cables in a protective pipe / single cable / bundle of cables
- 4 - mineral wool with density ≥ 35 kg/m³

ELECTRICAL CABLE penetration seal in wall

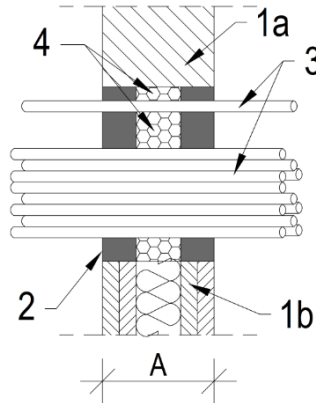


Fig.7 Electrical cable in gaps: area ≤ 225 cm² or max. 150x150mm wall $A \geq 100$ mm

- 1a - rigid wall, thickness $A \geq 100$ mm
- 1b - flexible wall, thickn. $A \geq 100$ mm
- 2 - INTU FR GRAPHITE sealant (width ≥ 10 mm, depth ≥ 25 mm)
- 3 - bundle of cables in a protective pipe / single cable / bundle of cables
- 4 - mineral wool with density ≥ 35 kg/m³

ELECTRICAL CABLE penetration

Fig.8 Electrical cable in casting pipes penetration seals in gaps: area ≤ 225 cm² or max. 150x150mm, wall $A \geq 100$ mm

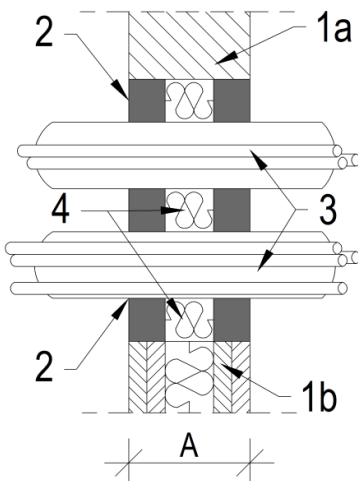
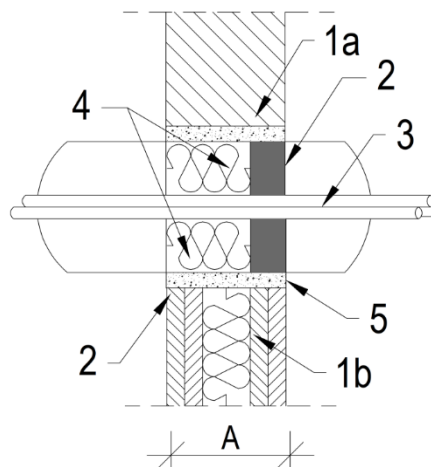


Fig.9 Electrical cable in AROT type pipe penetration seals in wall $A \geq 100$ mm



- 1a - rigid wall, thickness $A \geq 100$ mm
- 1b - flexible wall, thickn. $A \geq 100$ mm
- 2 - INTU FR GRAPHITE sealant (width ≥ 10 mm, depth ≥ 25 mm)
- 3 - (fig.8) single cable / bundle of cables in a protective pipe / empty combustible pipe or (Fig.9) bundle of cables in AROT pipe
- 4 - mineral wool with density ≥ 35 kg/m³
- 5 - (fig.9) cement mortar

Fig.9 The INTU FR GRAPHITE sealant dosage from any one side.