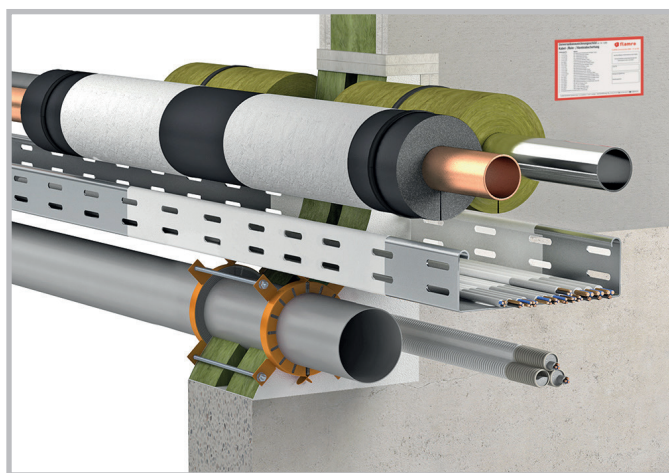


Assembly Instruction

FLAMRO Multi Combi Seal EN

according to ETA-13/0756



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Target audience

This assembly instruction is addressed exclusively to trained experts on fire technology.

Usage of assembly instruction

- Please read through the lot of this assembly instruction carefully prior to work start. Regard in particular the following safety information.
- The holder of assessment assumes no liability for damages which are caused by disregard for this assembly instruction.
- Graphic depictions serve as examples only. Assembly results may vary visually.





Safety information

For processing of partition components, please regard the safety data sheets.



Protection and hygiene measures:

- Observe the usual precautions when handling chemicals. Wash hands before work breaks and immediately after handling the product. Avoid contact with skin, eyes and clothing. Take off stained or soaked clothes or soaked clothes immediately.
- Eye wash with clean water (EN 15154).
Wear closed work clothing.

	Respiratory protection - Dust mask When exposure limit is exceeded (e.g. possible when turning on), use particle-filtering half mask FFP 1 (white).
	Hand protection - Protective gloves Use waterproof, abrasion- and alkali-resistant nitrile gloves. Different requirements can result depending on application. Therefore observe additional recommendations by the protective gloves' manufacturer.
	Eye protection – Use safety goggles
	Body protection – Use protective work wear

Safety information for installation of floor partitions

- The area beneath the floor partition is to be blocked during construction work and during cure time (28 days) (barrier tape and warning sign: beware of potentially falling object, do not enter this area, construction work in floor component opening).
- The contractor for the manufacture of floor insulations must inform the client in writing (for onward transmission to the building contractor or his representative), that fire protection insulation in floors must be secured with appropriate measures against burdens, especially the entering by trespassers (e.g. through fencing or grating covers).

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Components

Rigid walls:

The wall must have a minimum thickness of ≥ 122 mm and consist of concrete, aerated concrete or masonry. For its fire resistant class It has to be classified according to EN 13501 - 2 .

Light partition walls:

Light partition walls must have a minimum thickness of ≥ 122 mm and consist of steel stands (U- and C- Profiles; 0,5 - 1,5 mm thickness) that are covered on both sides with a minimum of 2 layers 15,0 mm or 3 layers 12,5 mm thick panels and the classification A2-s1, d0 or A1 according to EN 13501-1.

It is also allowed to use wood stands. There has to be a gap of min. 100 mm between the wood stands and the seal. The insulation between the stands has to have at least the building material class A1 or A2 (according to EN 13501-1) and minimum raw density of 85 - 115 kg/m³ (according to EN 1363-1).

The reveal cover has to be made of steel stands with a minimum thickness of 0,6 mm and panels with the same specifications as the wall.

The supporting construction has to be classified according to EN 13501-2 to determine the fire resistant duration.

The necessary technical fire protection measures are explained on the following pages and applies to subsequent installations as well.

Rigid floors:

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

For its fire resistant duration the floor has to be classified according to EN 13501 - 2 . Seals in floors have to be secured on the part of the building site against strains/access of guards or grid rots.

Application field

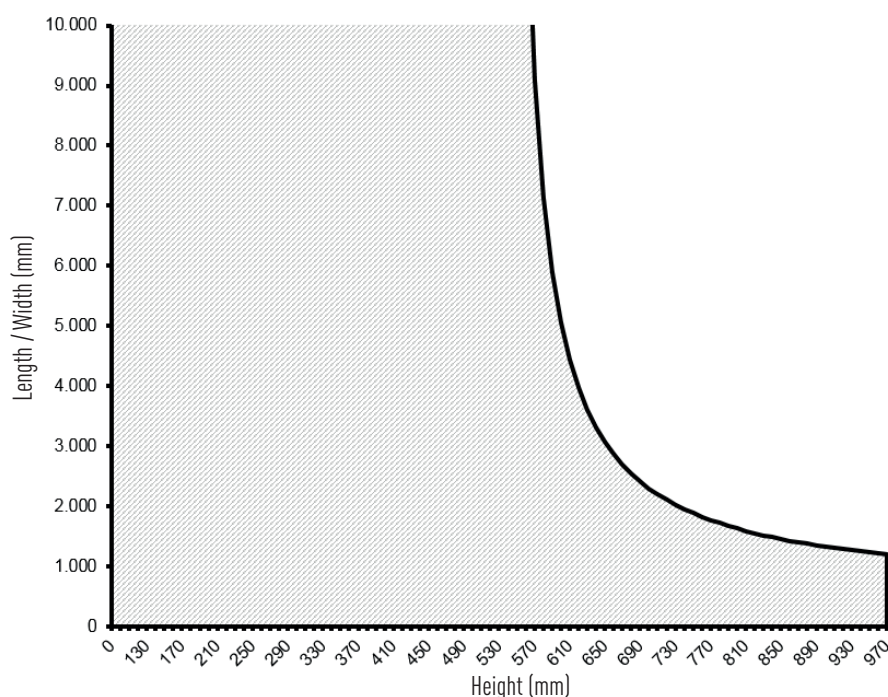
Identifier	Wall	Lightweight construction wall	Floor
Strength of building component	≥ 122 mm	≥ 122 mm	≥ 150 mm
Strength of seal	≥ 130 mm	≥ 130 mm	≥ 150 mm
Max. measures of building component opening (Width x Height)	970 x 1.250 mm or 1.250 x 970 mm	970 x 1.250 mm or 1.250 x 970 mm	≥ 100 mm
Distance to other openings and installations	200 mm	200 mm	200 mm

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Max. Measures of combi seal
„FLAMRO Multi Combi Seal EN“
in rigid floors



The maximum height of the seal in rigid floors is 970 mm.

The maximum length (width) of the seal in rigid floors has to be calculated as the following:

$$\text{Length (width)} = \frac{\text{Height}}{((c_{\text{gepr.}} / 2) * \text{Height}) - 1}$$

$$c_{\text{gepr.}} = \frac{\text{Extent}_{\text{gepr.}}}{\text{Surface of seal}_{\text{gepr.}}} = 3.729 \text{ m/m}^2; \text{ or } 0.003729 \text{ mm/mm}^2$$

The minimal relation of surface to opening in rigid floors is 3.729 m/m², or 0.003729 mm/mm².

$c_{\text{gepr.}}$ was calculated based on the measures of the approved seal (1200 mm x 970 mm).

The surface on the left side of diagram gives an overview on all possible combinations of length (width) and height where the minimum relation of surface to extent is $\geq c_{\text{gepr.}}$. At a length (width) of for example 1200 mm the height allowed is 970 mm; At a length (width) of for example 2300 mm the height allowed is 700 mm. At a height smaller than 724 mm there are no limitation in length (width).

Note: The dimensions of the diagram are not accurate (Source: DIN EN 1366-3)

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Approved assignments and classifications

Cable

Assignment	Additional fire protection measures	E	I	Pipe end configuration
All cable types $\varnothing \leq 80$ mm	All cable trays / cable ladders (Floor and Side), Cable and electric installation pipes / pipes have to be coated with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ on a length of ≥ 250 mm (measured on surface of the seal) of the seal and result in a thickness of ≥ 2 mm (dry film thickness) and in the conduct area (area between and under the mineral wool panels) a thickness of ≥ 3 mm (total dry film thickness).	120	90	-
Cable bundles up to $\varnothing \leq 100$ mm with single cables $\varnothing \leq 21$ mm		120	120	-
Conduits made of plastic or steel $\varnothing \leq 16$ mm	All electric installation pipes / pipes or the annular gap between the cable(s) and the electric installation pipes / pipes have to be sealed on both sides of the seal with „FLAMRO BMS“ / „FLAMRO BMK“ (unoccupied electric installation pipes / pipes have to be sealed with „FLAMRO BMS“ / „FLAMRO BMK“).	120	120	C/C
Bundle of up to 3 electric installation pipes made of steel (with / without cable occupation)*		120	120	C/C
Bundle of up to 3 electric installation pipes made of plastic (with / without cable occupation)**	Bundles of electric installation pipes made of plastic only have to be equipped with one layer of „FLAMRO UBB“ (stripe thickness 2mm, two stripes with a width of ≥ 65 mm or one stripe with a width of ≥ 130 mm), which lays inside and is installed on the level with the seal and if necessary additionally fixated with plastic cable straps or steel wire.	120	120	C/C

*Electric installation pipes according to EN 61386-21 with $\varnothing 16$ mm to 25 mm, wall thickness ≥ 0.9 mm (für $\varnothing \leq 20$ mm) or ≥ 1.0 mm (für $\varnothing 25$ mm) and electric installation pipes according to EN 61386-22 with $\varnothing 16$ mm to 25 mm, wall thickness ≥ 1.24 mm

**Electric installation pipes according to EN 61386-21 with $\varnothing 16$ mm to 25 mm, wall thickness 1.8 mm to 2.2 mm (on Polyolefinen) or 0.6 mm to 0.7 mm (on PVC-U) and electric installation pipes according to EN 61386-22 with $\varnothing 16$ mm to 25 mm, wall thickness 0.2 mm (on Polyolefinen) or 0.15 mm (on PVC-U)

Assembly Instruction

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Assignment	Additional fire protection measures	E	I	Pipe end configuration
All cable types $\varnothing \leq 80$ mm	All cable trays / cable ladders (Floor and Side), Cable and electric installation pipes / pipes have to be coated with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ on a length of ≥ 250 mm (measured on surface of the seal) of the seal and result in a thickness of ≥ 2 mm (dry film thickness) and in the conduct area (area between and under the mineral wool panels) a thickness of ≥ 3 mm (total dry film thickness).	120	120	-
Cable bundles to $\varnothing \leq 100$ mm with single cables $\varnothing \leq 21$ mm		120	120	-
Conduits made of plastic or steel $\varnothing \leq 16$ mm with / without occupation	All electric installation pipes / pipes or the annular gap between the cable(s) and the electric installation pipes / pipes have to be sealed on both sides of the seal with „FLAMRO BMS“ / „FLAMRO BMK“ (unoccupied electric installation pipes / pipes have to be sealed with „FLAMRO BMS“ / „FLAMRO BMK“).	120	120	C/C
Bundle of up to 3 electric installation pipes made of steel (with / without cable occupation)*		120	120	C/C
Bundle of up to 3 electric installation pipes made of plastic (with / without cable occupation)**	Bundles of electric installation pipes made of plastic only have to be equipped with one layer of „FLAMRO UBB“ (stripe thickness 2mm, two stripes with a width of ≥ 65 mm or one stripe with a width of ≥ 130 mm), which lays inside and is installed level with the seal and if necessary additionally fixated with plastic cable straps or steel wire.	120	120	C/C

*Electric installation pipes according to EN 61386-21 with $\varnothing 16$ mm to 25 mm, wall thickness ≥ 0.9 mm (for $\varnothing \leq 20$ mm) or ≥ 1.0 mm (for $\varnothing 25$ mm) and electric installation pipes according to EN 61386-22 with $\varnothing 16$ mm to 25 mm, wall thickness ≥ 1.24 mm

**Electric installation pipes according to EN 61386-21 with $\varnothing 16$ mm to 25 mm, wall thickness 1.8 mm to 2.2 mm (bei Polyolefinen) or 0.6 mm to 0.7 mm (bei PVC-U) and electric installation pipes according to EN 61386-22 with $\varnothing 16$ mm to 25 mm, wall thickness 0.2 mm (on Polyolefinen) or 0.15 mm (on PVC-U)

Steel cable trays (punched or unpunched) or steel ladders can go through the seal or end on its surface.

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Combustible pipes

Combustible pipes - Wall -						
Raw material	Outer diameter [mm]	Wall thickness [mm]	Additional fire protection measures	E	I	Pipe end configuration
PVC-U R pipes	≤ 63	1.9 to 7.0	Wall: FLAMRO VARIANT N II A collar on both sides	120	120	U/U
	> 63 to 110	1.8 to 8.2				
	> 110 to 160	1.8 to 7.7				
PE-HD pipes	≤ 63	1.8 to 5.8				
	> 63 to 110	2.7 to 10,0				
	> 110 to 160	14.6				

Combustible pipes - Floor -						
Raw material	Outer diameter [mm]	Wall thickness [mm]	Additional fire protection measures	E	I	Pipe end configuration
PVC-U pipes	≤ 50	1.8 to 5.6	Floor: FLAMRO VARIANT N II A collar under floor	120	120	U/U
	> 50 to 75	1.8 to 8.2				
	> 75 to 90	1.8 to 10.0				
	> 90 to 110	1.8 to 12.3				
	> 110 to 160	3.2 to 11.9				
PE-HD pipes	≤ 50	1.8 to 4.6				
	> 50 to 75	2.7 to 6.7				
	> 75 to 90	2.7 to 8.1				
	> 90 to 110	2.7 to 10.0				
	> 110 to 160	4.0 to 14.6				

Combustible pipes - Wall + Floor -						
Raw material	Outer diameter [mm]	Wall thickness [mm]	„Armaflex Protect“*	E	I	Pipe end configuration
PVC-U	25	1.5 to 2.8	Length ≥ 2000 mm, continuous thickness 20 mm (Hose)	120	120	U/C
	32 to 75	1.8 to 5.6	Length ≥ 2000 mm, continuous thickness 25 mm (Hose)			
PE-HD	20 to 25	1.9 to 2.3	Length ≥ 2000 mm, continuous thickness 20 mm (Hose)			
	32 to 75	1.9 to 6.8	Length ≥ 2000 mm, continuous thickness 25 mm (Hose)			
PP	25	2,3	Length ≥ 2000 mm, continuous thickness 20 mm (Hose)			

* The hoses (Length ≥ 2000 mm on both sides of the seal, locally interrupted LI or continuously interrupted over the pipe length CI) have to be coated on both sides of the seal with a length of ≥ 100 mm (measured at surface of seal) with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ resulting in a thickness of ≥ 2 mm (dry film thickness).

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Non-combustible pipes

Non-combustible pipes - Wall -						
Raw material	Wave height [mm]		„Armaflex Protect“*	E	I	Pipe end configuration
Copper pipes	8	1.0 to 14.2	Length ≥ 2000 mm, continuous thickness 16 mm (Hose)	120	120	C/U
	> 8 to 15		Length ≥ 2000 mm, continuous thickness 19 mm (Hose)			
	> 15 to 25		Length ≥ 2000 mm, continuous thickness 20 mm (Hose)			
	> 25 to 88.9		Length ≥ 2000 mm, continuous thickness 25 mm (Hose)			
Steel pipes	8	1.0 to 14.2	Length ≥ 2000 mm, continuous thickness 16 mm (Hose)	120	120	C/U
	> 8 to 15		Length ≥ 2000 mm, continuous thickness 19 mm (Hose)			
	> 15 to 25		Length ≥ 2000 mm, continuous thickness 20 mm (Hose)			
	> 25 to 88.9		Length ≥ 2000 mm, continuous thickness 25 mm (Hose)			
	> 88.9 to 168.3	> 2.0 to 14.3	Length ≥ 2000 mm, continuous thickness 26 mm (2 x 13 mm panels)	120	90	

*The hoses or panels have to be coated on both sides of the seal with a length of ≥ 100 mm (measured at surface of seal) with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ resulting in a thickness of ≥ 2 mm (dry film thickness).

Assembly Instruction

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Non-combustible pipes - Floor -						
Raw material	Wave height [mm]		„Armaflex Protect“*	E	I	Pipe end configuration
Copper pipes	8	1.0 to 14.2	Length ≥ 2000 mm, continuous thickness 16 mm (Hose)	120	120	C/U
	> 8 to 15		Length ≥ 2000 mm, continuous thickness 19 mm (Hose)			
	> 15 to 25		Length ≥ 2000 mm, continuous thickness 20 mm (Hose)			
	> 28 to 88.9		Length ≥ 2000 mm, continuous thickness 25 mm (Hose)		90	
Steel pipes	8	1.0 to 14.2	Length ≥ 2000 mm, continuous thickness 16 mm (Hose)	120	120	C/U
	> 8 to 15		Length ≥ 2000 mm, continuous thickness 19 mm (Hose)			
	> 15 to 25		Length ≥ 2000 mm, continuous thickness 20 mm (Hose)			
	> 15 to 28		Length ≥ 2000 mm, continuous thickness 25 mm (Hose)			
	> 28 to 88.9		Length ≥ 2000 mm, continuous thickness 25 mm (Hose)			
	> 88.9 to 168.3	> 2.0 to 14.3	Length ≥ 2000 mm, continuous thickness 26 mm (2 x 13 mm panel)		90	

*The hoses or panels have to be coated on both sides of the seal with a length of ≥ 100 mm (measured at surface of seal) with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ resulting in a thickness of ≥ 2 mm (dry film thickness).

Non-combustible pipes - Wall + Floor-						
Raw material	Outer diameter [mm]	Wall thickness [mm]	Prefabricated pipe shell (e.g. „ProRox PS 960“ / „Rockwool 880“) *	E	I	Pipe end configuration
Copper pipes	25	1.0 to 14.2	Thickness 30 mm	120	120	C/U
	> 25 to 88.9		Thickness 40 mm			
Steel pipes	20 to 25	1.0 to 14.2	Thickness 30 mm			
	> 25 to 168.3		Thickness 40 mm			

*(Length ≥ 1000 mm on both sides of the seal, locally interrupted LI or continuously interrupted over the pipe length CI)

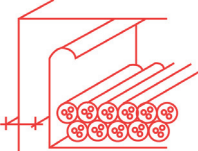
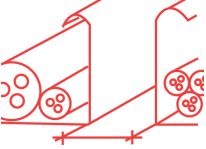
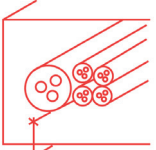
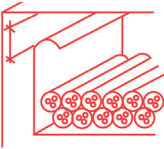

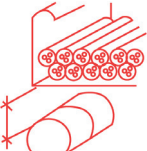

The prefabricated pipe shells have to be coated on both sides of the seal with a length of ≥ 100 mm (measured at surface of seal) with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ resulting in a thickness of ≥ 2 mm (dry film thickness).

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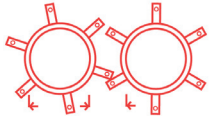
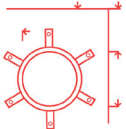

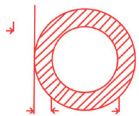
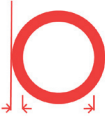
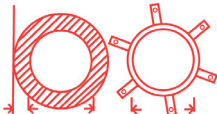


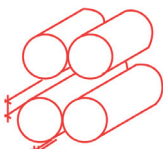
Distance regulations for rigid walls, light partition walls and floors

Cables / Cable bundles / Carrier construction	Distance	
	Lateral distance to building component reveal	≥ 0 mm
	Distance next to each other	≥ 0 mm
	Lower / back distance to building component reveal	≥ 0 mm
	Upper / front distance to building component reveal	≥ 41 mm (Wall) ≥ 25 mm (Floor)
	Distance between each other	≥ 60 mm
	Distance to combustible pipes	≥ 100 mm
	Distance to non-combustible pipes	≥ 100 mm measured from surface of pipes

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	Distance to combustible pipes	≥ 75 mm (Wall) ≥ 100 mm (Floor) measured from surface of pipes
	Distance of combustible pipes to building component reveal	≥ 50 mm (Wall) ≥ 55 mm (Floor) measured from surface of pipes
	Distance to combustible pipes	≥ 100 mm measured from surface of pipes
	Distance of combustible pipes to building component reveal	≥ 0 mm measured from surface of pipes
	Distance Armaflex Protect (combustible and non-combustible pipes) to building component reveal	≥ 0 mm measured from surface of pipes
	Distance from combustible to non-combustible pipes	≥ 100 mm measured from surface of pipes
	Distance of Armaflex Protect to prefabricated pipe shell (applies to combustible and non-combustible pipes)	≥ 100 mm measured from surface of pipes
	Distance of Armaflex Protect to Armaflex Protect insulated pipes	≥ 100 mm measured from surface of pipes
Control line made of steel or plastic		
	Distance next to each other	≥ 0 mm

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Applied Products

Image	Identifier	Art.-No.:
	FLAMRO BMA 1,0 kg 5,0 kg 12,5 kg	20010 20500 20125
	FLAMRO BMS / BMK 0,4 kg 1 kg Cartridge 1 kg 5 kg 12,5 kg	30004 30010 10010 10500 10125
	FLAMRO UBB 1.000 x 60 x 2 mm	90050
	FLAMRO BS 60-1	50060
	FLAMRO VARIANT N II A fire protection collar, to Ø 160 mm	
	Identification sign	14000

Assembly Instruction

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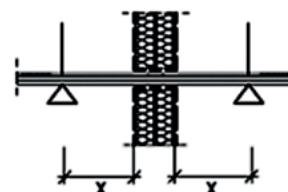
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Additional components	
Prefabricated raw shells	Prefabricated raw shells according to EN 14303 made of stone wool with classification A1 according to EN 13501-1, a nominal thickness of 130 kg/m ³ and a melting point of > 1000 °C according to DIN 4102-17 (e.g. „ProRox PS 960“ / „Rockwool 880“ by manufacturer „Deutsche Rockwool Mineralwoll GmbH & Co. OHG“)
Armaflex Protect	Closed cellular elastomer foam insulation in form of hoses and panels with intumescent fire protection additives with classification E according to EN 13501-1 – including „Armaflex Band self-adhesive“ and „Armaflex Glue 520“ – by manufacturer „Armacell GmbH“
Armaflex Band self-adhesive or product identical in construction	Closed cellular flexible elastomer foam insulation (FEF) in form of bands of a self-adhesive mechanism by manufacturer „Armacell GmbH“
Armaflex Glue 520 or product identical in construction	Glue on polychloropren basis, free of aromatic bonds (special glue for processing all flexible Armaflex insulation materials – excluding „HT/Armaflex“) by manufacturer „Armacell GmbH“

Arrangement of the first support (backings)

The supports / backing of the combustible pipes on walls / floors essential parts have to be non combustible and arranged with a distance according to the overview.

Installation	Wall	Floor
Cable trays	≤ 250 mm both sides	≤ 500 mm above
combustible pipes uninsulated	≤ 300 mm both sides	
combustible pipes insulated	≤ 400 mm both sides	
non combustible pipes	≤ 400 mm both sides	
electric installation pipes	≤ 250 mm both sides	



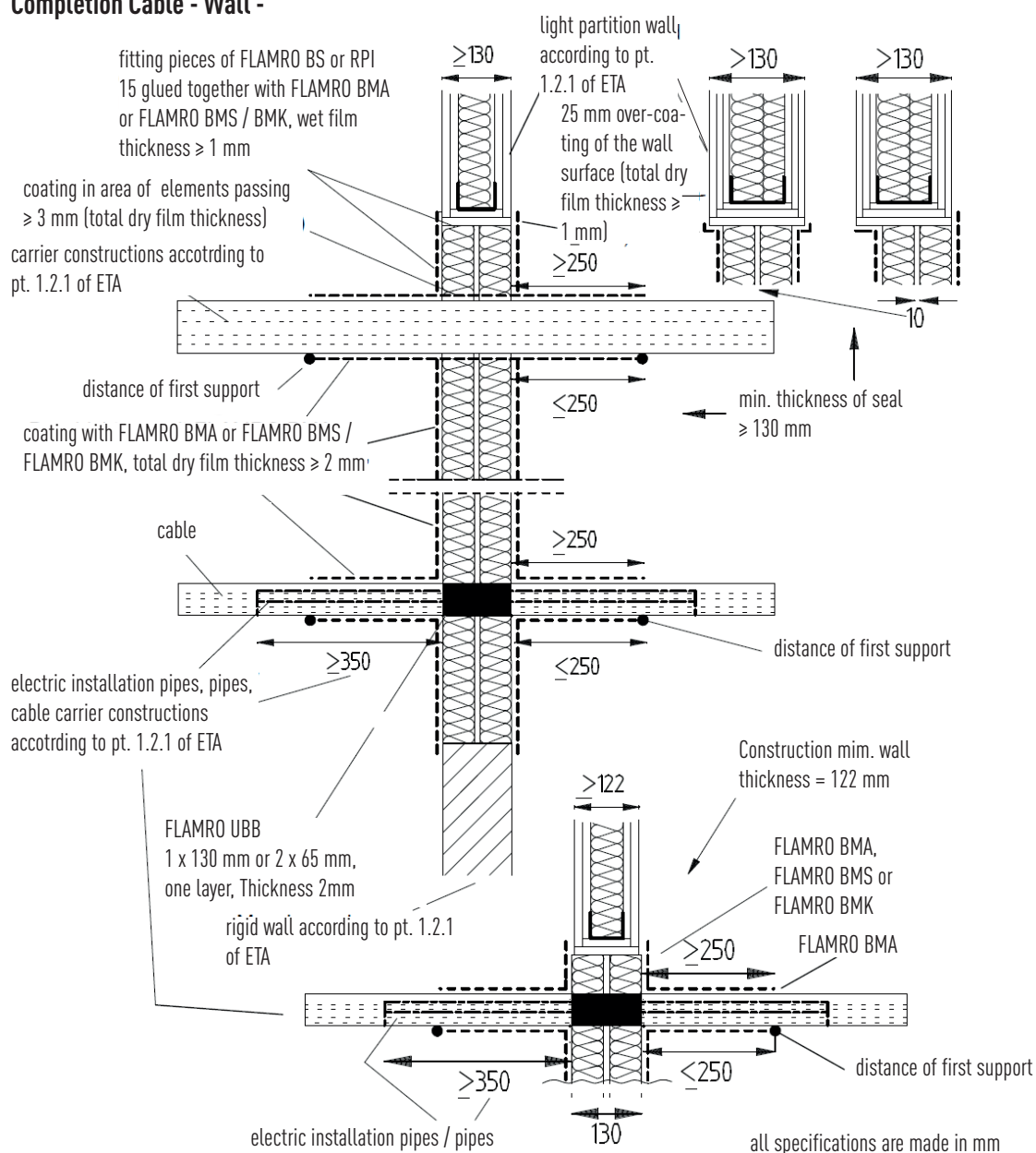
Assembly Instruction

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Fire protection measures in walls and floors

Completion Cable - Wall -



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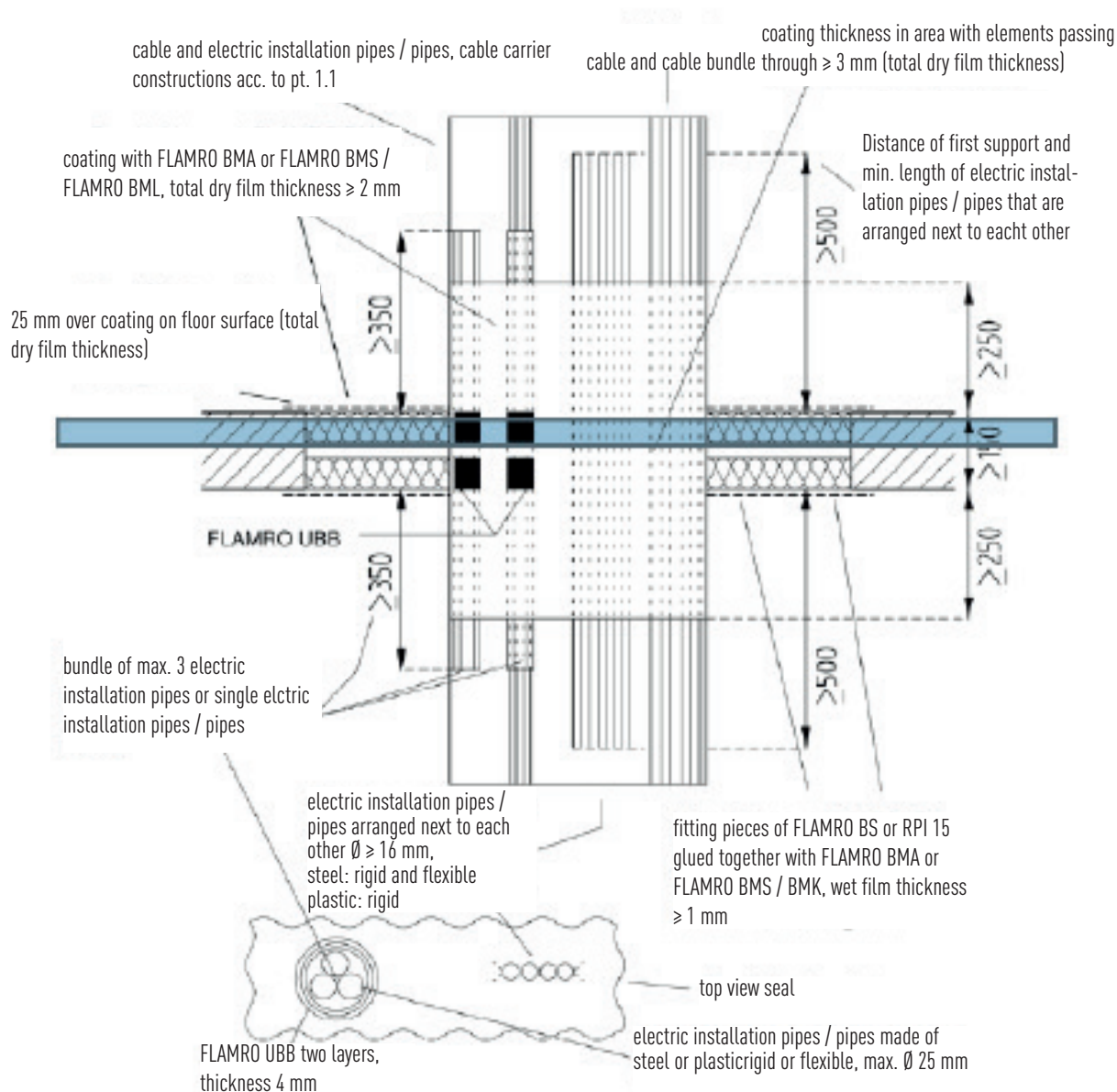
according to ETA-13/0756

- > All cable trays / Cable ladders (floor and sides), cables and electric installation pipes / pipes have to be coated on both sides of the seal on a length of ≥ 250 mm (measured on seal surface) with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ with a thickness of ≥ 2 mm (total dry film thickness) and in the area elements pass through (are below and between the mineral wool panels) with a thickness of ≥ 3 mm (total dry film thickness).
- > All electric installation pipes / pipes or annular gap between the cable (s) and the electric installation pipe / pipes have to be sealed on both sides of the seal with „FLAMRO BMS“ / „FLAMRO BMK“ (unoccupied electric installation pipes / pipes have to be sealed with „FLAMRO BMS“ / „FLAMRO BMK“).
- > Bundle of electric installation pipes made of plastic only have to be fixated with two layers of „FLAMRO UBB“ (Stripe thickness 2 mm, two stripes of ≥ 60 mm), which are placed inside, installed level with the seal and eventually fixated additionally with plastic cable straps or steel wire.

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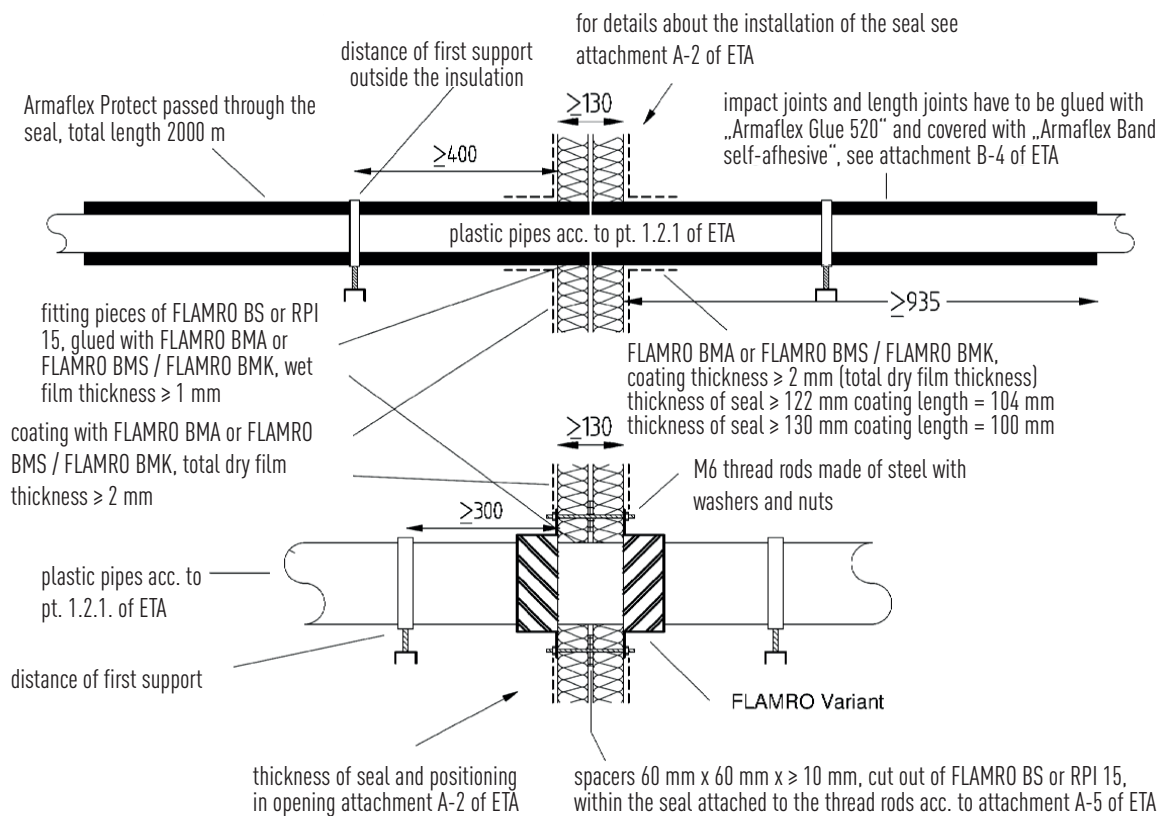
according to ETA-13/0756

- > All cable trays / Cable ladders (floor and sides), cables and electric installation pipes / pipes have to be coated on both sides of the seal on a length of ≥ 250 mm (measured on seal surface) with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ with a thickness of ≥ 2 mm (total dry film thickness) and in the area elements pass through (are below and between the mineral wool panels) with a thickness of ≥ 3 mm (total dry film thickness).
- > All electric installation pipes / pipes or annular gap between the cable (s) and the electric installation pipe / pipes have to be sealed on both sides of the seal with „FLAMRO BMS“ / „FLAMRO BMK“ (unoccupied electric installation pipes / pipes have to be sealed with „FLAMRO BMS“ / „FLAMRO BMK“).
- > Bundle of electric installation pipes made of plastic only have to be fixated with two layers of „FLAMRO UBB“ (Stripe thickness 2 mm, two stripes of ≥ 60 mm), which are placed inside, installed level with the seal and eventually fixated additionally with plastic cable straps or steel wire.

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all specifications are made in mm

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according to ETA-13/0756

Additional safety measures – Installation of „Armaflex Protect“:

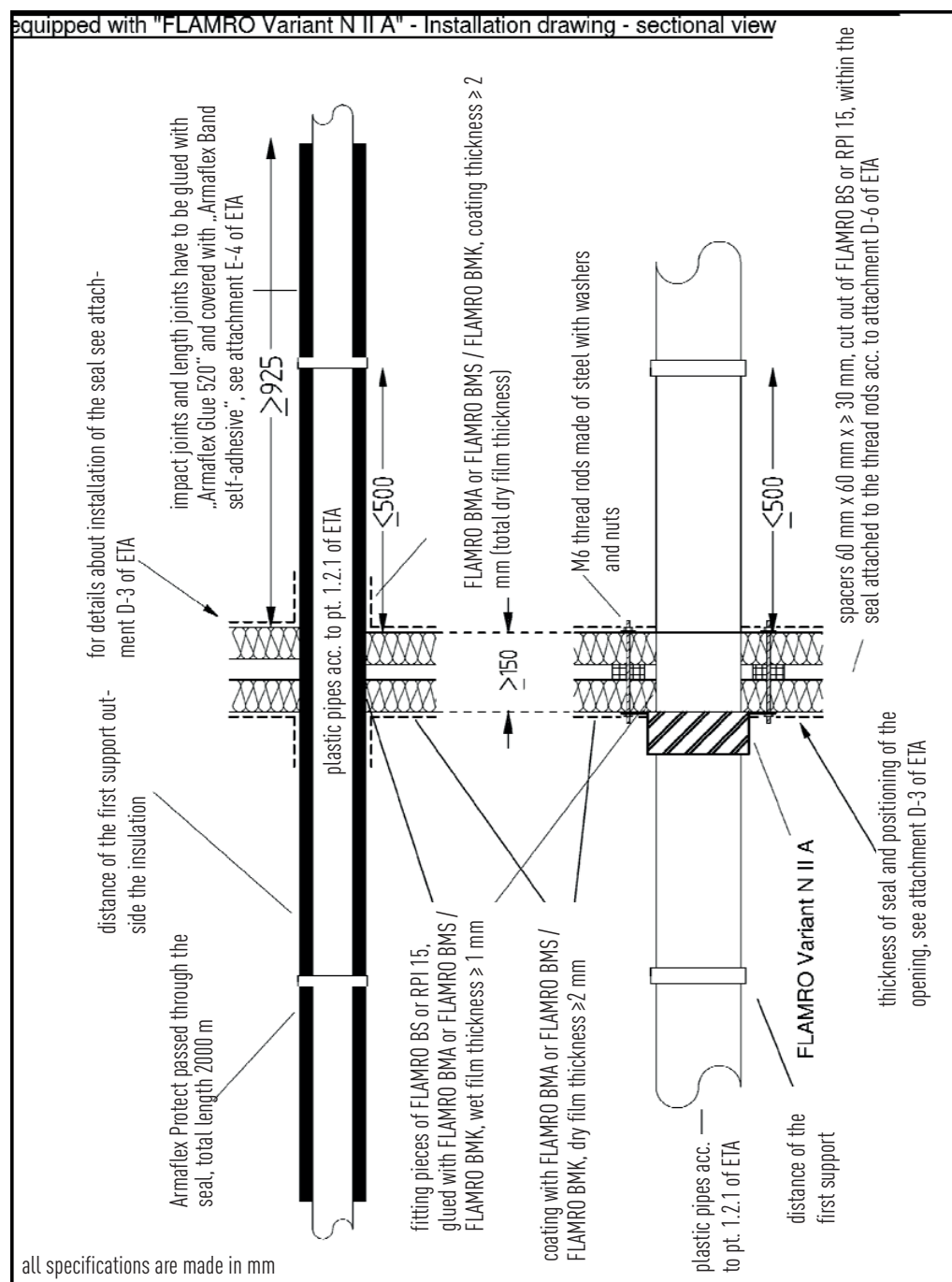
- > The hoses or panels of „Armaflex Protect“ with a total length of ≥ 2000 mm have to be installed centres in the seal.
- > The length of hoses and panels of „Armaflex Protect“ has to have ≥ 935 mm (measured on surface of the seal) on both sides of the seal.
- > When installing „Armaflex Protect“ all impact joints and length joints have to be glued with „Armaflex Glue 520“ and covered with „Armaflex Band self-adhesive“.
- > The applied ammount of „Armaflex Glue 520“ may not be more than 300 g/m^2 .
- > The measures of the stripe „Armaflex Band self-adhesive“ have to be $50 \text{ mm} \times 3 \text{ mm}$ (width x thickness).
- > The hose or the panel of „Armaflex Protect“ can be pasted along the necessary minimum insulation length (≥ 2000 mm) continuously or in the middle of the seal whereby the length of each of the two hoses or panels has to be ≥ 1000 mm.
- > In case of pipes with diameter ≤ 89 mm „Armaflex Protect“ has to be used as hose. The hose „Armaflex Protect“ can either be pulled over the pipe or cut and wrapped around the pipe and glued together on the longitudinal seam.
- > Junctions and pipe bends also have to be equipped with „Armaflex Protect“ along the necessary minimum insulation length.
- > The hoses and panels have to be coated on both sides of the seal with a length of ≥ 100 mm (measured on surface of the seal) with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ with a thickness of ≥ 2 mm (total dry film thickness).
- > Impact joints between „Armaflex Protect“ and other attached insulations can be glued together according to informations given by the manufacturer.

Assembly Instruction

FLAMRO Multi Combi Seal EN

according to ETA-13/0756

Completion combustible pipes - Floor -



Assembly Instruction

FLAMRO Multi Combi Seal EN

according to ETA-13/0756

Additional safety measures – Installation of „Armaflex Protect“:

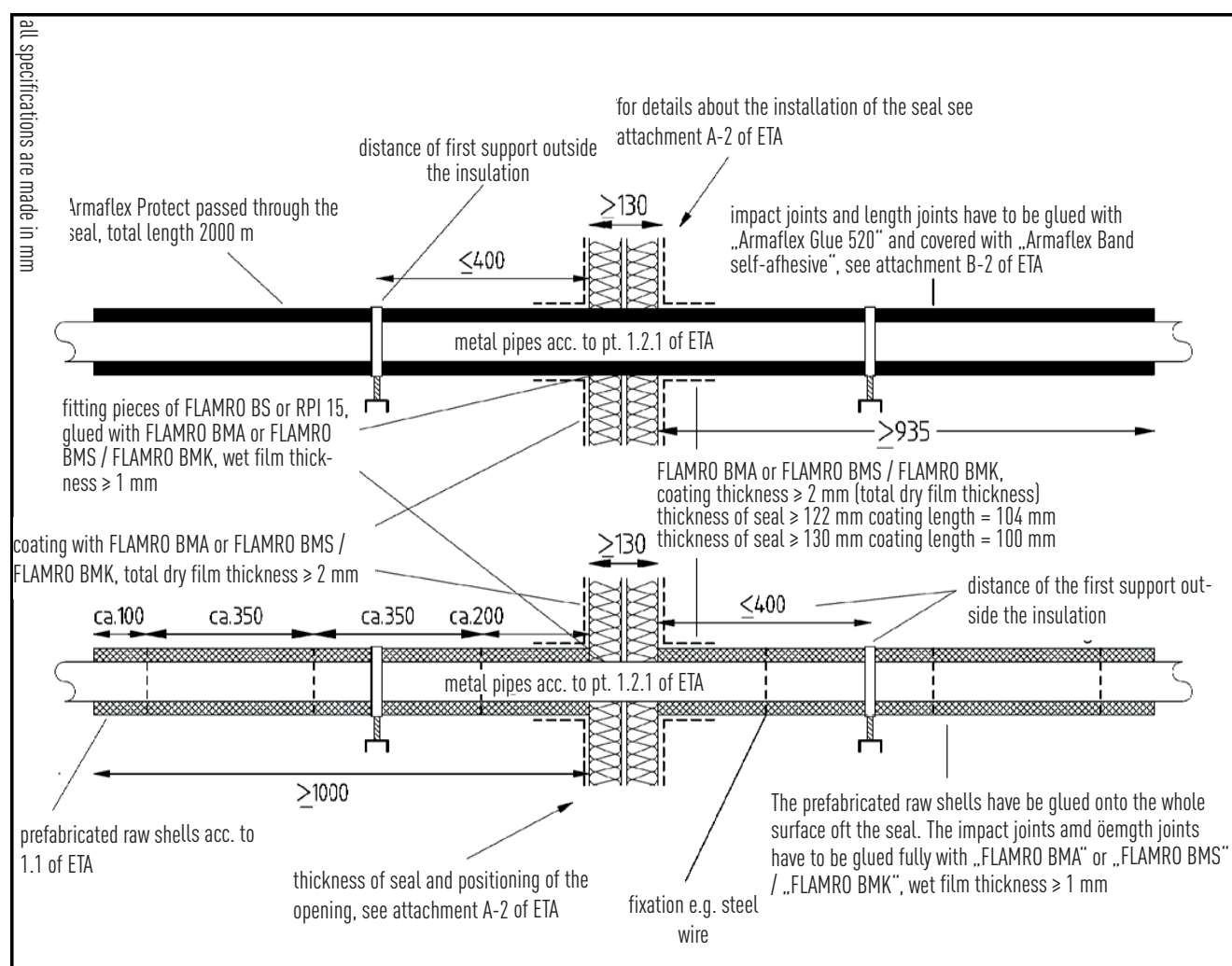
- > The hoses or panels of „Armaflex Protect“ with a total length of ≥ 2000 mm have to be installed centres in the seal.
- > The length of hoses and panels of „Armaflex Protect“ has to have ≥ 935 mm (measured on surface of the seal) on both sides of the seal.
- > When installing „Armaflex Protect“ all impact joints and length joints have to be glued with „Armaflex Glue 520“ and covered with „Armaflex Band self-adhesive“.
- > The applied ammount of „Armaflex Glue 520“ may not be more than 300 g/m^2 .
- > The measures of the stripe „Armaflex Band self-adhesive“ have to be $50 \text{ mm} \times 3 \text{ mm}$ (width x thickness).
- > The hose or the panel of „Armaflex Protect“ can be pasted along the necessary minimum insulation length (≥ 2000 mm) continuously or in the middle of the seal whereby the length of each of the two hoses or panels has to be ≥ 1000 mm.
- > In case of pipes with diameter ≤ 89 mm „Armaflex Protect“ has to be used as hose. The hose „Armaflex Protect“ can either be pulled over the pipe or cut and wrapped around the pipe and glued together on the longitudinal seam.
- > Junctions and pipe bends also have to be equipped with „Armaflex Protect“ along the necessary minimum insulation length.
- > The hoses and panels have to be coated on both sides of the seal with a length of ≥ 100 mm (measured on surface of the seal) with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ with a thickness of ≥ 2 mm (total dry film thickness).
- > Impact joints between „Armaflex Protect“ and other attached insulations can be glued together according to informations given by the manufacturer.

Assembly Instruction

FLAMRO Multi Combi Seal EN

according to ETA-13/0756

Completion non-combustible pipes - Wall -



Assembly Instruction

FLAMRO Multi Combi Seal EN

according to ETA-13/0756

Additional safety measures – Installation of „Armaflex Protect“:

- > The hoses or panels of „Armaflex Protect“ with a total length of ≥ 2000 mm have to be installed centres in the seal.
- > The length of hoses and panels of „Armaflex Protect“ has to have ≥ 935 mm (measured on surface of the seal) on both sides of the seal.
- > When installing „Armaflex Protect“ all impact joints and length joints have to be glued with „Armaflex Glue 520“ and covered with „Armaflex Band self-adhesive“.
- > The applied ammount of „Armaflex Glue 520“ may not be more than 300 g/m^2 .
- > The measures of the stripe „Armaflex Band self-adhesive“ have to be $50 \text{ mm} \times 3 \text{ mm}$ (width x thickness).
- > The hose or the panel of „Armaflex Protect“ can be pasted along the necessary minimum insulation length (≥ 2000 mm) continuously or in the middle of the seal whereby the length of each of the two hoses or panels has to be ≥ 1000 mm.
- > In case of pipes with diameter ≤ 89 mm „Armaflex Protect“ has to be used as hose. The hose „Armaflex Protect“ can either be pulled over the pipe or cut and wrapped around the pipe and glued together on the longitudinal seam.
- > Junctions and pipe bends also have to be equipped with „Armaflex Protect“ along the necessary minimum insulation length.
- > The hoses and panels have to be coated on both sides of the seal with a length of ≥ 100 mm (measured on surface of the seal) with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ with a thickness of ≥ 2 mm (total dry film thickness).
- > Impact joints between „Armaflex Protect“ and other attached insulations can be glued together according to informations given by the manufacturer.

Additional safety measures – Installation of prefabricated raw shells (e.g. „ProRox PS 960“ / „Rockwool 880“)

- > The prefabricated raw shell with a length of ≥ 1000 mm (measured on surface of the seal) have to be installed on both sides of the seal
- > The length joints of the prefabricated raw shells have to be glued on the whole surface with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ with a thickness of minimum 1 mm (wet film thickness).
- > The prefabricated raw shells have to be glued fully onto the surface of the seal with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ with a thickness of minimum 1 mm (wet film thickness).
- > The prefabricated raw shells have to be fixated with winding wire (steel wire with a diameter of ≥ 2 mm; 3 windings per meter; e.g. a distance of 200 mm, 550 mm and 900 mm - measured on surface of the seal) in its position.
- > Junctions and pipe bends also have to be equipped with prefabricated raw shells along the minimum insulation length (≥ 1000 mm – measured on surface of the seal) on both sides of the seal. The impact joints between insulation and pipes of the junctions or the pipe bend hast to be glued on the whole surface with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ with a thickness of minimum 1 mm (wet film thickness).
- > The prefabricated raw shell have to be coated on both sides of the seal with a length of ≥ 100 mm (measured on surface of the seal) with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ with a thickness of ≥ 2 mm (total dry film thickness).

Assembly Instruction

FLAMRO Multi Combi Seal EN

according to ETA-13/0756

Additional safety measures – Installation of „Armaflex Protect“:

- > The hoses or panels of „Armaflex Protect“ with a total length of ≥ 2000 mm have to be installed centres in the seal.
- > The length of hoses and panels of „Armaflex Protect“ has to have ≥ 935 mm (measured on surface of the seal) on both sides of the seal.
- > When installing „Armaflex Protect“ all impact joints and length joints have to be glued with „Armaflex Glue 520“ and covered with „Armaflex Band self-adhesive“.
- > The applied ammount of „Armaflex Glue 520“ may not be more than 300 g/m^2 .
- > The measures of the stripe „Armaflex Band self-adhesive“ have to be $50 \text{ mm} \times 3 \text{ mm}$ (width x thickness).
- > The hose or the panel of „Armaflex Protect“ can be pasted along the necessary minimum insulation length (≥ 2000 mm) continuously or in the middle of the seal whereby the length of each of the two hoses or panels has to be ≥ 1000 mm.
- > In case of pipes with diameter ≤ 89 mm „Armaflex Protect“ has to be used as hose. The hose „Armaflex Protect“ can either be pulled over the pipe or cut and wrapped around the pipe and glued together on the longitudinal seam.
- > Junctions and pipe bends also have to be equipped with „Armaflex Protect“ along the necessary minimum insulation length.
- > The hoses and panels have to be coated on both sides of the seal with a length of ≥ 100 mm (measured on surface of the seal) with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ with a thickness of ≥ 2 mm (total dry film thickness).
- > Impact joints between „Armaflex Protect“ and other attached insulations can be glued together according to informations given by the manufacturer.

Additional safety measures – Installation of prefabricated raw shells (e.g. „ProRox PS 960“ / „Rockwool 880“)

- > The prefabricated raw shell with a length of ≥ 1000 mm (measured on surface of the seal) have to be installed on both sides of the seal
- > The length joints of the prefabricated raw shells have to be glued on the whole surface with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ with a thickness of minimum 1 mm (wet film thickness).
- > The prefabricated raw shells have to be glued fully onto the surface of the seal with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ with a thickness of minimum 1 mm (wet film thickness).
- > The prefabricated raw shells have to be fixated with winding wire (steel wire with a diameter of ≥ 2 mm; 3 windings per meter; e.g. a distance of 200 mm, 550 mm and 900 mm - measured on surface of the seal) in its position.
- > Junctions and pipe bends also have to be equipped with prefabricated raw shells along the minimum insulation length (≥ 1000 mm – measured on surface of the seal) on both sides of the seal. The impact joints between insulation and pipes of the junctions or the pipe bend hast to be glued on the whole surface with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ with a thickness of minimum 1 mm (wet film thickness).
- > The prefabricated raw shell have to be coated on both sides of the seal with a length of ≥ 100 mm (measured on surface of the seal) with „FLAMRO BMA“ or „FLAMRO BMS“ / „FLAMRO BMK“ with a thickness of ≥ 2 mm (total dry film thickness).

Assembly Instruction

FLAMRO Multi Combi Seal EN

according to ETA-13/0756

Assembly Steps

Guidelines for installation

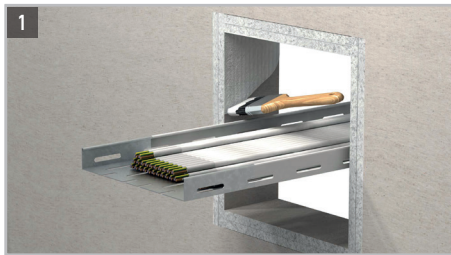
- > Before installing the seal the opening has to be cleaned properly. Afterwards a tape is pasted with a minimum distance of 2,5 cm to the opening around surrounding it.
- > For the installation of the seal "FLAMRO multi combi seal EN" two layers of mineral wool panels („FLAMRO BS" or „RPI-15") with a nominal thickness of 60 mm should be used.
- > In vertical or horizontal separating components two layers of mineral wool panels can be installed level to the surface, centred within the separating component or in all positions inbetween.
- > The distance between the two layers of mineral wool panels in walls has to be minimum 10 mm.
- > The distance between the two layers of mineral wool panels in floors has to be minimum 30 mm.
- > In case of seals in walls with unoccupied surfaces with size $> 0,43 \text{ m}^2$ within the seal, the two layers of mineral wool panels of the unoccupied surface have to be connected with thread rods made of steel with thread size $\geq \text{M6}$ (minimum 4 steel thread rods / m^2) and both sides have to be fixated with washers (outer diameter $\geq 25 \text{ mm}$; Inner diameter according to outer diameter of steel thread rod) and nuts (according to outer diameter of steel thread rod).
- > In case of seals in floors unoccupied surfaces with size $> 0,32 \text{ m}^2$ within the seal, the two layers of mineral wool panels of the unoccupied surface have to be connected with thread rods made of steel with thread size $\geq \text{M6}$ (minimum 4 steel thread rods / m^2) and both sides have to be fixated with washers (outer diameter $\geq 25 \text{ mm}$; Inner diameter according to outer diameter of steel thread rod) and nuts (according to outer diameter of steel thread rod).
- > All corners of the mineral wool panels „FLAMRO BS" or „RPI-15" have to be coated „FLAMRO BMA" or „FLAMRO BMS" / „FLAMRO BMK" with a minimum thickness of 1 mm (wet film thickness).
- > All mineral wool panels „FLAMRO BS" or „RPI-15" have to be glued to each other with „FLAMRO BMA" or „FLAMRO BMS" / „FLAMRO BMK".
- > Joints and gaps (maximum width 5mm) between the mineral wool panels, the mineral wool panels and the elements passing through (cables, electric installation pipes, pipes, metal pipes and cable carrier constructions), the mineral wool panels and separating building components have to be backfilled completely with „FLAMRO BMS" / „FLAMRO BMK".
- > In case of tightly fastened cable bundles the space between the cables doesn't have to be backfilled.
- > The mineral wool panels have to be coated on both sides on the visible surfaces of the seal with „FLAMRO BMA" or „FLAMRO BMS" / „FLAMRO BMK" with a minimum thickness of 2 mm (total dry film thickness).
- > The transition area between mineral wool panels and the separating building component have to be coated on both sides of the seal with „FLAMRO BMA" or „FLAMRO BMS" / „FLAMRO BMK" with a minimum thickness of 1 mm (total dry film thickness) in a way the coating has a minimum of 25 mm superfluous to the mineral wool panels.
- > All passing through elements (cables, electric installation pipes, pipes, metal pipes and cable carrier constructions) have to be equipped with additional security measures.
- > Plastic pipes are equipped with the fire protection collar Type FLAMRO VARIANT N II A with the according diameter. The fire protection collars are fixated with M6 thread rods. In case of floor seals only one fire protection collar has to be mounted below the floor, in case of wall seals they have to be placed on both sides of the wall.

Assembly Instruction

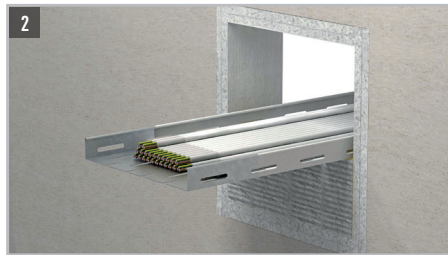
FLAMRO Multi Combi Seal EN

according to ETA-13/0756

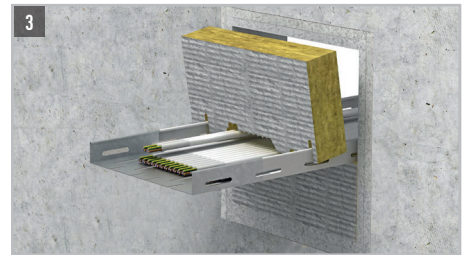
Assembly Steps



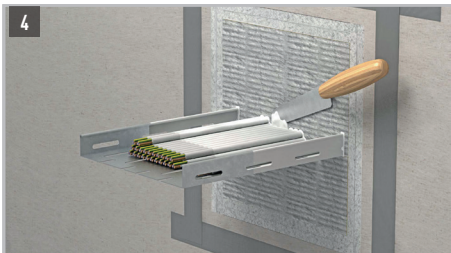
Clean opening and remove all loose parts. Coat opening reveal with fire protection coating FLAMRO BMA.



Coat cables and cable rack with FLAMRO BMA and fit FLAMRO BS 60-1 mineral fibre panel (Nominal thickness 60 mm) from both sides of the wall/floor.

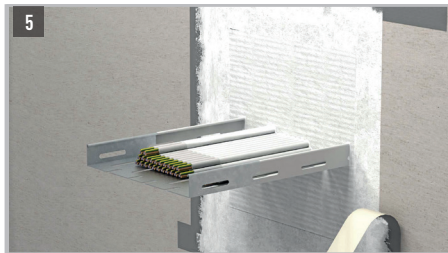


Close opening completely. Little gaps and joints are to be closed with mineral wool soaked in coating. In case of tightly closed cable bundles the spaces between the cables do not need to be backfilled.

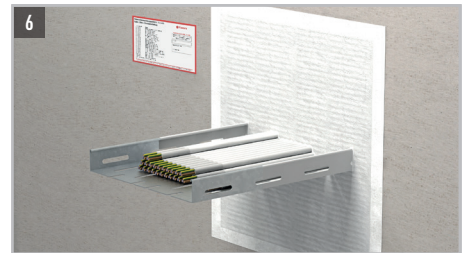


Mask the opening 2,5 cm bigger surrounding the shell construction opening. Gaps and joints (max. width 5 mm) have to be backfilled completely with „FLAMRO BMS/BMK“ on both sides of the seal. Gaps and joints (max. width 10 mm) have to be backfilled completely with „FLAMRO BMS/BMK“ on both sides of the seal.

Alternatively backfill with mineral wool (Stone wool with classification A1 according to EN 13501-1, a min. apparent density of 50 kg/m³ and a melting point ≥ 1000 °C according to DIN 4102-1) soaked in „FLAMRO BML“ or „FLAMRO BMS/BMK“. Then coat with „FLAMRO BMA“ or „FLAMRO BMS/BMK“ until a thickness of 2 mm (Total dry film thickness) is reached.



Coat complete surface within the masked area with FLAMRO BML so a dry film thickness of minimum 1 mm is resulted.



Remove tapes and label seal with identification sign. Clean construction site.

Assembly Instruction

FLAMRO Multi Combi Seal EN

according to ETA-13/0756

Subsequent installation and dismantling

Subsequent installation and dismantling of cables, electric installation pipes / pipes, pipes and cable support constructions is allowed.

Subsequent installation has to be performed according to the installation instructions.

Therefore an accordingly big opening in both seal panels (e.g. with a knife) has to be made. Afterwards the subsequent installation can be performed.

Remaining joints up to 5 mm between seal panels and installation are fully sealed with FLAMRO BMS or FLAMRO BMK.

In case of bigger joints tailored FLAMRO BS panel pieces can be pasted in with FLAMRO BMS or BMK.

Lastly the seal area affected by the subsequent installation is painted with FLAMRO BMA on both sides, so a dry film of minimum 2 mm results.

In case cables, electric installation pipes / pipes, pipes and cable support constructions are removed the remaining opening (hole) has to be sealed on both sides of the seal with a fitting piece of "FLAMRO BS" or "RPI-15" (Nominal thickness 60 mm). Gaps and joints (max. width 5 mm) between the tight-fitted piece of "FLAMRO BS" or "RPI-15" and the mineral wool panels have to be completely backfilled with "FLAMRO BMS" / "FLAMRO BMK". The fitting piece made of "FLAMRO BS" or "RPI-15" has to be coated with "FLAMRO BMA" or "FLAMRO BSM" / "FLAMRO BMK" at least 2 mm thick (Total dry film thickness) on both sides of the visible surface of the seal.



DECLARATION OF PERFORMANCE

for product **FLAMRO Multi Combi Seal EN**

- | | | |
|------|---|--|
| 1. | Distinct identification code of product type: | KA-13-0756 |
| 2. | Intended use: | Combi Seal |
| 3. | Manufacturer: | FLAMRO Brandschutz-Systeme GmbH
56291 Leiningen
Germany |
| 4. | Representative: | not relevant |
| 5. | System(s) of assessment and verification of constancy of performance: | System 1 |
| 6.a) | Harmonised Standard: | not relevant |
| 6.b) | Europäisches Bewertungsdokument: | ETAG-026, Part 2, August 2011 |
| | European Technical Document: | ETA-13/0756 |
| | Technical Assessment Body: | OIB - Österreichisches Institut für Bautechnik, Vienna |
| | Notified Body / Bodies: | Materialprüfanstalt für das Bauwesen
Braunschweig, Nr. 0761 |

7. Declared performance

Essential characteristics	Performance	Harmonised technical specifications
Combi Seal for installation of: Sheathed cable, tightly fastened cable bundles, Electrical installation pipes (EIR) made of steel and plastic, plastic pipes made of PVC-U, PE-HD and PP, metal pipes and cables constructions made of steel. For installations in openings of minimum 122 mm thick lightweight construction walls and rigid walls and minimum 150 mm thick rigid floors.*)	Max. EI 240 U/C	ETA-17/0468
	Use Category Type Y ₂	
Durability and service ability	NPD	
Air permeability	NPD	
Release of dangerous substances	NPD	
Mechanical resistance and stability	NPD	
Resistance to impact / movement	NPD	
Adhesion	NPD	
Airborne sound insulation	NPD	
Thermal properties	NPD	
Water vapour permeability	NPD	
Reaction to fire:	Euro Class according to EN 13501-1	
FLAMRO BMA	E	
FLAMRO BMS	E	
FLAMRO BMK	E	
FLAMRO UBB (non self-adhesive)	E	
FLAMRO Variant (intumesz. inlay)	E	
FLAMRO Variant (Sheet steel housing)	A1	
FLAMRO Variant N II A (intumesz. inlay)	E	
FLAMRO Variant N II A (Sheet steel housing)	A1	
Mineral fibre panel Rockwool RPI 15	A1	
*) Information from ETA-17/0468		

8. Appropriate technical documentation / specific technical documentation:

not relevant

Website where Declaration of Performance can be viewed:
www.flamro.com



The performance of the above product corresponds to the declared performance(s). The producer mentioned above is solely responsible for the preparation of the service declaration in accordance with Regulation (EU) No. 305/2011.

Signed for the manufacturer and on behalf of the manufacturer

Harry Vollmer, *Product Manager*
(Name and position)

A handwritten signature in blue ink, reading 'Harry Vollmer', written over a horizontal dotted line.

Leiningen, 08.09.2017
(Location and date of issue)