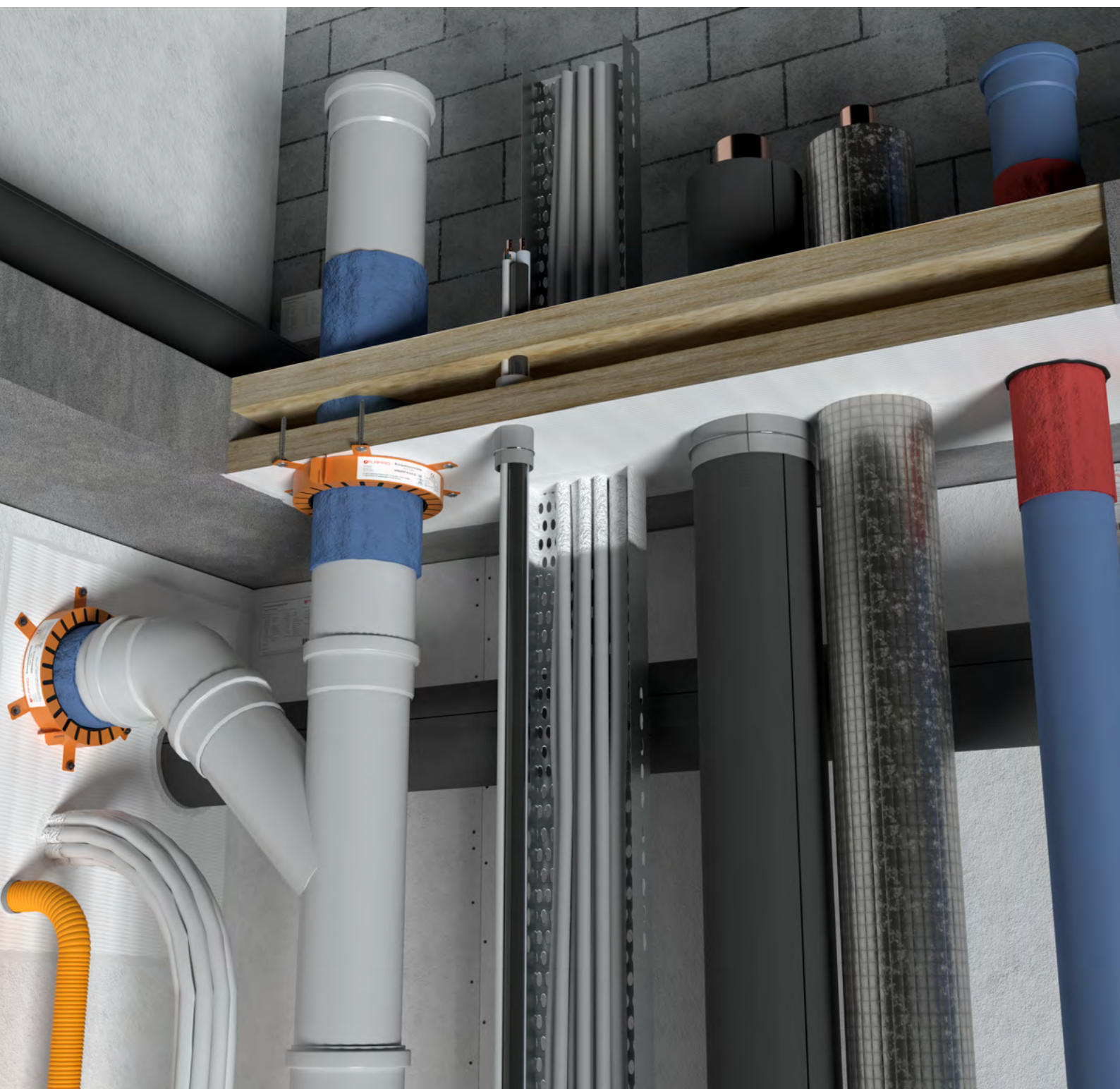# FLAMRO®

Mixed Penetration Sealing Systems
KSL Single Layer and KSL Double Layer

Penetration sealing systems made of mineral fibre board and an ablative fire protection coating

Expertise. Creativity. Continuity.

Flamro Brandschutz-Systeme GmbH has been developing and manufacturing products for preventive structural fire protection for over 30 years.

Cable and pipe penetration seals of various types, cable ducts with special fitting pieces as well as cable bandages and coatings reliably ensure continuous, uninterrupted building and system safety in case of fire – not only in Germany, but around the world.

Limiting property damage, preventing operational failures, avoiding environmental damage and, above all, saving human lives – these have always been our goals. We manufacture all our products ourselves, so our customers can rely on uncompromising quality: Continuous internal quality monitoring is a guarantee for consistent quality, external quality monitoring is its best confirmation.

Our company has grown year after year, and with it our team, which is characterised by competence, creativity and continuity:

It is the employees who have made Flamro what it is: a company with a solid past, a strong present and a secure future.

Strong alone – even Stronger Together

Since 2018, Flamro has been part of the svt group of companies, which has made an excellent name for itself as a highly qualified, leading "all-round provider" in the areas of preventive fire protection and restoration management.

Thanks to the customer-oriented bundling of products, systems and materials from the manufacturers svt, Rolf Kuhn, Flamro and AIK, svt has Europe's largest and most comprehensive portfolio of state-of-the-art fire protection products and fire protection applications for building and industrial construction, infrastructure, energy, aviation, ships, rolling stock, fire doors and batteries.

The synergies created by the merger benefit everyone involved, especially our customers. This way, you receive an unrivalled, technically and economically sophisticated range of services from a single source.
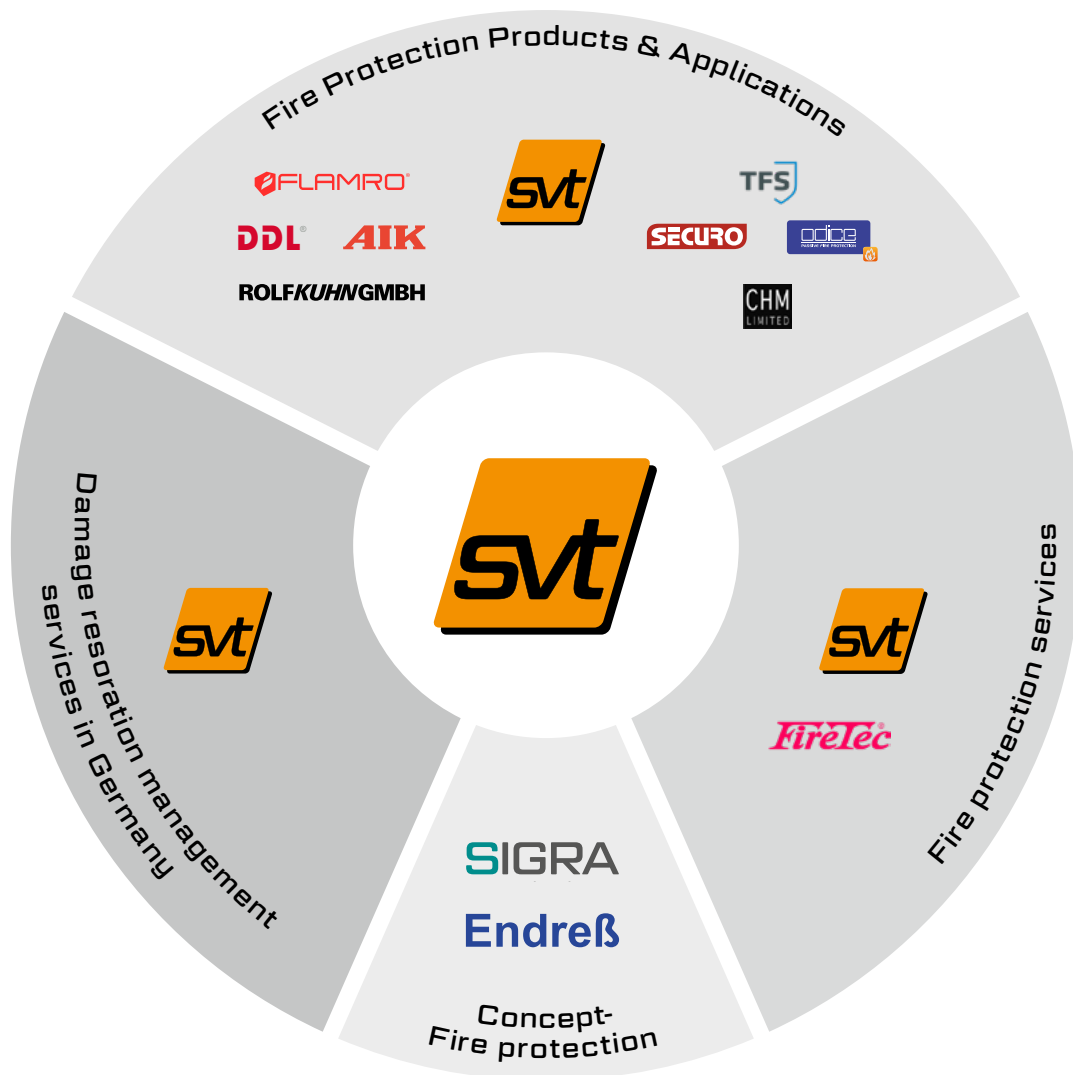
Penetration Sealing –
the Safe Way to Separate Fire Compartments

Penetration seals fulfil a vital function in buildings: In the event of a fire, they prevent the passage of flames and smoke from one fire compartment to the next. Due to the multitude of cables (whether transmitting electrical power, data, or telecommunications signals) and media-carrying pipes that are routed through today's buildings, open transits (penetrations) may occur even through fire-rated walls or floors, thus posing a high risk for the spread of fire and smoke. In order to ensure long-term safety for building occupants and their property, these openings must be sealed expertly – with high-quality fire protection products.

Penetration seals made of mineral fibre boards(panel seals)
Through-penetration fire protection is reliably performed by installing mineral fibre board seals;the boards being coated with a dedicated fire protection material. Depending on the applicable fire resistance requirements, one or more mineral fibre boards are inserted into the building component and then bonded to it. Depending on the type of application, media-carrying lines are either protected with fire protection coating (usually cables) or with dedicated insulation material, fire protection wraps or fire protection collars (usually pipes).

Mineral fibre boards have a low dead weight so that they can be handled and installed with ease and without exerting any significant static load on the building component. There is no need for time-consuming mixing or tempering, as is the case when using a fire protection mortar, and the materials are ready for immediate use. Mineral fibre board seals are a particularly economical solution, especially for large openings.

Penetration Sealing Systems – KSL single layer and KSL double layer

KSL mixed penetration sealing systems consist of either one 60 mm thick mineral fibre board (KSL single layer) or of two 50 mm thick boards (KSL double layer) covered with BML fire protection coating. The fire protection coating contains crystalline-bound water that is released in case of fire so as to exert a cooling effect. This endothermic reaction limits temperature transmission to the required degree and ensures reliable fire compartmentation. Adjacent building areas will thus remain protected from fire and smoke over the required fire resistance period.

Broad range of application solutions

✓ Classified penetration sealing for fire resistance classes EI 30 to EI 120 as per EN 13501-2

✓ Extensive applications for a wide variety of media-carrying lines, approved for a broad spectrum of diameters and insulation types

✓ Penetration seal for non-combustible pipes made of steel, stainless steel and cast iron up to an outside diameter of 219.1 mm and insulated with flexible elastomer foam (FEF) or mineral wool

✓ Penetration seal for non-combustible pipes provided insulated with PIR (KSL single layer)

✓ Numerous combination options with products from the Flamro fire protection range (fire protection wraps, fire protection collars, Cable Tubes)

Extremely easy to install and retrofit

✓ Dry film thickness on the penetration seal surface as well as on cables, cable bundles and cable trays – they need to be coated over very short lengths only

✓ Installation in plasterboard walls without reveal reinforcement (KSL double layer)

✓ Easy retrofit: Individually routed cables up to an outside diameter of 21 mm do not need to be coated; cut-outs and openings can be made into the mineral fibre boards using simple tools

High-quality materials

✓ The consistency of the BML coating compound ensures clean coating application to the cable and penetration seal surfaces, the coating remains flexible even after complete curing

✓ The required dry film thickness is applied in one operation

✓ The BML fire protection coating can be overcoated with other coating materials

✓ All materials used are insensitive to moisture

KSL single layer

Fire resistance class: max. EI 90 as per EN 13501-2

Mixed penetration seal made of mineral fibre boards (1x 60 mm) coated with an ablative fire protection material
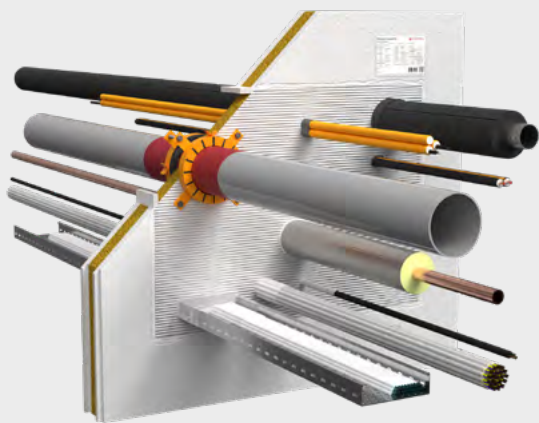
Application areas

• plasterboard walls   • solid walls   • solid floors

Advantages

✔ Short coating lengths with low dry film thickness on cables

✔ High flexibility and a variety of approved penetrations

✔ Suitable for use in damp and wet areas

✔ Recoatable

System data

Certificate of usability		KB 321100704-A ETA-16/0320
Thickness structural element	Wall	≥ 100
	Floor	≥ 150
Sealing thickness	Wall	≥ 60
	Floor	≥ 60
Maximum sealing size	Wall	2,000 x 1,224 or 1,224 x 2,000
	Floor	10,000 x 1,000

All specifications in mm

Configuration

Media lines			max. diameter*
	Cables		≤ 80
	Cable bundles		≤ 100 / ≤ 21
	Cable trays		✔
	Waveguide/coaxial cables		≤ 51.1
	EIC	Single	≤ 32
	EIC	Bundle	≤ 100 / ≤ 32
	Non-combustible pipes with mineral fibre insulation		≤ 219.1 (Steel) ≤ 88.9 (Copper)
	Non-combustible pipes with FEF insulation		≤ 219.1 (Steel) ≤ 88.9 (Copper)
	Non-combustible pipes with PIR insulation		≤ 219.1 (Steel) ≤ 108 (Copper)
	Combustible pipes		≤ 160
	Multilayer pipes		≤ 75
	HVAC split-line combinations		✔

*All specifications in mm

Products

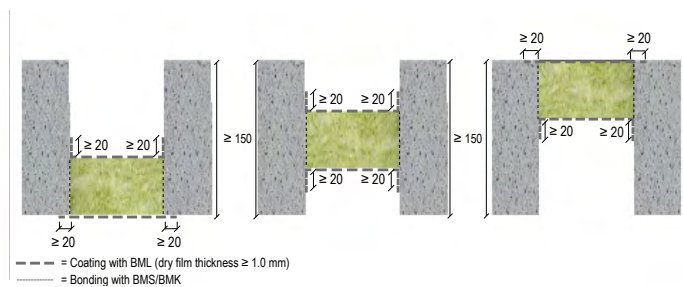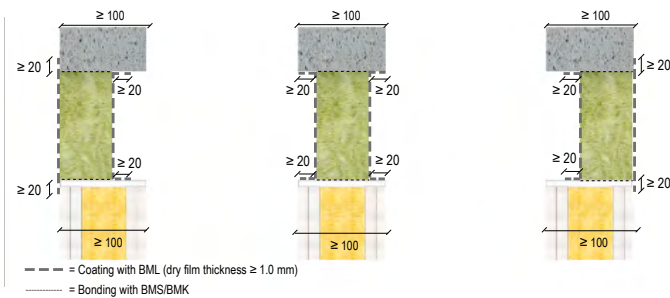|	
	BML **fire protection coating** Pail of 12.5 kg – Art. no. 40125
	BMS / BMK **fire protection filler** Cartridge of 0.4 kg – Art. no. 30004 Pail of 12.5 kg – Art. no. 10125
	BSL 60 / 2 **mineral fibre board,** **pre-coated on both sides** 1,000 x 600 x 60 mm – Art. no. 52036
	NBR-plus **fire protection wrap** Roll of 10 m x 125 mm (sep. into 2x 62.5 mm) – Art. no. 01261941
	KSL-W **fire protection fabric** Roll of 20 m x 50 mm self-adhesive – Art. no. 15520 Roll of 10 m x 100 mm – Art. no. 15530
	Variant N II A **fire protection collar** From Ø 32 mm to Ø 160 mm – Art. no. 15032 – 15160

Material consumption

Material consumption FLAMRO® BML			
Penetration seal size [m²]	**Occupancy rate**		
	0 %	30 %	60 %
0.01	0.26	0.29	0.32
0.02	0.41	0.46	0.51
0.03	0.53	0.59	0.66
0.05	0.73	0.81	0.90
0.10	1.22	1.35	1.50
0.20	0.82	2.03	2.25
0.30	2.43	2.70	3.00
0.50	3.65	4.05	4.50
1.00	6.20	6.89	7.65

Approx. values in kg

Design variants

--- = Coating with BML (dry film thickness ≥ 1.0 mm)
---------- = Bonding with BMS/BMK

--- = Coating with BML (dry film thickness ≥ 1.0 mm)
---------- = Bonding with BMS/BMK

Allowed services –
Fire resistance class EI 30 to EI 60 as per EN 13501-2

Service	Dimensions	Protective measure	
		Wall	**Floor**
Cables (with coating)			
Cables	Ø ≤ 21 mm	**BML fire protection coating** Length 100 mm x DFT 0.75 mm, on both sides	
	Ø ≤ 80 mm		
Cable bundles	Ø ≤ 100/21 mm		
Coaxial cable			
RADIAFLEX® RLK RFS	Ø ≤ 48.2 mm	**BML fire protection coating** Length 100 mm x DFT 1.0, on both sides	**BML fire protection coating** Length 100 mm x DFT 1.0, on both sides
CELLFLEX® LCF RFS	Ø ≤ 50.3 mm		
HELIAX CommScope	Ø ≤ 51.1 mm	**BML fire protection coating** Length 100 mm x DFT 1.0, on both sides (EI 45)	**BML fire protection coating** Length 100 mm x DFT 1.0, on both sides (EI 45)
Electrical installation conduits (EICs)			
Plastic EICs (Single)	Ø ≤ 32 mm with/without cables Ø ≤ 21 mm	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers (EI 45)
Plastic EICs (Bundle)	Ø ≤ 100 mm, consisting of individual EICs Ø ≤ 32 mm with/without cables Ø ≤ 21 mm		
Speedpipes			
Speedpipes, single or bundled, with/without optical fibre cables	Bundle Ø ≤ 40 mm, Single pipe Ø ≤ 14 mm	**NBR-plus fire protection wrap** Width 125 mm, 1x one layer	
Non-combustible pipes with mineral wool insulation		BD ≥ 35 kg/m3, melting point ≥ 1,000 °C, building material class min. A2	
Copper, steel, stainless steel, cast iron	Ø ≤ 42 mm	**Lamella mat** ≥ 470 x 30-100 mm, on both sides	
	Ø ≤ 60 mm	**Lamella mat** ≥ 470 x 30-100 mm, on both sides	**Lamella mat** ≥ 970 x 30-100 mm, on both sides
	Ø ≤ 88.9 mm	**Lamella mat** ≥ 720 x 30-100 mm, on both sides	
Steel, stainless steel, cast iron	Ø ≤ 114.3 mm	**Lamella mat** ≥ 470 x 30-100 mm, on both sides	
	Ø ≤ 219.1 mm	**Lamella mat** ≥ 970 x 30-100 mm, on both sides	
Non-combustible pipes with FEF insulation as per EN 14304			
Copper, steel, stainless steel, cast iron	Ø ≤ 15 mm, insulation thickness 10-38 mm	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers	
	Ø ≤ 42 mm, insulation thickness 12-38 mm		
	Ø ≤ 60 mm, insulation thickness 19-38 mm		
	Ø ≤ 88.9 mm, insulation thickness 22.5-38 mm		
Steel, stainless steel, cast iron	Ø ≤ 114.3 mm, insulation thickness 19-38 mm		
	Ø ≤ 159 mm, insulation thickness 25-38 mm	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers **+ FEF insulation** 250 x 19 mm	
	Ø ≤ 219.1 mm, insulation thickness 25-38 mm	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers **+ FEF insulation** 250 x 38 mm	
HVAC split lines			
Double copper pipe (Ø 18/18 mm) pre-insulated with PEF (9 mm) + PVC pipe (Ø 25 mm) + max. 3 accompanying cables (Ø ≤ 14 mm)		**NBR-plus fire protection wrap** Width 125 mm, 1x two layers	
Non-combustible pipes with PIR insulation as per EN 14308			
Copper, steel, stainless steel, cast iron	Ø ≤ 15 mm, insulation thickness 20-80 mm	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers
	Ø ≤ 88.9 mm, insulation thickness 30-80 mm		
	Ø ≤ 108 mm, insulation thickness 30-80 mm	–	
	Ø ≤ 108 mm, insulation thickness 40-80 mm		
Steel, stainless steel, cast iron	Ø ≤ 168.3 mm, insulation thickness 40-80 mm	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers	
	Ø ≤ 219.1 mm, insulation thickness 50 mm		–
	Ø ≤ 219.1 mm, insulation thickness 100 mm	–	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers

Service	Dimensions	Protective measure	
		Wall	**Floor**
Combustible pipes with/without PE acoustic insulation tube			
PVC-U, PVC-C, PE-HD, ABS, SAN+PVC PP-H	Ø ≤ 160 mm	**Variant N II A fire protection collar** On both sides	**Variant N II A fire protection collar** On the underside
Geberit Silent dB20 Geberit Silent PP Geberit Silent Pro Poloplast POLO-KAL NG Poloplast POLO-KAL XS Rehau RAUPIANO PLUS Wavin AS+	Ø ≤ 160 mm		–
Rehau RAUPIANO Light CONEL Drain	Ø ≤ 110 mm		
Multilayer pipes with FEF insulation as per EN 14304			
Geberit Mepla	Ø ≤ 16 mm, insulation thickness 8-35 mm	**KSL-W fire protection wrap** Width 50 mm, 2x one layer, on both sides	
	Ø ≤ 32 mm, insulation thickness 35 mm		
	Ø ≤ 32 mm, insulation thickness 8-35 mm	**KSL-W fire protection wrap** Width 50 mm, 2x one layer, on both sides (EI 45)	
	Ø ≤ 75 mm, insulation thickness 39 mm	**KSL-W fire protection wrap** Width 50 mm, 2x two layers, on both sides	
	Ø ≤ 75 mm, insulation thickness 9.5-39 mm	**KSL-W fire protection wrap** Width 50 mm, 2x two layers, on both sides (EI 45)	

This simplified overview is not meant to replace the installation instructions applicable to the system. Please be sure to refer to the dedicated Installation Manual for detailed information.

Allowed services –
Fire resistance class EI 90 as per EN 13501-2

Service	Dimensions	Protective measure	
Speedpipes		**Wall**	**Floor**
Speedpipes, single or bundled, with/without optical fibre cables	Bundle-Ø ≤ 40 mm, single pipe-Ø ≤ 7 mm	**NBR-plus fire protection wrap** Width 125 mm, 1x one layer	**NBR-plus fire protection wrap** Width 125 mm, 1x one layer
	Bundle-Ø ≤ 40 mm, single pipe-Ø ≤ 14 mm	–	
Non-combustible pipes with mineral wool insulation		BD ≥ 35 kg/m3, melting point ≥ 1,000 °C, building material class min. A2	
Steel, stainless steel, cast iron	Ø ≤ 63.5 mm	–	**Lamella mat** ≥ 220 x 30-100 mm, on both sides
	Ø ≤ 114.3 mm		**Lamella mat** ≥ 470 x 30-100 mm, on both sides
	Ø ≤ 159 mm		**Lamella mat** ≥ 970 x 30-100 mm, on both sides
Non-combustible pipes with FEF insulation as per EN 14304			
Copper, steel, stainless steel, cast iron	Ø ≤ 15 mm, insulation thickness 10-26 mm	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers	–
	Ø ≤ 42 mm, insulation thickness 16.5-26 mm		
	Ø ≤ 60 mm, insulation thickness 19 mm		
	Ø ≤ 88.9 mm, insulation thickness 38 mm	–	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers
Steel, stainless steel, cast iron	Ø ≤ 8.9 mm, insulation thickness 18 mm	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers	–
Non-combustible pipes with PIR insulation as per EN 14308			
Copper, steel, stainless steel, cast iron	Ø ≤ 42 mm, insulation thickness 40 mm	–	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers
Combustible pipes with/without PE acoustic insulation tube			
PVC-U, PVC-C, PE-HD, ABS, SAN+PVC PP-H	Ø ≤ 160 mm	**Variant N II A fire protection collar** On both sides	–
Geberit Silent dB20 Geberit Silent PP Geberit Silent Pro Poloplast POLO-KAL NG Poloplast POLO-KAL XS Rehau RAUPIANO PLUS Wavin AS+	Ø ≤ 160 mm		
Rehau RAUPIANO Light CONEL Drain	Ø ≤ 110 mm		
Multilayer pipes with FEF insulation as per EN 14304			
Geberit Mepla	Ø ≤ 63 mm, insulation thickness 35-39 mm	–	**KSL-W fire protection wrap** Width 50 mm, 2x two layers, on both sides

This simplified overview is not meant to replace the installation instructions applicable to the system. Please be sure to refer to the dedicated Installation Manual for detailed information.
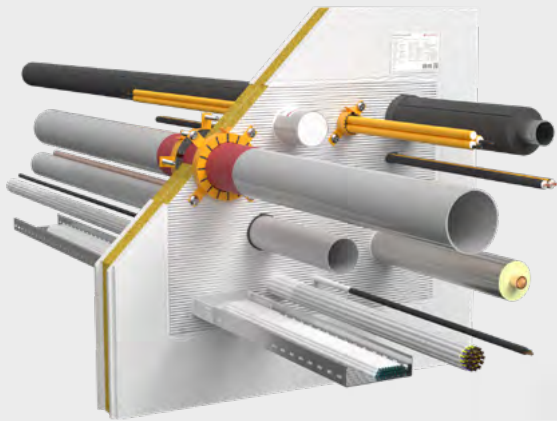
Room for Your Notes

KSL double layer

Fire resistance class: max. EI 120 as per EN 13501-2

Mixed penetration seal made of mineral fibre boards (2x 50 mm) coated with an ablative fire protection material

Application areas

• plasterboard walls   • solid walls   • solid floors
• shaft walls

Advantages

✔ High flexibility and approved for many different penetrations

✔ Can be installed without reveal reinforcement

✔ Suitable for use in damp and wet areas

✔ Recoatable

System data

Certificate of usability		ETA-16/0320
Thickness structural element	Wall	≥ 94
	Shaft wall	≥ 40
	Floor	≥ 150
Sealing thickness	Wall	≥ 100
	Floor	≥ 150
Maximum sealing size	Wall	1,100 x 2,200 or 2,200 x 1,100
	Shaft wall	800 x 600
	Floor	1,000 x ∞

All specifications in mm

Configuration

Media lines		max. diameter*
Cables		≤ 80
Cable bundles		≤ 100 / ≤ 21
Cable trays		✔
Waveguide/coaxial cables		≤ 51.1
EIC	Single	≤ 63 / ≤ 21
EIC	Bundle	≤ 125 / ≤ 63 / ≤ 21
Non-combustible pipes with mineral fibre insulation		≤ 219.1 (Steel) ≤ 88.9 (Copper)
Non-combustible pipes with FEF insulation		≤ 219.1 (Steel) ≤ 88.9 (Copper)
Combustible pipes		≤ 160
Multilayer composite pipes		≤ 75
HVAC split-line combinations		✔

*All specifications in mm

Products

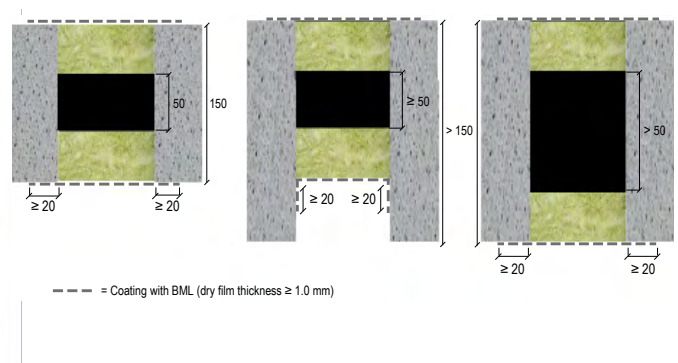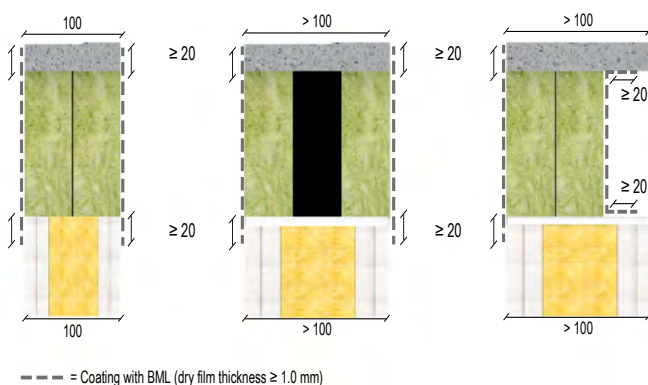|	
	BML **fire protection coating** Pail of 12.5 kg – Art. no. 40125
	BMS / BMK **fire protection filler** Cartridge of 0.4 kg – Art. no. 30004 Pail of 12.5 kg – Art. no. 10125
	BSL 50 / 1 **mineral fibre board** **pre-coated on one side** 1,000 x 600 x 50 mm – Art. no. 50050
	NBR-plus **fire protection wrap** Roll of 10 m x 125 mm (sep. into 2x 62.5 mm) – Art. no. 01261941
	KSL-W **fire protection fabric** Roll of 20 m x 50 mm self-adhesive – Art. no. 15520 Roll of 10 m x 100 mm – Art. no. 15530
	Variant N II A **fire protection collar** From Ø 32 mm to Ø 160 mm – Art. no. 15032 – 15160
	Variant N EC **endless collar** 10 m of fire protection wrap, 3 m of metal strap, 18 fastening hooks, 6 penetration seal labels – Art. no. 15103
	Cable Tube CT Ø 90 / length 300 mm – Art. no. 01279301 Ø 120 / length 300 mm – Art. no. 01271301

Material consumption

Material consumption FLAMRO® BML			
Penetration seal size [m²]	**Occupancy rate**		
	0 %	30 %	60 %
0.01	0.26	0.29	0.32
0.02	0.41	0.46	0.51
0.03	0.53	0.59	0.66
0.05	0.73	0.81	0.90
0.10	1.22	1.35	1.50
0.20	0.82	2.03	2.25
0.30	2.43	2.70	3.00
0.50	3.65	4.05	4.50
1.00	6.20	6.89	7.65

Approx. values in kg

Design variants

- - - - = Coating with BML (dry film thickness ≥ 1.0 mm)

- - - - = Coating with BML (dry film thickness ≥ 1.0 mm)

Allowed services –
Fire resistance class EI 90 as per EN 13501-2

Service	Dimensions	Protective measure	
Cables		**Wall**	**Floor**
Cables	Ø ≤ 80 mm	**BML fire protection coating** Length 100 mm x DFT 1 mm,on both sides	
Cable bundles	Ø ≤ 100/21 mm		
Coaxial cables			
RADIAFLEX® RLK RFS	Ø ≤ 48.2 mm	**BML fire protection coating** Length 100 mm x DFT 1 mm, on both sides	–
CELLFLEX® LCF RFS	Ø ≤ 50.3 mm		
HELIAX CommScope	Ø ≤ 51.1 mm		
Electrical installation conduits (EICs)			
Plastic EICs (Single)	Ø ≤ 32 mm with/without cables Ø ≤ 21 mm	**NBR-plus fire protection wrap** Width 62.5 mm, 2x one layer, (U/U: Pipe ends do **not** need to be capped!)	**NBR-plus fire protection wrap** Width 125 mm, 1x one layer (U/ U: Pipe ends do **not** need to be capped!)
	Ø ≤ 63 mm with/without cables Ø ≤ 21 mm	**Variant N II A / N II KS** On both sides (U/C: Capping of pipe ends with mineral wool and BMS/ BMK)	
	Ø ≤ 32 mm with/without cables Ø ≤ 21 mm	**BML fire protection coating** Length 150 mm x DFT 1 mm beidseitg (U/C: Capping of pipe ends with mineral wool and BMS/ BMK)	
Plastic EICs (Bundle)	Ø ≤ 100 mm, consisting of individual EICs Ø ≤ 32 mm with/without cables Ø ≤ 21 mm	**NBR-plus fire protection wrap** Width 62.5 mm, 2x two layers, (U/U: Pipe ends do **not** need to be capped!)	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers (U/U: Pipe ends do **not** need to be capped!)
	Ø ≤ 125 mm, consisting of individual EICs Ø ≤ 32 mm with/without cables Ø ≤ 21 mm	**Variant N II A / N II KS** On both sides (U/C: Capping of pipe ends with mineral wool and BMS/ BMK)	
Steel EICs (Single)	Ø ≤ 32 mm with/without cables Ø ≤ 21 mm	**Lamella mat** 500 x 30 mm	
Steel EICs (Bundle)	3x Ø ≤ 32 mm with/without cables Ø ≤ 21 mm		
Non-combustible pipes with mineral wool insulation		BD ≥ 35 kg/m3, melting point ≥ 1,000 °C, building material class min. A2	
Copper, steel, stainless steel, cast iron	Ø ≤ 60 mm	**Lamella mat** 1,000 x 30-100 mm	
	Ø ≤ 88.9 mm	**Lamella mat** 1,500 x 30 mm / 2,000 x 100 mm	**Lamella mat** 1,500 x 30 mm
Steel, stainless steel, cast iron	Ø ≤ 42 mm	**Lamella mat** 500 x 30-100 mm	
	Ø ≤ 114.3 mm	**Lamella mat** 1,000 x 30-100 mm	
	Ø ≤ 219.1 mm	**Lamella mat** 2,500 x 30-100 mm	
Non-combustible pipes with FEF insulation as per EN 14304			
Copper, steel, stainless steel, cast iron	Ø ≤ 42 mm, insulation thickness 10 mm	**NBR-plus fire protection wrap** Width 62.5 mm, 2x one layer	**NBR-plus fire protection wrap** Width 125 mm, 1x one layer
	Ø ≤ 88.9 mm, insulation thickness 19-38 mm	**NBR-plus fire protection wrap** Width 62.5 mm, 2x two layers	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers
Steel, stainless steel, cast iron	Ø ≤ 114.3 mm, insulation thickness 19-38 mm	**NBR-plus fire protection wrap** Width 62.5 mm, 2x two layers, **+ FEF insulation** 250 x 19 mm	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers, **+ FEF insulation** 250 x 19 mm
	Ø ≤ 219.1 mm, insulation thickness 25-38 mm	**NBR-plus fire protection wrap** Width 62.5 mm, 2x two layers, **+ FEF insulation** 500 x 38 mm	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers, **+ FEF insulation** 500 x 38 mm
HVAC split lines			
Double copper pipe (Ø 10/18 mm) pre-insulated with PEF (9 mm) + PVC pipe (Ø 25 mm) + max. 3 accompanying cables (Ø ≤ 14 mm)		**NBR-plus fire protection wrap** Width 62.5 mm, 2x two layers	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers

Service	Dimensions	Protective measure	
		Wall	**Floor**
Combustible pipes with/without PE acoustic insulation tube			
Standard pipes, special pipes/system pipes	Ø ≤ 160 mm	**Variant N II A** On both sides	**Variant N II A** On the underside
	Ø ≤ 160 mm	**Variant N EC** On both sides Ø ≤ 50 mm 2 layers Ø ≤ 75 mm 3 layers Ø ≤ 110 mm 4 layers Ø ≤ 125 mm 5 layers Ø ≤ 160 mm 6 layers	**Variant N EC** On the underside Ø ≤ 50 mm 2 layers Ø ≤ 75 mm 3 layers Ø ≤ 110 mm 4 layers Ø ≤ 125 mm 5 layers Ø ≤ 160 mm 6 layers
	Ø ≤ 110 mm	**KSL-W fire protection wrap** On both sides Ø ≤ 50 mm 2 layers Ø ≤ 110 mm 4/5 layers (without/with PE tube) Ø ≤ 160 mm 6 layers	**KSL-W fire protection wrap** On the underside Ø ≤ 50 mm 2 layers Ø ≤ 110 mm 4/5 layers (without/with PE tube) Ø ≤ 160 mm 6 layers
Combustible pipes with FEF insulation (B-s3, d0), e.g. AF/ArmaFlex			
Standard pipes	Ø ≤ 110 mm	**Variant N II A** On both sides	**Variant N II A** On the underside
Special pipes/system pipes	Ø ≤ 160 mm	–	**KSL-W** On the underside Ø ≤ 50 mm 2 layers Ø ≤ 110 mm 5 layers Ø ≤ 160 mm 6 layers
Multilayer composite pipes with FEF insulation (B-s3, dO) e. g. AF/ArmaFlex			
FRÄNKISCHE Alpex L, Alpex F50	Ø ≤ 20 mm, insulation thickness 8-30 mm	**Variant N EC** On both sides, 2 layers	**Variant N EC** On the underside, 2 layers
	Ø ≤ 75 mm, insulation thickness 9-38 mm	–	**Variant N EC** On the underside, 2 layers
Geberit Mepla	Ø ≤ 32 mm, insulation thickness 8-35 mm	**KSL-W fire protection wrap** On both sides, 1 layer	**KSL-W fire protection wrap** On the underside, 1 layer
	Ø ≤ 75 mm, insulation thickness 9-40 mm	**KSL-W fire protection wrap** On both sides, 2 layers	**KSL-W fire protection wrap** On the underside, 2 layers
Rehau Rautitan Stabil	Ø ≤ 32 mm, insulation thickness 8-35 mm	**KSL-W fire protection wrap** On both sides, 1 layer	**KSL-W fire protection wrap** Unterseitig, 1 layer
	Ø ≤ 40 mm, insulation thickness 9-35 mm	**KSL-W fire protection wrap** On both sides, 2 layers	**KSL-W fire protection wrap** On the underside, 2 layers
KE KELIT KELOX	Ø ≤ 32 mm, insulation thickness 8-35 mm	**KSL-W fire protection wrap** On both sides, 1 layer	**KSL-W fire protection wrap** On the underside, 1 layer
	Ø ≤ 75 mm, insulation thickness 9-40 mm	**KSL-W fire protection wrap** On both sides, 2 layers	**KSL-W fire protection wrap** On the underside, 2 layers
Multilayer composite pipes with PEF pre-insulation			
Henco Pipes	Ø ≤ 32 mm, insulation thickness 6-13 mm	**KSL-W fire protection wrap** On both sides, 1 layer	**KSL-W fire protection wrap** On the underside, 1 layer
Geberit Mepla	Ø ≤ 32 mm, insulation thickness 6-13 mm		
KE KELIT KELOX	Ø ≤ 32 mm, insulation thickness 4-13 mm		
Rehau Rautitan Stabil	Ø ≤ 32 mm, insulation thickness 4-26 mm		
CT Cable Tubes		CT overall length 300 mm (Ø 90 or 120 mm)	
Cables	Ø ≤ 21 mm	✓	✓
Cable bundles	Ø ≤ 100/21 mm	✓	✓

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Allowed services –
Fire resistance class EI 120 as per EN 13501-2

Service	Dimensions	Protective measure	
Cables		**Wall**	**Floor**
Cables	Ø ≤ 21 mm	**BML fire protection coating** Length 100 mm x DFT 1 mm, on both sides	
	Ø ≤ 80 mm	–	**BML fire protection coating** Length 150 mm x DFT 1 mm, on both sides
Cable bundles	Ø ≤ 100/21 mm	**BML fire protection coating** Length 150 mm x DFT 1 mm, on both sides	
Coaxial cables			
RADIAFLEX® RLK RFS	Ø ≤ 48.2 mm	**BML fire protection coating** Length 100 mm x DFT 1 mm, on both sides	–
CELLFLEX® LCF RFS	Ø ≤ 50.3 mm		
HELIAX CommScope	Ø ≤ 51.1 mm		
Electrical installation conduits (EICs)			
Plastic EICs (Single)	Ø ≤ 32 mm with/without cables Ø ≥ 21 mm	**NBR-plus fire protection wrap** Width 62.5 mm, 2x one layer	**NBR-plus fire protection wrap** Width 125 mm, 1x one layer
Plastic EICs (Single)	Ø ≤ 32 mm with/without cables Ø ≥ 21 mm	**Variant N II A / N II KS** On both sides	
Plastic EICs (Bundle)	Ø ≤ 100 mm, consisting of individual EICs Ø ≤ 32 mm with/without cables Ø ≤ 21 mm	**NBR-plus fire protection wrap** Width 62.5 mm, 2x two layers	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers
Steel EICs (Single)	Ø ≤ 32 mm with/without cables Ø ≤ 21 mm	**Lamella mat** 500 x 30 mm	**Lamella mat** 500 x 30 mm
Steel EICs (Bundle)	3x Ø ≤ 32 mm with/without cables Ø ≤ 21 mm	–	
Non-combustible pipes with mineral wool insulation		BD ≥ 35 kg/m3, melting point ≥ 1,000 °C, building material class min. A2	
Copper, steel, stainless steel, cast iron	Ø ≤ 42 mm	**Lamella mat** 1,000 x 30-100 mm	
	Ø ≤ 60 mm	**Lamella mat** 1,000 x 30-100 mm	–
	Ø ≤ 88.9 mm	**Lamella mat** 1,000 x 100 mm	
Steel, stainless steel, cast iron	Ø ≤ 42 mm	**Lamella mat** 500 x 30-100 mm	
	Ø ≤ 114.3 mm	**Lamella mat** 1,000 x 30-100 mm	
	Ø ≤ 159 mm	**Lamella mat** 2,500 x 100 mm	**Lamella mat** 2,500 x 30-100 mm
	Ø ≤ 219.1 mm	–	**Lamella mat** 2,500 x 30 mm
Non-combustible pipes with FEF insulation as per EN 14304			
Copper, steel, stainless steel, cast iron	Ø ≤ 42 mm, insulation thickness 10-38 mm	**NBR-plus fire protection wrap** Width 62.5 mm, 2x two layers	–
	Ø ≤ 54 mm, insulation thickness 19-38 mm		**NBR-plus fire protection wrap** Width 125 mm, 1x two layers
	Ø ≤ 60 mm, insulation thickness 13-40 mm	–	
	Ø ≤ 88.9 mm, insulation thickness 25 mm	**NBR-plus fire protection wrap** Width 62.5 mm, 2x two layers	
Steel, stainless steel, cast iron	Ø ≤ 114.3 mm, insulation thickness 19-38 mm	**NBR-plus fire protection wrap** Width 62.5 mm, 2x two layers, **+ FEF insulation** 250 x 19 mm	–
	Ø ≤ 159 mm, insulation thickness 25-38 mm	**NBR-plus fire protection wrap** Width 62.5 mm, 2x two layers, **+ FEF insulation** 250 x 19 mm	**NBR-plus fire protection wrap** Width 62.5 mm, 2x two layers, **+ FEF insulation** 250 x 19 mm
	Ø ≤ 219.1 mm, insulation thickness 25-38 mm	**NBR-plus fire protection wrap** Width 62.5 mm, 2x two layers, **+ FEF insulation** 500 x 38 mm	**NBR-plus fire protection wrap** Width 62.5 mm, 2x two layers, **+ FEF insulation** 500 x 38 mm
HVAC split lines			
Double copper pipe (Ø 10/18 mm) pre-insulated with PEF (9 mm) + PVC pipe (Ø 25 mm) + max. 3 accompanying cables (Ø ≤ 14 mm)		**NBR-plus fire protection wrap** Width 62.5 mm, 2x two layers	**NBR-plus fire protection wrap** Width 125 mm, 1x two layers

Service	Dimensions	Protective measure	
		Wall	**Floor**
Combustible pipes with/without PE acoustic insulation tube			
Standard pipes, special pipes/system pipes	Ø ≤ 160 mm	**Variant N II A** On both sides	**Variant N II A** On the underside
	Ø ≤ 160 mm	**Variant N EC** On both sides Ø ≤ 50 mm 2 layers Ø ≤ 75 mm 3 layers Ø ≤ 110 mm 4 layers Ø ≤ 125 mm 5 layers Ø ≤ 160 mm 6 layers	**Variant N EC** On the underside Ø ≤ 50 mm 2 layers Ø ≤ 75 mm 3 layers Ø ≤ 110 mm 4 layers Ø ≤ 125 mm 5 layers Ø ≤ 160 mm 6 layers
	Ø ≤ 110 mm	**KSL-W fire protection wrap** On both sides Ø ≤ 50 mm 2 layers Ø ≤ 110 mm 4/5 layers (without/with PE tube)	**KSL-W fire protection wrap** On the underside Ø ≤ 50 mm 2 layers Ø ≤ 110 mm 4/5 layers (without/with PE tube)
Combustible pipes with FEF insulation (B-s3, d0), e.g. AF/ArmaFlex			
Standard pipes	Ø ≤ 110 mm	**Variant N II A** On both sides	**Variant N II A** On the underside
Special pipes/system pipes	Ø ≤ 160 mm	–	**KSL-W fire protection wrap** Ø ≤ 50 mm 2 layers Ø ≤ 110 mm 5 layers Ø ≤ 160 mm 6 layers
Multilayer pipes with FEF insulation (B-s3, dO) e. g. AF/ArmaFlex			
FRÄNKISCHE Alpex L, Alpex F50	Ø ≤ 16 mm, insulation thickness 8-30 mm	**Variant N EC** On both sides, 2 layers	–
	Ø ≤ 20 mm, insulation thickness 9-11.5 mm		
Henco pipe	Ø ≤ 32 mm, insulation thickness 8-32 mm	**KSL-W fire protection wrap** On both sides, 1 layer	–
Geberit Mepla	Ø ≤ 32 mm, insulation thickness 8-35 mm	**KSL-W fire protection wrap** On both sides, 1 layer	**KSL-W fire protection wrap** On the underside, 1 layer
	Ø ≤ 75 mm, insulation thickness 9-40 mm	**KSL-W fire protection wrap** On both sides, 2 layers	**KSL-W fire protection wrap** On the underside, 2 layers
Rehau Rautitan Stabil	Ø ≤ 32 mm, insulation thickness 8-35 mm	**KSL-W fire protection wrap** On both sides, 1 layer	**KSL-W fire protection wrap** On the underside, 1 layer
	Ø ≤ 40 mm, insulation thickness 9-35 mm	**KSL-W fire protection wrap** On both sides, 2 layers	**KSL-W fire protection wrap** On the underside, 2 layers
Rehau Rautitan Stabil	Ø ≤ 32 mm, insulation thickness 8-35 mm	**KSL-W fire protection wrap** On both sides, 1 layer	**KSL-W fire protection wrap** On the underside, 1 layer
	Ø ≤ 75 mm, insulation thickness 9-40 mm	**KSL-W fire protection wrap** On both sides, 2 layers	**KSL-W fire protection wrap** On the underside, 2 layers
Multilayer pipes with PEF pre-insulation			
Henco Pipes	Ø ≤ 32 mm, insulation thickness 6-13 mm	**KSL-W fire protection wrap** On both sides, 1 layer	**KSL-W fire protection wrap** On the underside, 1 layer
Geberit Mepla	Ø ≤ 32 mm, insulation thickness 6-13 mm		
KE KELIT KELOX	Ø ≤ 32 mm, insulation thickness 4-13 mm		
Rehau Rautitan Stabil	Ø ≤ 32 mm, insulation thickness 4-26 mm		
Multilayer pipes with pipe sleeves made of mineral wool		Minimal density 80 kg/m³, classification at least A2L-s1,d0	
Geberit Mepla	Ø ≤ 20 mm	**Pipe sleeve** 1,000 x 20-30 mm	
	Ø ≤ 23 mm	**Pipe sleeve** 1,000 x 20-40 mm	
	Ø ≤ 50 mm	**Pipe sleeve** 1,000 x 20-50 mm	
	Ø ≤ 63 mm	**Pipe sleeve** 1,000 x 20-60 mm	
	Ø ≤ 70 mm	**Pipe sleeve** 1,000 x 20-80 mm	
CT Cable Tubes		CT overall length 300 mm (Ø 90 or 120 mm)	
Cables	Ø ≤ 21 mm	–	✓
Cable bundles	Ø ≤ 100/21 mm		✓

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Step-by-Step Installation Guide

Clean the reveal surfaces of the component opening as well as the installations penetrants and mask the reveal with adhesive tape.

Take measurements for cutting the board to size, mark cutting lines and cut the board as required; make cutouts for the feed-throughs and check proper fit.

Stir the coating compound and coat the cables in the penetration seal area with BML; coat the component reveals and the edges of the mineral fibre board with BML or BMS/BMK. Insert one or two boards into the opening.
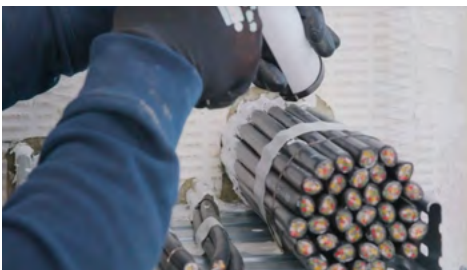
Stuff the remaining openings with mineral wool and fill with BMS/BMK.

Finishing coat: Coat each side of the cable over a length of 100 mm in front of the penetration seal and the penetration seal surface, as well as an an extra length of 20 mm with BML.

Remove the tape, clean the site and attach the penetration seal label.

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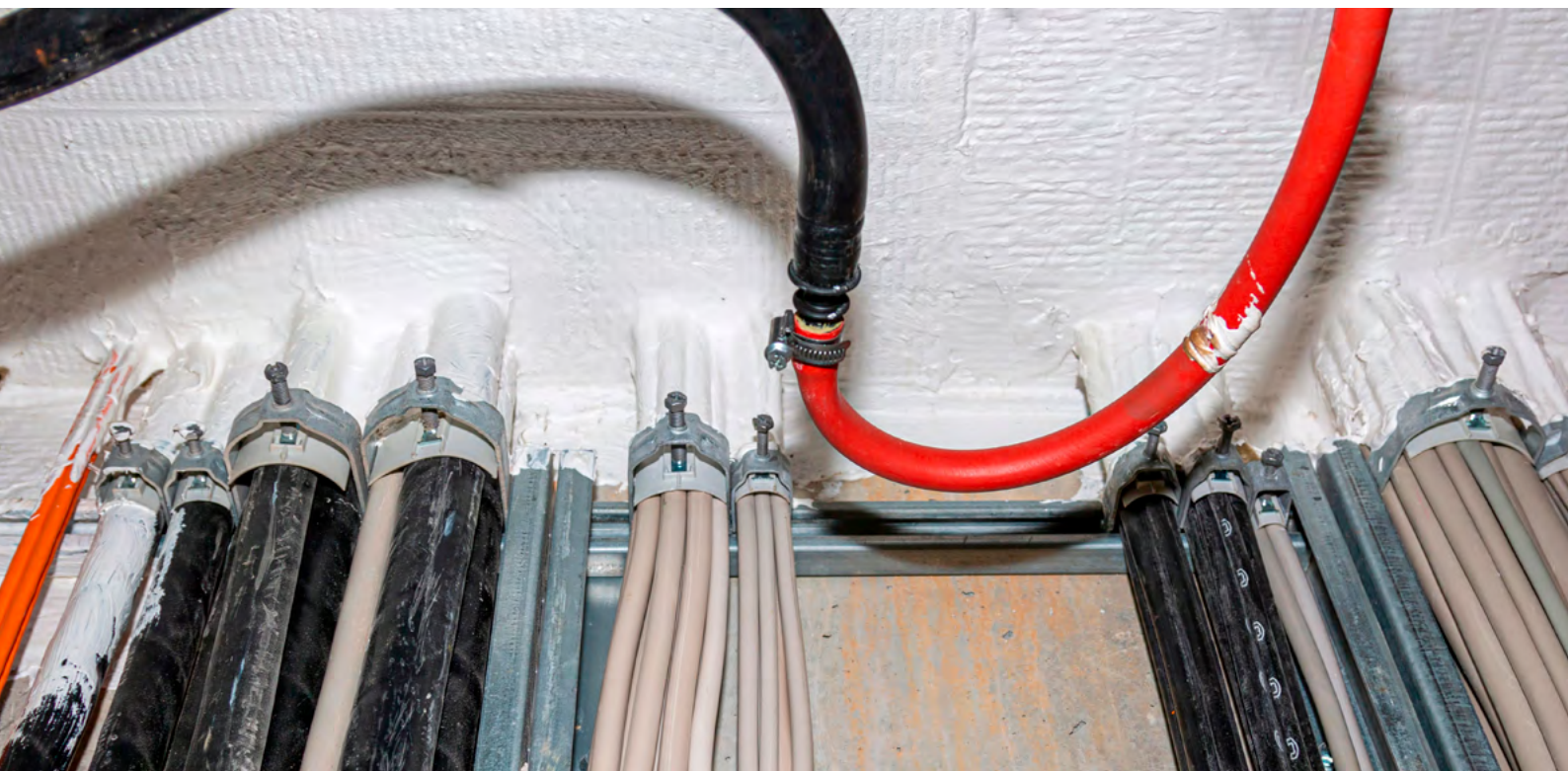
We look forward to hearing from you!

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