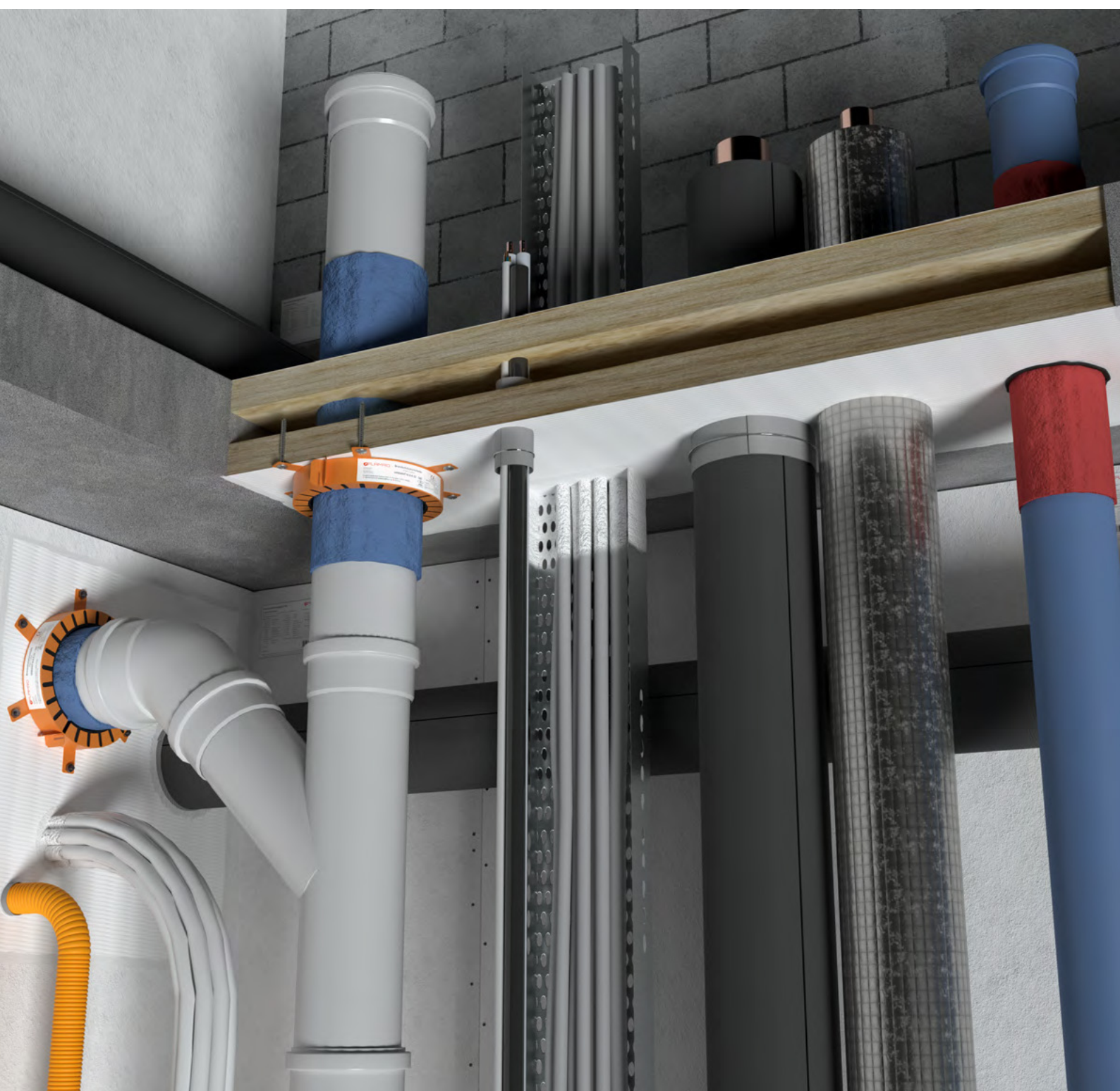


Mixed Penetration Sealing Systems KSL Single Layer and KSL Double Layer

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



Single Layer allowed services - Fire resistance class EI 60 as per EN 13501-2

Service	Dimensions	Protective measure	
Cables (with coating)		Wall	Floor
Cables	$\varnothing \leq 21$ mm	BMA-L fire protection coating Length 100 mm x DFT 1.0 mm, on both sides	
	$\varnothing \leq 80$ mm		
Cable bundles	$\varnothing \leq 100/21$ mm		
Coaxial cable (with coating)			
RADIAFLEX® RLK RFS	$\varnothing \leq 48.2$ mm	BMA-L fire protection coating Length 150 mm x DFT 1.0 mm, on both sides	
CELLFLEX® LCF RFS	$\varnothing \leq 50.3$ mm		
HELIAX CommScope	$\varnothing \leq 51.1$ mm (EI 45)		
Cables (with fire protection wrap)			
Cables	$\varnothing \leq 80$ mm	NBR-plus fire protection wrap Width 125 mm, 2x two layers, on both sides (ETA 22/0052)	
Cable bundles	$\varnothing \leq 100$ mm		
Electrical Installation conduits (EIC's)			
Plastic EICs (Single)	$\varnothing \leq 32$ mm with/without cables $\varnothing \leq 21$ mm	NBR-plus fire protection wrap Width 125 mm, 1x one layer (U/U: Pipe ends do not need to be capped!)	
Plastic EICs (Bundle)	$\varnothing \leq 100$ mm, consisting of individual EICs		
Plastic EICs (Single)	$\varnothing \leq 63$ mm with/without cables $\varnothing \leq 21$ mm	AWM II fire protection collar On both sides (U/C)	AWM II fire protection collar On lower side (U/C)
Plastic EICs (Bundle)	$\varnothing \leq 125$ mm, consisting of individual EICs		
Plastic EICs (Single)	$\varnothing \leq 16$ mm	BMA-L fire protection coating Length 150 mm x DFT 1 mm, on both sides (U/C)	
Speedpipes			
Speedpipes, single or bundled, with/ without optical fibre cables	Bundle $\varnothing \leq 40$ mm Single pipe $\varnothing \leq 14$ mm	NBR-plus fire protection wrap Width 125 mm, 1x one layer	

Single Layer allowed services - Fire resistance class EI 60 as per EN 13501-2

Service	Dimensions	Protective measure	
Combustable pipes with/without PE acoustic insulation tube		Wall	Floor
Standard pipes PVC-U, PVC-C, PE-HD, ABS, SAN+PVC PP-H Special pipes Geberit, Poloplast, Rehau, Wavin	$\varnothing \leq 160$ mm	AWM II fire protection collar, on both sides	AWM II fire protection collar, on lower side
		N B/EC fire protection collar On both sides $\varnothing \leq 50$ mm 2 layers $\varnothing \leq 75$ mm 3 layers $\varnothing \leq 110$ mm 4 layers $\varnothing \leq 125$ mm 5 layers $\varnothing \leq 160$ mm 6 layers	N B/EC fire protection collar On lower side $\varnothing \leq 50$ mm 2 layers $\varnothing \leq 75$ mm 3 layers $\varnothing \leq 110$ mm 4 layers $\varnothing \leq 125$ mm 5 layers $\varnothing \leq 160$ mm 6 layers
		IWM III fire protection wrap Width 50 mm, on both sides $\varnothing \leq 50$ mm 2 layers $\varnothing \leq 75$ mm 3 layers $\varnothing \leq 110$ mm 4 layers $\varnothing \leq 160$ mm 6 layers	IWM III fire protection wrap Width 50 mm, on lower side $\varnothing \leq 50$ mm 2 layers $\varnothing \leq 75$ mm 3 layers $\varnothing \leq 110$ mm 4 layers $\varnothing \leq 160$ mm 6 layers
Combustable pipes with Flexible Elastomeric Foam (FEF) insulation (B-s3, d0)			
Standard pipes	$\varnothing \leq 110$ mm	AWM II fire protection collar, on both sides	AWM II fire protection collar, on lower side
		N B/EC fire protection collar On both sides	N B/EC fire protection collar On lower side
Special pipes/system pipes	$\varnothing \leq 160$ mm	IWM III fire protection wrap Width 50 mm, on both sides $\varnothing \leq 50$ mm 2 layers $\varnothing \leq 75$ mm 3 layers $\varnothing \leq 114$ mm 4 layers $\varnothing \leq 160$ mm 6 layers	IWM III fire protection wrap Width 50 mm, on lower side $\varnothing \leq 50$ mm 2 layers $\varnothing \leq 75$ mm 3 layers $\varnothing \leq 114$ mm 4 layers $\varnothing \leq 160$ mm 6 layers
Combustable pipes with Mineral Wool insulation			
Standard pipes, Special pipes/system pipes	$\varnothing \leq 70$ mm	Stonewool pipeshell $\geq 500 \times 20-80$ mm, 100 mm BMA-L, on both sides	
Multilayer pipes with/without PE Acoustic insulation tube			
Multilayer Pipes, Alpex, Unipor, Geberit Mepla, KE KELIT KELOX, Henco	≤ 110 mm	N B/EC fire protection collar, on both sides	N B/EC fire protection collar, on lower side
		IWM III fire protection wrap Width 50 mm, on both sides $\varnothing \leq 50$ mm 2 layers $\varnothing \leq 75$ mm 3 layers $\varnothing \leq 110$ mm 4 layers	IWM III fire protection wrap Width 50 mm, on lower side $\varnothing \leq 50$ mm 2 layers $\varnothing \leq 75$ mm 3 layers $\varnothing \leq 110$ mm 4 layers
Multilayer pipes with Flexible Elastomeric Foam (FEF) insulation (B-s3, d0)			
Multilayer Pipes, Alpex, Unipor, Geberit Mepla, KE KELIT KELOX, Henco	$\varnothing \leq 75$ mm, insulation thickness 9-38 mm	AWM II fire protection collar, on both sides	AWM II fire protection collar, on lower side
		N B/EC fire protection collar, on both sides	N B/EC fire protection collar, on lower side
	IWM III fire protection wrap Width 50 mm		
	$\varnothing \leq 32$ mm, insulation thickness 9-38 mm	1 layer, on both sides	1 layer, on lower side
	$\varnothing \leq 50$ mm, insulation thickness 9-38 mm	2 layers, on both sides	2 layers, on lower side
	$\varnothing \leq 75$ mm, insulation thickness 9-38 mm	3 layers, on both sides	3 layers, on lower side
$\varnothing \leq 110$ mm, insulation thickness 9-38 mm	4 layers, on both sides	4 layers, on lower side	
Multilayer pipes with Polyethylene Foam (PEF)			
Multilayer Pipes, Alpex, Unipor, Geberit Mepla, KE KELIT KELOX, Henco	$\varnothing \leq 32$ mm, insulation thickness 6-13 mm	IWM III fire protection wrap 1 layer, width 50 mm, on both sides	IWM III fire protection wrap 1 layer, width 50 mm, on lower side
Multilayer pipes with Mineral Wool insulation			
Geberit Mepla	$\varnothing \leq 70$ mm	Stonewool pipeshell $\geq 500 \times 20-80$ mm, 100 mm BMA-L, on both sides	

Single Layer allowed services - Fire resistance class EI 60 as per EN 13501-2

Service	Dimensions	Protective measure	
		Wall	Floor
Non-combustable pipes			
Steel, stainless steel, cast iron	$\varnothing \leq 114.3$ mm	BMA-L fire protection coating Length 400 mm x DFT 3.0 mm, on both sides	
	$\varnothing \leq 42$ mm	BMA-L fire protection coating Length 300 mm x DFT 3.0 mm, on both sides (Efectis)	
Copper	$\varnothing \leq 28$ mm		
Non-combustable pipes with Mineral Wool insulation (with coating)			
Copper, steel, stainless steel, cast iron	$\varnothing \leq 42$ mm	Stonewool pipeshell $\geq 500 \times 25$ -100 mm, 100 mm BMA-L, on both sides	
	$\varnothing \leq 60$ mm		
	$\varnothing \leq 108$ mm		
Steel, stainless steel, cast iron	$\varnothing \leq 114.3$ mm	Stonewool pipeshell $\geq 500 \times 25$ -100 mm, 100 mm BMA-L, on both sides	
	$\varnothing \leq 219.1$ mm		
	$\varnothing \leq 274$ mm	Stonewool pipeshell $\geq 1000 \times 40$ -100 mm, 100 mm BMA-L, on both sides	
Non-combustable pipes with Flexible Elastomeric Foam (FEF) insulation			
Copper, steel, stainless steel, cast iron	$\varnothing \leq 15$ mm, insulation thickness 10-38 mm	NBR-plus fire protection wrap Width 100 mm, 1x two layers	
	$\varnothing \leq 42$ mm, insulation thickness 12-38 mm		
	$\varnothing \leq 60$ mm, insulation thickness 19-38 mm		
	$\varnothing \leq 88,9$ mm, insulation thickness 22.5-38 mm		
Steel, stainless steel, cast iron	$\varnothing \leq 114.3$ mm, insulation thickness 19-38 mm	N B/EC fire protection collar, on both sides	
	$\varnothing \leq 159$ mm, insulation thickness 25-38 mm		
	$\varnothing \leq 219.1$ mm, insulation thickness 25-38 mm		
Steel, stainless steel, cast iron	$\varnothing \leq 108$ mm, insulation thickness ≤ 19 mm	N B/EC fire protection collar, on lower side	
Non-combustable pipes with PIR insulation			
Copper, steel, stainless steel, cast iron	$\varnothing \leq 15$ mm, insulation thickness 20-80 mm	NBR-plus fire protection wrap Width 100 mm, 1x two layers	
	$\varnothing \leq 88,9$ mm, insulation thickness 30-80 mm		
	$\varnothing \leq 108$ mm, insulation thickness 30-80 mm		
Steel, stainless steel, cast iron	$\varnothing \leq 168.3$ mm, insulation thickness 40-90 mm	NBR-plus fire protection wrap Width 100 mm, 1x two layers	
	$\varnothing \leq 219.1$ mm, insulation thickness 50-100 mm		
HVAC split lines			
Double copper pipe ($\varnothing 18/18$ mm) pre-insulated with PEF (9 mm) + PVC pipe ($\varnothing 25$ mm) + max. 3 accompanying cables ($\varnothing 14$ mm)		NBR-plus fire protection wrap Width 100 mm, 1x two layers	

Double Layer allowed services - Fire resistance class EI 120 as per EN 13501-2

Service	Dimensions	Protective measure	
Cables (with coating)		Wall	Floor
Cables	$\varnothing \leq 21$ mm	BMA-L fire protection coating Length 150 mm x DFT 1.0 mm, on both sides	
	$\varnothing \leq 80$ mm		
Cable bundles	$\varnothing \leq 100/21$ mm		
Coaxial cable (with coating)			
RADIAFLEX® RLK RFS	$\varnothing \leq 48.2$ mm	BMA-L fire protection coating Length 100 mm x DFT 1.0 mm, on both sides	
CELLFLEX® LCF RFS	$\varnothing \leq 50.3$ mm		
HELIAX CommScope	$\varnothing \leq 51.1$ mm		
Cables (with fire protection wrap)			
Cables	$\varnothing \leq 80$ mm	NBR-plus fire protection wrap Width 125 mm, 2x two layers, on both sides (ETA 22/0052)	
Cable bundles	$\varnothing \leq 100$ mm		
Electrical Installation conduits (EIC's)			
Plastic EICs (Single)	$\varnothing \leq 32$ mm with/without cables $\varnothing \leq 21$ mm	NBR-plus fire protection wrap Width 125 mm, 1x one layer	
Plastic EICs (Bundle)	$\varnothing \leq 100$ mm, consisting of individual EICs	NBR-plus fire protection wrap Width 125 mm, 1x two layers	
Plastic EICs (Single)	$\varnothing \leq 63$ mm with/without cables $\varnothing \leq 21$ mm	AWM II fire protection collar On both sides (EI 90 U/C)	AWM II fire protection collar On lower sides (U/C)
Plastic EICs (Bundle)	$\varnothing \leq 125$ mm, consisting of individual EICs		

Service	Dimensions	Protective measure	
CT Cable Tubes			
Cables	$\varnothing \leq 21$ mm	CT overall length 300 mm (Ø90 or 120 mm) (EI 90 U/C)	CT overall length 300 mm (Ø90 or 120 mm)
Cable bundles	$\varnothing \leq 100/21$ mm		

Double Layer allowed services - Fire resistance class EI 120 as per EN 13501-2

Service	Dimensions	Protective measure	
		Wall	Floor
Combustable pipes with/without PE acoustic insulation tube			
Standard pipes PVC-U, PVC-C, PE-HD, ABS, SAN+PVC PP-H Special pipes Geberit, Poloplast, Rehau, Wavin	$\varnothing \leq 160$ mm	AWM II fire protection collar , on both sides	AWM II fire protection collar , on lower side
		N B/EC fire protection collar On both sides $\varnothing \leq 50$ mm 2 layers $\varnothing \leq 75$ mm 3 layers $\varnothing \leq 110$ mm 4 layers $\varnothing \leq 125$ mm 5 layers $\varnothing \leq 160$ mm 6 layers	N B/EC fire protection collar On lower side $\varnothing \leq 50$ mm 2 layers $\varnothing \leq 75$ mm 3 layers $\varnothing \leq 110$ mm 4 layers $\varnothing \leq 125$ mm 5 layers $\varnothing \leq 160$ mm 6 layers
		IWM III fire protection wrap Width 50 mm, on both sides $\varnothing \leq 50$ mm 2 layers $\varnothing \leq 75$ mm 3 layers $\varnothing \leq 110$ mm 4 layers $\varnothing \leq 125$ mm 5 layers	IWM III fire protection wrap Width 50 mm, on lower side $\varnothing \leq 50$ mm 2 layers $\varnothing \leq 75$ mm 3 layers $\varnothing \leq 110$ mm 4 layers $\varnothing \leq 125$ mm 5 layers
Combustable pipes with Flexible Elastomeric Foam (FEF) insulation (B-s3, d0)			
Standard pipes	$\varnothing \leq 110$ mm	AWM II fire protection collar , on both sides	AWM II fire protection collar , on lower side
Special pipes/system pipes	$\varnothing \leq 110$ mm	IWM III fire protection wrap Width 50 mm, on both sides $\varnothing \leq 50$ mm 2 layers $\varnothing \leq 110$ mm 4 layers (U/U) $\varnothing \leq 160$ mm 6 layers	IWM III fire protection wrap Width 50 mm, on lower side $\varnothing \leq 50$ mm 2 layers $\varnothing \leq 110$ mm 4 layers (U/U) $\varnothing \leq 160$ mm 6 layers

Service	Dimensions	Protective measure	
		Wall	Floor
Multilayer pipes			
Multilayer Pipes, Alpex, Unipor, Geberit Mepla, KE KELIT KELOX, Henco	≤ 110 mm	N B/EC fire protection collar , on both sides	N B/EC fire protection collar , on lower side
Multilayer pipes with Flexible Elastomeric Foam (FEF) insulation (B-s3, d0)			
Multilayer Pipes, Alpex, Unipor, Geberit Mepla, KE KELIT KELOX, Henco		IWM III fire protection wrap Width 50 mm	
	$\varnothing \leq 32$ mm, insulation thickness 9-32 mm	1 layer, on both sides	1 layer, on lower side
	$\varnothing \leq 75$ mm, insulation thickness 9-38 mm	2 layers, on both sides	2 layers, on lower side
Multilayer pipes with Polyethylene Foam (PEF)			
Multilayer Pipes, Alpex, Unipor, Geberit Mepla, KE KELIT KELOX, Henco	$\varnothing \leq 32$ mm, insulation thickness 6-13 mm	IWM III fire protection wrap 1 layer, width 50 mm, on both sides	IWM III fire protection wrap 1 layer, width 50 mm, on lower side
Multilayer pipes with Mineral Wool pipeshell			
Geberit Mepla	$\varnothing \leq 70$ mm	Stonewool pipeshell $\geq 1.000 \times 20-80$ mm, 100 mm BMA-L, on both sides	

Double Layer allowed services - Fire resistance class EI 120 as per EN 13501-2

Service	Dimensions	Protective measure	
		Wall	Floor
Non-combustable pipes			
Non-combustable pipes with Mineral Wool insulation (with coating)			
Copper, steel, stainless steel, cast iron	$\varnothing \leq 42$ mm	Stonewool pipeshell $\geq 1000 \times 25-100$ mm, 100 mm BMA-L, on both sides	
	$\varnothing \leq 60$ mm		
	$\varnothing \leq 88.9$ mm		
Steel, stainless steel, cast iron	$\varnothing \leq 114.3$ mm	Stonewool pipeshell $\geq 1000 \times 25-100$ mm, 100 mm BMA-L, on both sides	
	$\varnothing \leq 219.1$ mm	Stonewool pipeshell $\geq 2500 \times 40-100$ mm, 100 mm BMA-L, on both sides	
Non-combustable pipes with Flexible Elastomeric Foam (FEF) insulation			
Copper, steel, stainless steel, cast iron	$\varnothing \leq 15$ mm, insulation thickness 10-38 mm	NBR-plus fire protection wrap Width 125 mm, 1x two layers	
	$\varnothing \leq 42$ mm, insulation thickness 12-38 mm		
	$\varnothing \leq 60$ mm, insulation thickness 19-38 mm		
	$\varnothing \leq 88,9$ mm, insulation thickness 22.5-38 mm		
Steel, stainless steel, cast iron	$\varnothing \leq 114.3$ mm, insulation thickness 19-38 mm		
	$\varnothing \leq 159$ mm, insulation thickness 25-38 mm		
	$\varnothing \leq 219.1$ mm, insulation thickness 25-38 mm		
Steel, stainless steel, cast iron	$\varnothing \leq 108$ mm, insulation thickness ≤ 19 mm	N B/EC fire protection collar, on both sides	N B/EC fire protection collar, on lower side
HVAC split lines			
Double copper pipe ($\varnothing 18/18$ mm) pre-insulated with PEF (9 mm) + PVC pipe ($\varnothing 25$ mm) + max. 3 accompanying cables ($\varnothing 14$ mm)		NBR-plus fire protection wrap Width 100 mm, 1x two layers	

Four Layer allowed services - Fire resistance class EI 240 as per EN 13501-2

Service	Dimensions	Protective measure
Cables (with fire protection wrap)		
Cables	$\varnothing \leq 80$ mm	NBR-plus fire protection wrap Width 125 mm, 2x two layers, on both sides
Cable bundles	$\varnothing \leq 100$ mm	

Service	Dimensions	Protective measure	
Non-combustable pipes with Mineral Wool insulation (with coating)		Wall	Floor
Steel, stainless steel, cast iron	$\varnothing \leq 42.4$ mm	Stonewool pipeshell $\geq 750 \times 50$ mm, 100 mm BMA-L, on both sides Fire protection wrap , width 50 mm, on both sides Stonewool pipeshell $\geq 500 \times 30$ mm	
	$\varnothing \leq 88.9$ mm	Stonewool pipeshell $\geq 1.000 \times 60$ mm, 100 mm BMA-L, on both sides Fire protection wrap , width 50 mm, on both sides Stonewool pipeshell $\geq 500 \times 30$ mm	
	$\varnothing \leq 168.3$ mm	Stonewool pipeshell $\geq 1.250 \times 70$ mm, 100 mm BMA-L, on both sides Fire protection wrap , width 50 mm, on both sides Stonewool pipeshell $\geq 750 \times 30$ mm	
	$\varnothing \leq 219.1$ mm	Stonewool pipeshell $\geq 1.500 \times 80$ mm, 100 mm BMA-L, on both sides Fire protection wrap , width 100 mm, on both sides Stonewool pipeshell $\geq 1.000 \times 30$ mm	
	$\varnothing \leq 323.9$ mm	Stonewool pipeshell $\geq 1.750 \times 90$ mm, 100 mm BMA-L, on both sides Fire protection wrap , width 100 mm, on both sides Stonewool pipeshell $\geq 1.250 \times 30$ mm	

Service	Dimensions	Protective measure	
Combustable pipes		Wall	Floor
Standard pipes PVC-U, PVC-C, PE-HD, ABS, SAN+PVC, PP-H	$\varnothing \leq 200$ mm	N II fire protection collar , on both sides	

OSI allowed services - Fire resistance class EI 90 as per EN 13501-2

Service	Dimensions	Protective measure
Cables (with coating)		Shaftwall
Cables	$\varnothing \leq 21$ mm	BMA-L fire protection coating Length 300 mm x DFT 1.0 mm, on one side (fireside)
Cable bundles	$\varnothing \leq 100/21$ mm	
Duo-coax bundle (with coating)		
Duo coax bundle	$\varnothing \leq 21/14$ mm	BMA-L fire protection coating Length 300 mm x DFT 1.0 mm, on one side (fireside)
Cables (with fire protection wrap)		
Cables	$\varnothing \leq 21$ mm	NBR-plus fire protection wrap Width 125 mm, 2x one layer, on one side (fireside)
Cable bundles	$\varnothing \leq 100$ mm	
Electrical Installation conduits (EIC's)		
Plastic EICs (Single)	$\varnothing \leq 21$ mm	NBR-plus fire protection wrap Width 125 mm, 2x two layers
Plastic EICs (Bundle)	$\varnothing \leq 100$ mm	NBR-plus fire protection wrap Width 125 mm, 2x two layers
Speedpipes		
Speedpipes, single or bundled, with/ without optical fibre cables	Single pipe $\varnothing \leq 12$ mm Bundle max. 5 pcs.	NBR-plus fire protection wrap Width 125 mm, 2x two layers, on both sides
Non-combustable pipes (with coating)		
Steel, stainless steel, cast iron	$\varnothing \leq 42$ mm	BMA-L fire protection coating Length 600 mm x DFT 3.0 mm, on one side (fireside)
Non-combustable pipes with Mineral Wool insulation (with coating)		
Steel, stainless steel, cast iron	$\varnothing \leq 114.3$ mm	Stonewool pipeshell $\geq 1.000 \times 25-100$ mm, 100 mm BMA-L, on one side (fireside)
Non-combustable pipes with Flexible Elastomeric Foam (FEF) insulation		
Steel, stainless steel, cast iron	$\varnothing \leq 114.3$ mm	NBR-plus fire protection wrap Width 125 mm, 1x two layers
Combustable pipes		
Standard pipes PVC-U, PVC-C, PE-HD, ABS, SAN+PVC PP-H	$\varnothing \leq 110$ mm	AWM II fire protection collar , on one side (fireside)
	$\varnothing \leq 50$ mm	IWM III fire protection wrap , width 100 mm, 2x 1 layer
	$\varnothing \leq 70$ mm	IWM III fire protection wrap , width 100 mm, 2x 2 layers
	$\varnothing \leq 110$ mm	IWM III fire protection wrap , width 100 mm, 2x 3 layers
Combustable pipes with/without Flexible Elastomeric Foam (FEF) insulation (B-s3, d0)		
Standard pipes, Special pipes/system pipes	$\varnothing \leq 50$ mm	DG-SC Graphite filler 25-50 x 25 mm
Multilayer pipes with/without Flexible Elastomeric Foam (FEF) insulation (B-s3, d0)		
Multilayer pipes	$\varnothing \leq 32$ mm	DG-SC Graphite filler 25-50 x 25 mm