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Authorised and notified according to Article 29 of the Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011

European Technical Assessment ETA-21/0109 of 2021/01/03

I General Part

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: ETA-Danmark A/S

Trade name of the construction product:	ROKU® AC Sealant
Product family to which the above construction product belongs:	Fire Stopping & Fire Sealing Products. Penetration seals
Manufacturer:	Rolf Kuhn GmbH Jägersgrund 10 DE-57339 Emdtebrück Telephone: +49 2753 59450 www.kuhn-brandschutz.com
Manufacturing plant:	A003
This European Technical Assessment contains:	36 pages including 1 annex which form an integral part of the document
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of:	EAD 350454-00-1104 Fire Stopping and Fire Sealing Products - Part 2: Penetration Seals Issued September 2017
This version replaces:	-

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document and should be identified as such.

1 Technical Description of the Product

1) ROKU® AC Sealant is a sealant used to form a penetration seal around metallic pipes, plastic pipes and electrical cables to reinstate the fire resistance performance of wall and floor constructions, where they have been provided with apertures for the penetration of services.

2) The ROKU® AC Sealant is supplied in liquid form contained within 310 & 380 ml cartridges and 600 ml foil packs. The sealant is gunned into the aperture in the separating element/elements and around the service or services, to a specified depth utilising mineral fibre insulation backing material.

3) ROKU® AC Sealant contains no carcinogenic substances or mutagenic substances, flame retardants or antimicrobiological agents.

4) The applicant has submitted a written declaration that ROKU® AC Sealant does not contain substances which have to be classified as dangerous according to Directive 67/548/EEC and Regulation (EC) No 1272/2008 and listed in the "Indicative list on dangerous substances" of the EGDS - taking into account the installation conditions of the construction product and the release scenarios resulting from there. An emission report has also been provided.

   In addition to the specific clauses relating to dangerous substances contained in this European technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

2 Specification of the intended use(s) in accordance with the applicable European Assessment Document (hereinafter EAD)

Detailed information and data is given in Annex A.

1) The intended use of system ROKU® AC Sealant is to reinstate the fire resistance performance of flexible wall constructions, rigid wall constructions and rigid floor constructions where they are penetrated by various metal pipe services with and without combustible insulation, plastic pipes and electrical cables.

2) The specific elements of construction that the system ROKU® AC Sealant may be used to provide a penetration seal in, are as follows:

a. Flexible walls:The wall must have a minimum thickness of 100 mm and comprise steel studs lined on both faces with minimum 2 layers of 12.5 mm thick boards.

b. Rigid walls: The wall must have a minimum thickness of 150 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m^3.

c. Rigid floors: The floor must have a minimum thickness of 150 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m^3.

   The supporting construction must be classified in accordance with EN 13501-2 for the required fire resistance period.

3) The system ROKU® AC Sealant may be used to provide a penetration seal with specific single insulated metal pipes, uninsulated metal pipes, plastic pipes and with specific electrical cables, single or in a bundle (for details see Annex A).

4) Apertures in the separating element shall be maximum 240 mm diameter or 100 x 1000 mm. The annular space/gap around the services shall be infilled with mineral fibre insulation backing material and ROKU® AC Sealant sealant. Blank seals up to 170 mm diameter are permitted. For full details, see Annex B.

5) Pipes shall be supported at maximum 350 mm away from both faces of the wall constructions and from the upper face of floor constructions.

6) The provisions made in this European Technical Assessment are based on an assumed working life of the ROKU® AC Sealant of 10 years, provided that the conditions laid down in the product data sheet regarding packaging/transport/ storage/installation/use/repair are met. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

Use Category

Type Z_2: Intended for uses in internal conditions with humidity lower than 85 % RH excluding temperatures below 0°C, without exposure to rain or UV.

3 Performance of The Product And References To The Methods Used For Its Assessment

Product-type: Sealant		Intended use: Penetration Seal
	Essential characteristic	Performance
Safety in case of fire		
	Reaction to fire	Class F (untested)
	Resistance to fire	Annex A
Hygiene, health and environment		
	Air permeability (material property)	No performance assessed
	Water permeability (material property)	No performance assessed
	Release of dangerous substances	Declaration of manufacturer
Safety in use		
	Mechanical resistance and stability	No performance assessed
	Resistance to impact/movement	No performance assessed
	Adhesion	No performance assessed
Protection against noise		
	Airborne sound insulation	No performance assessed
Energy economy and heat retention		
	Thermal properties	No performance assessed
	Water vapour permeability	No performance assessed
General aspects relating to fitness for use		
	Durability and serviceability	Z_2

4 Assessment and verification of constancy of performance (hereinafter AVCP) system applied, with reference to its legal base

According to the decision 1999/454/EC of the European Commission the system of assessment and verification of constancy of performance (see Annex V to the Regulation (EU) No 305/2011) given in the following table apply:

Product(s)	Intended use(s)	Level(s) or class(es)	System(s)
Fire stopping and Fire Sealing Products	For fire compartmentation and/or fire protection or fire performance	Any	1

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at ETA-Danmark A/S prior to CE marking

Issued in Copenhagen on 2021-01-03 by

Thomas Bruun

Managing Director, ETA-Danmark

Annex A

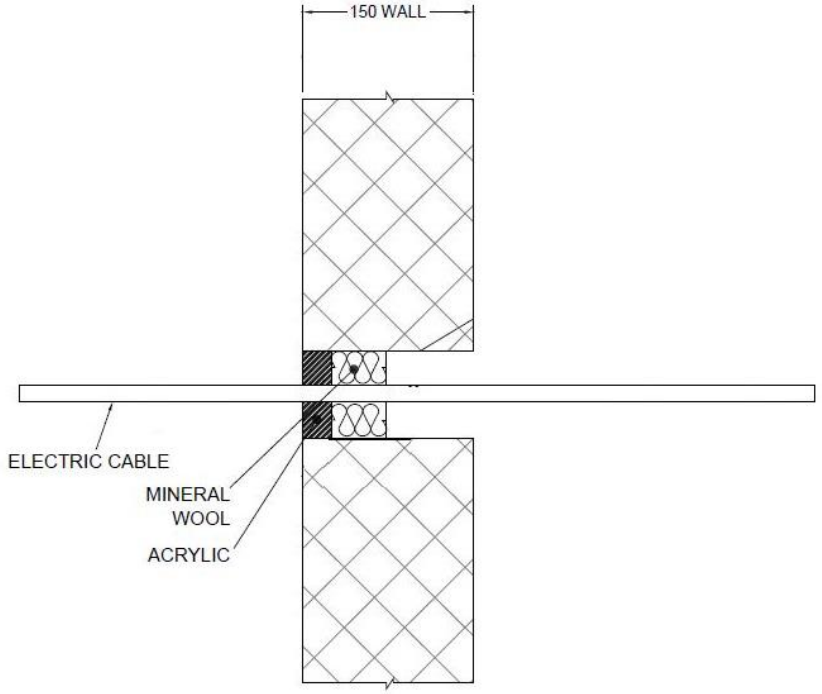
Resistance to fire classification

A.1 Rigid wall constructions according to 1.2.1 with wall thickness of minimum 150 mm

A.1.1 Single side penetration seal with cables

Penetration Seal: Cables (single) fitted at centrally within the aperture, with ROKU® AC Sealant to either side of the wall (or at any position in between), backed with stone wool insulation 35kg/m^3 or 'AES Fibre ≥ 128kg/m^3'.

Construction details:



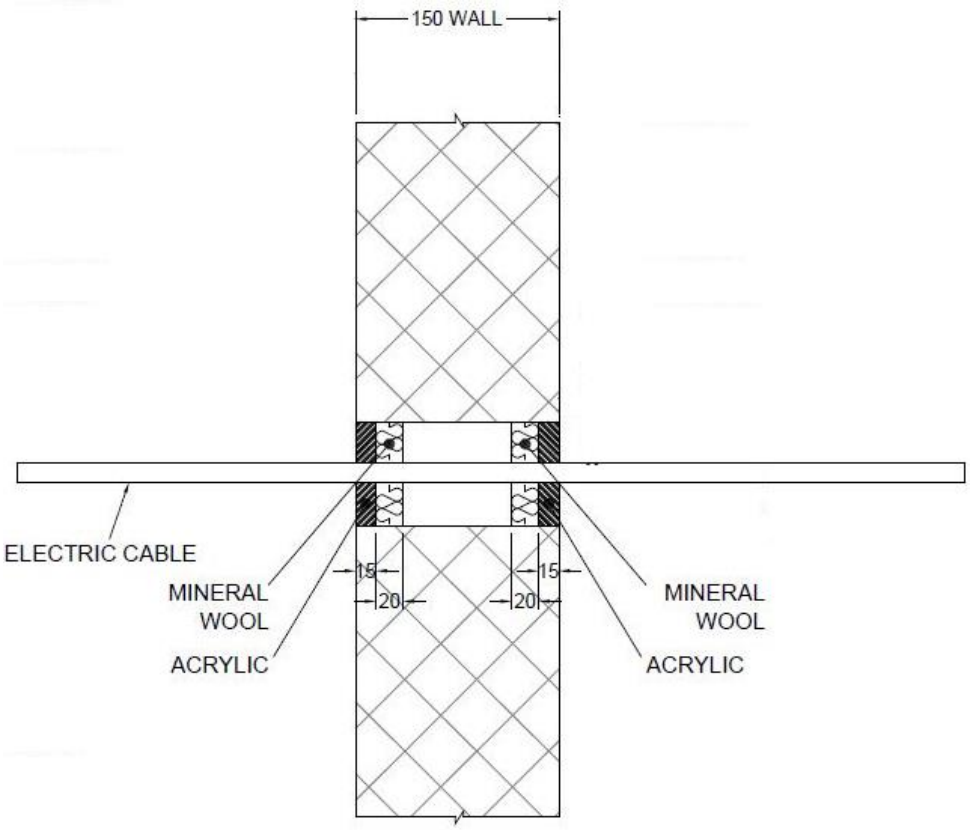
A.1.1.1

Services	Sealant depth	Backing	Seal width (around cable)	Classification
Single electrical cables up to 21 mm Ø	25 mm	48 mm deep AES Fibre ≥ 128kg/m^3	7-31 mm	**E 240, EI 90**

A.1.2 Single side penetration seal with cables

Penetration Seal: Cables (single) fitted at centrally within the aperture, with ROKU® AC Sealant to both sides of the wall, backed with stone wool insulation 40kg/m^3.

Construction details:



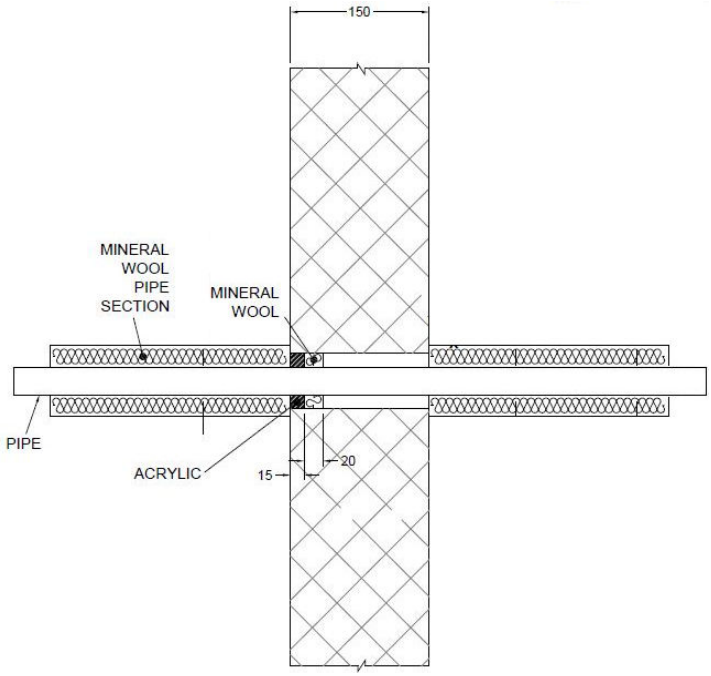
A.1.2.1

Services	Sealant depth	Backing	Aperture Ø	Classification
Single electrical cables up to 21 mm Ø	15 mm	Stone wool 20 mm deep, 40 kg/m^3	36-82 mm	**E 240, EI 90**
			Up to 170 mm	**E 120, EI 90**

A.1.3 Single side penetration seal with metallic (and composite) pipes

Penetration Seal: LI (Local Interrupted) of minimum length stated below or CI (Continuous Interrupted) insulated metallic and composite pipes (single) fitted central within the aperture, with 15 mm deep ROKU® AC Sealant to either side of the wall (or at any position between), backed with 20 mm deep 40 kg/m^3 stone wool insulation*.

Construction details:

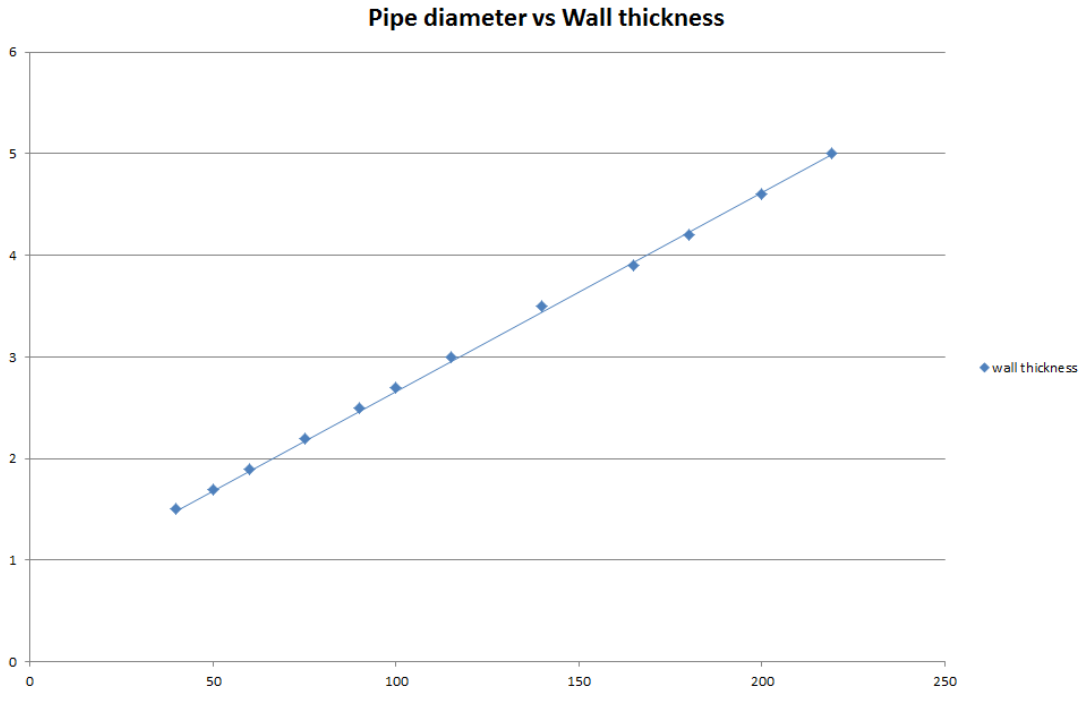


A.1.3.1

Services	Seal width around pipe	Insulation	Classification
Copper pipe up to 54 mm diameter/0.9-14.2 mm wall	8-9 mm	1000 mm length 20 mm Stone wool insulation 80 kg/m^3	**E 240 C/U, EI 180 C/U**
Copper pipe up to 12 mm diameter/0.9-5 mm wall	8 mm		**EI 240 C/U**
Alupex composite pipe 75 mm diameter/7.5 mm wall	30 mm	25 mm AES Fibre ≥ 128kg/m^3, 600 mm long (min.)	**EI 120 C/U**

Services Mild or stainless steel pipe	Seal width around pipe	Insulation	Classification
40 mm diameter/1.5-14.2 mm wall*	6-18 mm	1000 mm length of 20 mm Stone wool insulation 80 kg/m^3	**EI 240 C/U**
40 mm diameter/1.5-14.2 mm wall*		1000 mm length of 30 mm Stone wool insulation 80 kg/m^3	**E 180, EI 90 C/U**
50 mm diameter/1.7-14.2 mm wall*			
60 mm diameter/1.9-14.2 mm wall*			
75 mm diameter/2.2-14.2 mm wall*			
90 mm diameter/2.5-14.2 mm wall*			
100 mm diameter/2.7-14.2 mm wall*			
115 mm diameter/3-14.2 mm wall*			
140 mm diameter/3.5-14.2 mm wall*			
165 mm diameter/ 3.9-14.2 mm wall*			
180 mm diameter/ 4.2-14.2 mm wall*			
200 mm diameter/ 4.6-14.2 mm wall*			
219 mm diameter/ 5.0-14.2 mm wall*			

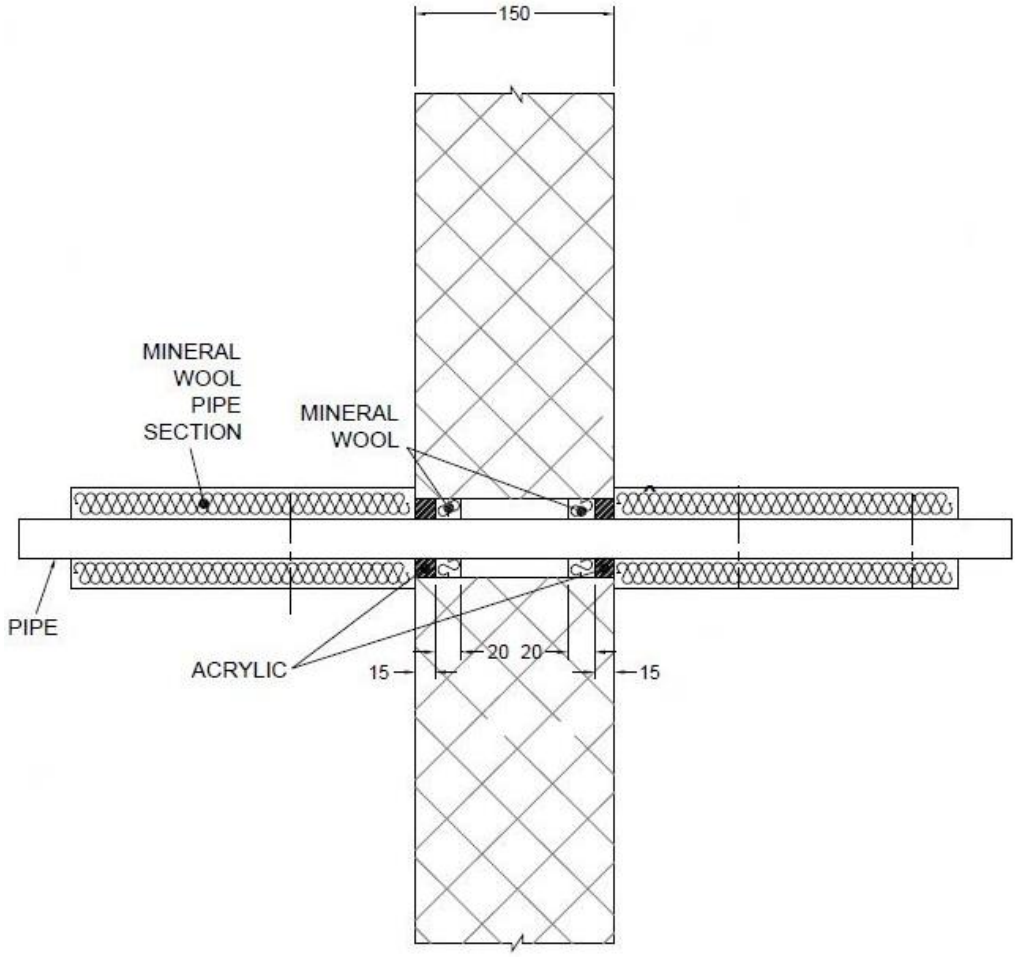
* Typical pipe diameters shown, see below graph for intermediate sizes



A.1.4 Double side penetration seal with metallic pipes

Penetration Seal: 1000 mm (min.) LI (Local Interrupted) or CI (Continuous Interrupted) insulated metallic pipes (single) fitted central within the aperture, with 15 mm deep ROKU® AC Sealant to both sides of the wall), backed with 20 or 30 mm deep 40 kg/m^3 stone wool insulation.

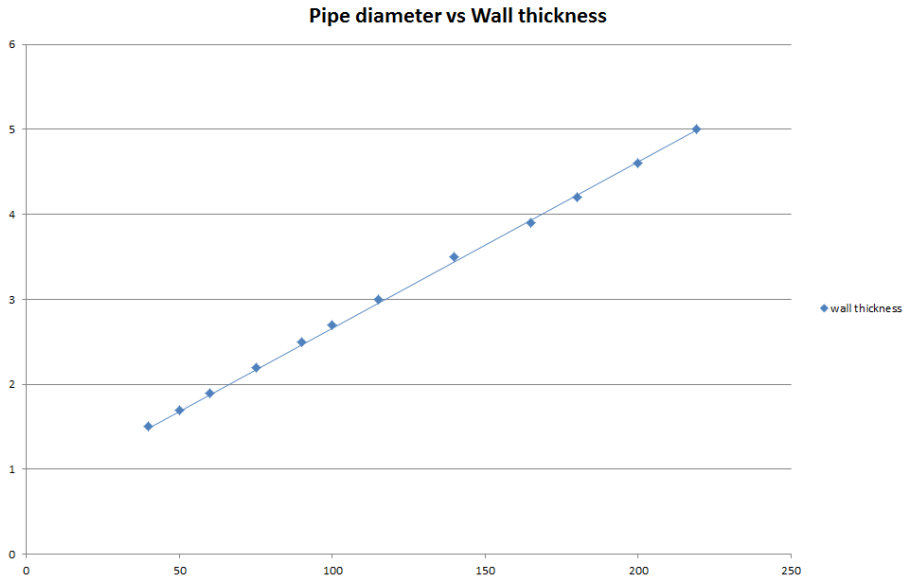
Construction details:



A.1.4.1

Services Mild or stainless steel pipe	Seal width around pipe	Insulation	Classification
40 mm diameter/1.5-14.2 mm wall*	6-18 mm	20 mm Stone wool insulation 80 kg/m^3	**EI 240 C/U**
40 mm diameter/1.5-14.2 mm wall*	6-18 mm	30 mm Stone wool insulation 80 kg/m^3	**E 240, EI 120 C/U**
50 mm diameter/1.7-14.2 mm wall*			
60 mm diameter/1.9-14.2 mm wall*			
75 mm diameter/2.2-14.2 mm wall*			
90 mm diameter/2.5-14.2 mm wall*			
100 mm diameter/2.7-14.2 mm wall*			
115 mm diameter/3-14.2 mm wall*			
140 mm diameter/3.5-14.2 mm wall*			
165 mm diameter/ 3.9-14.2 mm wall*			
180 mm diameter/ 4.2-14.2 mm wall*			
200 mm diameter/ 4.6-14.2 mm wall*			
219 mm diameter/ 5.0-14.2 mm wall*			
40 mm diameter/1.5-14.2 mm wall*	Seal diameter up to 170 mm		**EI 120 C/U**
50 mm diameter/1.7-14.2 mm wall*			
60 mm diameter/1.9-14.2 mm wall*			
75 mm diameter/2.2-14.2 mm wall*			
90 mm diameter/2.5-14.2 mm wall*			
100 mm diameter/2.7-14.2 mm wall*			
115 mm diameter/3-14.2 mm wall*			
140 mm diameter/3.5-14.2 mm wall*			
165 mm diameter/ 3.9-14.2 mm wall*			
180 mm diameter/ 4.2-14.2 mm wall*			
200 mm diameter/ 4.6-14.2 mm wall*			
219 mm diameter/ 5.0-14.2 mm wall*			

* Typical pipe diameters shown, see below graph for intermediate sizes

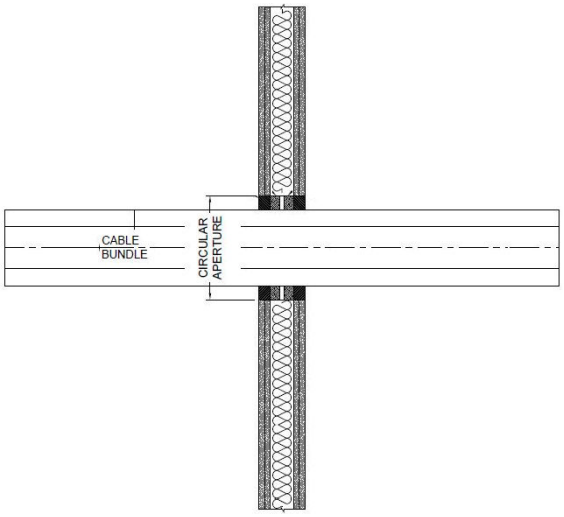

Pipe diameter vs Wall thickness
6
5
4
3
2
1
0
0
50
100
150
200
250
wall thickness

A.2 Flexible wall constructions according to 1.2.1 with wall thickness of minimum 100 mm

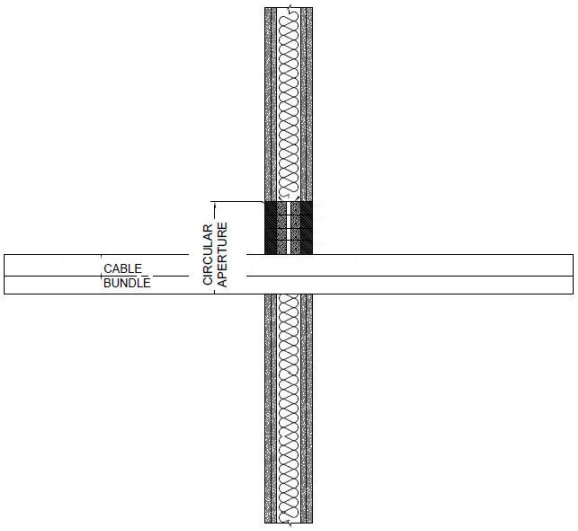
A.2.1 Double side penetration seal with cables

Penetration Seal: Cables (single or bundles up to 100 mm Ø) fitted at any position within the aperture, with ROKU® AC Sealant to both sides of the wall, backed with stone wool insulation 40kg/m^3, 140 kg/m^3 or 'AES Fibre ≥ 128kg/m^3'.

Construction details:



Construction details:



A.2.1.1

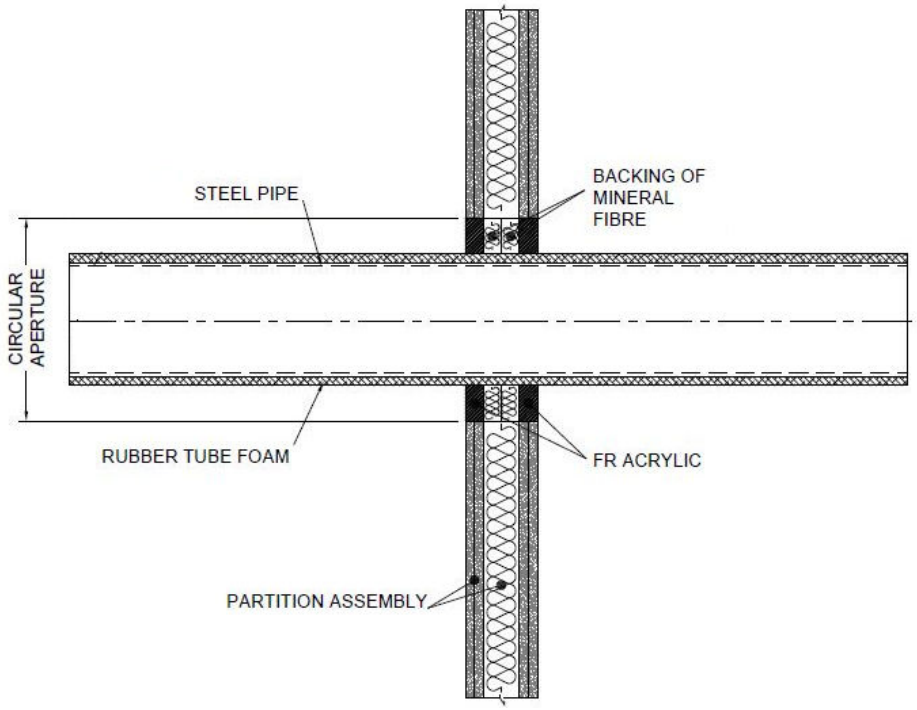
Services	Sealant depth	Backing	Maximum aperture Ø	Classification
None (blank)	12.5 mm	Stone wool 20 mm deep 140 kg/m^3	170 mm*	**EI 120**
Electrical cables up to 21 mm Ø, single or in bundles up to 100 mm Ø	25 mm	Stone wool 20 mm deep 40 kg/m^3		**EI 120**
Electrical cables up to 80 mm Ø, single or in bundles up to 100 mm Ø		25 mm AES Fibre ≥ 128kg/m^3		**E 120, EI 60**
Telecommunication cables up to 21 mm Ø single or in bundles up to 100 mm Ø		Stone wool 20 mm deep 40 kg/m^3		**EI120**
Single 'E cable' - 1 x 185 mm^2 core HD603.3 electrical cable with PVC insulation, PVC sheath and 23-27 mm diameter	12.5 mm	Stone wool 20 mm deep/140 kg/m^3		**E 120, EI 60**

* Or 30 mm wide x 3000 mm high for cables up to 21 mm Ø

A.2.2 Double side penetration seal with metallic pipes

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes (single) fitted central within the aperture, with ROKU® AC Sealant to both sides of the wall, 10-30 mm seal width around service, backed with stone wool insulation or 'AES Fibre ≥ 128kg/m^3'.

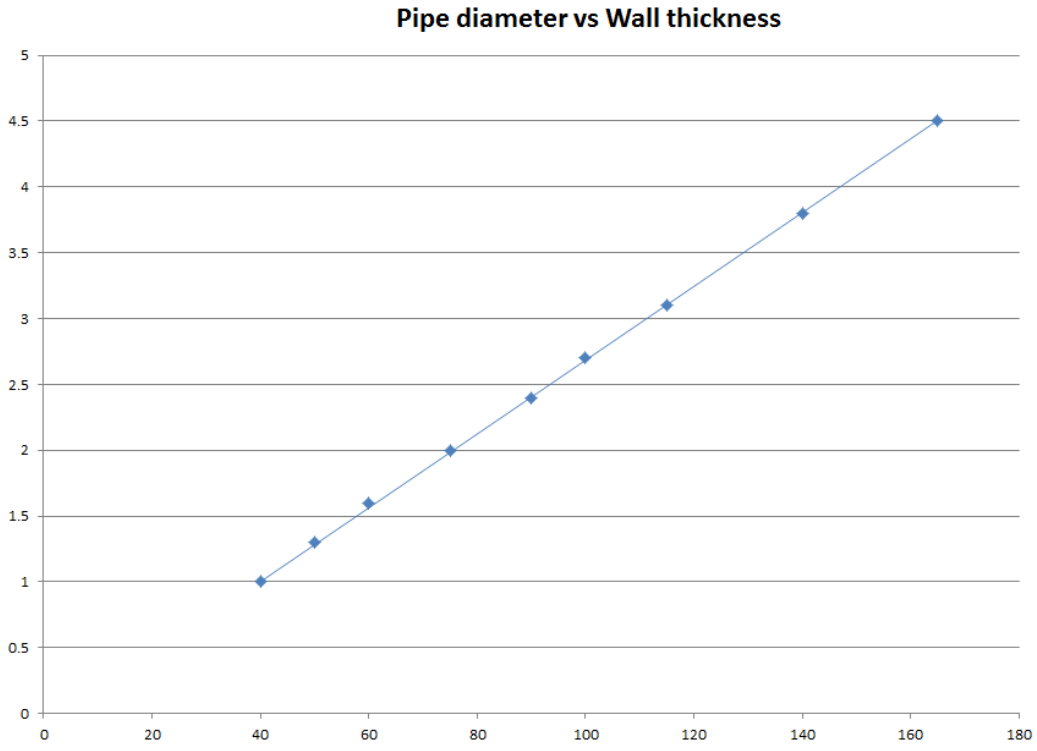
Construction details:



A.2.2.1

Services Mild or stainless steel pipe	Sealant depth	Backing	Insulation	Classification
40 mm diameter/1-14.2 mm wall	12.5 mm	20 mm Stone wool 40 kg/m^3	13 -19 mm Kaiflex ST insulation	**EI 120**
40 mm diameter/1-14.2 mm wall*	25 mm	25 mm AES Fibre ≥ 128kg/m^3		**E 120, EI 60**
50 mm diameter/1.3-14.2 mm wall*				
60 mm diameter/1.6-14.2 mm wall*				
75 mm diameter/2-14.2 mm wall*				
90 mm diameter/2.4-14.2 mm wall*				
100 mm diameter/2.7-14.2 mm wall*				
115 mm diameter/3.1-14.2 mm wall*				
140 mm diameter/3.8-14.2 mm wall*				
165 mm diameter/ 4.5-14.2 mm wall*				

* Typical pipe diameters shown, see below graph for intermediate sizes

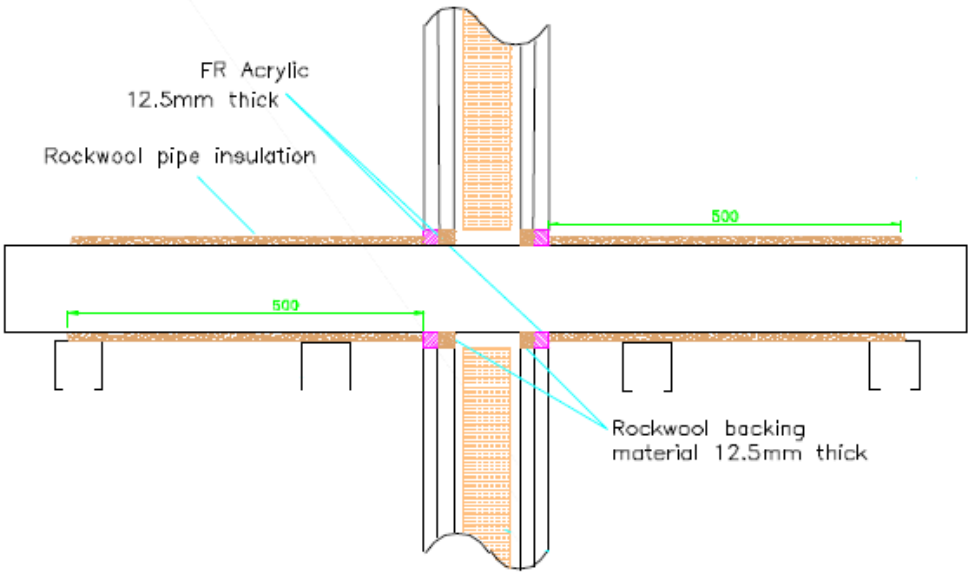


Services	Sealant depth	Backing	Insulation	Classification
Copper pipe				
12 mm diameter/1 mm wall	25 mm	25 mm AES Fibre ≥ 128kg/m^3	9 mm Kaiflex ST insulation	**EI 120 C/C**
12-54 mm diameter/1-1.2 mm wall			9-13 mm Kaiflex ST insulation	**E 120, EI 60 C/C**
12-54 mm diameter/1-1.2 mm wall			13-25 mm Kaiflex ST insulation	**EI 60 C/C**
Gerberit Mepla MLC (PE-Xb/Aluminium/PE-HD pipe)*				
16 mm diameter/2.25 mm wall	25 mm	25 mm AES Fibre ≥ 128kg/m^3	9 mm Kaiflex ST insulation	**EI 120 C/C**
16 mm diameter/2.25 mm wall			9-25 mm Kaiflex ST insulation	**EI 60 C/C**
20 mm diameter/2.5 mm wall				
26 mm diameter/3 mm wall				
32 mm diameter/3 mm wall				
40 mm diameter/3.5 mm wall				
50 mm diameter/4 mm wall				
63 mm diameter/4.5 mm wall				
75 mm diameter/4.7 mm wall				

A.2.3 Double side penetration seal with composite pipes

Penetration Seal: CI (Continuous Interrupted) or CS (Continuous Sustained) insulated composite pipes (single) fitted central within the aperture, with ROKU® AC Sealant to both sides of the wall, minimum 10 mm seal width around service, maximum seal diameter of 170 mm diameter, backed with stonewool.

Construction details:



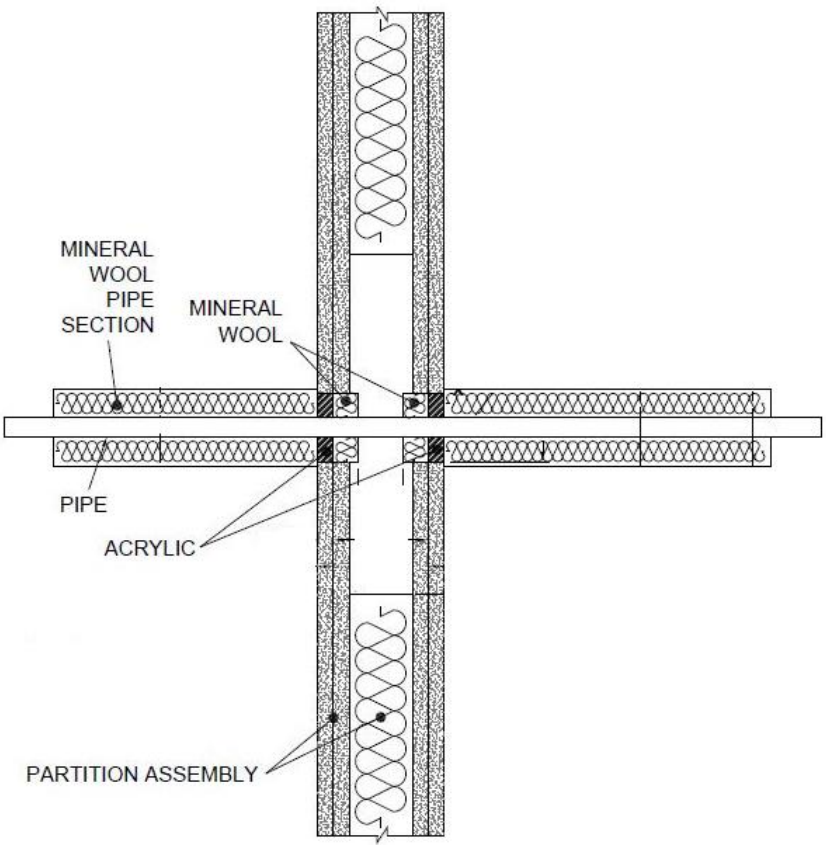
A.2.3.1

Services Gerberit Mepla MLC (PE-Xb/Aluminium/PE-HD pipe)*	Sealant depth	Backing	Insulation (minimums)	Classification
16 mm diameter/2.25 mm wall	12.5 mm	12.5 mm stonewool 40 kg/m^3	20 mm stonewool 80 kg/m^3, 500 mm length from both sides of the seal	**EI 120 C/C**
20 mm diameter/2.5 mm wall				
26 mm diameter/3 mm wall				
32 mm diameter/3 mm wall				
40 mm diameter/3.5 mm wall				
50 mm diameter/4 mm wall				
63 mm diameter/4.5 mm wall				
75 mm diameter/4.7 mm wall				

A.2.4 Double side penetration seal with metallic (and composite) pipes

Penetration Seal: LI (Local Interrupted) of minimum length stated below or CI (Continuous Interrupted) insulated metallic pipes and composite (single) fitted central within the aperture, with ROKU® AC Sealant to both sides of the wall, min. 10 mm seal width around service, backed with stone wool insulation or 'AES Fibre ≥ 128kg/m³'.

Construction details:

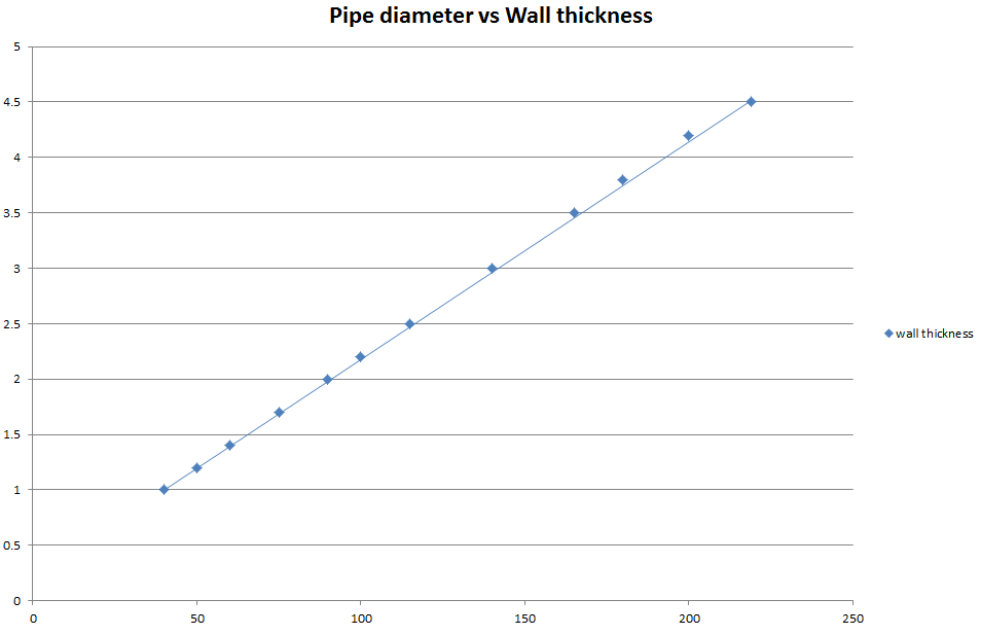


A.2.4.1

Services	Sealant depth	Backing	Insulation	Classification
Maximum aperture size 170 mm Ø				
Copper pipe up to 54 mm diameter/1-14.2 mm wall	12.5 mm	20 mm Stone wool 40 kg/m³	500 mm length of 20 mm stone woo,l 80 kg/m³	**EI 120 C/U**
Alupex composite pipe 75 mm diameter/7.5 mm wall		20 mm Stone wool 140 kg/m³	600 mm length of 25 mm AES Fibre ≥ 128kg/m³	**EI 60 C/U**

Services Mild or stainless steel pipe	Sealant depth	Backing	Insulation	Classification
Maximum aperture size 170 mm Ø				
40 mm diameter/1-14.2 mm wall	12.5 mm	20mm Stone wool 40 kg/m^3	500 mm length of 20 mm stone wool 80 kg/m^3	**EI 120 C/U**
40 mm diameter/1-14.2 mm wall*			500 mm length of 30 mm stone wool 80 kg/m^3	**E 120, EI 90 C/U**
50 mm diameter/1.2-14.2 mm wall*				
60 mm diameter/1.4-14.2 mm wall*				
75 mm diameter/1.7-14.2 mm wall*				
90 mm diameter/2-14.2 mm wall*				
100 mm diameter/2.2-14.2 mm wall*				
115 mm diameter/2.5-14.2 mm wall*				
140 mm diameter/3-14.2 mm wall*				
Aperture size = pipe diameter + 20 mm				
165 mm diameter/3.5-14.2 mm wall*	12.5 mm	20mm Stone wool 40 kg/m^3	500 mm length of 30 mm stone wool 80 kg/m^3	**E 120, EI 90 C/U**
180 mm diameter/3.8-14.2 mm wall*				
200 mm diameter/4.2-14.2 mm wall*				
219 mm diameter/4.5-14.2 mm wall*				

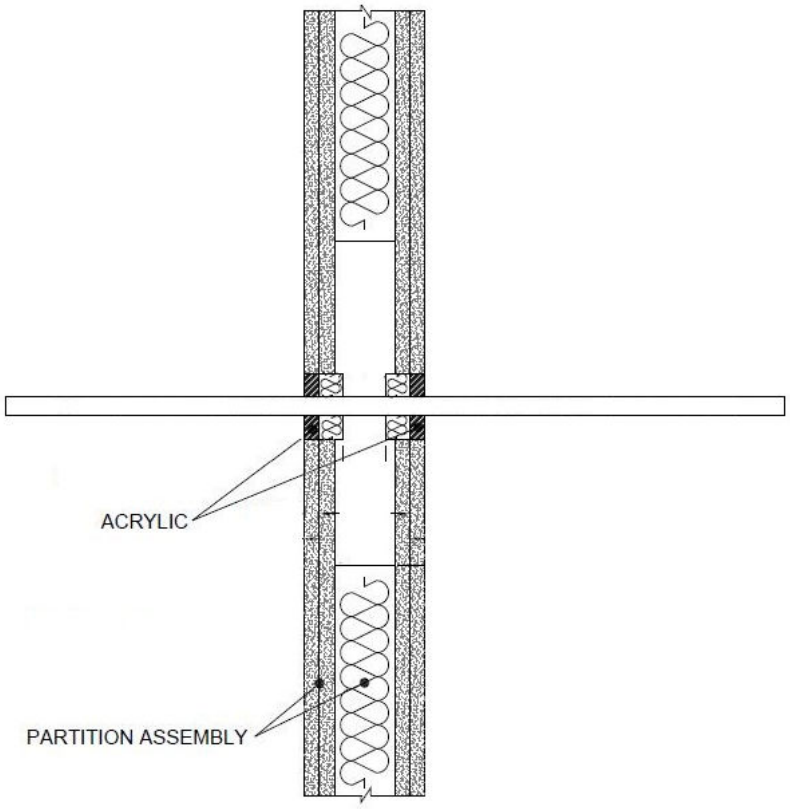
* Typical pipe diameters shown, see below graph for intermediate sizes



A.2.5 Double side penetration seal with plastic pipes

Penetration Seal: Combustible pipes (single) fitted central within the aperture, with ROKU® AC Sealant to both sides of the wall, 10 mm seal width around PVC pipes and 29 mm around PP pipes. No backing material is required but PE foam may be utilised.

Construction details:



A.2.5.1

Services	Sealant depth	Backing	Aperture Ø	Classification
PVC-U pipe according to EN 1329-1, EN 1452-1 and EN 1453-1* 32 mm Ø/1.7 mm wall	12.5 mm	None required	52 mm	**EI 45 U/C, EI 45 C/C**
	25 mm			**EI 90 U/C, EI 90 C/C**
PP pipe according to EN 1451-1 32 mm Ø/2 mm wall	25 mm		90 mm	

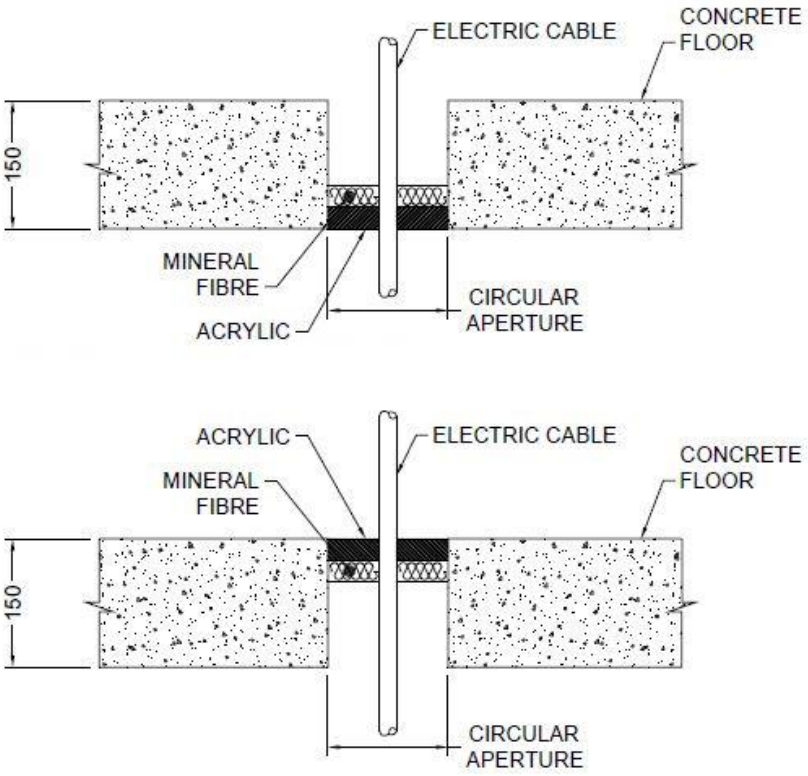
* In Germany the pipes have additionally to comply with DIN 19531-10

A.3 Rigid floor constructions according to 1.2.1 with floor thickness of minimum 150 mm

A.3.1 Single side penetration seal with cables

Penetration Seal: Cables (single) fitted centrally within circular apertures or min. 30 mm from the edges of rectilinear apertures, with ROKU® AC Sealant to either side of the floor (or at any position in between), backed with 'AES Fibre ≥ 128kg/m³'.

Construction details:



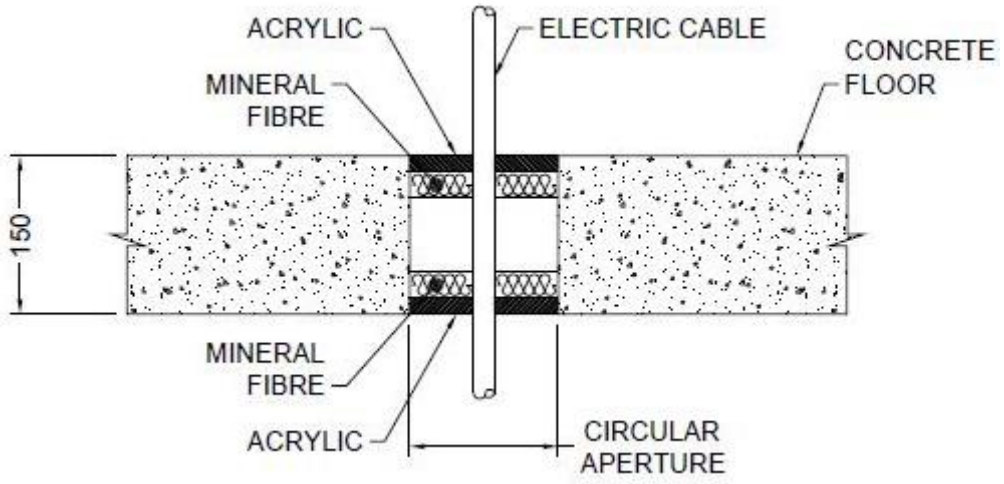
A.3.1.1

Services	Sealant depth	Backing	Aperture	Classification
Single electrical cables up to 21 mm Ø	25 mm	AES Fibre ≥ 128kg/m³ 25 mm deep	82 mm Ø or max. 100 x 1000 mm	**E 120, EI 60**

A.3.2 Double side penetration seal with cables

Penetration Seal: Cables (single) fitted circular apertures or min. 7 mm from the edges of rectilinear apertures, with ROKU® AC Sealant to both sides of the floor, backed with stone wool insulation 35kg/m^3.

Construction details:



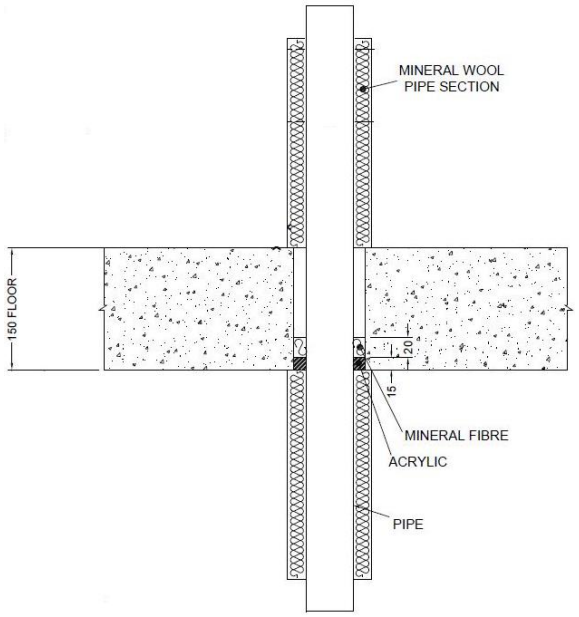
A.3.2.1

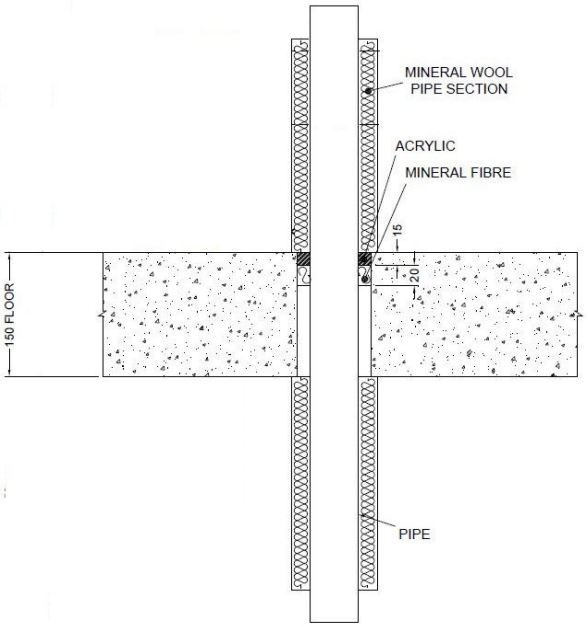
Services	Sealant depth	Backing	Aperture	Classification
Single electrical cables up to 21 mm Ø	15 mm	Stone wool 25 mm deep	100 x 1000 mm	**EI 120**

A.3.3 Single side penetration seal with metallic pipes

Penetration Seal: 1000 mm (min.) LI (Local Interrupted) or CI (Continuous Interrupted) insulated metallic pipes (single) fitted central within the aperture, with 15 or 25 mm deep ROKU® AC Sealant to either side of the floor (or at any position between), backed with 40 kg/m^3 stone wool insulation or AES Fibre ≥ 128kg/m^3.

Construction details:



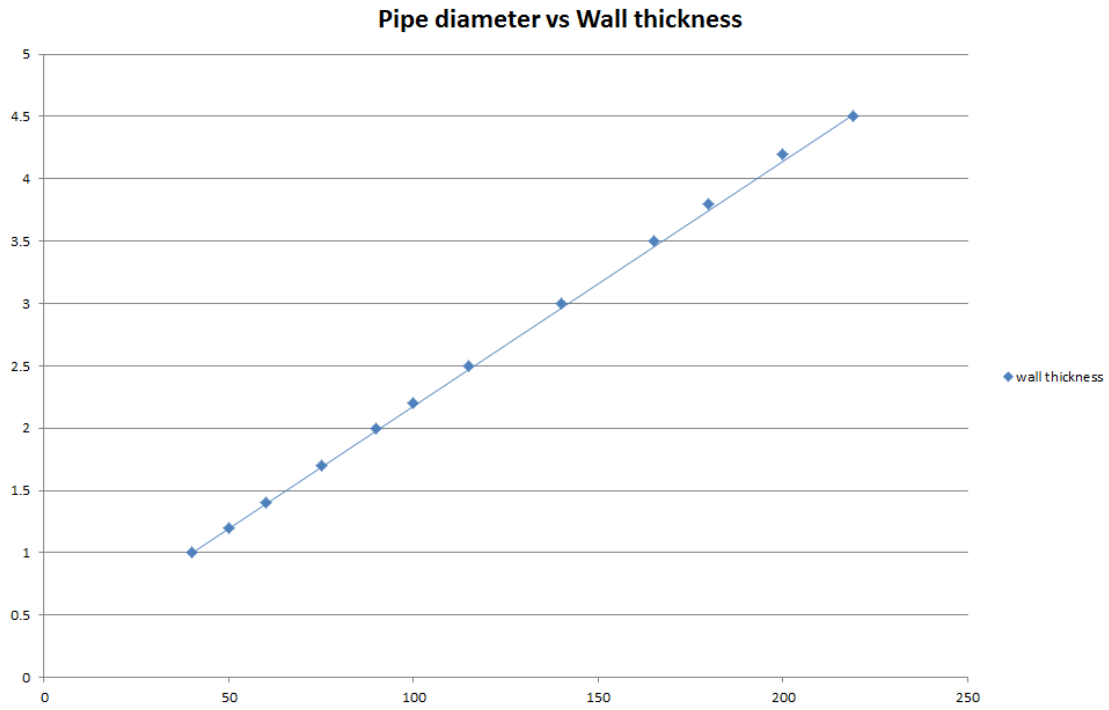


A.3.3.1

Services	Max. seal size	Insulation	Sealant depth	Classification
Copper pipe up to 54 mm diameter/0.9-14.2 mm wall	10 mm width around pipe	20 mm Stone wool insulation 80 kg/m^3	15 mm	**E 240 C/U, EI 180 C/U**
Copper pipe up to 12 mm diameter/0.9-5 mm wall				**EI 240 C/U**
Copper pipe up to 54 mm diameter/0.9-14.2 mm wall	Up to 100 x 1000 mm		25 mm	**EI 120 C/U**

Services Mild or stainless steel pipe	Max. Seal Size	Insulation	Sealant Depth	Classification
40 mm diameter/1-14.2 mm wall	10 mm width around pipe	20 mm Stone wool insulation 80 kg/m^3	15 mm	**EI 240 C/U**
40 mm diameter/1-14.2 mm wall*		30 mm Stone wool insulation 80 kg/m^3		**E 240, EI 90 C/U**
50 mm diameter/1.2-14.2 mm wall*				
60 mm diameter/1.4-14.2 mm wall*				
75 mm diameter/1.7-14.2 mm wall*				
90 mm diameter/2-14.2 mm wall*				
100 mm diameter/2.2-14.2 mm wall*				
115 mm diameter/2.5-14.2 mm wall*				
140 mm diameter/3-14.2 mm wall*				
165 mm diameter/3.5-14.2 mm wall*				
180 mm diameter/3.8-14.2 mm wall*				
200 mm diameter/4.2-14.2 mm wall*				
219 mm diameter/4.5-14.2 mm wall*				
40 mm diameter/1-14.2 mm wall*	Up to 100 x 1000 mm	20 mm Stone wool insulation 80 kg/m^3	25 mm	**E120, EI 90 C/U**
50 mm diameter/1.2-14.2 mm wall*		30 mm Stone wool insulation 80 kg/m^3		
60 mm diameter/1.4-14.2 mm wall*				
75 mm diameter/1.7-14.2 mm wall*				
90 mm diameter/2-14.2 mm wall*				
100 mm diameter/2.2-14.2 mm wall*				
115 mm diameter/2.5-14.2 mm wall*				
140 mm diameter/3-14.2 mm wall*				
165 mm diameter/3.5-14.2 mm wall*				
180 mm diameter/3.8-14.2 mm wall*				
200 mm diameter/4.2-14.2 mm wall*				
219 mm diameter/4.5-14.2 mm wall*				

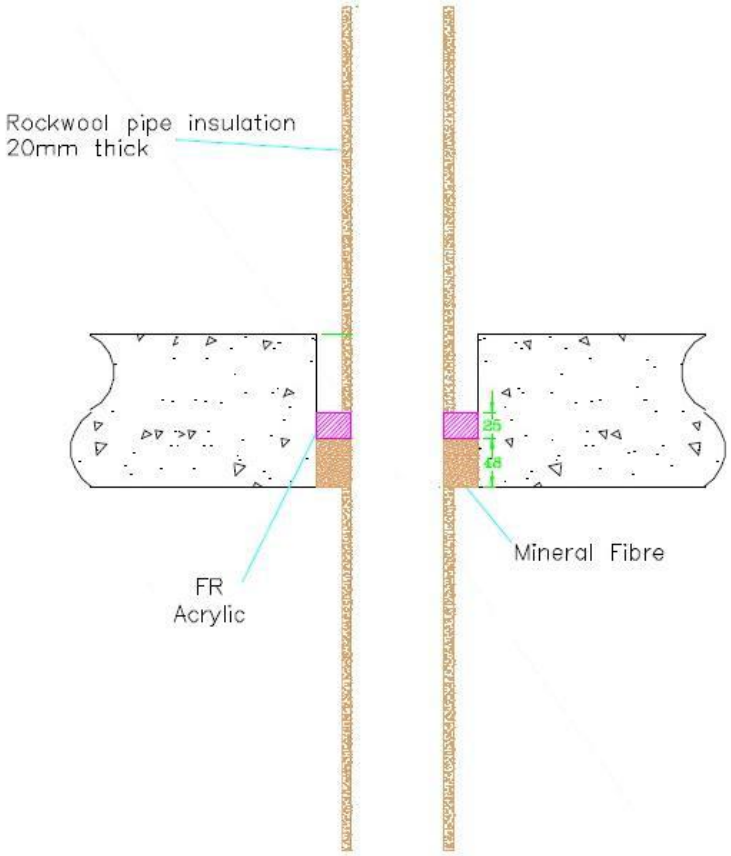
* Typical pipe diameters shown, see below graph for intermediate sizes


Pipe diameter vs Wall thickness
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
0
50
100
150
200
250
wall thickness

A.3.4 Single side penetration seal with composite pipes

Penetration Seal: CI (Continuous Interrupted) insulated composite pipes (single) fitted central within the aperture, with ROKU® AC Sealant, minimum 10 mm seal width around service and maximum 170mm diameter seal, backed with 'AES Fibre ≥ 128kg/m^3'.

Construction details:



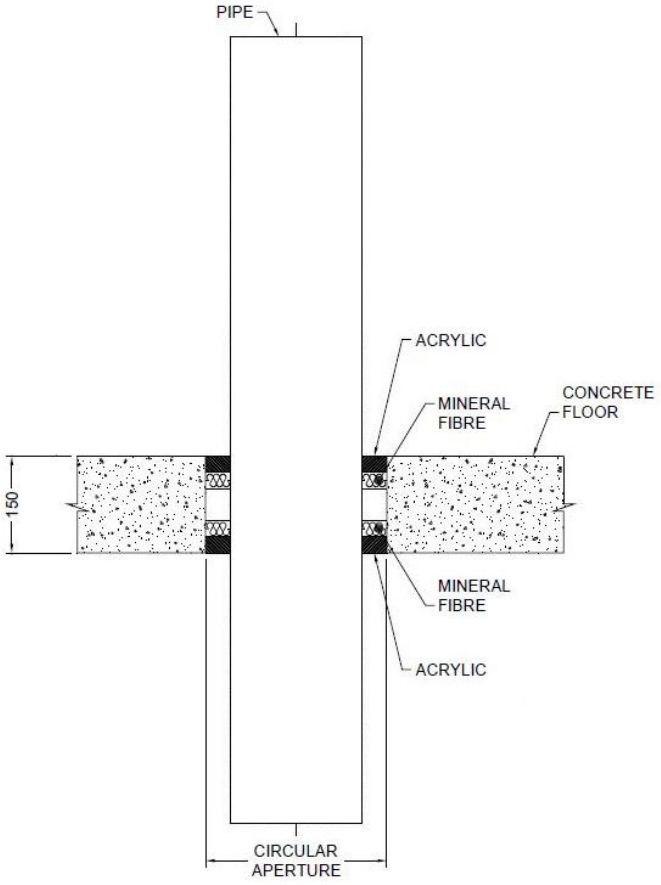
A.3.4.1

Services Gerberit Mepla MLC (PE-Xb/Aluminium/PE-HD pipe)*	Sealant depth	Backing	Insulation (minimums)	Classification
16 mm diameter/2.25 mm wall	25 mm	48 mm AES Fibre ≥ 128kg/m^3	20 mm stonewool 80 kg/m^3, 500 mm length from both sides of the seal	**EI 240 C/C**
20 mm diameter/2.5 mm wall				
26 mm diameter/3 mm wall				
32 mm diameter/3 mm wall				
40 mm diameter/3.5 mm wall				
50 mm diameter/4 mm wall				
63 mm diameter/4.5 mm wall				
75 mm diameter/4.7 mm wall				

A.3.5 Double side penetration seal with metallic pipes

Penetration Seal: Non-insulated metallic pipes (single) fitted central within the aperture, with 25 mm deep ROKU® AC Sealant to both sides of the floor, backed with 25 mm deep 140 kg/m^3 stone wool insulation.

Construction details:



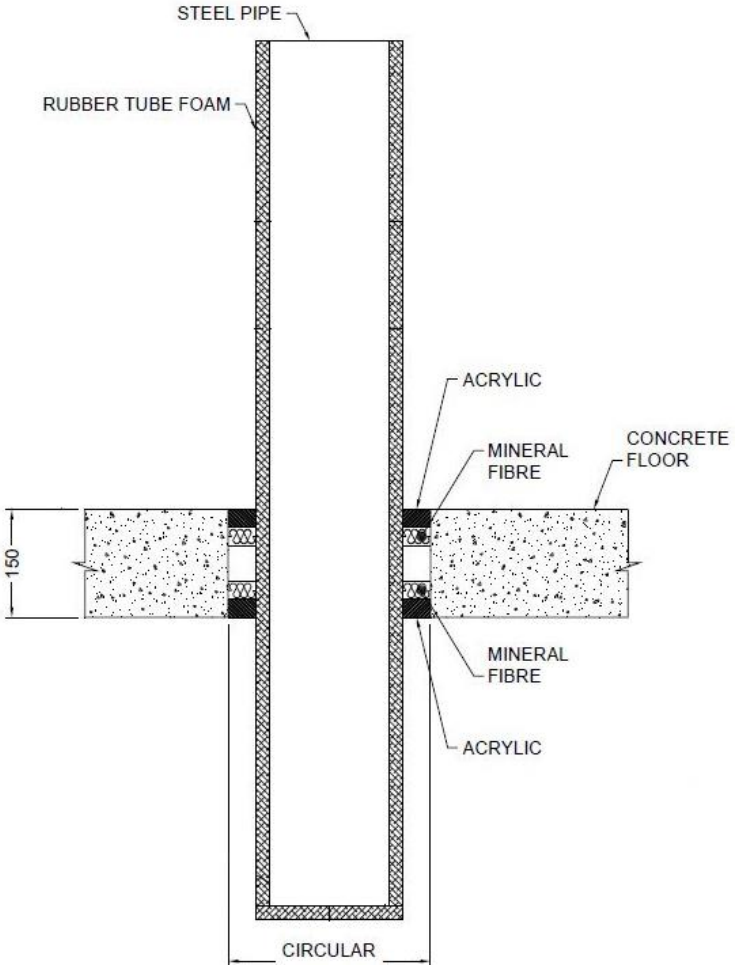
A.3.5.1

Services	Seal Size	Insulation	Backing	Classification
Copper pipe 54 mm diameter/2-14.2 mm wall	30 mm around pipe	None	25 mm deep 140 kg/m^3 stone wool	**E 120 C/U, EI 20 C/U**
Mild steel pipe 16 mm diameter/1.5-7.5 mm wall	34 mm around pipe			**EI 240 C/U**
Mild steel pipe 16 mm diameter/1.5-7.5 mm wall	Up to 100 x 1000 mm		AES Fibre ≥ 128kg/m^3 25 mm deep	**EI 120 C/U**

A.3.6 Double side penetration seal with metallic pipes

Penetration Seal: CS (Continuous Sustained) insulated metallic pipes (single) fitted central within the aperture, with ROKU® AC Sealant to both sides of the wall, 10-30 mm seal width around service, backed with stone wool insulation or 'AES Fibre ≥ 128kg/m³'.

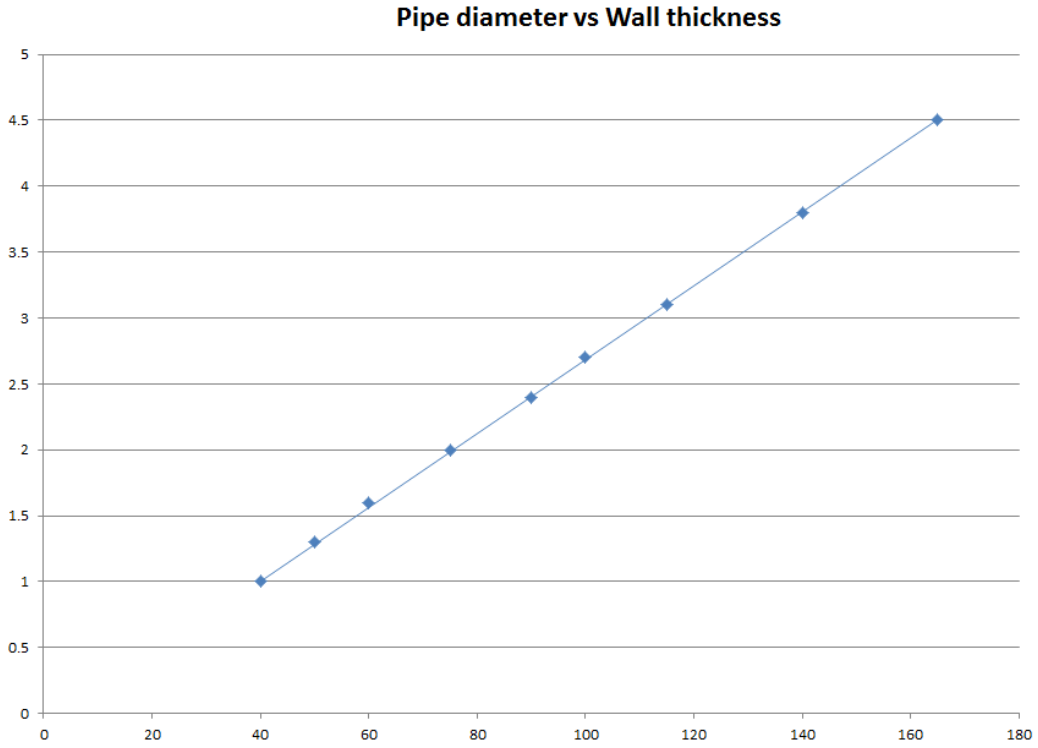
Construction details:



A.3.6.1

Services Mild or stainless steel pipe	Sealant depth	Backing	Insulation	Classification
40 mm diameter/1-14.2 mm wall	25 mm	20 mm Stone wool 40 kg/m^3	13 -19 mm Kaiflex ST insulation	**EI 180**
40 mm diameter/1-14.2 mm wall*	25 mm	25 mm AES Fibre ≥ 128kg/m^3		**EI 60**
50 mm diameter/1.3-14.2 mm wall*				
60 mm diameter/1.6-14.2 mm wall*				
75 mm diameter/2-14.2 mm wall*				
90 mm diameter/2.4-14.2 mm wall*				
100 mm diameter/2.7-14.2 mm wall*				
115 mm diameter/3.1-14.2 mm wall*				
140 mm diameter/3.8-14.2 mm wall*				
165 mm diameter/ 4.5-14.2 mm wall*				

* Typical pipe diameters shown, see below graph for intermediate sizes

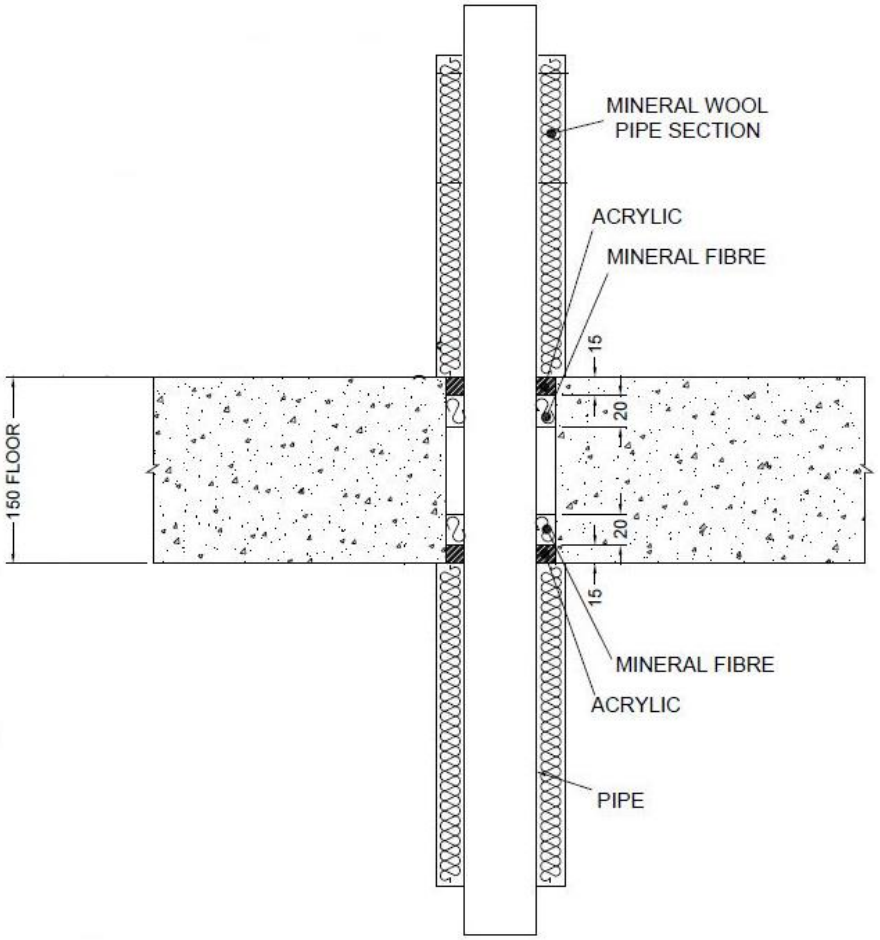


Services	Sealant depth	Backing	Insulation	Classification
Copper pipe				
12 mm diameter/1 mm wall	25 mm	25 mm AES Fibre ≥ 128kg/m^3	9 mm Kaiflex ST insulation	**E 240 C/C, EI 180 C/C**
12-54 mm diameter/1-1.2 mm wall			9-13 mm Kaiflex ST insulation	**E 180, EI 120 C/C**
12-54 mm diameter/1-1.2 mm wall			13-25 mm Kaiflex ST insulation	**E 90 C/C, EI 60 C/C**
Gerberit Mepla MLC (PE-Xb/Aluminium/PE-HD pipe)*				
16 mm diameter/2.25 mm wall	25 mm	25 mm AES Fibre ≥ 128kg/m^3	9 mm Kaiflex ST insulation	**EI 180 C/C**
16 mm diameter/2.25 mm wall			9-13 mm Kaiflex ST insulation	**E 120 C/C, EI 60 C/C**
20 mm diameter/2.5 mm wall				
26 mm diameter/3 mm wall				
32 mm diameter/3 mm wall				
40 mm diameter/3.5 mm wall				
50 mm diameter/4 mm wall				
63 mm diameter/4.5 mm wall				
75 mm diameter/4.7 mm wall				
16 mm diameter/2.25 mm wall			13-25 mm Kaiflex ST insulation	**EI 60 C/C**
20 mm diameter/2.5 mm wall				
26 mm diameter/3 mm wall				
32 mm diameter/3 mm wall				
40 mm diameter/3.5 mm wall				
50 mm diameter/4 mm wall				
63 mm diameter/4.5 mm wall				
75 mm diameter/4.7 mm wall				

A.3.7 Double side penetration seal with metallic pipes

Penetration Seal: 1000 mm (min.) LI (Local Interrupted) or CI (Continuous Interrupted) insulated metallic pipes (single) fitted central within the aperture, with 15 mm deep ROKU® AC Sealant to both sides of the floor (or at any position between), backed with 20 or 30 mm deep 40 kg/m^3 stone wool insulation*.

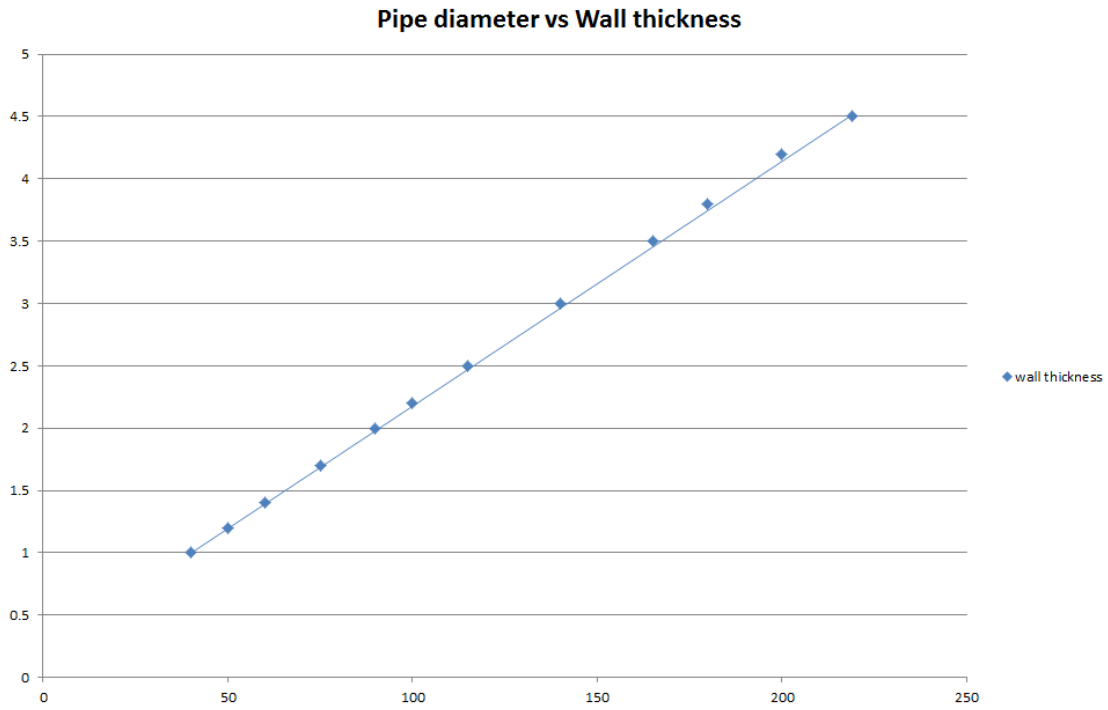
Construction details:



A.3.7.1

Services	Seal size	Insulation	Classification
Mild or stainless steel pipe			
40 mm diameter/1-14.2 mm wall	10 mm width around pipe	20 mm Stone wool insulation 80 kg/m^3	**EI 240 C/U**
40 mm diameter/1-14.2 mm wall*		30 mm Stone wool insulation 80 kg/m^3	**E 240, EI 120 C/U**
50 mm diameter/1.2-14.2 mm wall*			
60 mm diameter/1.4-14.2 mm wall*			
75 mm diameter/1.7-14.2 mm wall*			
90 mm diameter/2-14.2 mm wall*			
100 mm diameter/2.2-14.2 mm wall*			
115 mm diameter/2.5-14.2 mm wall*			
140 mm diameter/3-14.2 mm wall*			
165 mm diameter/3.5-14.2 mm wall*			
180 mm diameter/3.8-14.2 mm wall*			
200 mm diameter/4.2-14.2 mm wall*			
219 mm diameter/4.5-14.2 mm wall*			
40 mm diameter/1-14.2 mm wall*	Up to 100 x 1000 mm		**EI 120 C/U**
50 mm diameter/1.2-14.2 mm wall*			
60 mm diameter/1.4-14.2 mm wall*			
75 mm diameter/1.7-14.2 mm wall*			
90 mm diameter/2-14.2 mm wall*			
100 mm diameter/2.2-14.2 mm wall*			
115 mm diameter/2.5-14.2 mm wall*			
140 mm diameter/3-14.2 mm wall*			
165 mm diameter/3.5-14.2 mm wall*			
180 mm diameter/3.8-14.2 mm wall*			
200 mm diameter/4.2-14.2 mm wall*			
219 mm diameter/4.5-14.2 mm wall*			

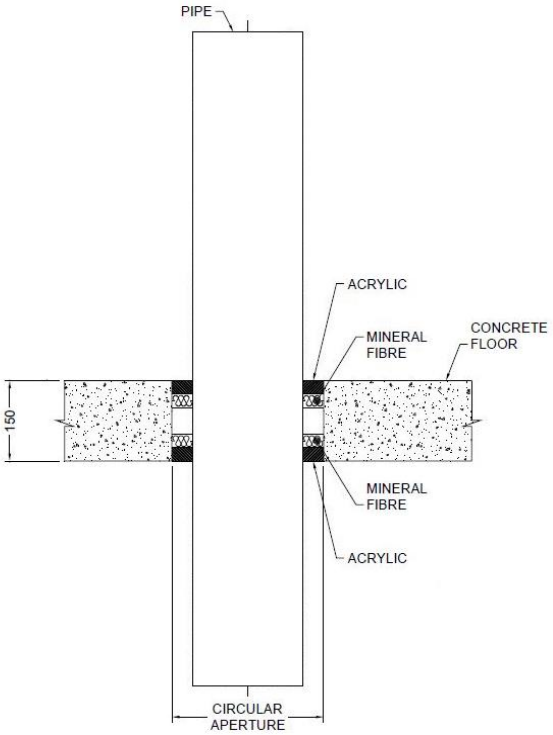
* Typical pipe diameters shown, see below graph for intermediate sizes


Pipe diameter vs Wall thickness
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
0
50
100
150
200
250
wall thickness

A.3.8 Double side penetration seal with plastic pipes

Penetration Seal: Combustible pipes (single) fitted central within the aperture, with ROKU® AC Sealant to both sides of the floor.

Construction details:



A.3.8.1

Services	Sealant depth	Backing	Aperture Ø	Classification
PP pipe according to EN 1451-1	25 mm	25 mm AES Fibre ≥ 128kg/m³	65 mm	**EI 120 U/C, EI 120 C/C**
40 mm Ø/3 mm wall				
75 mm Ø/2.8 mm wall		25 mm stone wool 140 kg/m³	115 mm	**EI 180 U/C, EI 180 C/C**
PE pipe according to EN 1519-1, EN 12201-2 and EN 12666-1* 40 mm Ø/4 mm wall			65 mm	**EI 240 U/C, EI 240 C/C**

* In Germany the pipes have additionally to comply with DIN 19535-10