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designated according to Article 29 of the Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment, www.eota.eu)

European Technical Assessment

ETA 23/0055
of 28/11/2023

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: **UL International (Netherlands) B.V.**

Trade name of the construction product

Mulcol® Multisealant GR

Product family to which the construction product belongs

Fire Stopping and Sealing Product:
• Penetration Seals

Manufacturer

Mulcol International BV
PO Box 93
4330 AB Middelburg
The Netherlands

Manufacturing plant(s)

L/002

This European Technical Assessment contains

139 pages including 3 Annexes which form an integral part of this assessment.

This European Technical Assessment is issued in accordance with regulation (EU) No 305/2011, on the basis of

EAD 350454-00-1104

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I.	SPECIFIC PARTS OF THE EUROPEAN TECHNICAL ASSESMENT	3
1.	Technical description of the product	3
2.	Specification of the intended uses of the product in accordance with the applicable European Assessment Document (hereinafter EAD): EAD 350454-00-1104	3
3.	Performance of the product and references to the methods used for its assessment	5
4.	Assessment and Verification of Constancy of Performance (hereinafter AVCP) applied, with reference to its legal base	6
5.	Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD	6
	Annex - Resistance to Fire Classification - Mulcol® Multisealant GR	
	Annex A - Flexible and rigid walls	11
	Annex B - Rigid floors	69
	Annex C - General	123

I. SPECIFIC PARTS OF THE EUROPEAN TECHNICAL ASSESSMENT

1. Technical description of the product

- 1) Mulcol® Multisealant GR is a sealant and pipe closure device used to form penetration seals where insulated and uninsulated metal pipes, combustible pipes, combustible cable conduits and cables penetrate walls and floors.
- 2) The Multisealant GR is supplied in liquid form contained within 310 cartridges. The sealant is gunned into the aperture in the separating element/elements and around the service or (mixed) services, to a specified depth utilizing backing material where needed.
- 3) The products below can be used in conjunction with Mulcol® Multisealant GR depending upon the required application and classification (see Annex A & B). These products are subject to separate ETAs.
 - Mulcol® Multimastic FB, firestop board
 - Mulcol® Multitherm Bandage, thermal insulation

The applicant has submitted a written declaration that the product and/or constituents of the product contains no substances which have been 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.

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.
- 4) The use category of Mulcol® Multisealant GR in relation to BWR 3 (Hygiene, health and environment) is IA1, S/W3

2. Specification of the intended uses of the product in accordance with the applicable European Assessment Document (hereinafter EAD): EAD 350454-00-1104

Detailed information and data is given in Annex A, B and C.

- 1) The intended use of Mulcol® Multisealant GR is to reinstate the fire resistance performance of flexible wall, rigid wall and floor constructions where they are penetrated by various services.
- 2) The specific elements of construction that the system Mulcol® Multisealant GR 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. Apertures in flexible walls are not required to be lined.
 - b) Rigid walls*: The wall must have a minimum thickness of 100 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 400 kg/m³.
 - c) Rigid floors: The floor must have a minimum thickness of 150 mm and comprise aerated concrete or concrete with a minimum density of 400 kg/m³.

* See Annex C for the field of application.
The supporting construction must be classified in accordance with EN 13301-2 for the required fire resistance period.
- 3) The system Mulcol® Multisealant GR may be used to provide a penetration seal with services e.g. cables, cable trays, metal pipes, composite pipes and plastic pipes, with and without insulation, with mixed services within the same seal/aperture (for details see Annex A and B).
- 4) Mutual distances between services and minimum support distances are given in Annex C.
- 6) The provisions made in this European Technical Assessment are based on an assumed working life of the Mulcol® Multisealant GR of 25 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 or the Technical Assessment Body 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.
- 7) Type Z₂: Intended for uses in internal conditions with humidity lower than 85 % RH excluding temperatures below 0°C, without exposure to rain or UV.

8) Insulation types

The following elastomeric insulation types are given in Annex A and B (or equal, not limited by brand or type):

- Reaction to fire class $\leq$ B-s1, d0 – e.g. ArmaFlex Ultima, Kaiflex KK Plus S1
- Reaction to fire class $\leq$ B-s2, d0 – e.g. ArmaFlex AF EVO, Kaiflex KK Plus S2 / ST, K-Flex ST
- Reaction to fire class $\leq$ B-s3, d0 – e.g. ArmaFlex AF / XG / SH, K-Flex H
- Reaction to fire class $\leq$ C-s2, d0 – e.g. Kaiflex HT S2
- Reaction to fire class $\leq$ D-s3, d0 – e.g. ArmaFlex NH / SH / HT

The insulations may also have a B_L, C_L or D_L classification (linear insulation).

9) Pipes types

The following multi layered pipes (or equal) are allowed:

- Alpex DUO, Valsir Pexal, Valsir Mixal and APE Plain (PE-Xb/AL/PE-Xb)
- Uponor and Geberit Mepla (PE-RT/AL/PE-RT)
- Uponor and Henco (PE-Xc/AL/PE-Xc)
- Uponor and REHAU (PE-Xa) and REHAU (PE-Xc)
- SP Superpipe and POLYGON PEX (PE-X/AL/PE-X)
- Valsir Pexal and Valsir Mixal (PE/AL/PE-Xb)
- Wavin Tigris, Protecta-Line System and Alpex F50 Profi (PE-X/AL/PE)

The following fibre composite pipes (or equal) are allowed:

- Aquatechnik Fusio PP-R 80, Aquatechnik Fusio PP-RCT
- Aquatherm Blue-MF, Aquatherm Blue-S, Aquatherm Red-MF, Aquatherm Green-MF, Aquatherm Green-MS, Aquatherm Green-S, Aquatherm Lilac-S, Aquatherm Grey-MS and Aquatherm Orange M
- Bänninger PP-R, Bänninger Climatec PP-RCT and Bänninger Watertec PP-RCT

3. Performance of the product and references to the methods used for its assessment

Product-type: Sealant		Intended use: Penetration Seal
Assesment method	Essential characteristic	Product Performance
<u>BWR 2 Safety in case of fire</u>		
EN 13501-1	Reaction to fire	E
EN 13501-2	Resistance to fire	Annex A, B & C
<u>BWR 3 Hygiene, health and enviroment</u>		
EN 1026	Air permeability	No performance determined
EAD 350454-00-1104, Annex C	Water permeability	No performance determined
Declaration of manufacturer & EN 16516	Release of dangerous substances	IA1, S/W 1 - Declaration of manufacturer
<u>BWR 4 Safety in use</u>		
EOTA TR 001:2003	Mechanical resistance and stability	No performance determined
EOTA TR 001:2003	Resistance to impact/movement	No performance determined
EOTA TR 001:2003	Adhesion	No performance determined
EAD 350454-00-1104, Clause 2.2.9	Durability	Z ₂
<u>BWR 5 Protection against noise</u>		
EN 10140-1,2,4,5 / EN ISO 7171-1	Airborne sound insulation	Rs,w (C;Ctr) = 55 (-2;-9) dB
<u>BWR 6 Energy economy and theat retention</u>		
EN 12664, EN 12667, EN 12939, EN ISO 8990, EN ISO 6946, EN ISO 14683, EN ISO 10211, EN ISO 10456	Thermal properties	No performance determined
EN ISO 13372, EN 12086, EN ISO 10456	Water vapour permeability	No performance determined

4. Assessment and Verification of Constancy of Performance (hereinafter AVCP) applied, with reference to its legal base

According to the decision 1999/454/EC – Commission Decision of date 22nd June 1999 on the procedure for attesting the conformity of construction products pursuant to Article 20(2) of Council Directive 89/133/EEC as regards to fire stopping, fire sealing and fire protective products, published in the Official Journal of the European Union (OJEU) L178/52 of 14/07/1999, see <http://eur-lex.europa.eu/JOIndex.do> of the European Commission¹, as amended, the system(s) of assessment and verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table(s) applies (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

Tasks of the manufacturer:

Factory production control

The manufacturer shall exercise permanent internal control of production. All the elements, requirements and provisions adopted by the manufacturer shall be documented in a systematic manner in the form of written policies and procedures, including records of results performed. This production control system shall ensure that the product is in conformity with this European Technical Assessment.

The manufacturer may only use initial / raw / constituent materials stated in the technical documentation of this European Technical Assessment.

The factory production control shall be in accordance with the Control Plan of 15 June 2023 relating to the European Technical Assessment ETA 23/0055 issued on 28/11/2023 which is part of the technical documentation of this European Technical Assessment. The “Control Plan” is laid down in the context of the factory production control system operated by the manufacturer and deposited at UL International (Netherlands) B.V.

The results of factory production control shall be recorded and evaluated in accordance with the provisions of the Control Plan.

Other tasks of the manufacturer:

Additional information

The manufacturer shall provide a technical data sheet and an installation instruction with the following minimum information:

(a) Technical data sheet:

- Field of application:
- Building elements for which the penetration seal is suitable, type and properties of the building elements like minimum thickness, density, and - in case of lightweight constructions - the construction requirements.
- Limits in size, minimum thickness etc. of the penetration seal
- Construction of the penetration seal including the necessary components and additional products (e.g. backfilling material) with clear indication whether they are generic or specific.
- Services which the penetration seal is suitable, type and properties of the services like material, diameter, thickness etc. in case of pipes including insulation materials; necessary/allowed supports/fixings (e.g. pipe trays)

(b) Installation instruction:

- Steps to be followed
- Procedure in case of retrofitting
- Stipulations on maintenance, repair and replacement

6. Issued on:

28 November 2023

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For and on behalf of UL International (Netherlands) B.V.

Annex - Resistance to Fire Classification - Mulcol® Multisealant GR

Annex A.1 - Flexible and rigid walls

A.1.1	Flexible or rigid wall - Cables, trays and conduits	11
A.1.1.1	Cables	11
A.1.1.2	Single plastic conduits	12
A.1.1.3	Single plastic conduits - Multimastic FB1	13
A.1.1.4	Single plastic conduits - Multimastic FB2	14
A.1.1.5	Multiple plastic conduits with cables	15
A.1.1.6	Multiple plastic conduits with cables - Multimastic FB1	16
A.1.1.7	Cable bundle	17
A.1.2	Flexible or rigid wall - Combustible pipes	18
A.1.2.1	Plastic pipes	18
A.1.2.2	Plastic pipes - Multimastic FB1	19
A.1.2.3	Plastic pipes with cables	20
A.1.3	Flexible or rigid wall - Multilayer pipes (MLC) insulated	21
A.1.3.1	Multilayer pipes (MLC) - Elastomer	21
A.1.3.2	Multilayer pipes (MLC) - Elastomer - Multimastic FB1	22
A.1.3.3	Multilayer pipes (MLC) - PE foam LS 300 / CS	23
A.1.3.4	Multilayer pipes (MLC) - PE foam LI 300 / CI	24
A.1.3.5	Multilayer pipes (MLC) - PE foam LS 300 / CS - Multimastic FB1	25
A.1.3.6	Multilayer pipes (MLC) - PE foam LI 300 / CI - Multimastic FB1	26
A.1.4	Flexible or rigid wall - Multilayer pipes (MLC) uninsulated	27
A.1.4.1	Multilayer pipes (MLC)	27
A.1.4.2	Multiple Multilayer pipes (MLC)	28
A.1.4.3	Multilayer pipes (MLC) - Multimastic FB1	29
A.1.4.4	Flexible plastic conduit with Multilayer pipes (MLC)	30
A.1.4.5	Flexible plastic conduit with Multilayer pipes (MLC) - Multimastic FB1	31
A.1.5	Flexible or rigid wall - Metal pipes insulated elastomer	32
A.1.5.1	Copper and steel pipes - Elastomer LS 400 / CS	32
A.1.5.2	Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB1	34
A.1.5.3	Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB1 - Multitherm Bandage	36
A.1.5.4	Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB2	38
A.1.5.5	Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB2 - Multitherm Bandage	40
A.1.5.6	Copper and steel pipes - Elastomer LS 300-500 / CS	42
A.1.6	Flexible or rigid wall - Metal pipes insulated foam	43
A.1.6.1	Copper and steel pipes - PIR thermal insulation LS / CS	43
A.1.6.2	Copper and steel pipes - PIR foam LS 400 / CS - Multimastic FB1	44
A.1.6.3	Steel pipes - Phenolic foam LS 400 / CS	45
A.1.6.4	Steel pipes - Phenolic foam LS 400 / CS - Multimastic FB1	46
A.1.7	Flexible or rigid wall - Metal pipes uninsulated	47
A.1.7.1	Steel pipes - Multisealant GR coated on pipe	47
A.1.7.2	Steel pipes - Multimastic FB1 - Multisealant GR coated on pipe	48
A.1.7.3	Steel pipes - Multimastic FB2 - Multisealant GR coated on pipe	49
A.1.7.4	Copper and steel pipes	50
A.1.7.5	Copper and steel pipes - Multitherm Bandage	51
A.1.8	Flexible or rigid wall - Multiple services	52
A.1.8.1	Multiple pipes and cables	52
A.1.8.2	Multiple pipes and cables	53
A.1.8.3	PP-R - with/without Elastomer CS	54
A.1.9	Flexible or rigid wall - Gas pipes	55
A.1.9.1	Corrugated stainless steel tube gas (CSST) pipes - Multitherm Bandage	55
A.1.9.2	Corrugated stainless steel tube gas (CSST) pipes - Multimastic FB1 - Multitherm Bandage	56
A.2.1	Rigid walls - Cables, trays and conduits	57
A.2.1.1	Cables and trays	57
A.2.1.2	Cables	58
A.2.1.3	Cable bundle	59
A.2.2	Rigid walls - Combustible pipes	60
A.2.2.1	Plastic pipes	60
A.3.1	Shaft walls - Cables, trays and conduits	61
A.3.1.1	Cables	61
A.3.1.2	Multiple conduits with cables	62
A.3.2	Shaft walls - Combustible pipes	63
A.3.2.1	Plastic pipes	63
A.3.2.2	Plastic pipes - Flue gas pipes	64
A.3.3	Shaft walls - Multilayer pipes (MLC)	65
A.3.3.1	Multilayer pipes (MLC)	65
A.3.3.2	Multiple Multilayer pipes (MLC)	66
A.3.4	Shaft walls - Metal pipes uninsulated	67
A.3.4.1	Copper and steel pipes - Multitherm Bandage	67
A.3.4.2	Steel spiral duct - Multitherm Bandage	68

Annex B.1 - Rigid floors

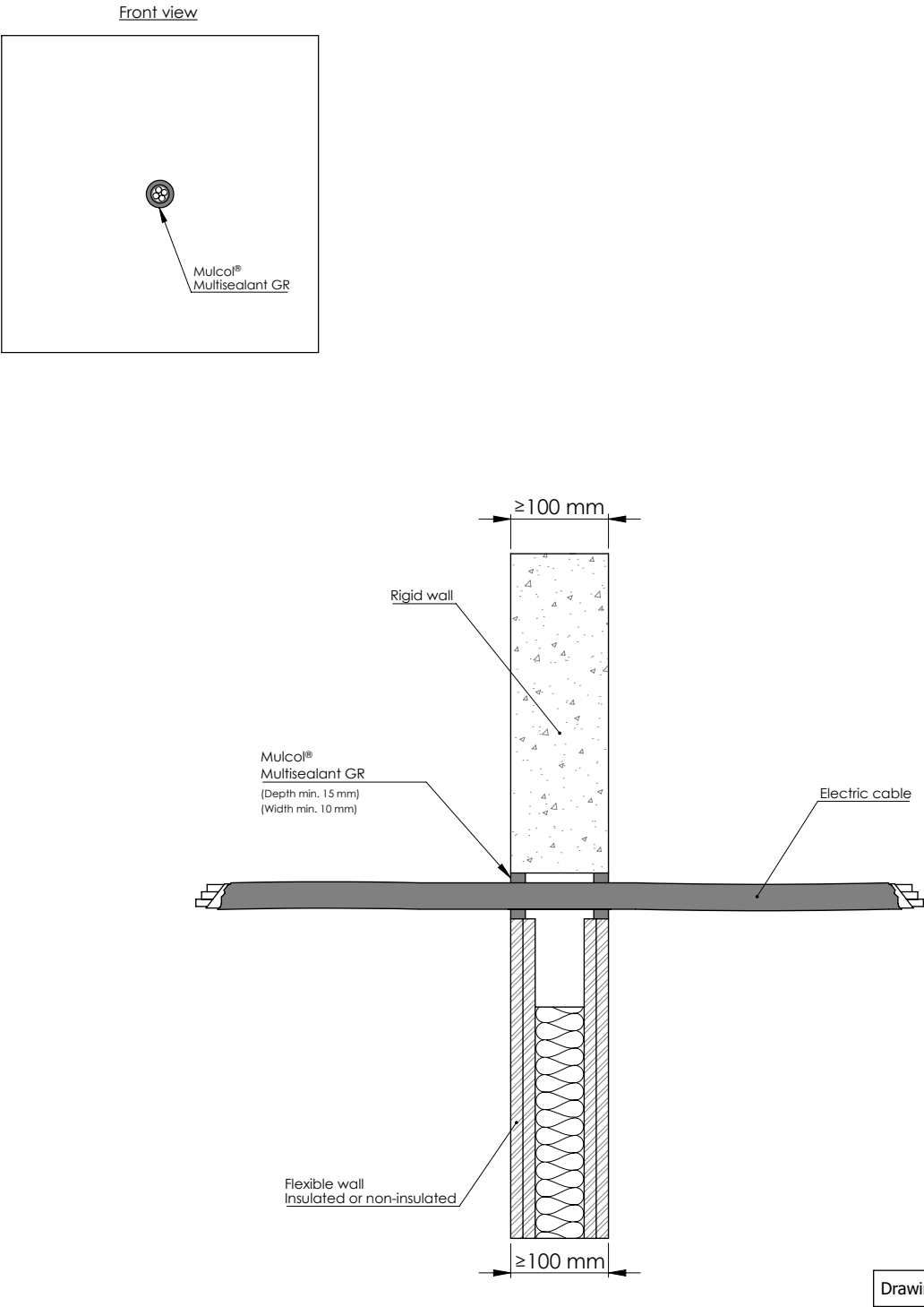
B.1.1	Rigid floors - Cables, trays and conduits	69
B.1.1.1	Cables - Bottom of floor	69
B.1.1.2	Cables - Top of floor	70
B.1.1.3	Multiple conduits with cables	71
B.1.1.4	Multiple conduits with cables - Multimastic FB1	72
B.1.1.5	Cable bundle - Bottom of floor	73
B.1.1.6	Cable bundle - Top of floor	74
B.1.1.7	Flexible conduit with cables - Bottom of floor	75
B.1.1.8	Flexible conduit with cables - Top of floor	76
B.1.2	Rigid floors - Combustible pipes	77
B.1.2.1	Plastic pipes	77
B.1.2.2	Plastic pipes - Multimastic FB1	79
B.1.2.3	Plastic pipes with cables	80
B.1.2.4	Encased plastic pipes	81
B.1.3	Rigid floors - Multilayer pipes (MLC) insulated	82
B.1.3.1	Multilayer pipes (MLC) - Elastomer LS 300 / CS - Multimastic FB1	82
B.1.3.2	Multilayer pipes (MLC) - Elastomer LI 300 / CI - Multimastic FB1	83
B.1.3.3	Multilayer pipes (MLC) - Elastomer LS 300 / CS - Multimastic FB1 cavity	84
B.1.3.4	Multilayer pipes (MLC) - Elastomer LI 300 / CI - Multimastic FB1 cavity	85
B.1.3.5	Multilayer pipes (MLC) - PE foam LS 300 / CS	86
B.1.3.6	Multilayer pipes (MLC) - PE foam LI 300 / CI	87
B.1.3.7	Multilayer pipes (MLC) - PE foam LS 300 / CS - Multimastic FB1	88
B.1.3.8	Multilayer pipes (MLC) - PE foam LI 300 / CI - Multimastic FB1	89
B.1.4	Rigid floors - Multilayer pipes (MLC) uninsulated	90
B.1.4.1	Multilayer pipes (MLC)	90
B.1.4.2	Multilayer pipes (MLC) - Multimastic FB1	91
B.1.4.3	Multilayer pipes (MLC) - Multimastic FB1 cavity	92
B.1.4.4	Multilayer pipes (MLC) - Multitherm bandage	93
B.1.5	Rigid floors - Metal pipes insulated elastomer	94
B.1.5.1	Copper and steel pipes - Elastomer LS 450 / CS	94
B.1.5.2	Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB1	95
B.1.5.3	Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB1 cavity	97
B.1.5.4	Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB2	99
B.1.6	Rigid floors - Metal pipes uninsulated	101
B.1.6.1	Copper and steel pipes	101
B.1.6.2	Copper and steel pipes - Multimastic FB1	102
B.1.6.3	Copper and steel pipes - Multimastic FB1 cavity	103
B.1.6.4	Copper and steel pipes - Multimastic FB2	104
B.1.6.5	Copper and steel pipes - Multitherm bandage - Bottom of floor	105
B.1.6.6	Copper and steel pipes - Multitherm Bandage - Bottom of floor	106
B.1.6.7	Copper and steel pipes - Multitherm Bandage - Top of floor	107
B.1.6.8	Copper and steel pipes - Multitherm bandage - Top of floor	108
B.1.7	Rigid floors - Gas pipes	109
B.1.7.1	Corrugated stainless steel tube gas (CSST) pipes - Multitherm Bandage	109
B.1.7.2	Corrugated stainless steel tube gas (CSST) pipes - Multimastic FB1 - Multitherm Bandage	110
B.1.8	Rigid floors - Electrical room services	111
B.1.8.1	Cables - Bottom of floor	111
B.1.8.2	Cables - Top of floor	112
B.1.8.3	Cable bundle - Bottom of floor	113
B.1.8.4	Cable bundle - Top of floor	114
B.1.8.5	Flexible conduit with cables - Bottom of floor	115
B.1.8.6	Flexible conduit with cables - Top of floor	116
B.1.8.7	Multilayer pipes (MLC)	117
B.1.8.8	Multilayer pipes (MLC) - PE foam	118
B.1.8.9	Multilayer pipes (MLC) - Multitherm Bandage	119
B.1.8.10	Copper and steel pipes - Multitherm Bandage - Bottom of floor	120
B.1.8.11	Copper and steel pipes - Multitherm Bandage - Top of floor	122

Annex C - General

C.1	Flexible and rigid wall - General	123
C.1.1	Mutual distances & distance to first support	123
C.1.2	Flexible and rigid wall - Maximum seal dimensions	124
C.1.2.1	Multimastic FB1 - 2x 50 mm no aperture framing	124
C.1.2.2	Multimastic FB1 - 2x 50 mm with aperture framing	125
C.1.2.3	Maximum seal dimensions - Multimastic FB2 - 1x 60 mm with aperture framing	126
C.1.2.4	Maximum seal dimensions - Multimastic FB2 - 1x 60 mm with aperture framing	127
C.2	Rigid floor - General	128
C.2.1	Mutual distances & distance to first support	128
C.2.2	Rigid floor - Maximum seal dimensions	129
C.2.2.1	Maximum seal dimensions - Multimastic FB1 - 2x 50 mm no cavity	129
C.2.2.2	Maximum seal dimensions - Multimastic FB1 - 2x 50 mm cavity	130
C.2.2.3	Maximum seal dimensions - Multimastic FB2 - 1x 60 mm	131
C.3	Wall configurations	132
C.3.1	Allowed wall configurations	132

A.1.1 Flexible or rigid wall - Cables, trays and conduits

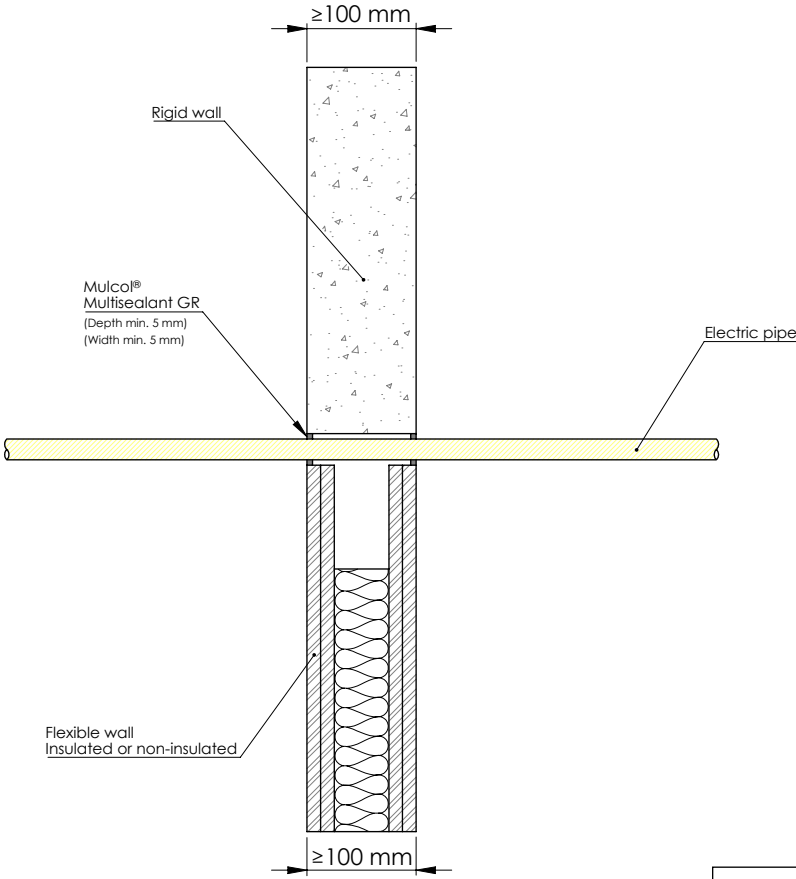
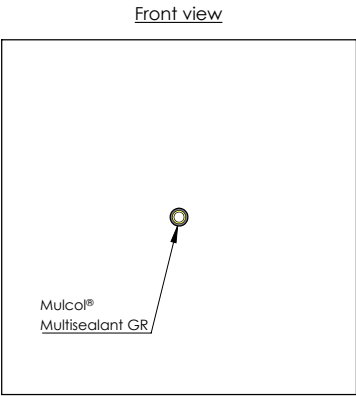
A.1.1.1 Cables



Servicesc	Sealing (mm)	Classification
Cables ≤ Ø 25 mm, YMvK 5G 25 mm²	Multisealant GR ≥ 10 x 15 (wxd)	EI 60, E 120

A.1.1 Flexible or rigid wall - Cables, trays and conduits

A.1.1.2 Single plastic conduits

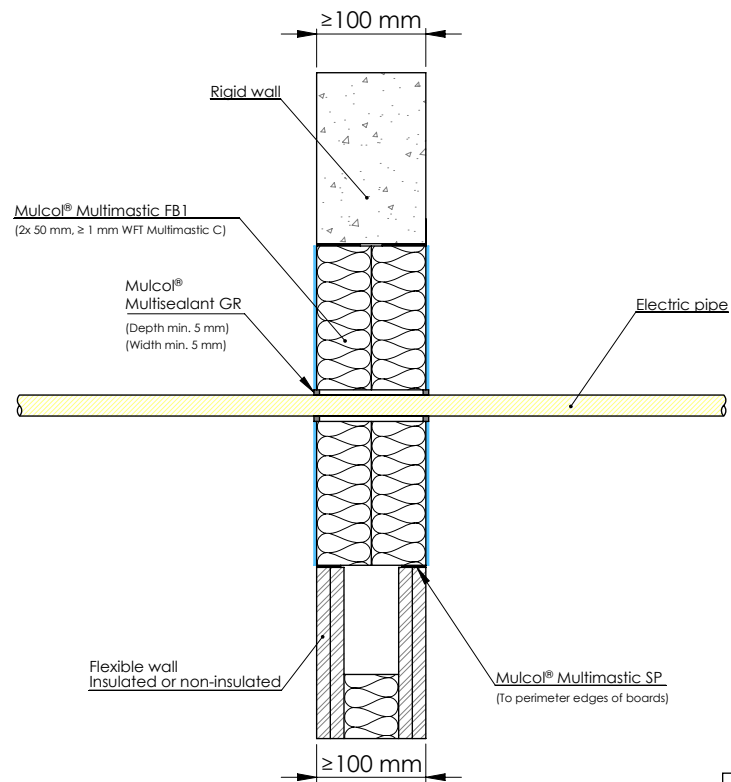
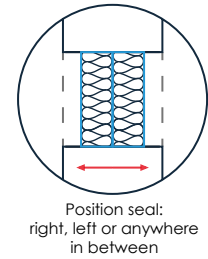
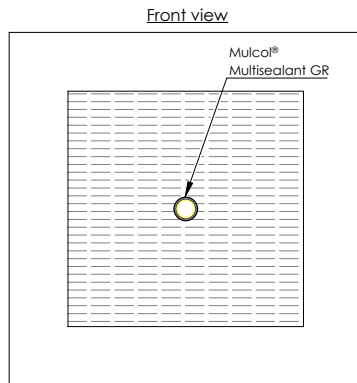


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Services	Sealing (mm)	Classification
Plastic conduits $\leq \varnothing 19$ mm, with or without cables	Multisealant GR $\geq 5 \times 5$ (wxd)	EI 60 U/U, E 90 U/U

A.1.1 Flexible or rigid wall - Cables, trays and conduits

A.1.1.3 Single plastic conduits - Multimastic FB1

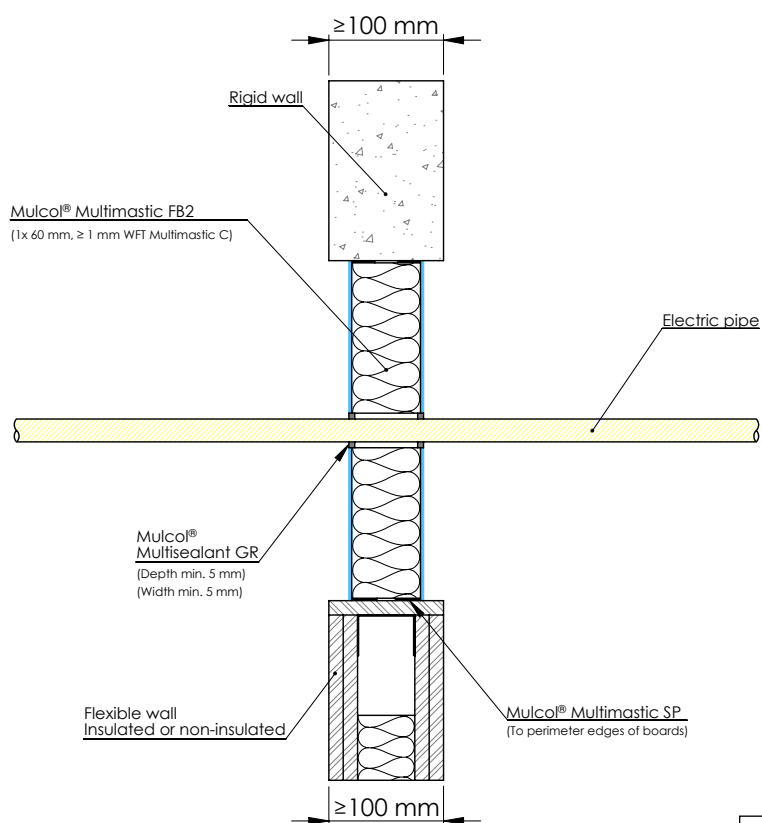
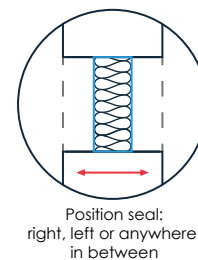
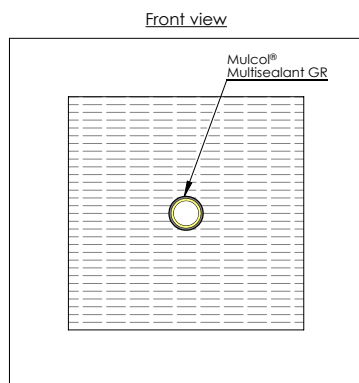


Drawing: PBfw.E-EP-MFB1-G2.0.10

Services	Sealing (mm)	Classification
Plastic conduits ≤ Ø 19 mm, with or without cables	Multisealant GR ≥ 5 x 5 (wxd)	EI 60 U/U, E 90 U/U

A.1.1 Flexible or rigid wall - Cables, trays and conduits

A.1.1.4 Single plastic conduits - Multimastic FB2

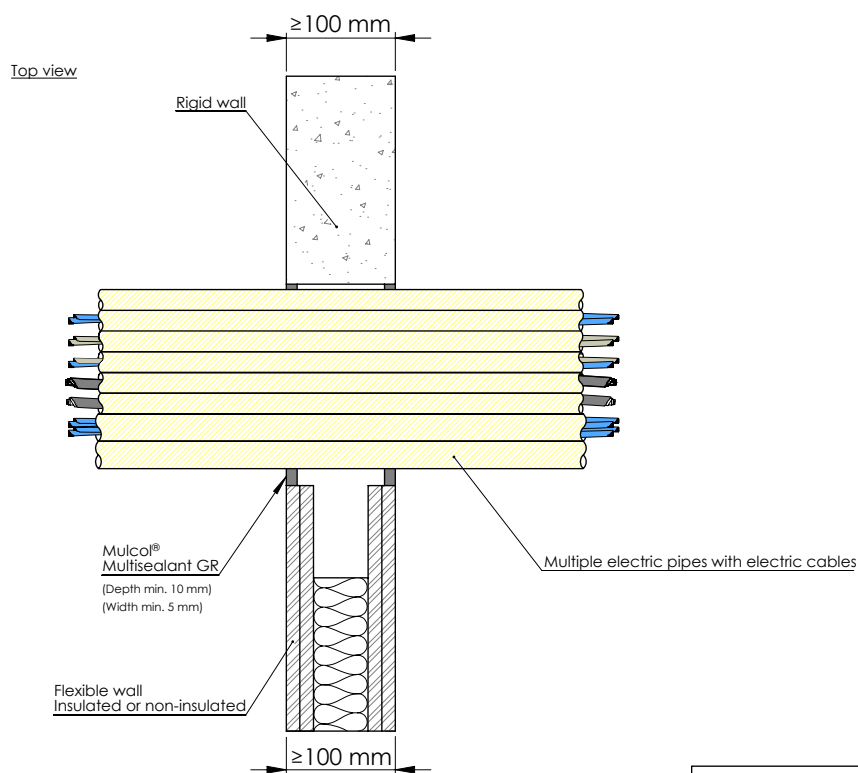
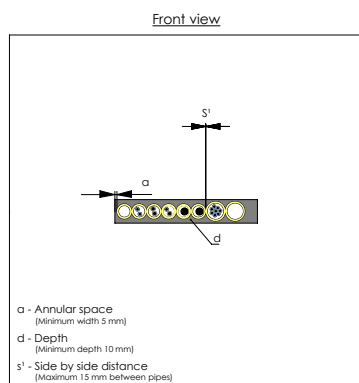


Drawing: PBfw.E-EP-MFB2-G2.0.10

Services	Sealing (mm)	Classification
Plastic conduits $\leq \varnothing 19$ mm, with or without cables	Multisealant GR $\geq 5 \times 5$ (wxd)	EI 60 U/U, E 90 U/U

A.1.1 Flexible or rigid wall - Cables, trays and conduits

A.1.1.5 Multiple plastic conduits with cables

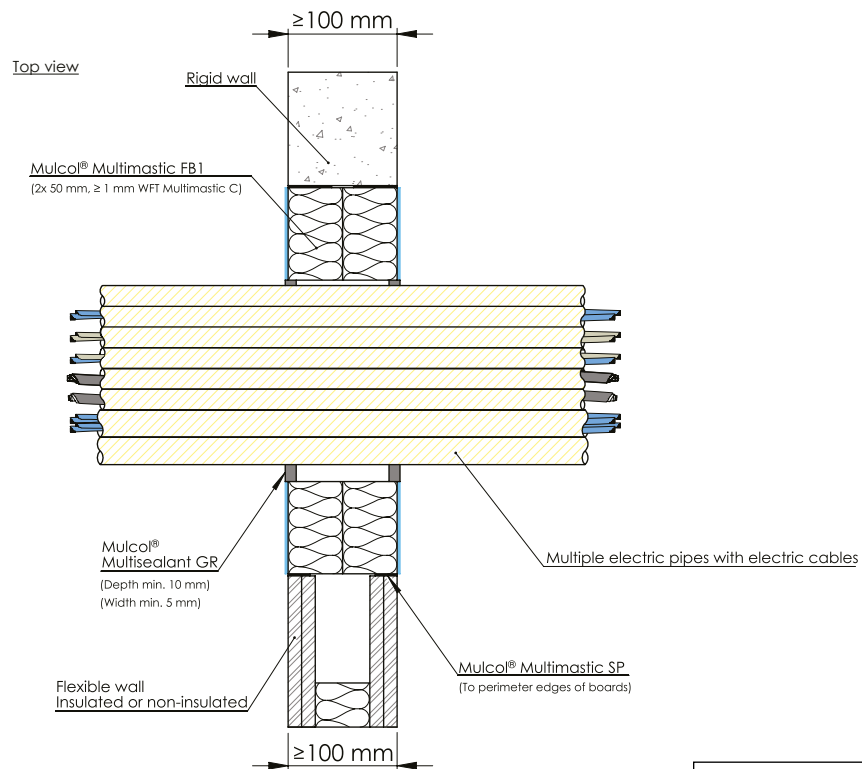
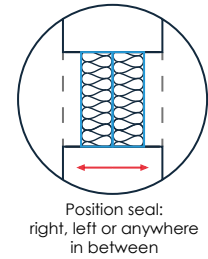
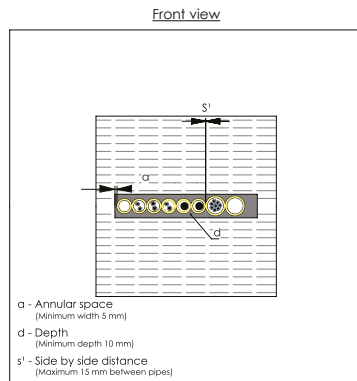


Drawing: FW.E-EP8-G2.1.10

Services	Sealing (mm)	Classification
Plastic conduits ≤ Ø 25 mm, with or without cables, max 8 pcs.	Multisealant GR ≥ 5 x 10 (wxd)	EI 90 U/U, E 120 U/U

A.1.1 Flexible or rigid wall - Cables, trays and conduits

A.1.1.6 Multiple plastic conduits with cables - Multimastic FB1

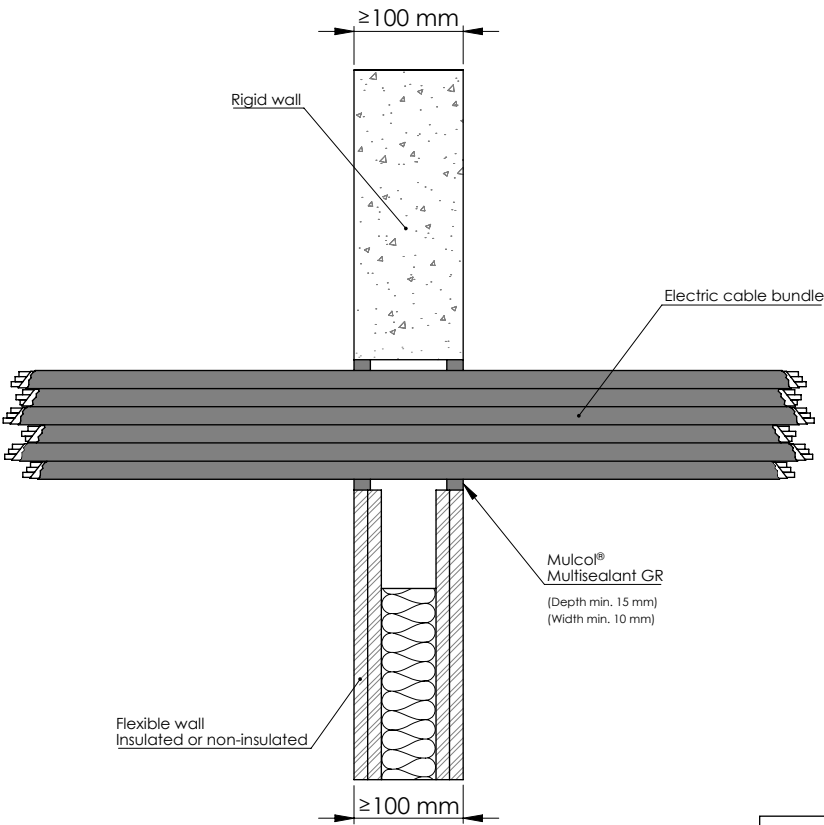
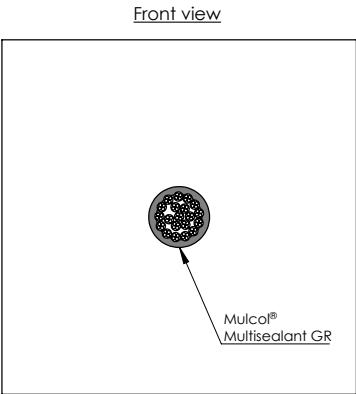


Drawing: PBfw.E-EP8-G2.1.10

Services	Sealing (mm)	Classification
Plastic conduits ≤ Ø 25 mm, with or without cables, max 8 pcs.	Multisealant GR ≥ 5 x 10 (wxd)	EI 90 U/U, E 120 U/U

A.1.1 Flexible or rigid wall - Cables, trays and conduits

A.1.1.7 Cable bundle



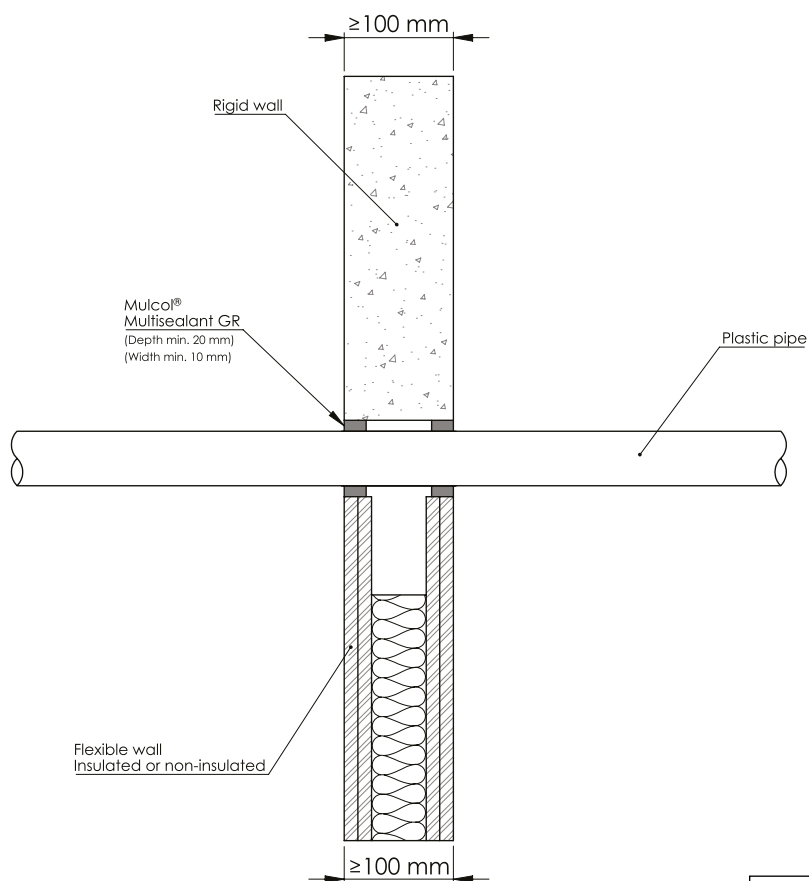
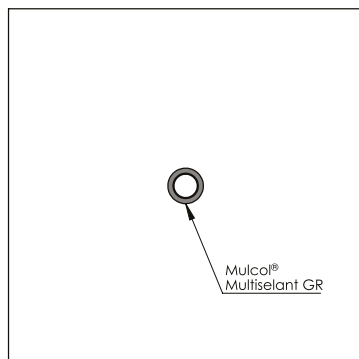
Drawing: FW.E-ECB-G2.2.10

Services	Sealing (mm)	Classification
Cables ≤ Ø 21 mm in a tied bundle ≤ Ø 100 mm	Multisealant GR ≥ 10 x 15 (wxd)	EI 60, E 120

A.1.2 Flexible or rigid wall - Combustile pipes

A.1.2.1 Plastic pipes

Front view

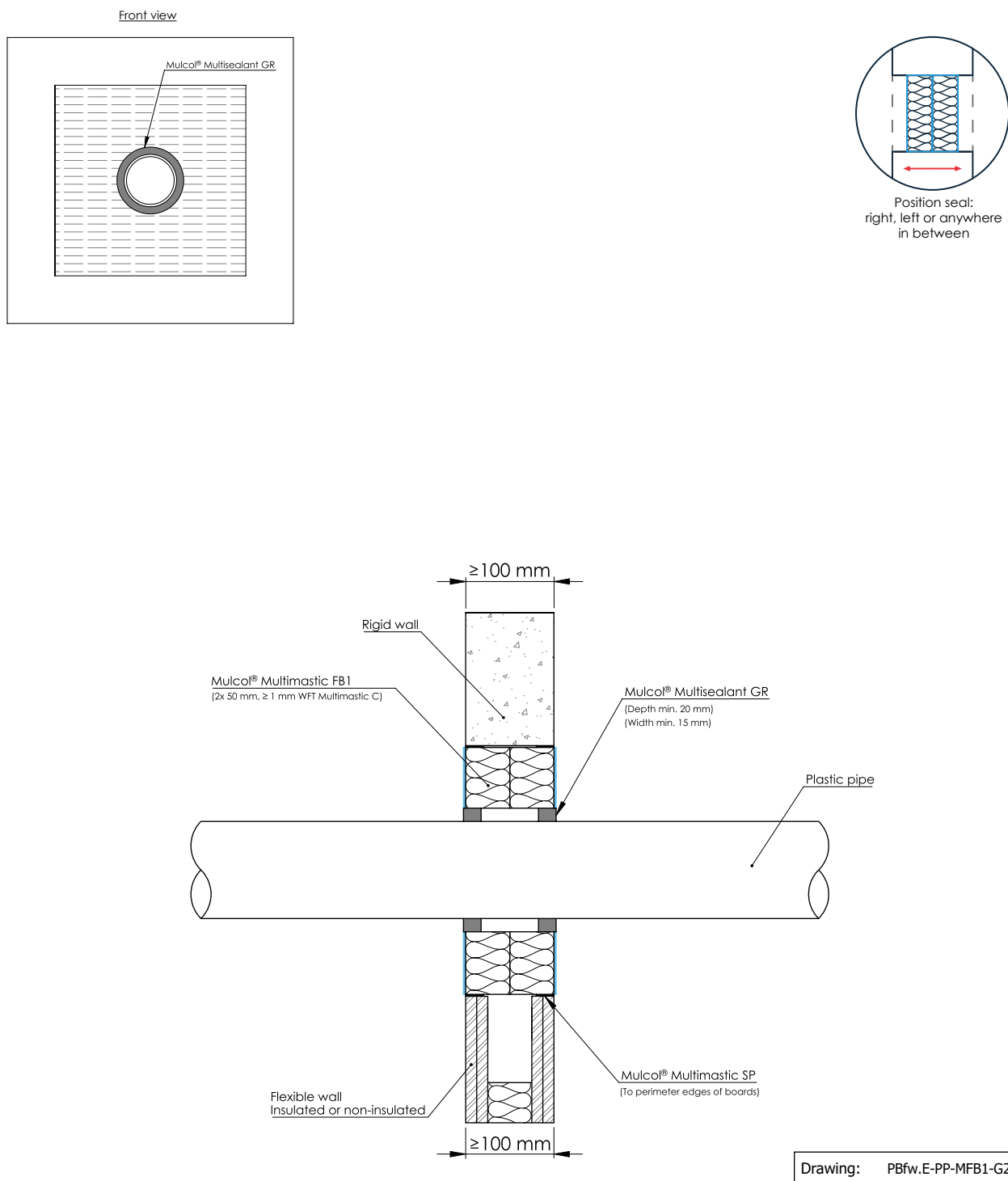


Drawing: FW.E-PP-G2.4.10

Services	Pipe dimensions (mm)		Sealing (mm)	Classification
	Outer dimension	Wall thickness		
PE(-HD) / PE-X / ABS / SAN+PVC	≤ Ø 40	2.4 - 10	Multisealant GR ≥ 10 x 20 (wxd)	EI 120 U/C
	≤ Ø 110	2.7 - 10		
PP	≤ Ø 40	2.3 - 10		EI 120 U/U
	≤ Ø 110	2.7 - 10		
PVC(-U/-C)	≤ Ø 32	1.8 - 10		EI 120 U/C
	≤ Ø 50	2.0 - 10		
	≤ Ø 40	1.9 - 10		
	≤ Ø 110	2.2 - 10		
	≤ Ø 160	3.2 - 11.8		

A.1.2 Flexible or rigid wall - Combustible pipes

A.1.2.2 Plastic pipes - Multimastic FB1

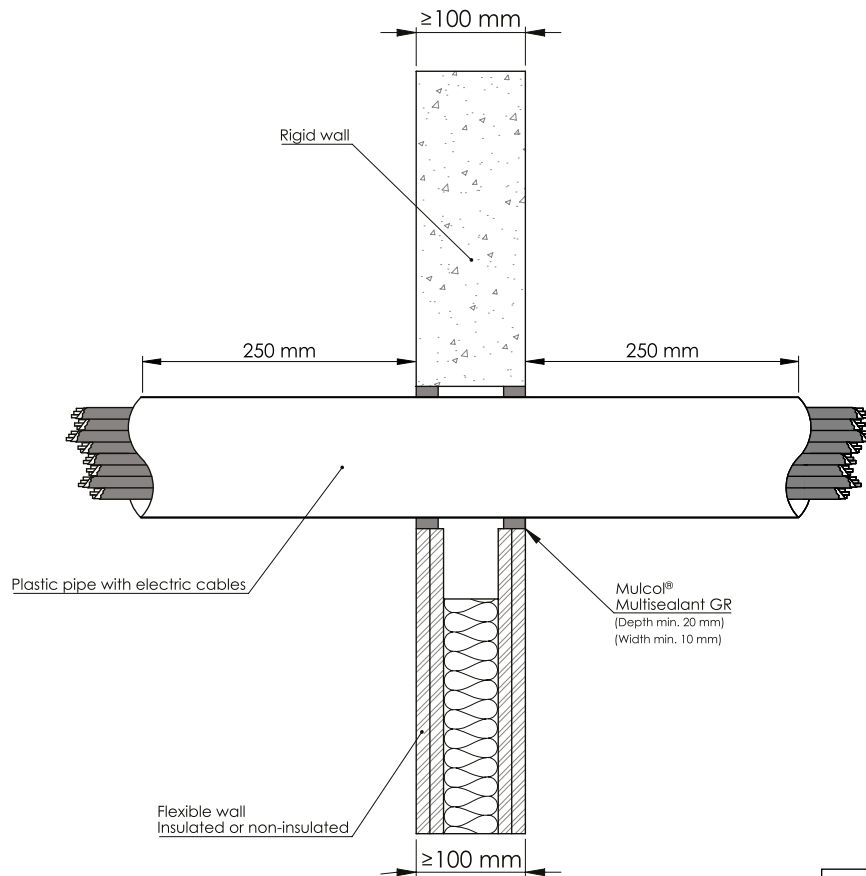
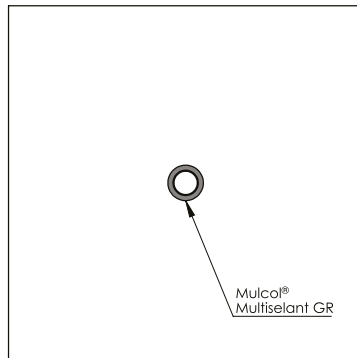


Services	Pipe dimensions (mm)		Sealing (mm)	Classification
	Outer dimension	Wall thickness		
PE(-HD) / PE-X / ABS / SAN+PVC	≤ Ø 110	2.7 - 10	Multisealant GR ≥ 15 x 20 (wxd)	EI 60 U/C
	≤ Ø 110	10		EI 120 U/C
PP	≤ Ø 110	2.7 - 10	Multisealant GR ≥ 10 x 20 (wxd)	EI 90 U/C, E 120 U/C
	≤ Ø 110	10		EI 120 U/C
PVC(-U/-C)	≤ Ø 32	1.8	Multisealant GR ≥ 10 x 20 (wxd)	EI 120 U/U
	≤ Ø 50	3		EI 60 U/U
	≤ Ø 110	2.7 - 10	Multisealant GR ≥ 15 x 20 (wxd)	EI 60 U/C
	≤ Ø 110	10		EI 120 U/C

A.1.2 Flexible or rigid wall - Combustile pipes

A.1.2.3 Plastic pipes with cables

Front view

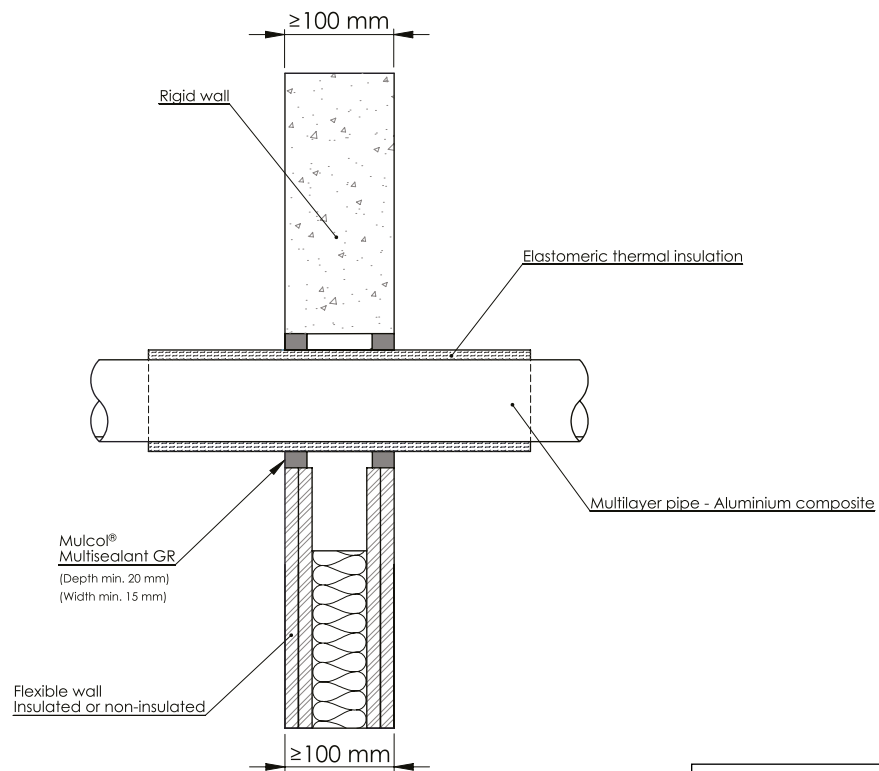
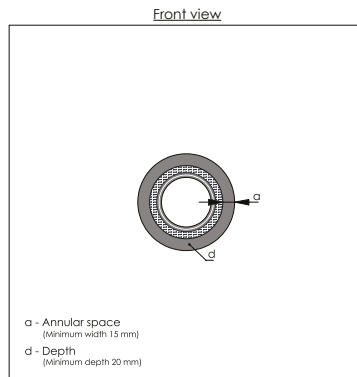


Drawing: FW.E-PPEC-G2.4.10

Services	Pipe dimensions (mm)		Sealing (mm)	Classification
	Outer dimension	Wall thickness		
PE(-HD) / PE-X / ABS / SAN+PVC	≤ Ø 110	2.7 - 10	Multisealant GR ≥ 10 x 20 (wxd)	EI 120 U/C
PP				
PVC(-U/-C)				
Cables ≤ Ø 21 mm	-	-	-	EI 120
Cables ≤ Ø 80 mm	-	-	-	EI 90, E 120
Cables ≤ Ø 21 mm in a tied bundle ≤ Ø 100 mm	-	-	-	EI 120

A.1.3 Flexible or rigid wall - Multilayer pipes (MLC) insulated

A.1.3.1 Multilayer pipes (MLC) - Elastomer

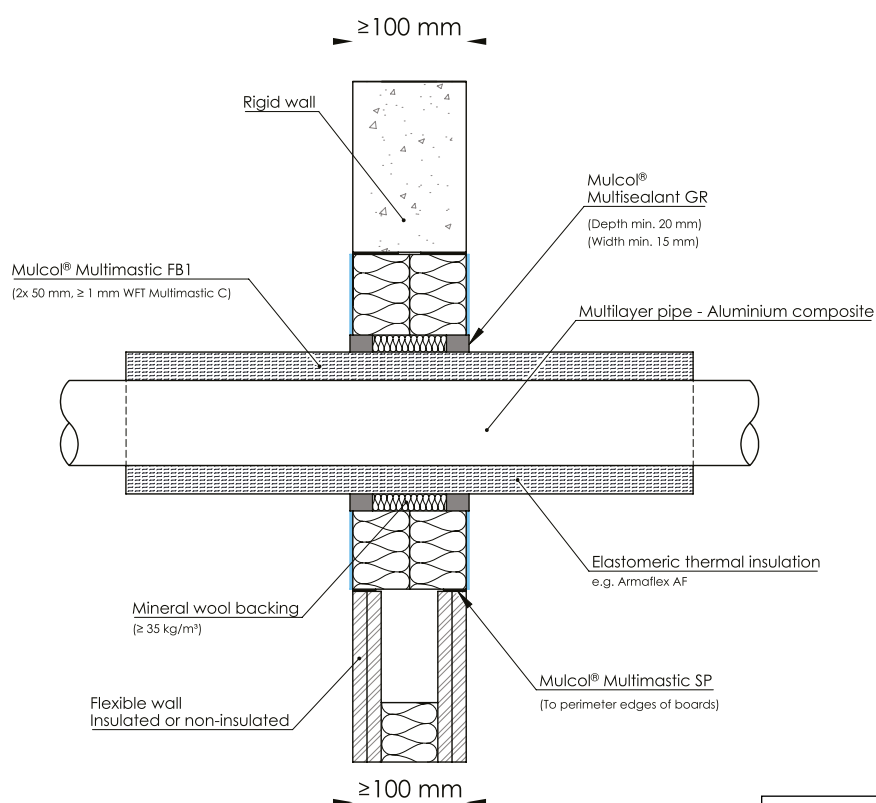
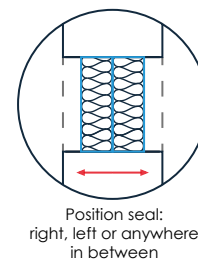
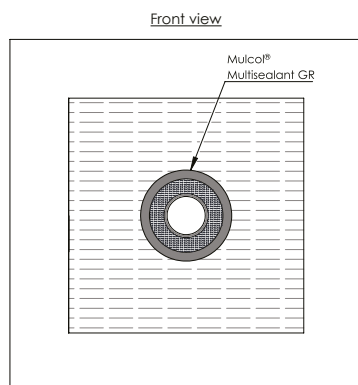


Drawing: FW.E-MLA-G2.4.22

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Multilayer pipes (MLC)	≤ Ø 75	6	ArmaFlex AF (min. class B-s3, d0 B _L -s3, d0)	9 - 32	LS 400 / CS	Multisealant GR ≥ 15 x 20 (wxd)	EI 90 U/C E 120 U/C

A.1.3 Flexible or rigid wall - Multilayer pipes (MLC) insulated

A.1.3.2 Multilayer pipes (MLC) - Elastomer - Multimastic FB1

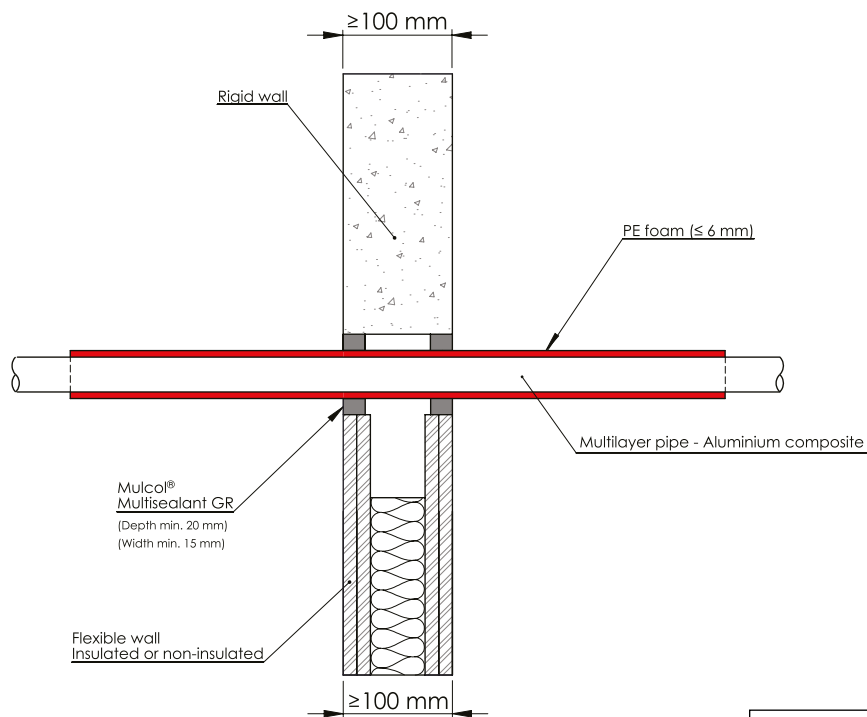
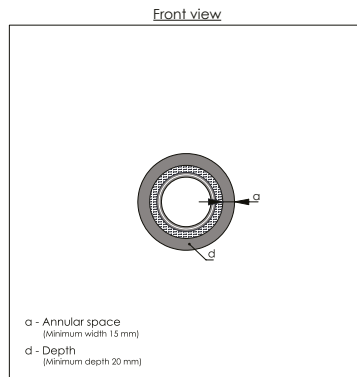


Drawing: PBfw.E-MLA-G2.4.22

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Multilayer pipe (MLC)	≤ Ø 75	6.0	ArmaFlex AF (min. class B-s3, d0 B _L -s3, d0)	9 - 32	LS 400 / CS	Multisealant GR ≥ 15 x 20 (wxd)	Stone wool (≥ 35 kg/m³)	EI 90 U/C E 120 U/C

A.1.3 Flexible or rigid wall - Multilayer pipes (MLC) insulated

A.1.3.3 Multilayer pipes (MLC) - PE foam LS 300 / CS

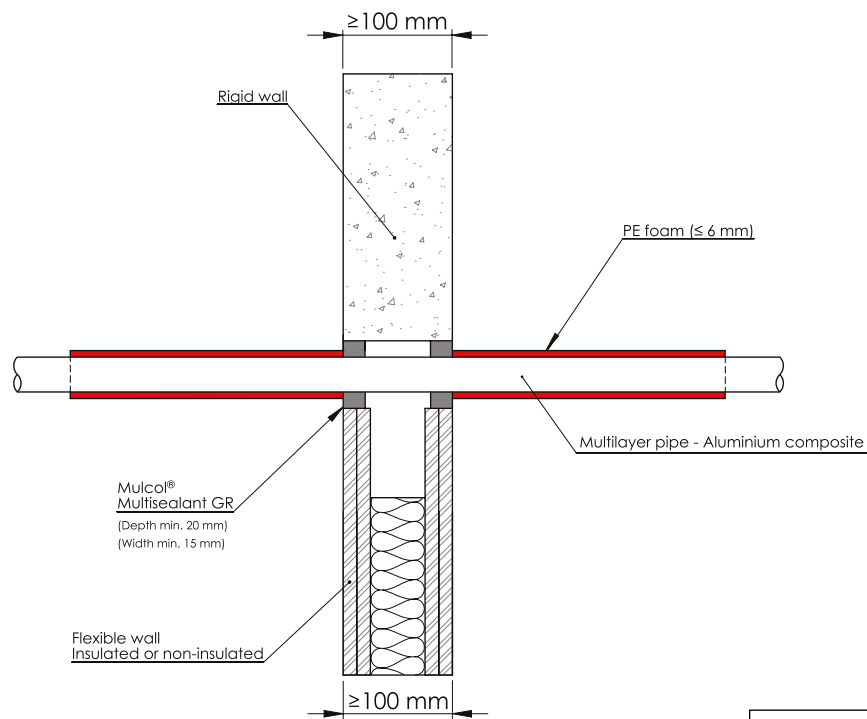
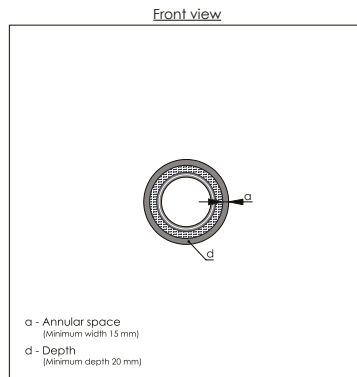


Drawing: FW.E-MLA-G2.4.23

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Multilayer pipes (MLC)	$\leq \text{Ø } 32$	2.0 - 3.0	PE Foam	6	LS 300 / CS	Multisealant GR $\geq 15 \times 20$ (wxd)	EI 120 U/C

A.1.3 Flexible or rigid wall - Multilayer pipes (MLC) insulated

A.1.3.4 Multilayer pipes (MLC) - PE foam LI 300 / CI

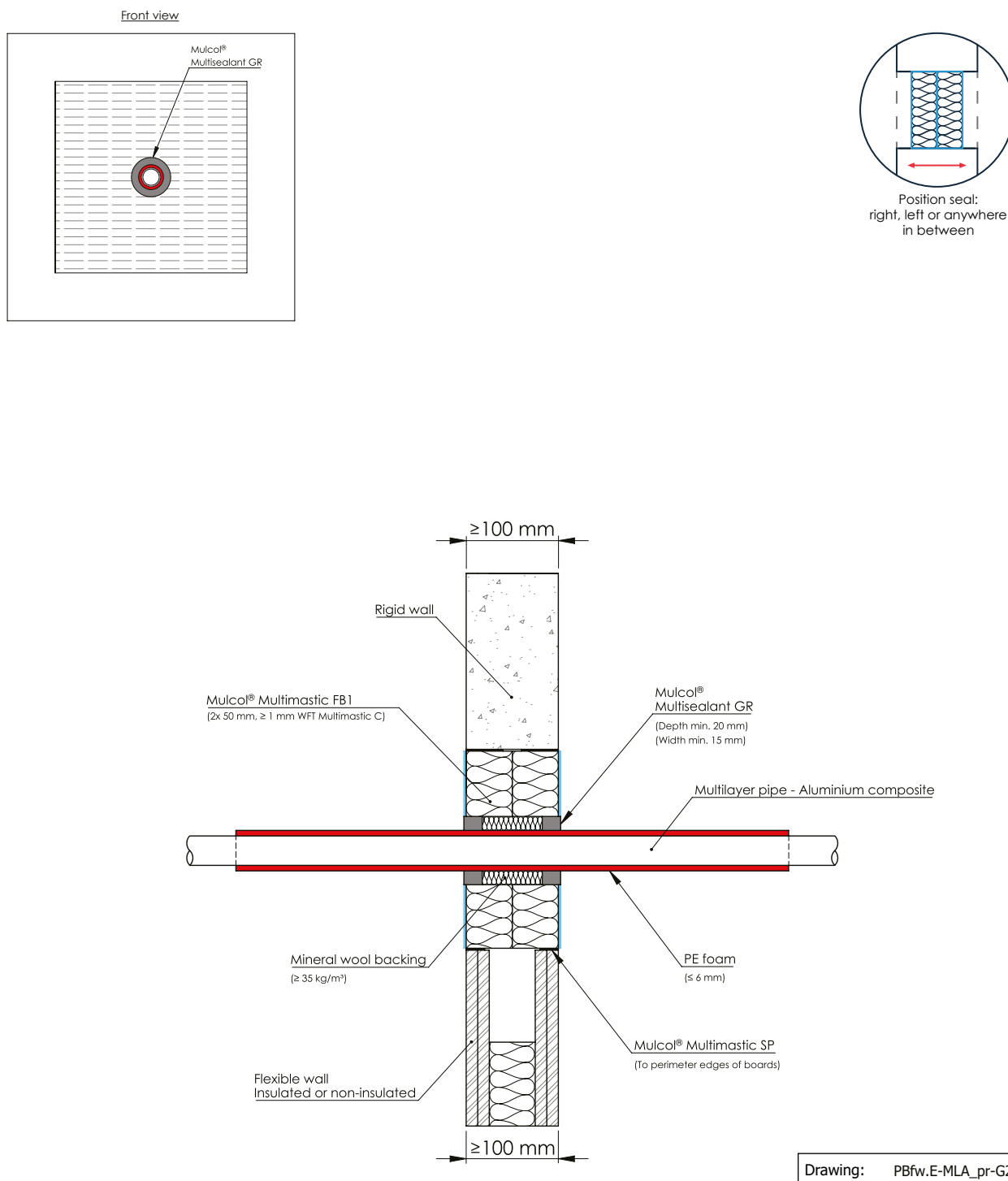


Drawing: W.E-MLA-G2.4.23.L

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Multilayer pipes (MLC)	$\leq \varnothing 32$	2.0 - 3.0	PE Foam	6	LI 300 / CI	Multisealant GR $\geq 15 \times 20$ (wxd)	EI 120 U/C

A.1.3 Flexible or rigid wall - Multilayer pipes (MLC) insulated

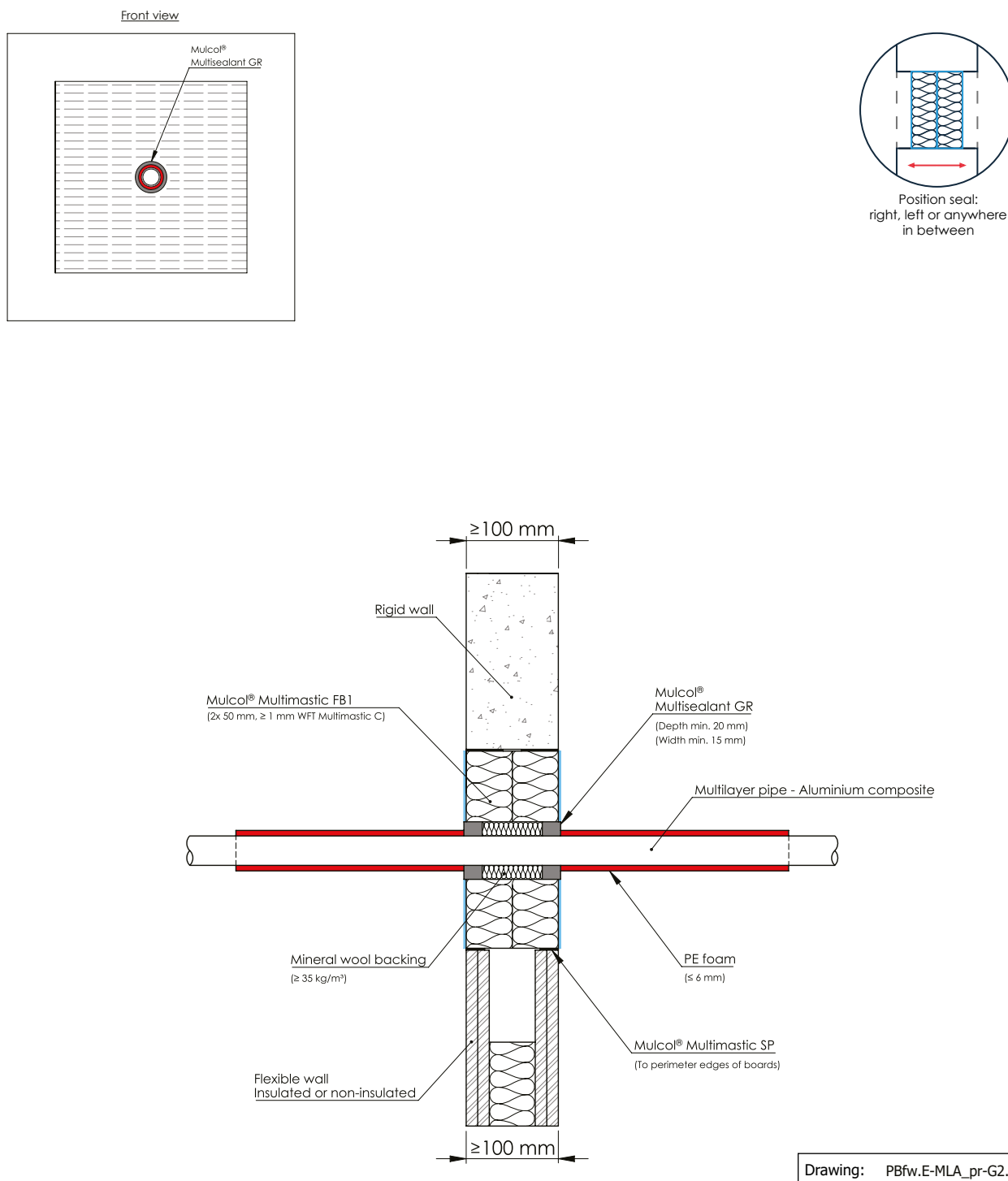
A.1.3.5 Multilayer pipes (MLC) - PE foam LS 300 / CS - Multimastic FB1



Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Multilayer pipes (MLC)	≤ Ø 32	2.0 - 3.0	PE Foam	≤ 6	LS 300 / CS	Multisealant GR ≥ 15 x 20 (wxd)	Stone wool (≥ 35 kg/m³)	EI 120 U/C

A.1.3 Flexible or rigid wall - Multilayer pipes (MLC) insulated

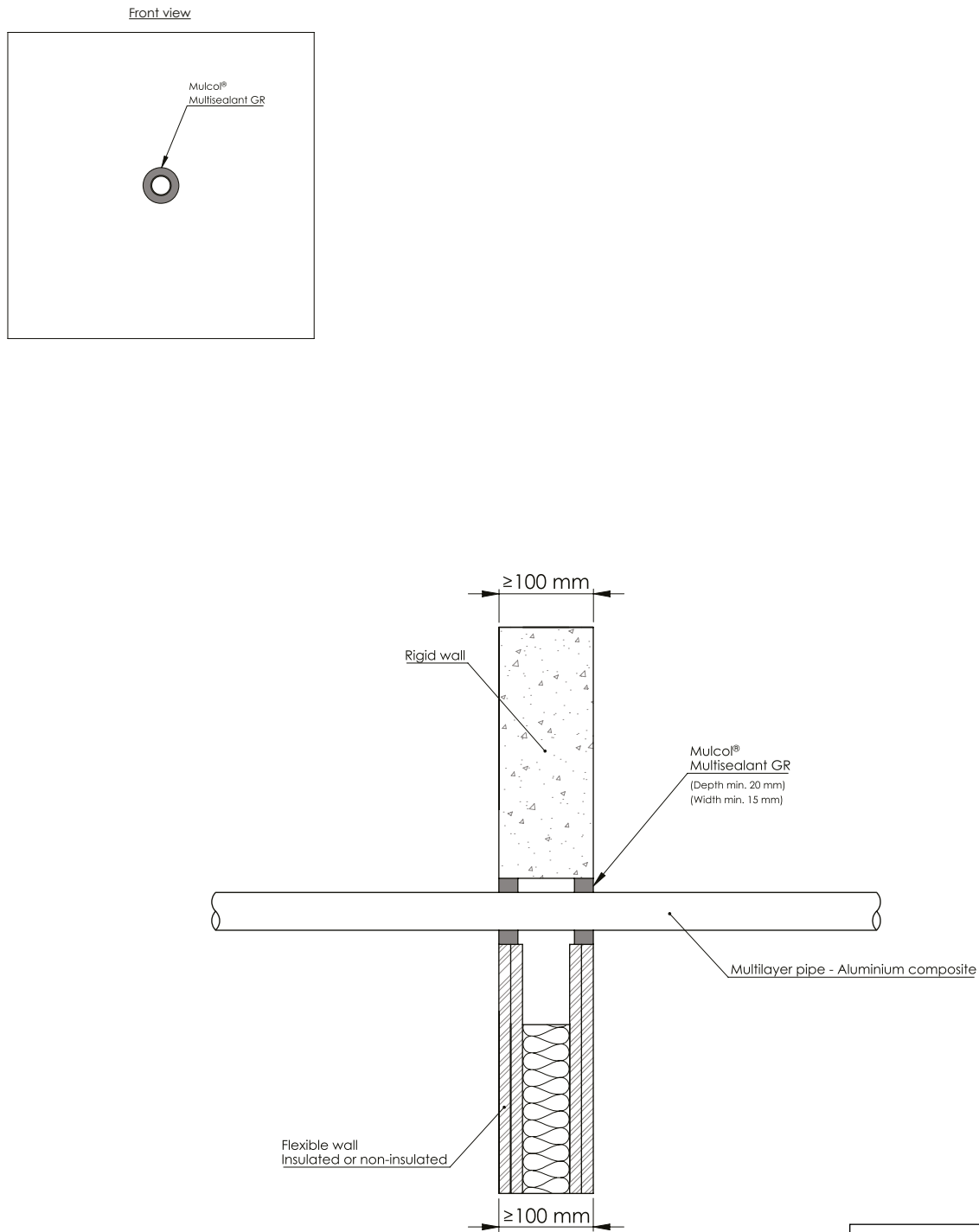
A.1.3.6 Multilayer pipes (MLC) - PE foam LI 300 / CI - Multimastic FB1



Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Multilayer pipes (MLC)	≤ Ø 32	2.0 - 3.0	PE Foam	≤ 6	LI 300 / CI	Multisealant GR ≥ 15 x 20 (wxd)	Stone wool (≥ 35 kg/m³)	EI 120 U/C

A.1.4 Flexible or rigid wall - Multilayer pipes (MLC) uninsulated

A.1.4.1 Multilayer pipes (MLC)

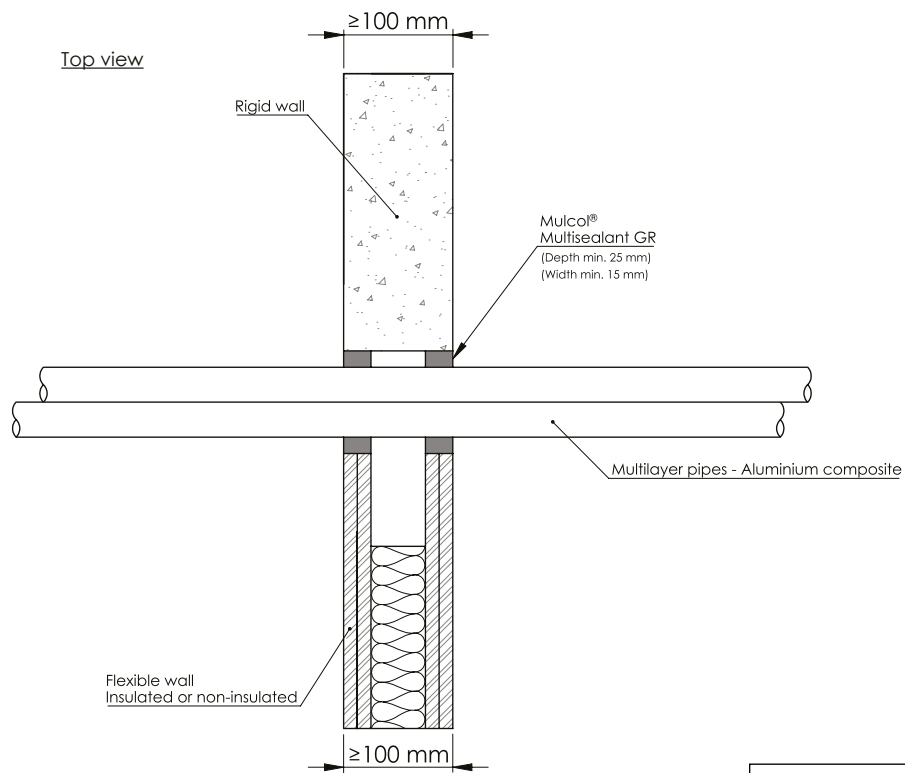
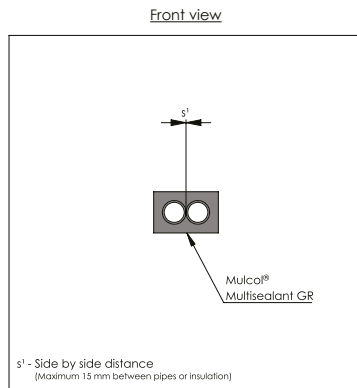


Drawing: FW.E-MLA-G2.4.10

Services	Pipe dimensions (mm)		Sealing (mm)	Classification
	Outer dimension	Wall thickness		
Multilayer pipes (MLC)	≤ Ø 20	2.0	Multisealant GR ≥ 15 x 20 (wxd)	EI 120 U/C
	≤ Ø 32	3.0		
	≤ Ø 40	3.5 - 4.0		

A.1.4 Flexible or rigid wall - Multilayer pipes (MLC) uninsulated

A.1.4.2 Multiple Multilayer pipes (MLC)

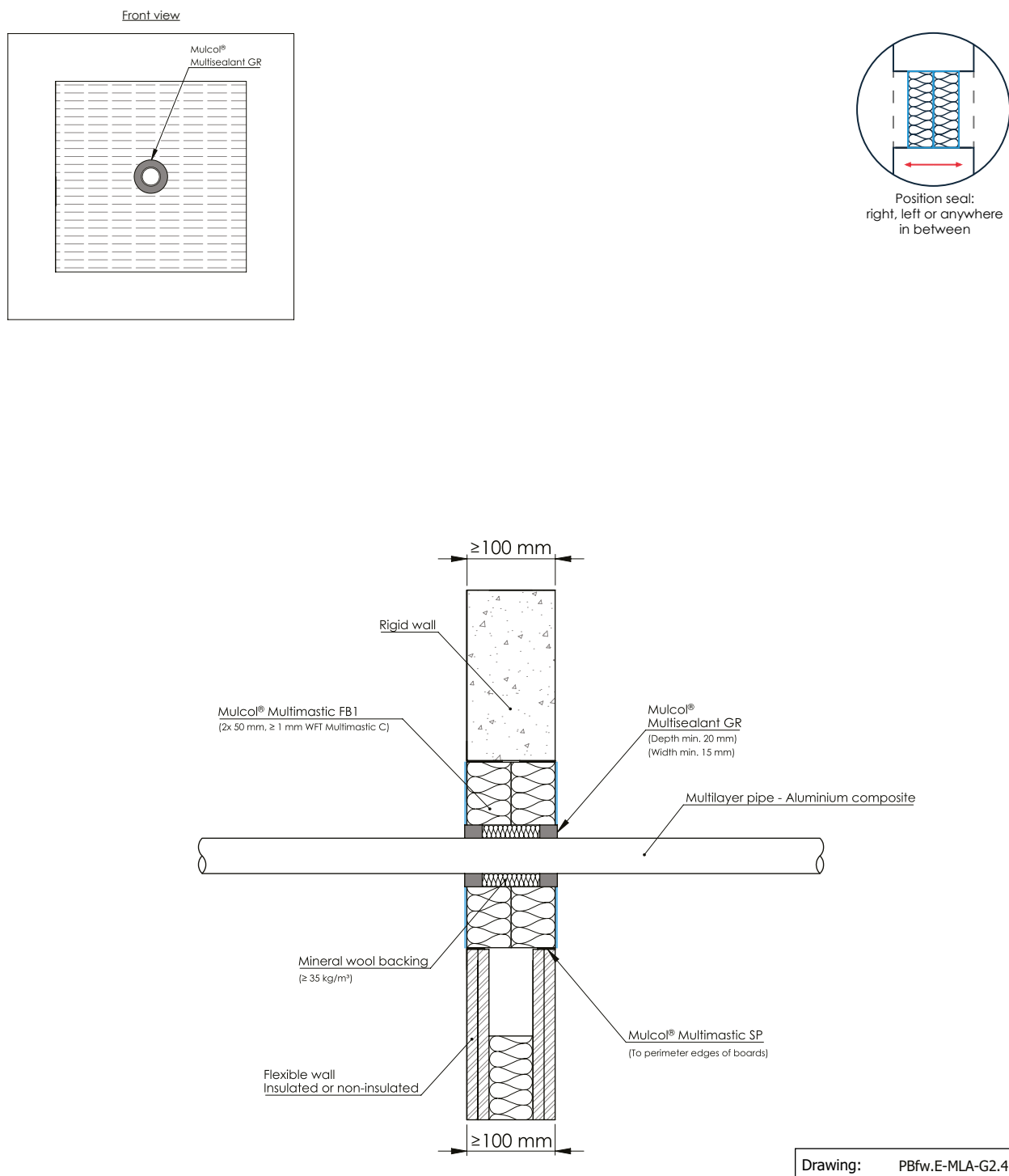


Drawing: FW.E-MLP2-G2.5.10

Services	Pipe dimensions (mm)		Sealing (mm)	Classification
	Outer dimension	Wall thickness		
Multilayer pipes (MLC) max 2 pcs.	≤ Ø 25	3.5	Multisealant GR ≥ 15 x 25 (wxd)	EI 120 U/C
	≤ Ø 32	2.0 - 3.0		

A.1.4 Flexible or rigid wall - Multilayer pipes (MLC) uninsulated

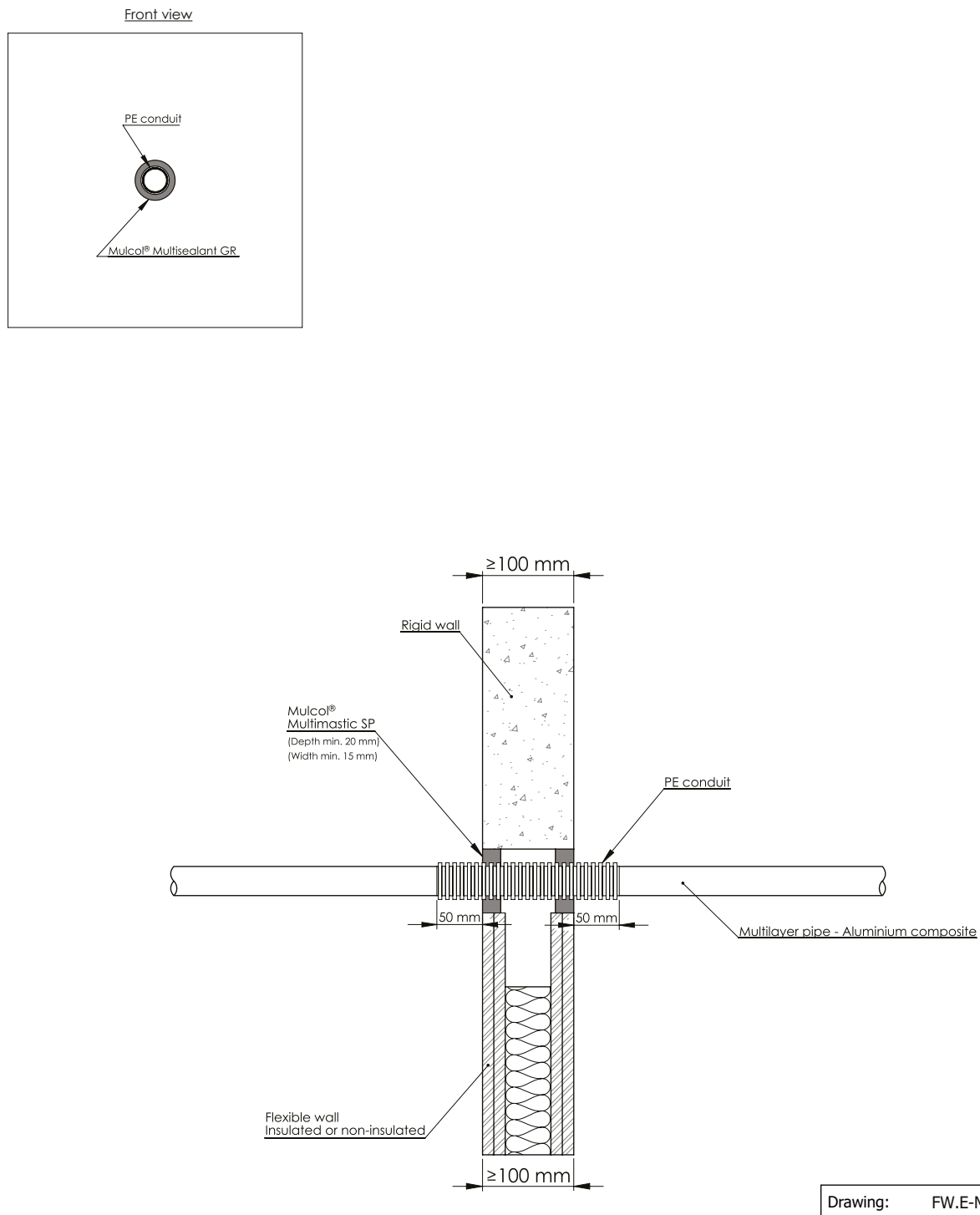
A.1.4.3 Multilayer pipes (MLC) - Multimastic FB1



Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness			
Multilayer pipes (MLC)	≤ Ø 20	2.0	Multisealant GR ≥ 15 x 20 (wxd)	Stone wool (≥ 35 kg/m³)	EI 120 U/C
	≤ Ø 32	3.0			
	≤ Ø 40	3.5 - 4.0			

A.1.4 Flexible or rigid wall - Multilayer pipes (MLC) uninsulated

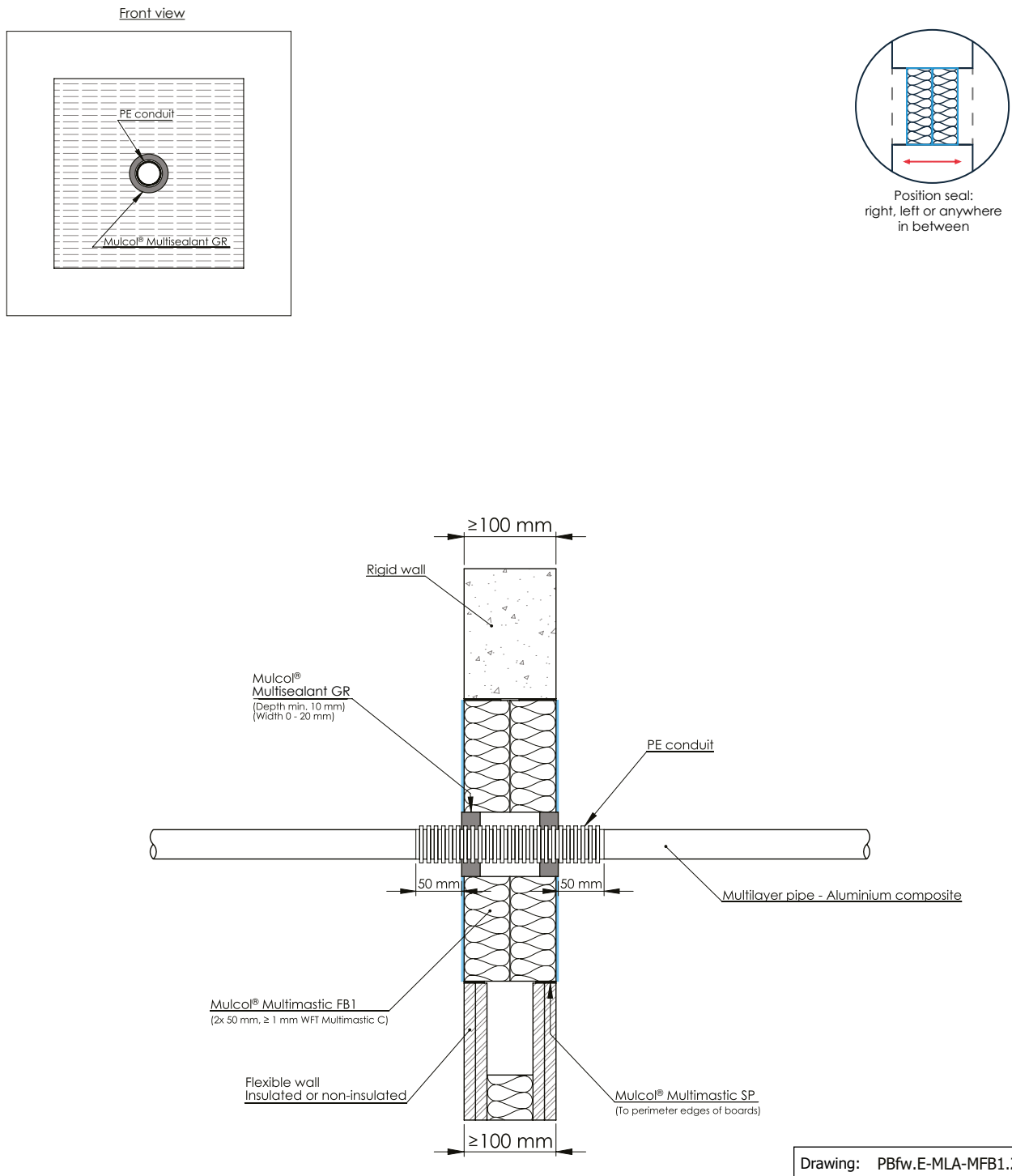
A.1.4.4 Flexible plastic conduit with Multilayer pipes (MLC)



Services	Pipe dimensions (mm)		Conduit			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Outer dimension (mm)	Configuration		
Multilayer pipes (MLC)	≤ Ø 32	3.0	PE-conduit ribbed	≤ Ø 40	LS 50 / CS	Multisealant GR ≥ 15 x 20 (wxd)	EI 60 U/C E 90 U/C

A.1.4 Flexible or rigid wall - Multilayer pipes (MLC) uninsulated

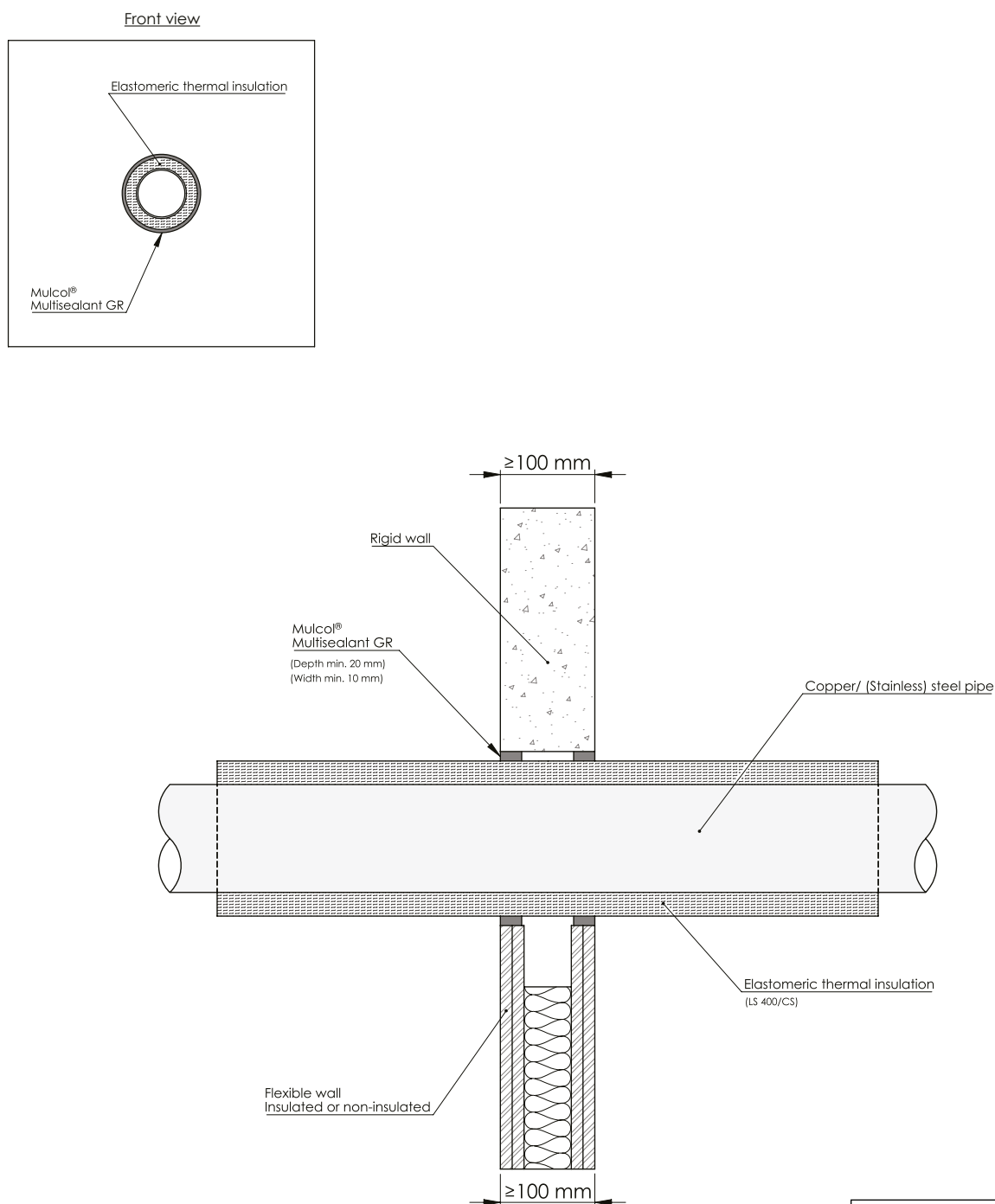
A.1.4.5 Flexible plastic conduit with Multilayer pipes (MLC) - Multimastic FB1



Services	Pipe dimensions (mm)		Conduit			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Outer dimension (mm)	Configuration		
Multilayer pipes (MLC)	≤ Ø 32	3.0	PE-conduit ribbed	≤ Ø 40	LS 50 / CS	Multisealant GR 0-20 x ≥ 10 (wxd)	EI 60 U/C

A.1.5 Flexible or rigid wall - Metal pipes insulated elastomer

A.1.5.1 Copper and steel pipes - Elastomer LS 400 / CS



Drawing: FW.E-CU-G2.4.22

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex AF (min. class B-s3, d0 B _L -s3, d0)	8.5	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	EI 90 C/U, E 120 C/U
				8.5 - 38			EI 90 C/U
				13.5 - 38			EI 30 C/U, E 90 C/U
	≤ Ø 54	≥ 1.5		13.5	CS		EI 90 C/U
				13.5 - 38			EI 60 C/U, E 90 C/U
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		38	LS 400 / CS		EI 90 C/U
				8.5			EI 90 C/U, E 120 C/U
				8.5 - 38			EI 90 C/U
	≤ Ø 114.3	≥ 3.6		15 - 43			EI 45 C/U, E 90 C/U
				43			EI 60 C/U, E 90 C/U

A.1.5 Flexible or rigid wall - Metal pipes insulated elastomer

A.1.5.1 Copper and steel pipes - Elastomer LS 400 / CS

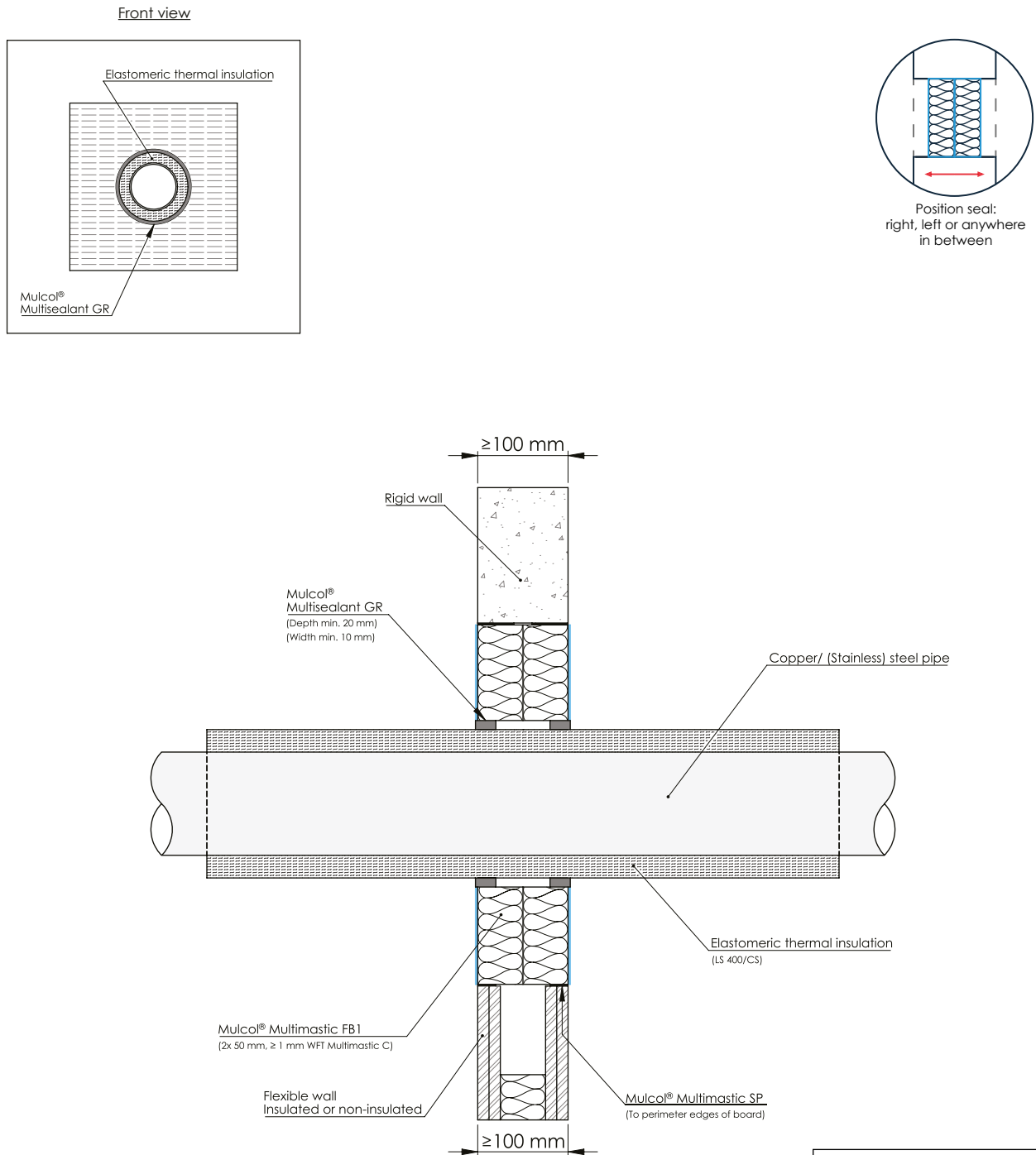
Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3	Kaiflex KK (min. class B-s2, d0 B _L -s2, d0)	8.5	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	EI 120 C/U

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex NH (min. class D-s3, d0 D _L -s3, d0)	9	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	EI 90 C/U
				9 - 25			EI 60 C/U
	13	CS		EI 45 C/U, E 90 C/U			
	13			EI 60 C/U, E 90 C/U			
	13 - 25			EI 45 C/U			
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		9	LS 400 / CS		EI 90 C/U, E 120 C/U
				9 - 25			EI 60 C/U
	≤ Ø 114.3	≥ 3.6		19 - 25			EI 45 C/U
				25			EI 60 C/U, E 90 C/U

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification		
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration				
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex Ultima (min. class B-s1, d0 B _L -S1, d0)	9 - 32	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	EI 60 C/U, E 120 C/U		
				32			EI 90 C/U		
	≤ Ø 54	≥ 1.5		13			EI 60 C/U, E 120 C/U		
				13 - 32			EI 60 C/U, E 90 C/U		
				32			EI 90 C/U		
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		9					EI 120 C/U
				9 - 32					EI 90 C/U, E 120 C/U
	≤ Ø 114.3	≥ 3.6		13					EI 90 C/U
				13 - 32					EI 60 C/U, E 120 C/U

A.1.5 Flexible or rigid wall - Metal pipes insulated elastomer

A.1.5.2 Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB1



Drawing: PBfw.E-CU-MFB1-G2.4.22

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification	
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex AF (min. class B-s3, d0 B _L -s3, d0)	8.5	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	EI 90 C/U, E 120 C/U	
				8.5 - 38			EI 90 C/U	
	13.5 - 38	EI 30 C/U, E 90 C/U						
	≤ Ø 54	≥ 1.5		13.5	CS		EI 90 C/U	
				13.5 - 38			EI 60 C/U, E 90 C/U	
				38	LS 400 / CS		EI 90 C/U	
(Stainless) Steel / cast iron				≤ Ø 26.9			≥ 2.3	8.5
	8.5 - 38	EI 90 C/U						
	≤ Ø 114.3	≥ 3.6		15 - 43			EI 45 C/U, E 90 C/U	
				43	EI 60 C/U, E 90 C/U			

A.1.5 Flexible or rigid wall - Metal pipes insulated elastomer

A.1.5.2 Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB1

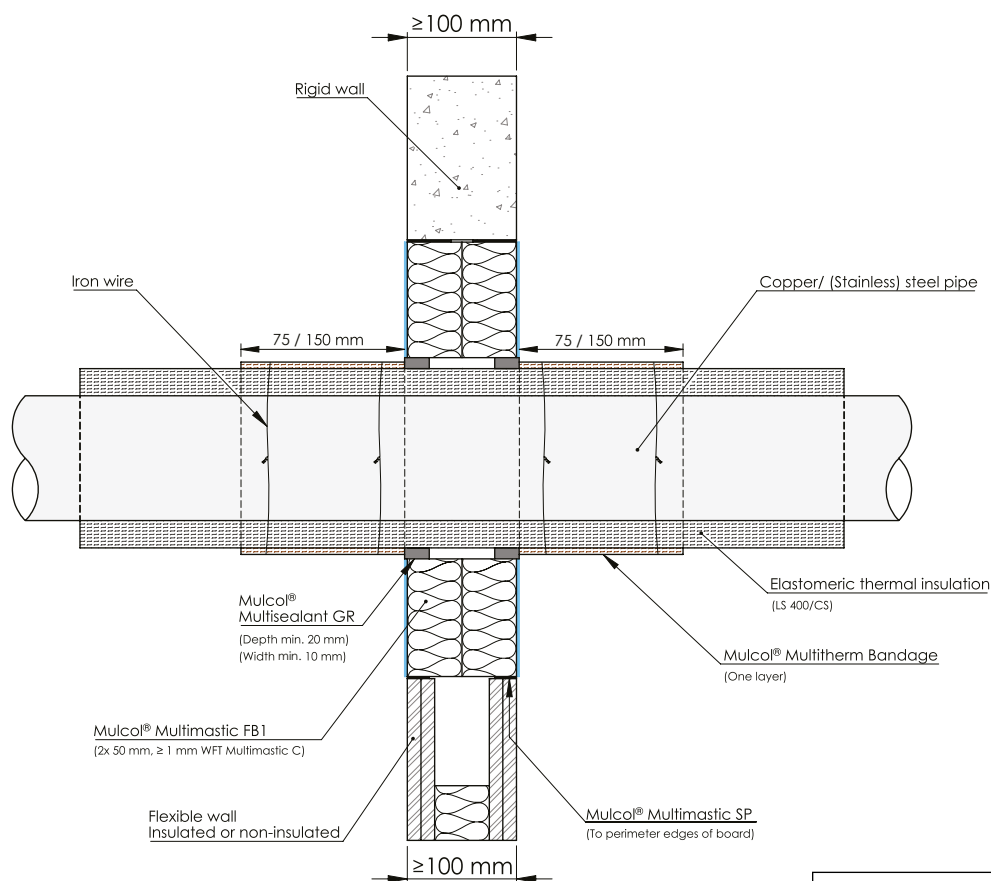
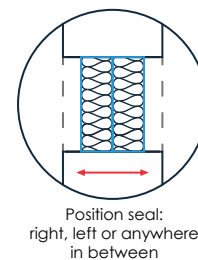
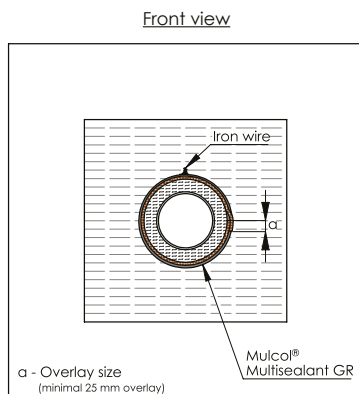
Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
(Stainless) Steel / cast iron	$\leq \varnothing 26.9$	≥ 2.3	Kaiflex KK Plus (min. class B-s2, d0 B _L -s2, d0)	8.5	LS 400 / CS	Multisealant GR $\geq 10 \times 20$ (wxd)	EI 120 C/U

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex NH (min. class D-s3, d0 D _L -s3, d0)	9	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	EI 90 C/U
	≤ Ø 54	≥ 1.5		9 - 25			EI 60 C/U
				13			EI 45 C/U, E 90 C/U
				13	EI 60 C/U, E 90 C/U		
				13 - 25	EI 45 C/U		
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		9	LS 400 / CS		EI 90 C/U, E 120 C/U
	≤ Ø 114.3	≥ 3.6		9 - 25			EI 60 C/U
				19 - 25			EI 45 C/U
			25	EI 60 C/U, E 90 C/U			

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex Ultima (min. class B-s1, d0 B _L -s1, d0)	9 - 32	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	EI 60 C/U, E 120 C/U
	≤ Ø 54	≥ 1.5		32			EI 90 C/U
				13			EI 60 C/U, E 120 C/U
				13 - 32			EI 60 C/U, E 90 C/U
				32			EI 90 C/U
9				EI 120 C/U			
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		9 - 32			EI 90 C/U, E 120 C/U
	≤ Ø 114.3	≥ 3.6		13			EI 90 C/U
				13 - 32			EI 60 C/U, E 120 C/U

A.1.5 Flexible or rigid wall - Metal pipes insulated elastomer

A.1.5.3 Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB1 - Multitherm Bandage



Drawing: PBfw.E-CU-MFB1-G2.4.92

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Multitherm Bandage	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex AF (min. class B-s3, d0 B _L -s3, d0)	8.5	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	LI ≥ 75 one layer (one wire)	EI 90 C/U, E 120 C/U
	≤ Ø 54	≥ 1.5		8.5 - 38				EI 90 C/U
				13.5 - 38				CS
				13.5 - 38	EI 60 C/U, E 90 C/U			
				38	LS 400 / CS			EI 90 C/U
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		8.5			EI 90 C/U, E 120 C/U	
	≤ Ø 114.3	≥ 3.6		8.5 - 38				EI 90 C/U
				18.5				EI 90 C/U, E 120 C/U
				18.5 - 43				EI 90 C/U

A.1.5 Flexible or rigid wall - Metal pipes insulated elastomer

A.1.5.3 Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB1 - Multitherm Bandage

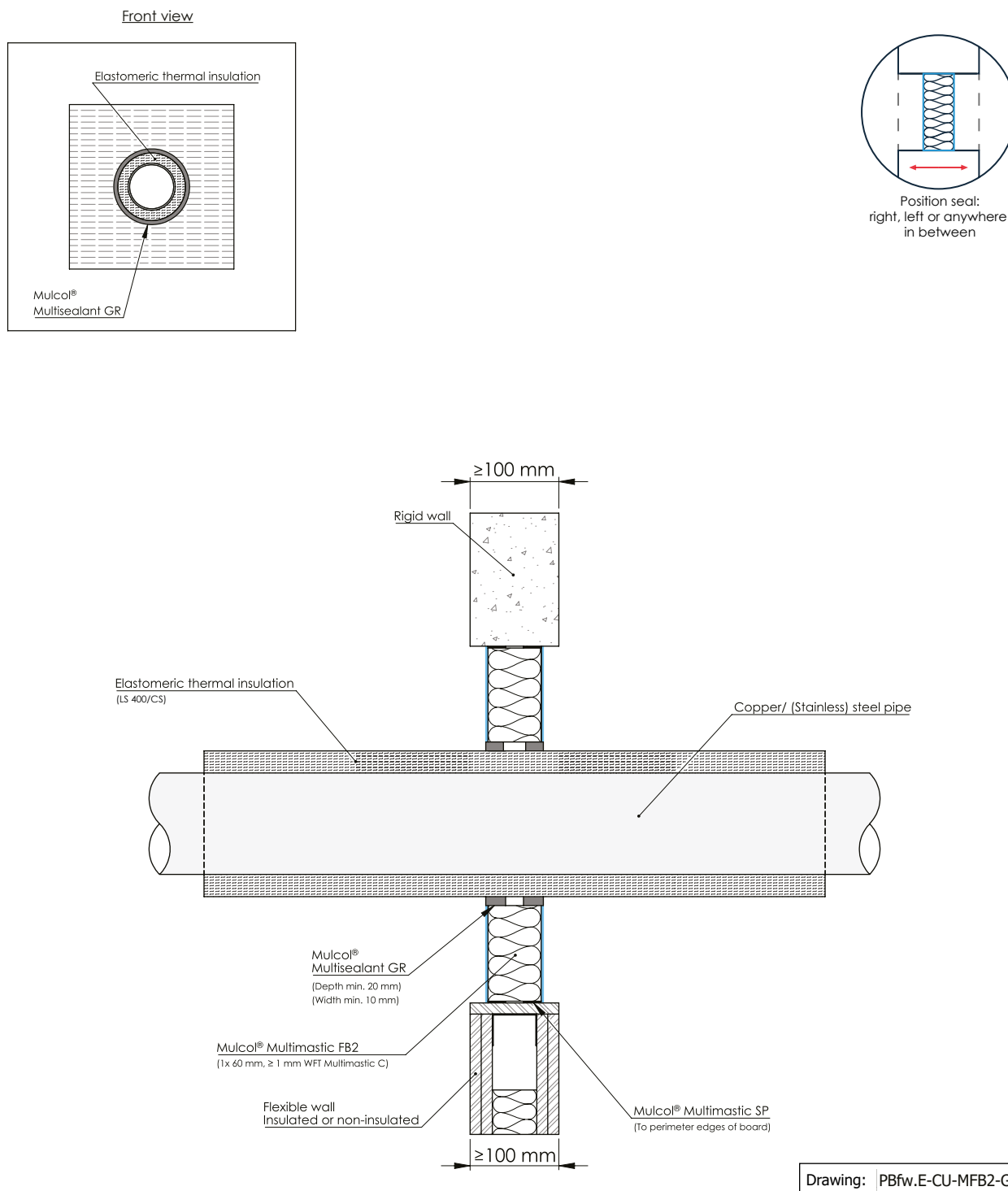
Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Multitherm Bandage	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Copper / (stainless) steel / cast iron	≤ Ø 54	≥ 1.5	Kaiflex KK Plus (min. class B-s2, d0 B _L -s2, d0)	13.5	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	LI ≥ 75 one layer (two wires)	EI 120 C/U
				13.5 - 35.5			LI ≥ 150 one layer (two wires)	EI 90 C/U, E 120 C/U
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		8.5			LI ≥ 75 one layer (two wires)	EI 120 C/U
				8.5 - 35.5			LI ≥ 150 one layer (two wires)	EI 90 C/U, E 120 C/U
	≤ Ø 114.3	≥ 3.6		15 - 35.5				EI 90 C/U, E 120 C/U
				35.5 - 40				EI 120 C/U

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Multitherm Bandage	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex NH (min. class D-s3, d0 D _L -S3, d0)	9	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	LI ≥ 75 one layer (two wires)	EI 90 C/U
				9 - 25				EI 60 C/U
	≤ Ø 54	≥ 1.5		13	CS			EI 45 C/U, E 90 C/U
				13				EI 60 C/U, E 90 C/U
				13 - 25	EI 45 C/U			
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		9	LS 400 / CS			EI 90 C/U, E 120 C/U
				9 - 25				EI 60 C/U, E 90 C/U
				19 - 25				EI 45 C/U
	≤ Ø 114.3	≥ 3.6		25				EI 60 C/U, E 90 C/U

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Multitherm Bandage	Classification		
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration					
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex Ultima (min. class B-s1, d0 B _L -s1, d0)	9 - 32	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	LI ≥ 75 one layer (two wires)	EI 90 C/U, E 120 C/U		
				32				EI 90 C/U		
	≤ Ø 54	≥ 1.5		13			LI ≥ 150 one layer (two wires)	EI 120 C/U		
				13 - 32				EI 90 C/U		
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		9			LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	LI ≥ 75 one layer (two wires)	EI 120 C/U
				9 - 32						EI 90 C/U, E 120 C/U
	≤ Ø 114.3	≥ 3.6		13 - 32					LI ≥ 75 one layer (two wires)	EI 90 C/U
				32						LI ≥ 150 one layer (two wires)

A.1.5 Flexible or rigid wall - Metal pipes insulated elastomer

A.1.5.4 Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB2



Services	Pipe dimensions (mm)		Insulation			System (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex AF (min. class B-s3, d0 B _L -s3, d0)	8.5 - 33.5	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	EI 60 C/U, E 90 C/U
				33.5			EI 60 C/U, E 120 C/U
	≤ Ø 54	≥ 1.5		13.5 - 38			EI 45 C/U, E 60 C/U
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		8.5 - 43	CS		EI 60 C/U
	≤ Ø 114.3	≥ 3.6		15 - 43			EI 45 C/U, E 60 C/U
				15 - 43	EI 60 C/U		
				43	LS 400 / CS		EI 60 C/U

A.1.5 Flexible or rigid wall - Metal pipes insulated elastomer

A.1.5.4 Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB2

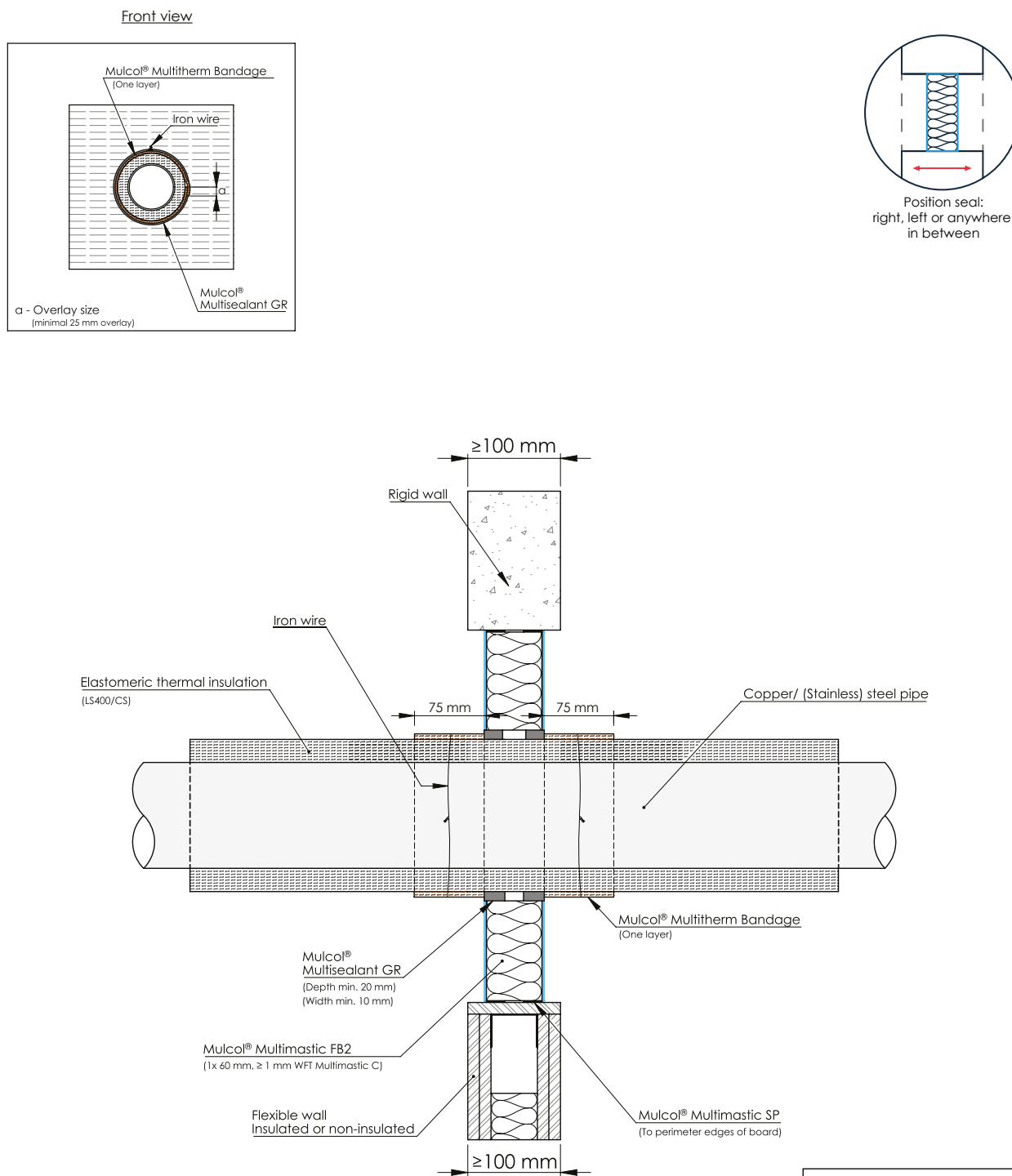
Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	Kaiflex KK Plus (min. class B-s2, d0 B _L -s2, d0)	35.5	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	EI 45 C/U / E 90 C/U
	≤ Ø 54	≥ 1.5		35.5			EI 45 C/U / E 90 C/U
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		8.5			EI 90 C/U / E 120 C/U
	≤ Ø 114.3	≥ 3.6		8.5 - 40			EI 45 C/U / E 120 C/U
				15 - 40			EI 45 C/U / E 90 C/U

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex NH (min. class D-s3, d0 D _L -S3, d0)	9 - 25	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	EI 30 C/U, E 60 C/U
				9 - 25	CS		EI 60 C/U
				25	LS 400 / CS		EI 60 C/U
	13	EI 45 C/U, E 120 C/U					
	≤ Ø 54	≥ 1.5		13	CS		EI 60 C/U, E 120 C/U
				13 - 25	LS 400 / CS		EI 45 C/U, E 60 C/U
(Stainless) Steel / cast iron				≤ Ø 26.9			≥ 2.3
	≤ Ø 114.3	≥ 3.6		9 - 25			EI 60 C/U
				13 - 25			EI 60 C/U

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex Ultima (min. class B-s1, d0 B _L -S1, d0)	9 - 25	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	EI 45 C/U, E 120 C/U
				25			EI 60 C/U, E 120 C/U
	≤ Ø 54	≥ 1.5		13 - 32			EI 45 C/U, E 90 C/U
				32			EI 60 C/U, E 90 C/U
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		9 - 32			EI 60 C/U, E 90 C/U
				32			EI 60 C/U, E 120 C/U
	≤ Ø 114.3	≥ 3.6		13 - 32			EI 90 C/U, E 120 C/U

A.1.5 Flexible or rigid wall - Metal pipes insulated elastomer

A.1.5.5 Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB2 - Multitherm Bandage



Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Multitherm Bandage	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex AF (min. class B-s3, d0 B _L -s3, d0)	8.5 - 33.5	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	LI ≥ 75 one layer (one wire)	EI 60 C/U
	≤ Ø 54	≥ 1.5		17 - 43				
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		8.5 - 43				
	≤ Ø 114.3	≥ 3.6		15 - 43				

A.1.5 Flexible or rigid wall - Metal pipes insulated elastomer

A.1.5.5 Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB2 - Multitherm Bandage

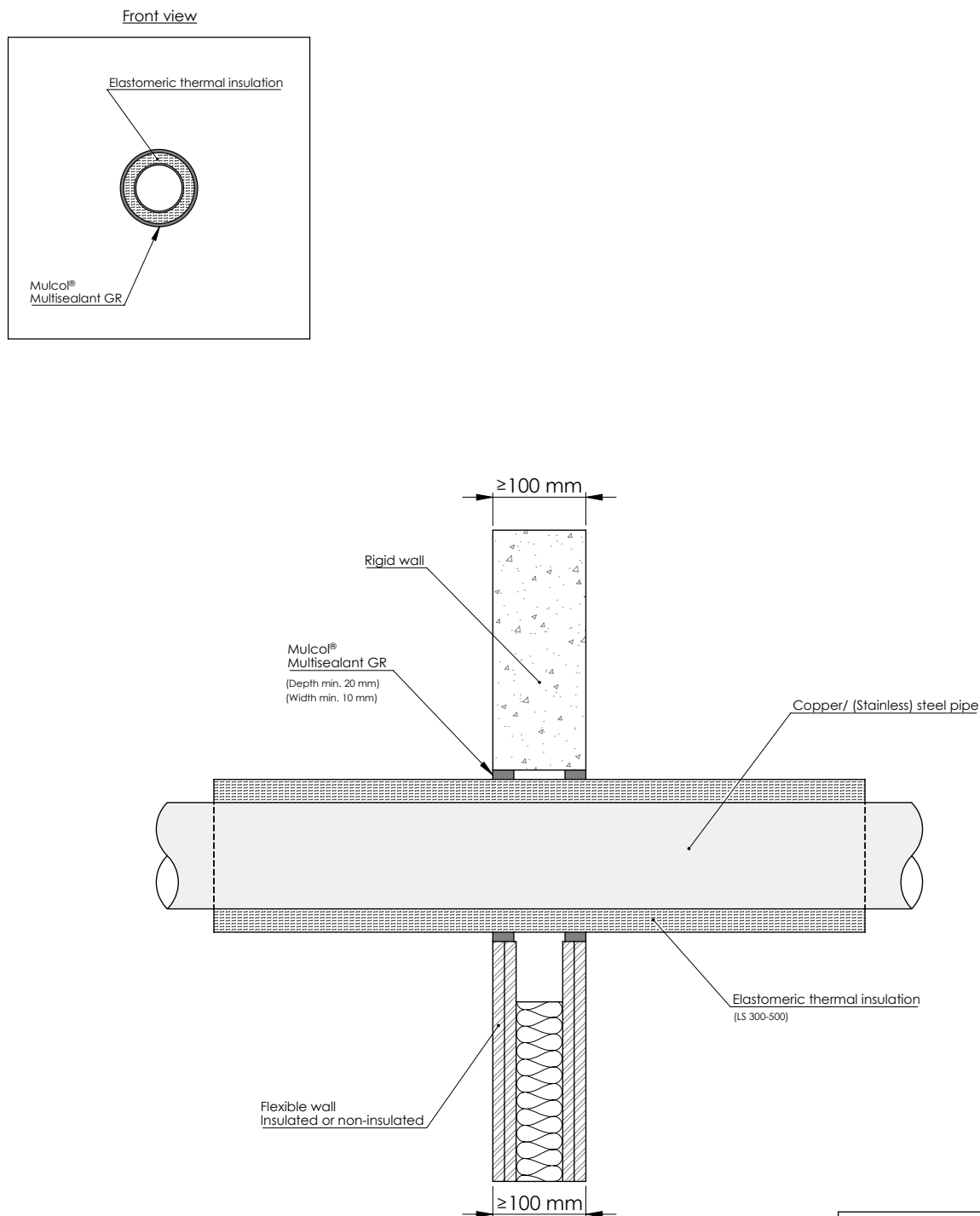
Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Multitherm Bandage	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	Kaiflex KK Plus (min. class B-s2, d0 B _L -s2, d0)	9 - 35.5	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	LI ≥ 75 one layer (one wire)	EI 60 C/U
	≤ Ø 54	≥ 1.5		21 - 35.5				
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		8.5 - 35.5				
	≤ Ø 114.3	≥ 3.6		15 - 40				

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Multitherm Bandage	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex NH (min. class D-s3, d0 D _L -S3, d0)	9 - 25	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	LI ≥ 75 one layer (one wire)	EI 60 C/U
	≤ Ø 54	≥ 1.5		13 - 25				
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		9 - 25				
	≤ Ø 114.3	≥ 3.6		13 - 25				

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Multitherm Bandage	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex Ultima (min. class B-s1, d0 B _L -S1, d0)	13 - 32	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	LI ≥ 75 one layer (one wire)	EI 60 C/U
	≤ Ø 54	≥ 1.5		13 - 32				
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		9 - 32				
	≤ Ø 114.3	≥ 3.6		13 - 32				

A.1.5 Flexible or rigid wall - Metal pipes insulated elastomer

A.1.5.6 Copper and steel pipes - Elastomer LS 300-500 / CS

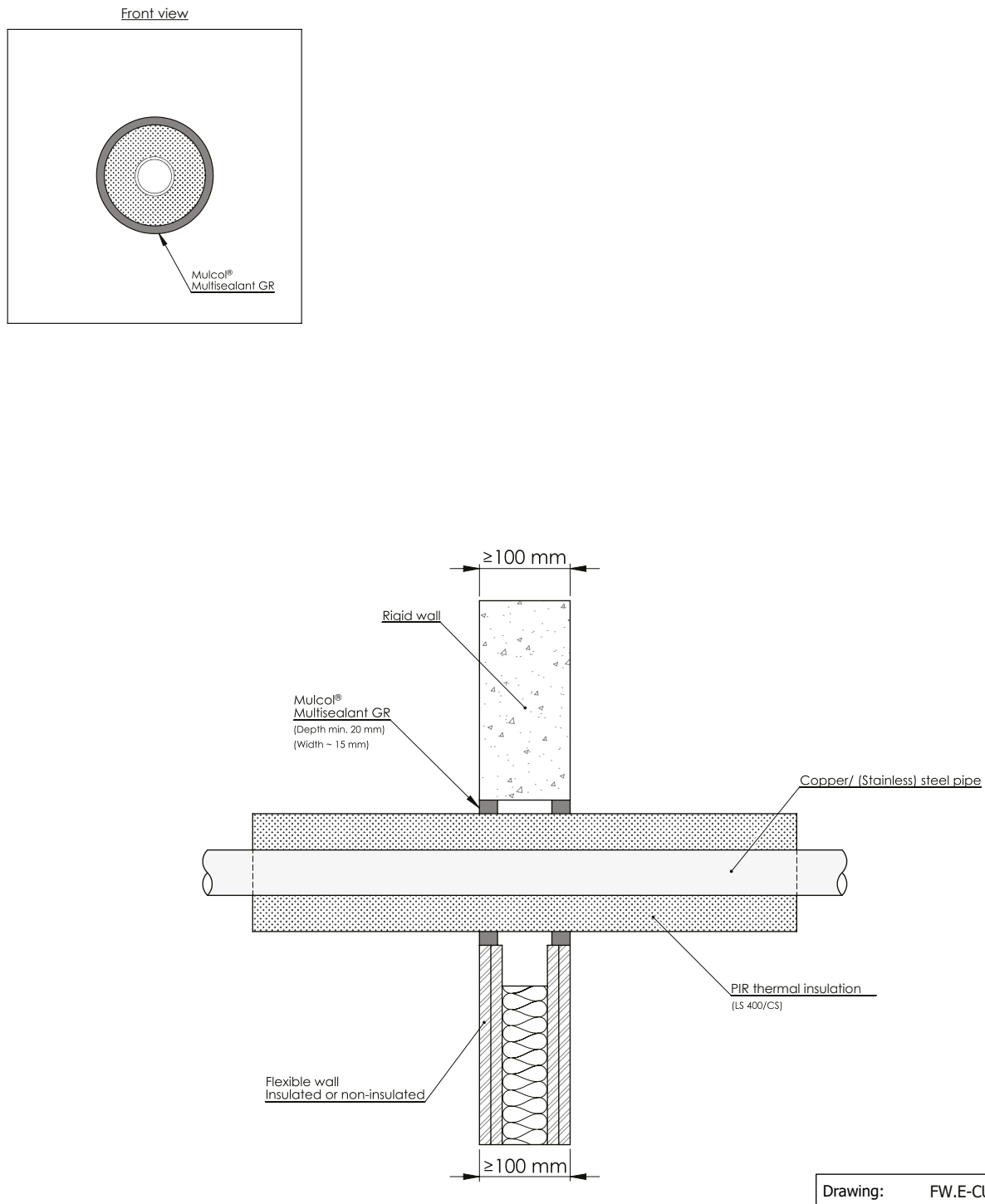


Drawing: FW.E-CU-G2.12.22

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Copper / (stainless) steel / cast iron	≤ Ø 54	≥ 1.5	ArmaFlex AF (min. class B-s3, d0	13	LS 300 / CS	Multisealant GR ≥ 15 x 20 (wxd)	EI 60 C/U, E 120 C/U
	≤ Ø 76.1	≥ 2.0			LS 500 / CS		EI 45 C/U, E 120 C/U
(Stainless) Steel / cast iron	≤ Ø 219.1	≥ 4.0	B _L -s3, d0)	25			
	≤ Ø 168.3	≥ 4.5					

A.1.6 Flexible or rigid wall - Metal pipes insulated foam

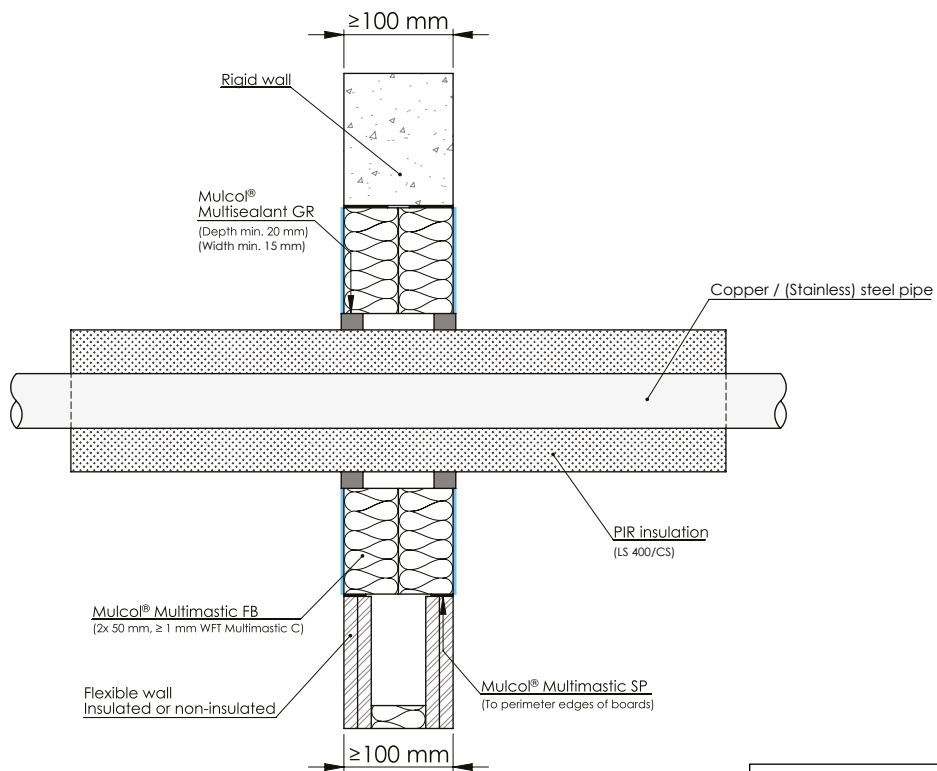
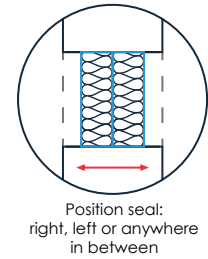
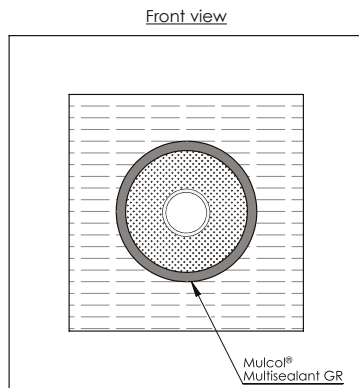
A.1.6.1 Copper and steel pipes - PIR thermal insulation LS / CS



Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	PIR (min. class E)	20	LS 400 / CS	Multisealant GR ≥ 15 x 20 (wxd)	EI 60 C/U
	≤ Ø 54	≥ 1.5		25	LS 300 / CS		EI 120 C/U
	≤ Ø 76.1	≥ 2.0			LS 500 / CS		EI 45 C/U, E 120 C/U
					CS		EI 60 C/U, E 120 C/U
(Stainless) Steel / cast iron	≤ Ø 114.3	≥ 3.6		25 - 40	LS 400 / CS		EI 60 C/U
	≤ Ø 219.1	≥ 4.0		25	LS 500 / CS		EI 60 C/U, E 120 C/U

A.1.6 Flexible or rigid wall - Metal pipes insulated foam

A.1.6.2 Copper and steel pipes - PIR foam LS 400 / CS - Multimastic FB1

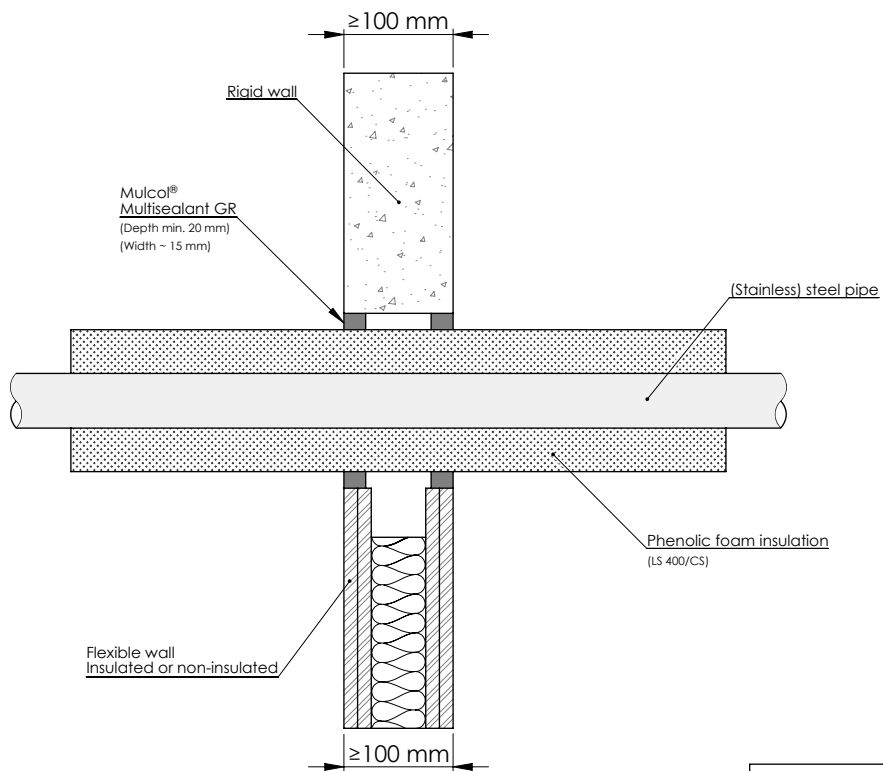
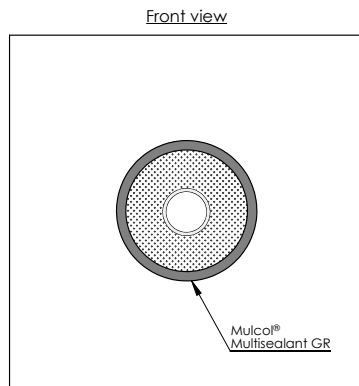


Drawing: PBfw.E-CU-MFB1-G2.4.28

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	PIR (min. class E)	20	LS 400 / CS	Multisealant GR ≥ 15 x 20 (wxd)	EI 60 C/U
	≤ Ø 54	≥ 1.5		25			
(Stainless) Steel / cast iron	≤ Ø 114.3	≥ 3.6		25 - 40			

A.1.6 Flexible or rigid wall - Metal pipes insulated foam

A.1.6.3 Steel pipes - Phenolic foam LS 400 / CS

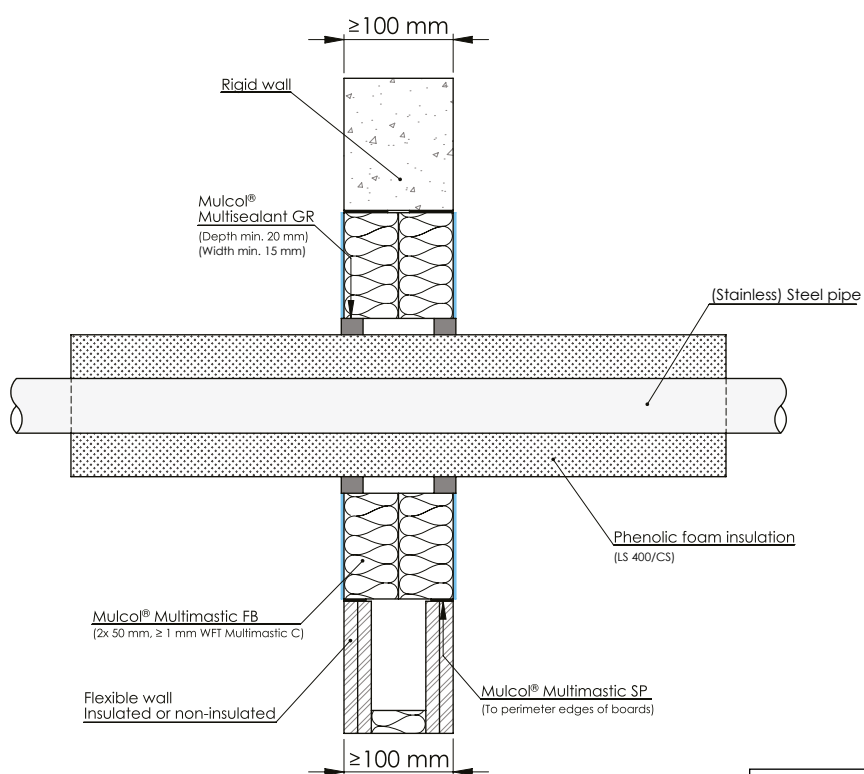
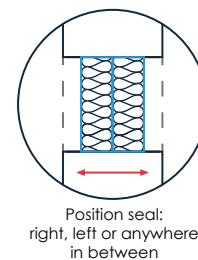
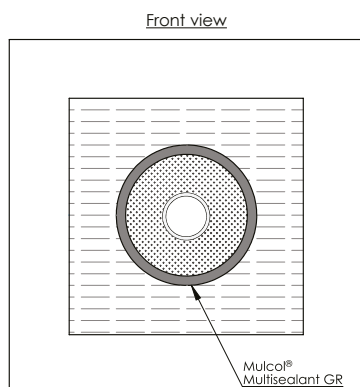


Drawing: FW.E-ST-G2.4.22

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3	Kingspan Kooltherm	15	LS 400 / CS	Multisealant GR ≥ 15 x 20 (wxd)	EI 60 C/U
	≤ Ø 114.3	≥ 3.6		20 - 45			

A.1.6 Flexible or rigid wall - Metal pipes insulated foam

A.1.6.4 Steel pipes - Phenolic foam LS 400 / CS - Multimastic FB1

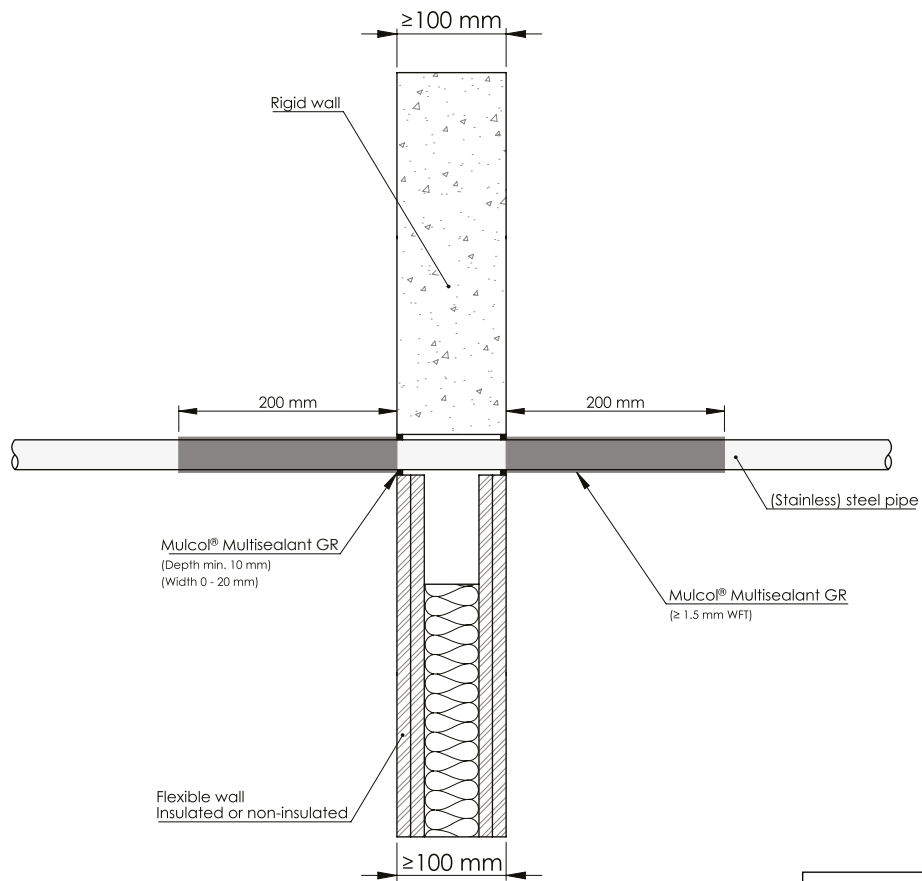
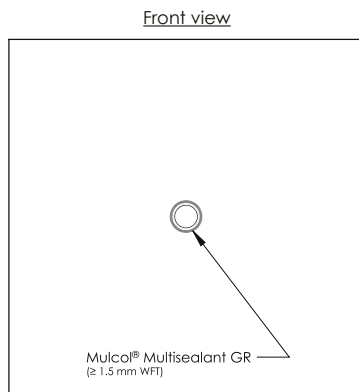


Drawing: PBfw.E-ST-MFB1-G2.4.27

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3	Kingspan Kooltherm	15	LS 400 / CS	Multisealant GR ≥ 15 x 20 (wxd)	EI 60 C/U
	≤ Ø 114.3	≥ 3.6		20 - 45			

A.1.7 Flexible or rigid wall - Metal pipes uninsulated

A.1.7.1 Steel pipes - Multisealant GR coated on pipe



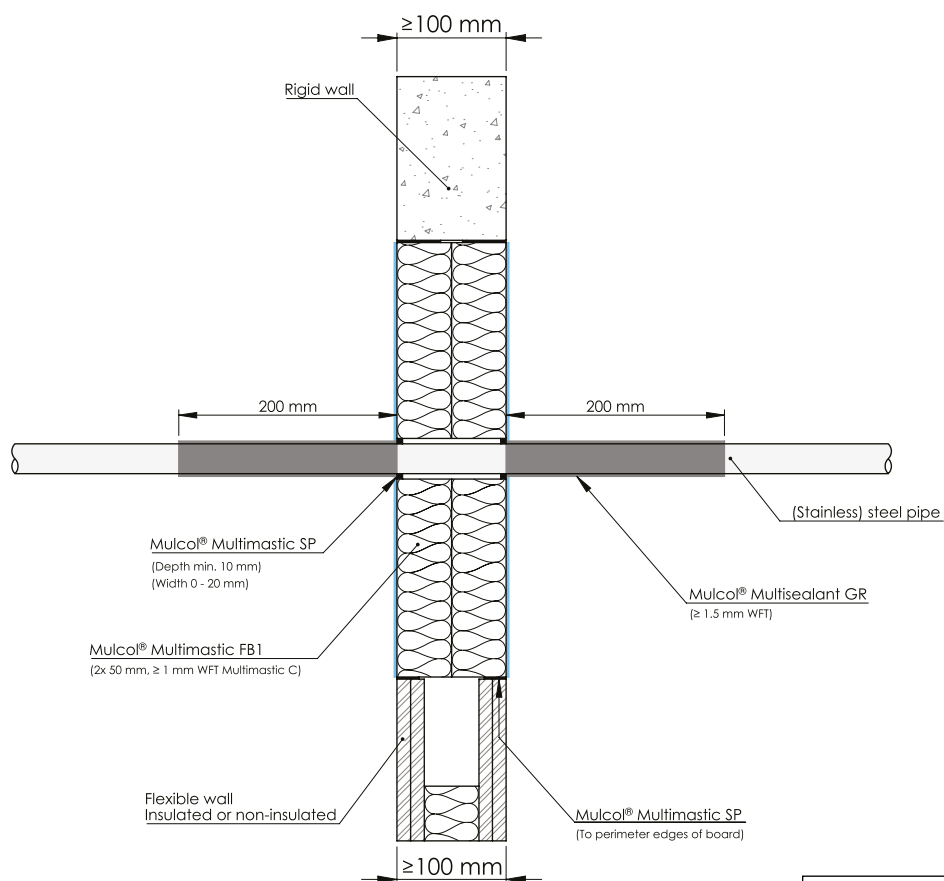
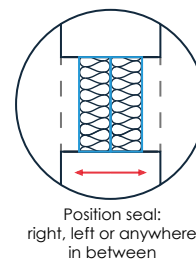
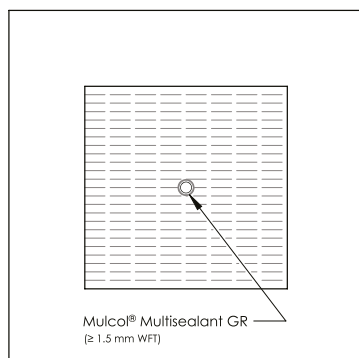
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Services	Pipe dimensions (mm)		Coating	Sealing (mm)	Classification
	Outer dimension	Wall thickness			
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.6	Coat back 200 mm ≥ 1.5 mm WFT Multisealant GR	Multisealant GR 0-20 x ≥ 10 (wxd)	EI 90 C/U, E 120 C/U
	≤ Ø 60.3	≥ 3.6			

A.1.7 Flexible or rigid wall - Metal pipes uninsulated

A.1.7.2 Steel pipes - Multimastic FB1 - Multisealant GR coated on pipe

Front view



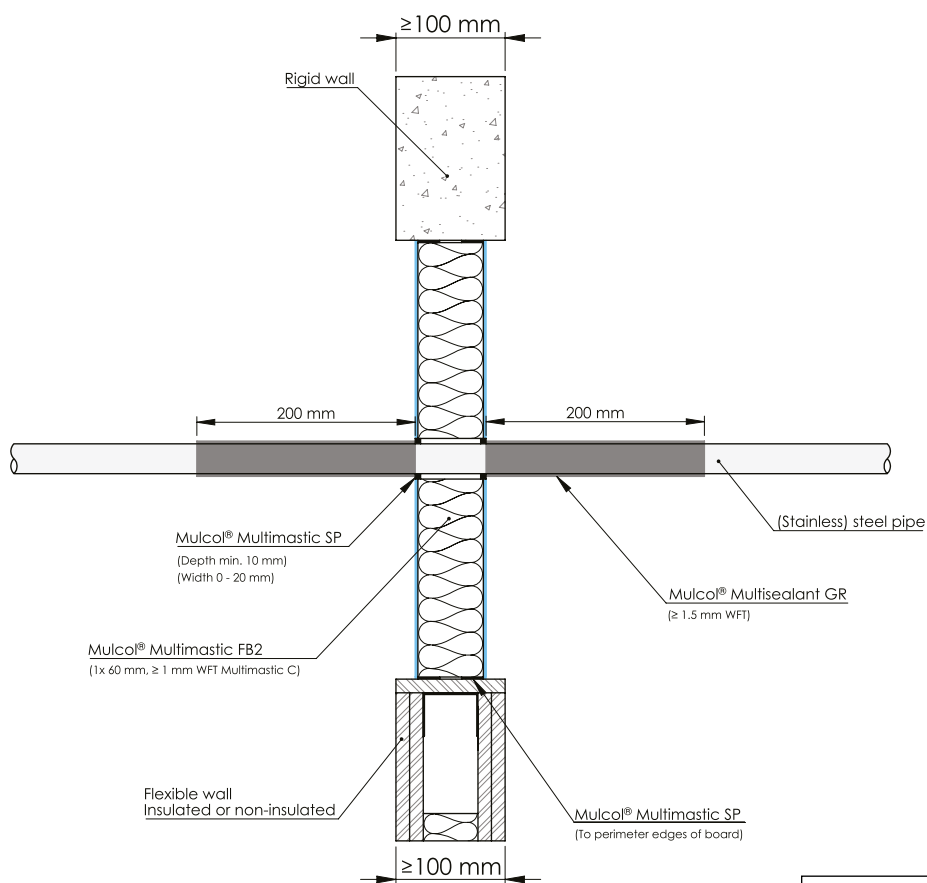
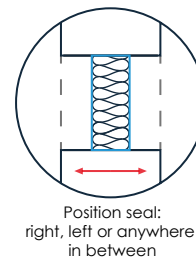
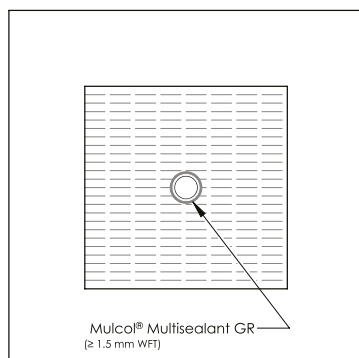
Drawing: PBfw.E-ST-MFB1-GRC.1.10

Services	Pipe dimensions (mm)		Coating	Sealing (mm)	Classification
	Outer dimension	Wall thickness			
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.6	Coat back 200 mm ≥ 1.5 mm WFT Multisealant GR	Multisealant GR 0-20 x ≥ 10 (wxd)	EI 90 C/U, E 120 C/U
	≤ Ø 60.3	≥ 3.6			

A.1.7 Flexible or rigid wall - Metal pipes uninsulated

A.1.7.3 Steel pipes - Multimastic FB2 - Multisealant GR coated on pipe

Front view

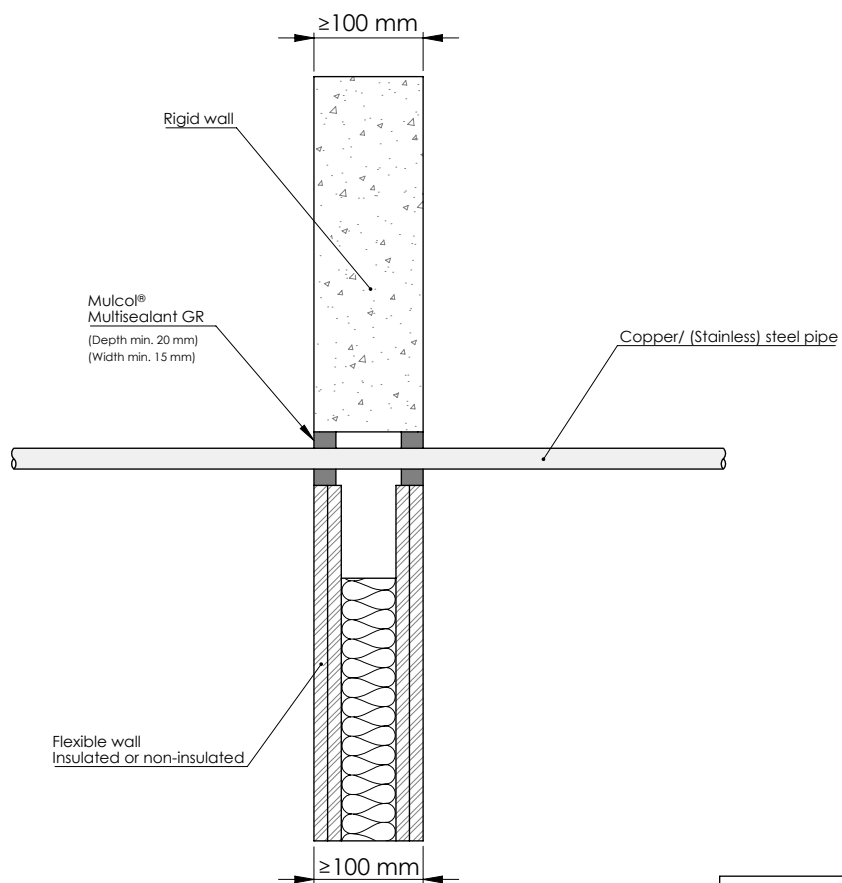
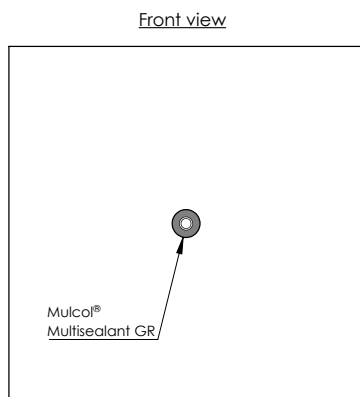


Drawing: PBfw.E-ST-MFB2-GRC.1.10

Services	Pipe dimensions (mm)		Coating	Sealing (mm)	Classification
	Outer dimension	Wall thickness			
(Stainless) Steel / cast iron	$\leq \varnothing 26.9$	≥ 2.6	Coat back 200 mm ≥ 1.5 mm WFT Multisealant GR	Multisealant GR 0-20 x ≥ 10 (wxd)	EI 60 C/U, E 120 C/U
	$\leq \varnothing 60.3$	≥ 3.6			

A.1.7 Flexible or rigid wall - Metal pipes uninsulated

A.1.7.4 Copper and steel pipes

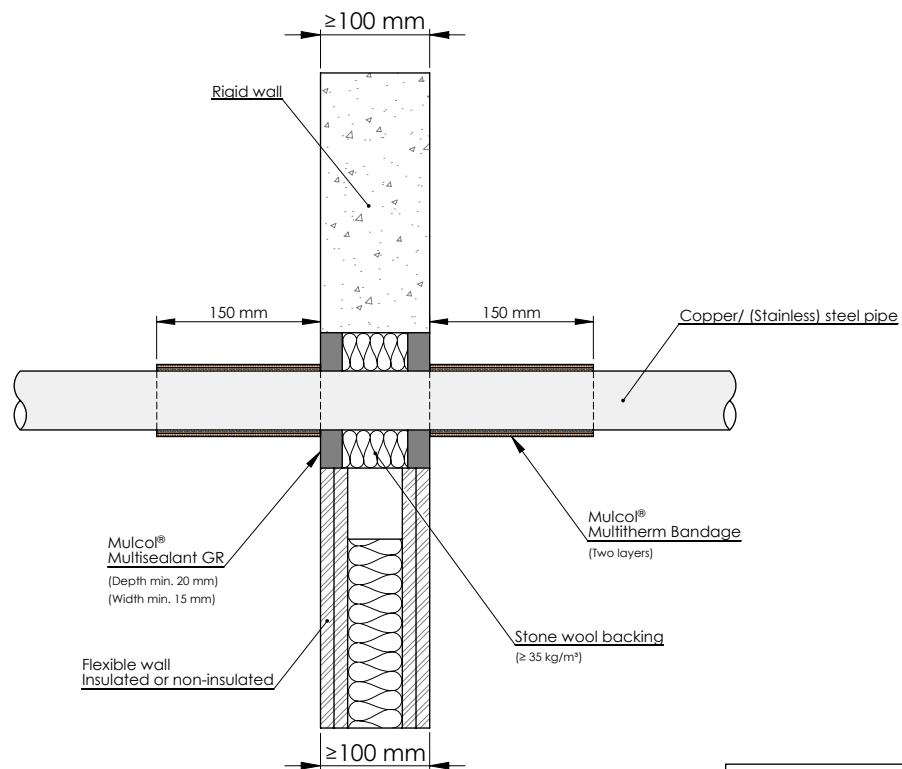
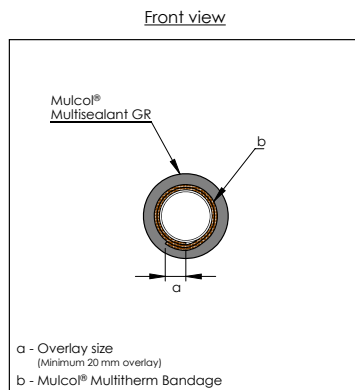


Drawing: FW.E-CU-G2.4.10

Services	Pipe dimensions (mm)		Sealing (mm)	Classification
	Outer dimension	Wall thickness		
Copper / (stainless) steel / cast iron	≤ Ø 15	≥ 1.0	Multisealant GR ≥ 15 x 20 mm (wxd)	EI 30 C/U, E 120 C/U

A.1.7 Flexible or rigid wall - Metal pipes uninsulated

A.1.7.5 Copper and steel pipes - Multitherm Bandage

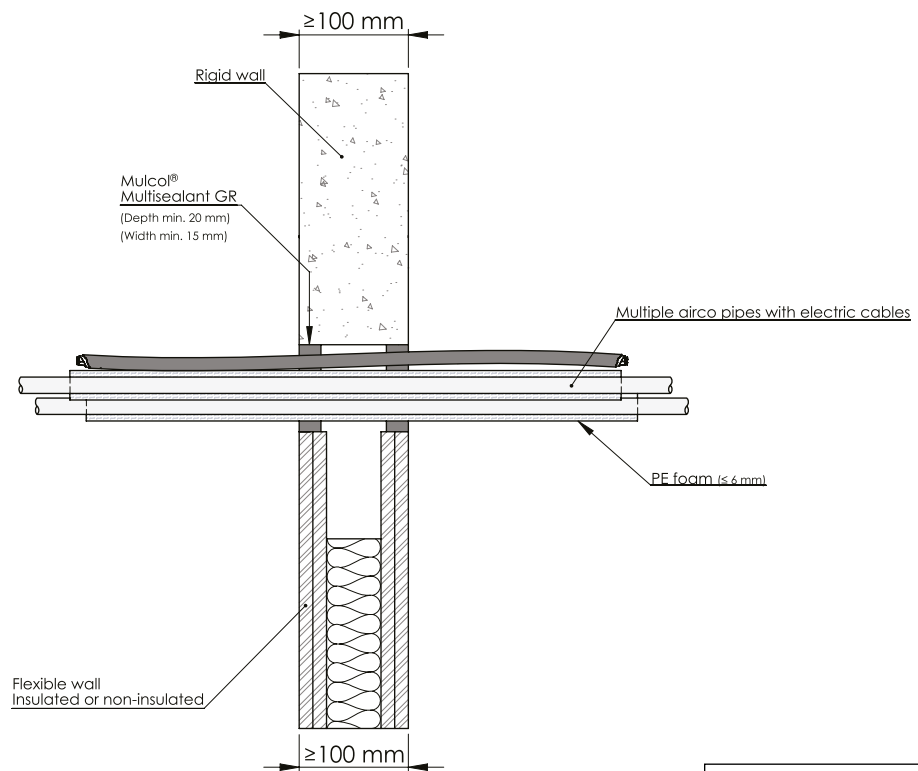
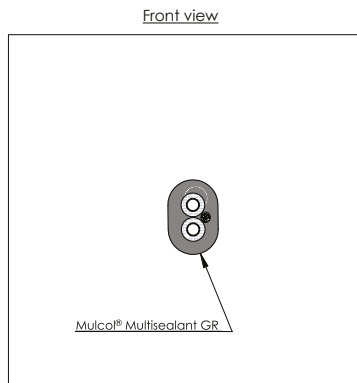


Drawing: FW.E-CU-B2.1.20

Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Multitherm Bandage	Classification
	Outer dimension	Wall thickness				
Copper / (stainless) steel / cast iron	≤ Ø 54	≥ 1.5	Multisealant GR ≥ 15 x 20 (wxd)	Stone wool (≥ 35 kg/m³)	LI 150 two layers	EI 45 C/U E 120 C/U

A.1.8 Flexible or rigid wall - Multiple services

A.1.8.1 Multiple pipes and cables



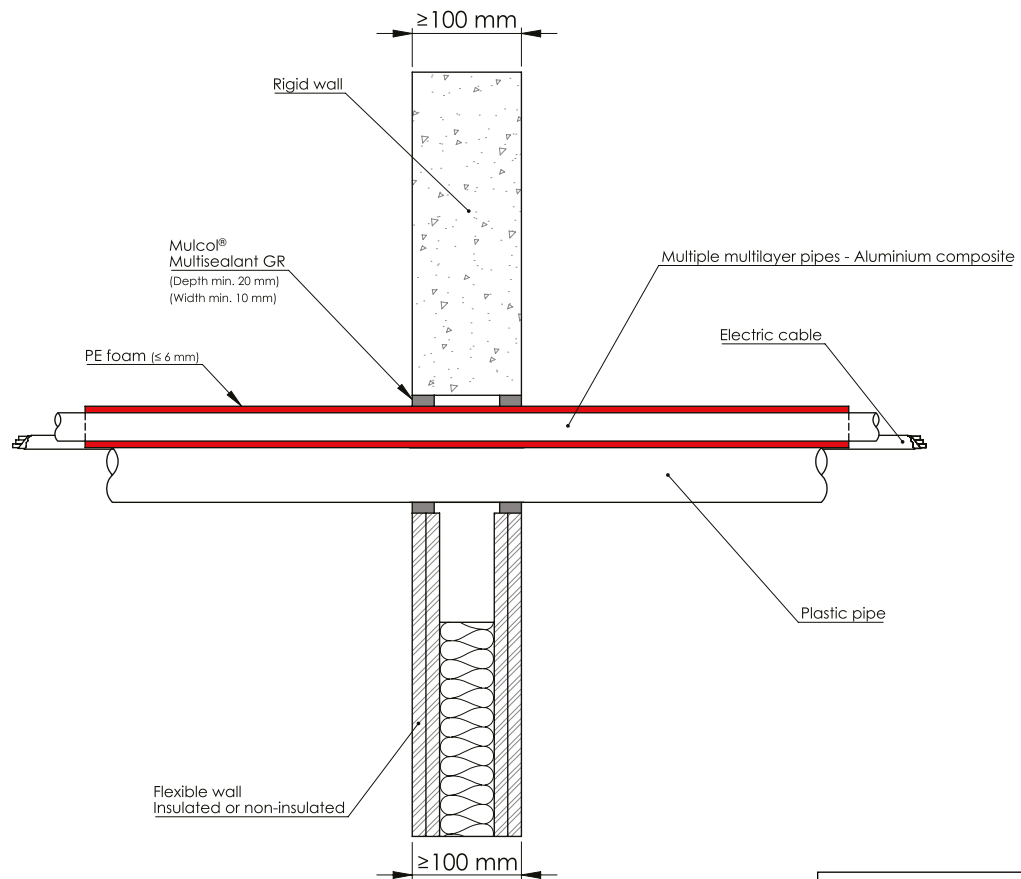
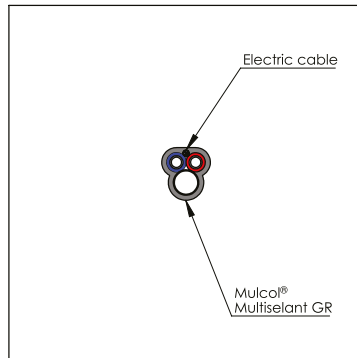
Drawing: FW.E-CU2-10.0.22

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Multilayer pipes (MLC)	$2x \leq \varnothing 15$	2.0	PE foam	≤ 6	CS	Multisealant GR $\geq 10 \times 20$ (wxd)	EI 120 U/C
PVC(-U/-C)	$\leq \varnothing 50$	2.0	-	-	-		EI 120 U/U
Sheated cable	$\leq \text{YMKV}$ $5 \times 2.5 \text{ mm}^2$	-	-	-	-		EI 120

A.1.8 Flexible or rigid wall - Multiple services

A.1.8.2 Multiple pipes and cables

Front view

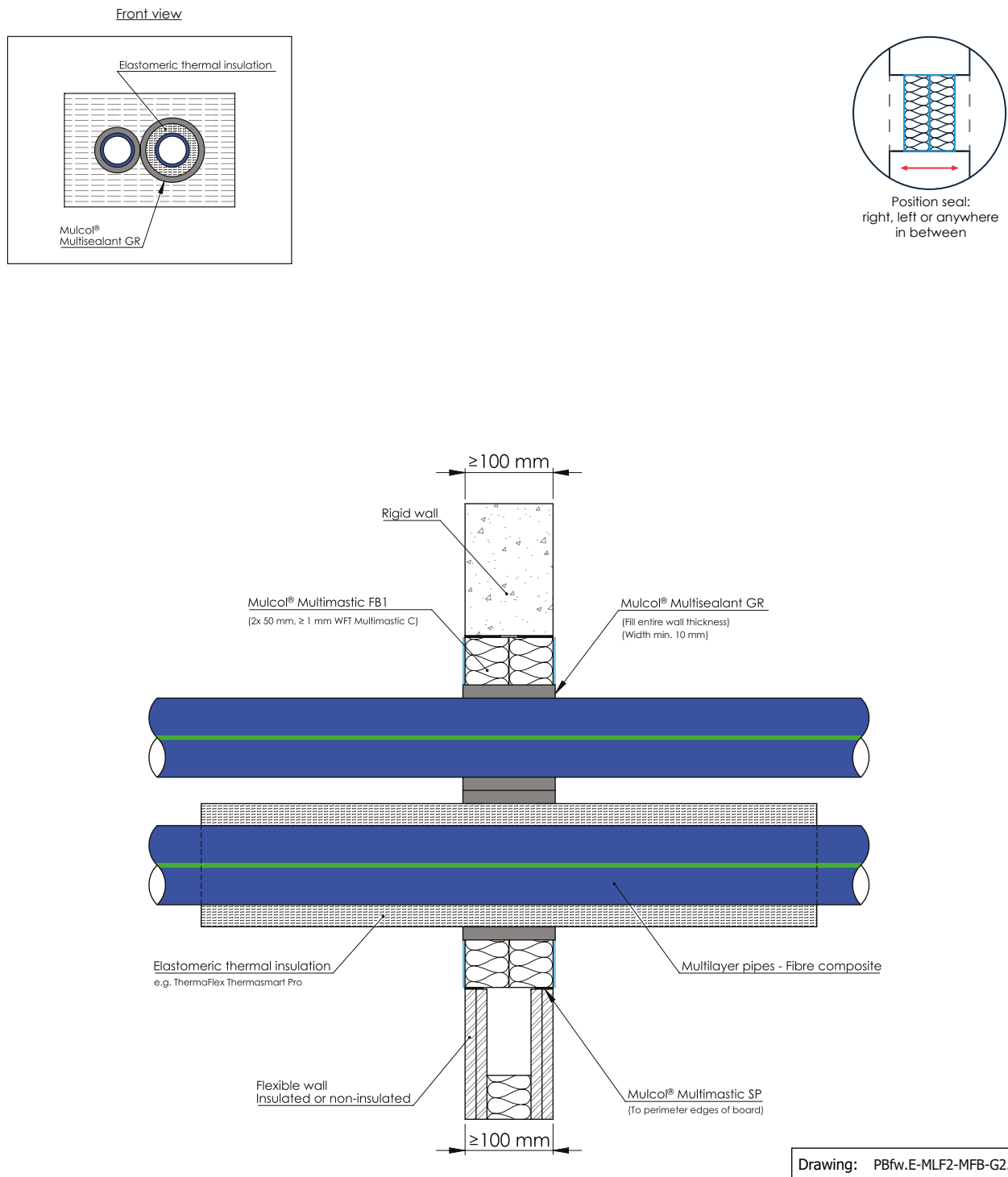


Drawing: FW.E-PP-MLA2-G2.4.23

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Set of airconditioning pipes	$2x \leq \varnothing 15$	1.5	PE foam	≤ 6	LS 400 / CS LI 400 / CI	Multisealant GR ≥ 10 x 20 (wxd)	EI 90
Sheated cable	≤ YMKV 3 x 1.5 mm ²	-	-	-	-		

A.1.8 Flexible or rigid wall - Multiple services

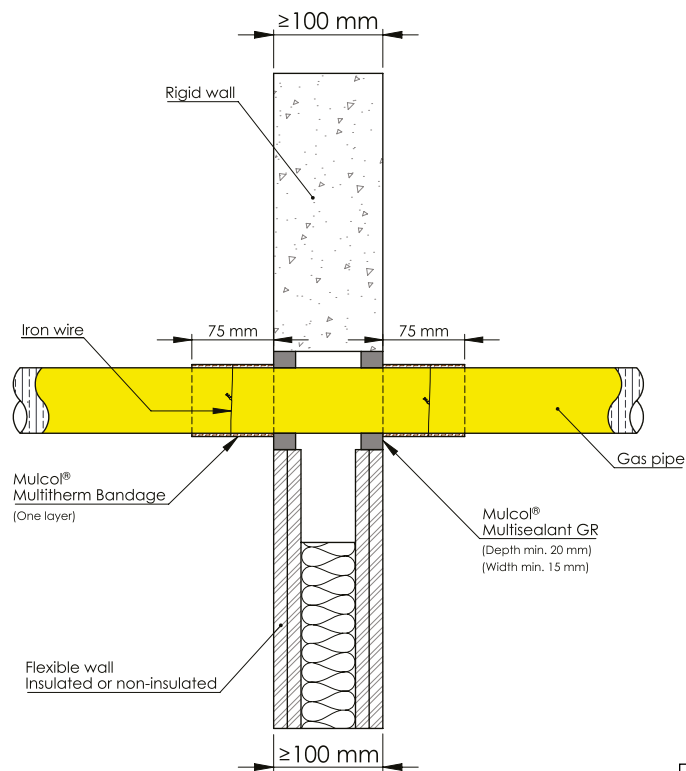
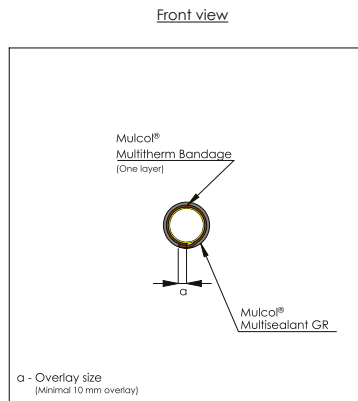
A.1.8.3 PP-R - with/without Elastomer CS



Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
PP-R Multilayer pipes	≤ Ø 90	8.2	ThermaFlex (min. class B-s1, d0 B _L -s1, d0)	≥ 25	CS	Multisealant GR ≥ 15 x 100 mm (wxd)	EI 60 U/C
	≤ Ø 90	8.2	-	-	-		EI 60 U/C, E 90 U/C

A.1.9 Flexible or rigid wall - Gas pipes

A.1.9.1 Corrugated stainless steel tube gas (CSST) pipes - Multitherm Bandage

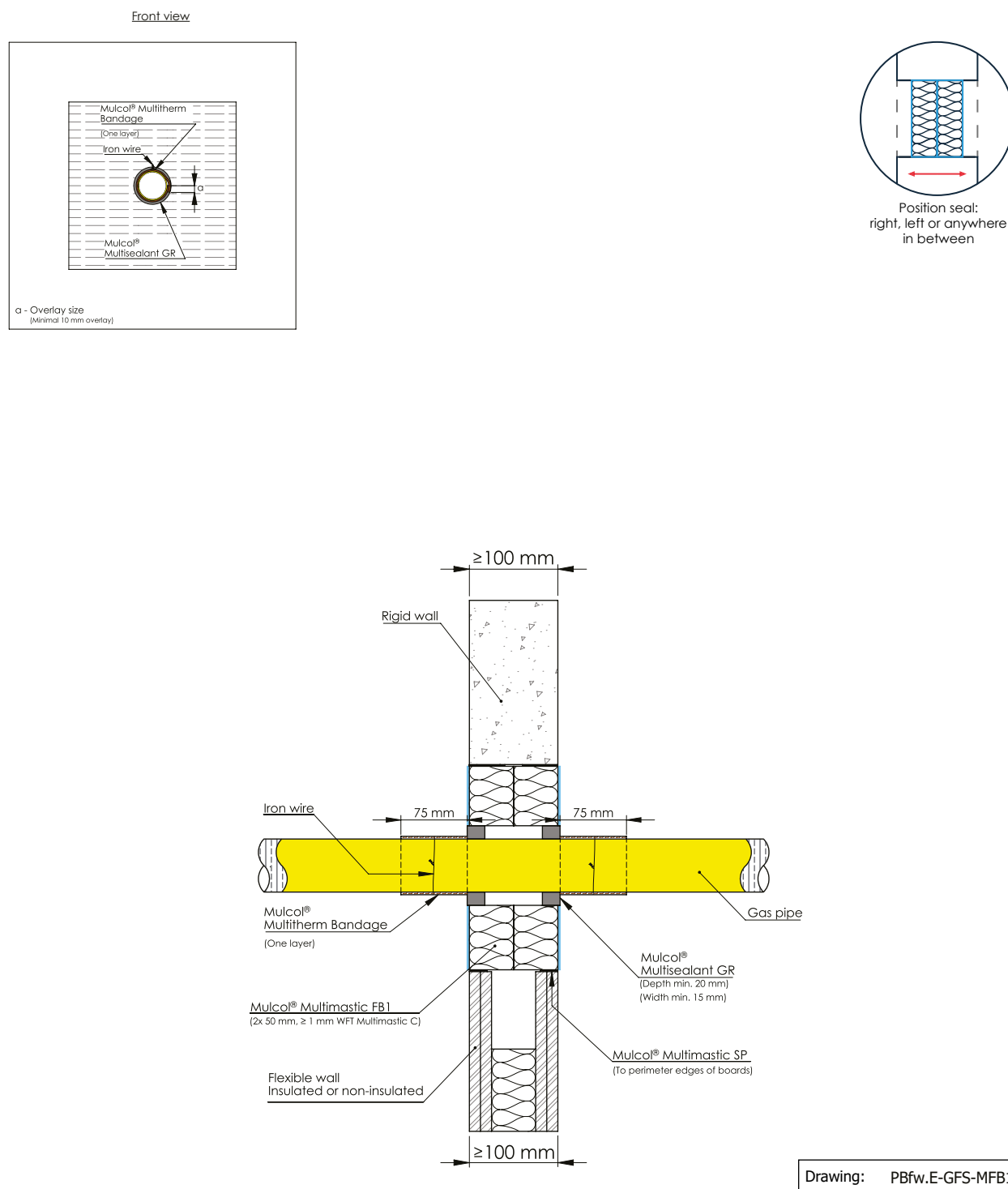


Drawing: FW.E-GFS-G2.1.90-75

Services	Service dimensions (mm)		Sealing (mm)	Multitherm Bandage	Classification
	Outer dimension	Number of pipes			
Corrugated stainless steel tube (CSST) gas pipes	≤ Ø 19.9	≤ 1	Multisealant GR ≥ 15 x 20 (wxd)	LI 75 one layer (one wire)	EI 60 U/C, E 90 U/C
		≤ 2			EI 60 U/C
	≤ Ø 40.8	≤ 1			EI 90 U/C
	≤ Ø 60.3	≤ 1			EI 120 U/C

A.1.9 Flexible or rigid wall - Gas pipes

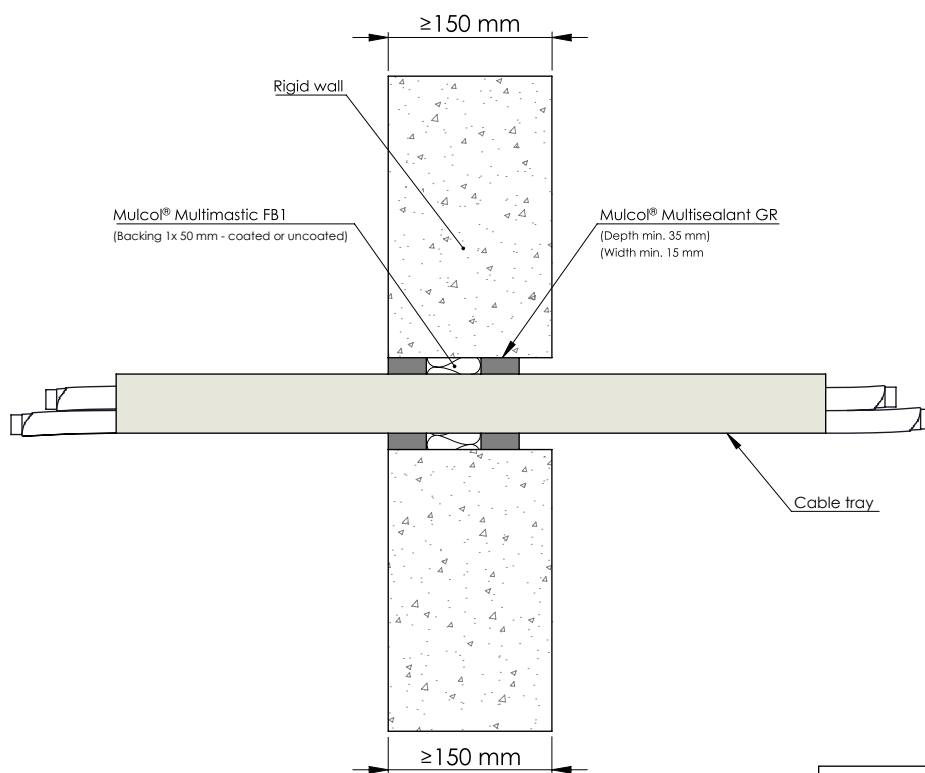
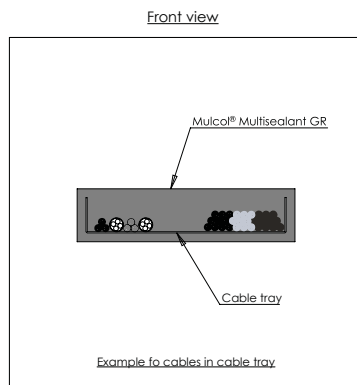
A.1.9.2 Corrugated stainless steel tube gas (CSST) pipes - Multimastic FB1 - Multitherm Bandage



Services	Service dimensions (mm)		Sealing (mm)	Multitherm Bandage	Classification
	Outer dimension	Number of pipes			
Corrugated stainless steel tube (CSST) gas pipes	≤ Ø 19.9	≤ 2	Multisealant GR ≥ 15 x 20 (wxd)	LI 75 one layer (one wire)	EI 60 U/C
	≤ Ø 40.8	≤ 1			
	≤ Ø 60.3	≤ 1			

A.2.1 Rigid walls - Cables, trays and conduits

A.2.1.1 Cables and trays



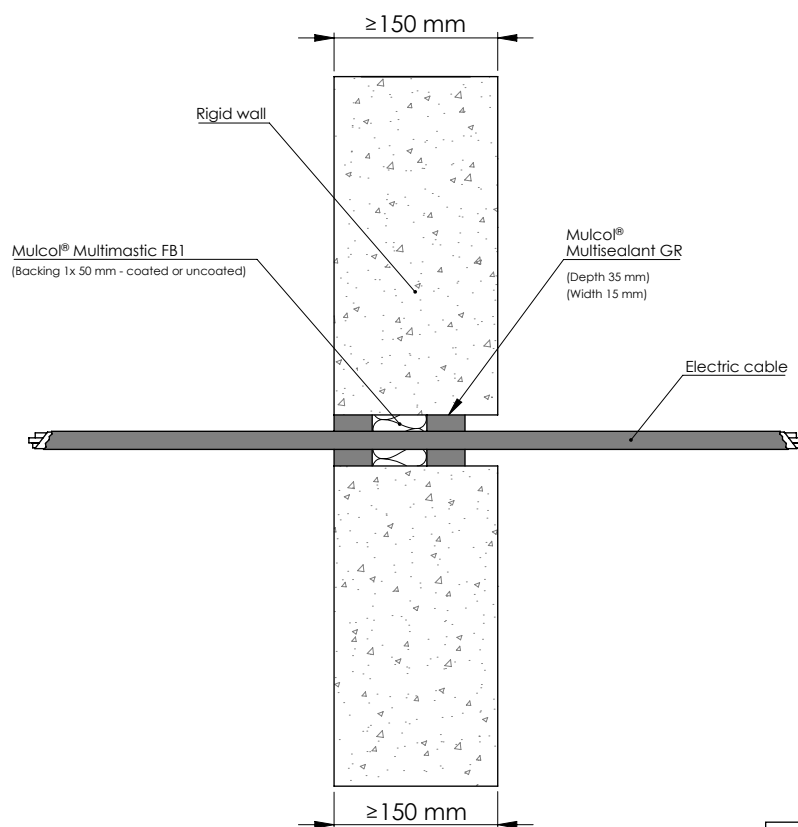
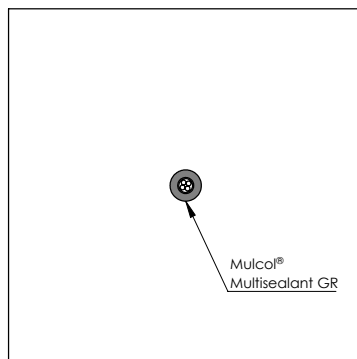
Drawing: RW150.E-CT-G2.15.10

Services	Sealing (mm)	Backing	Classification
Metal cable ladders	Multisealant GR ≥ 15 x 35 (wxd)	Multimastic FB1 coated or uncoated	EI 180, E 240
Cables ≤ Ø 21 mm			

A.2.1 Rigid walls - Cables trays and conduits

A.2.1.2 Cables

Front view



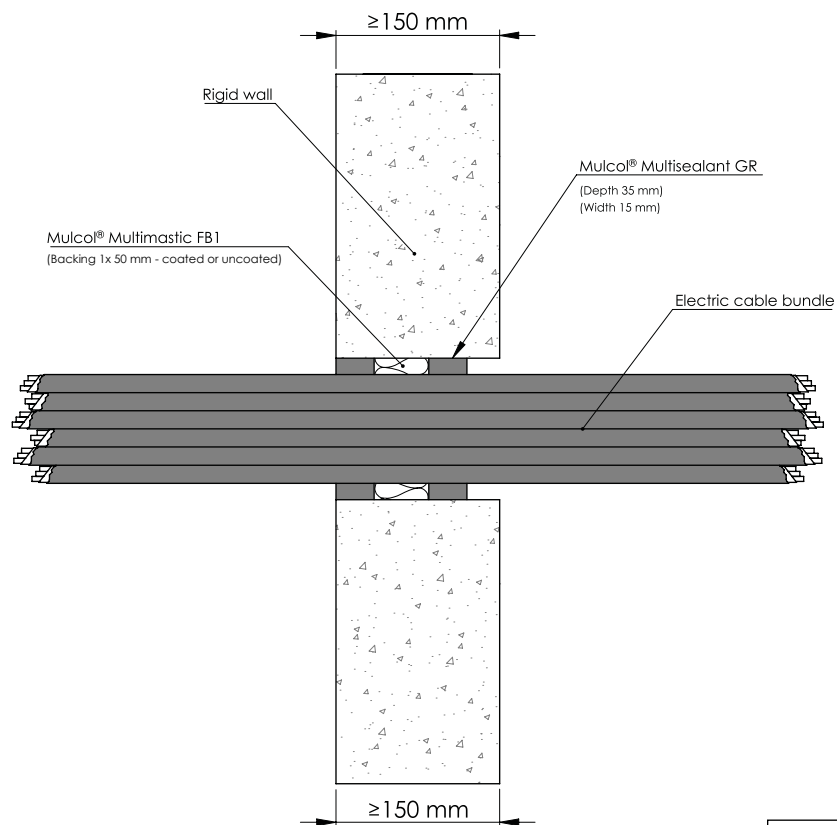
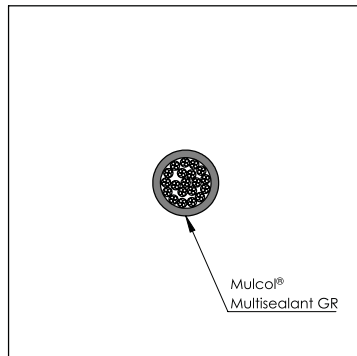
Drawing: RW150.E-EC-G2.15.10

Services	Sealing (mm)	Backing	Classification
Cables ≤ Ø 21 mm	Multisealant GR ≥ 15 x 35 (wxd)	Multimastic FB1 coated or uncoated	EI 180, E 240

A.2.1 Rigid walls - Cables trays and conduits

A.2.1.3 Cable bundle

Front view



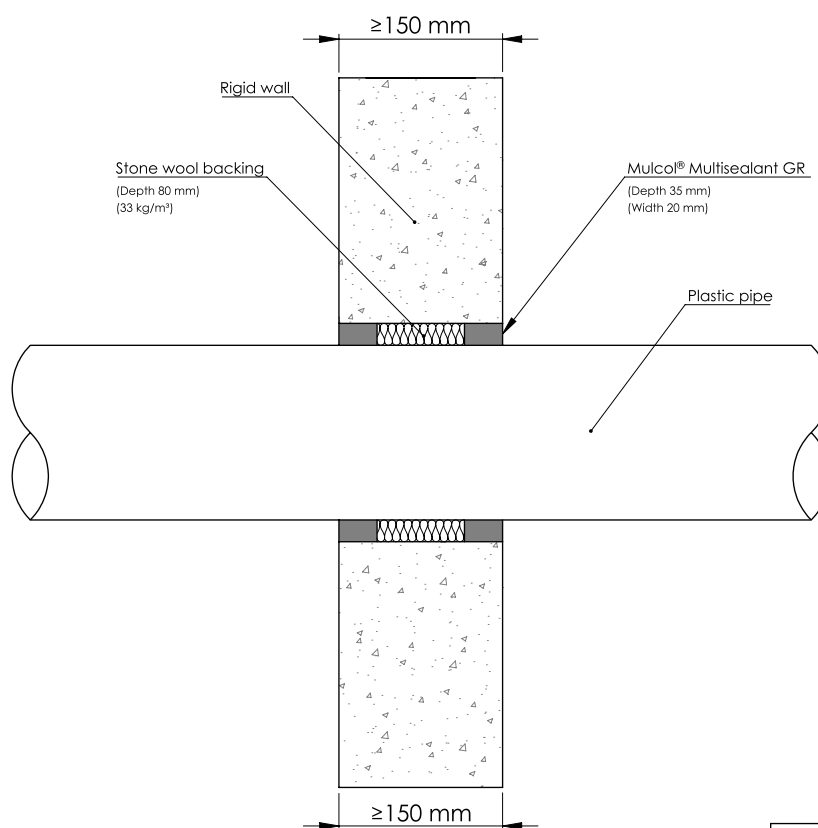
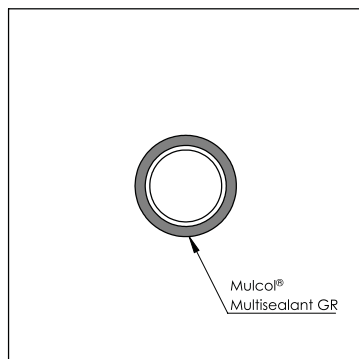
Drawing: RW150.E-ECB-G2.15.10

Services	Sealing (mm)	Backing	Classification
Cables $\leq \varnothing 21$ mm in a tied bundle $\leq \varnothing 100$ mm	Multisealant GR $\geq 15 \times 35$ (wxd)	Multimastic FB1 coated or uncoated	EI 90, E 180

A.2.2 Rigid walls - Combustible pipes

A.2.2.1 Plastic pipes

Front view

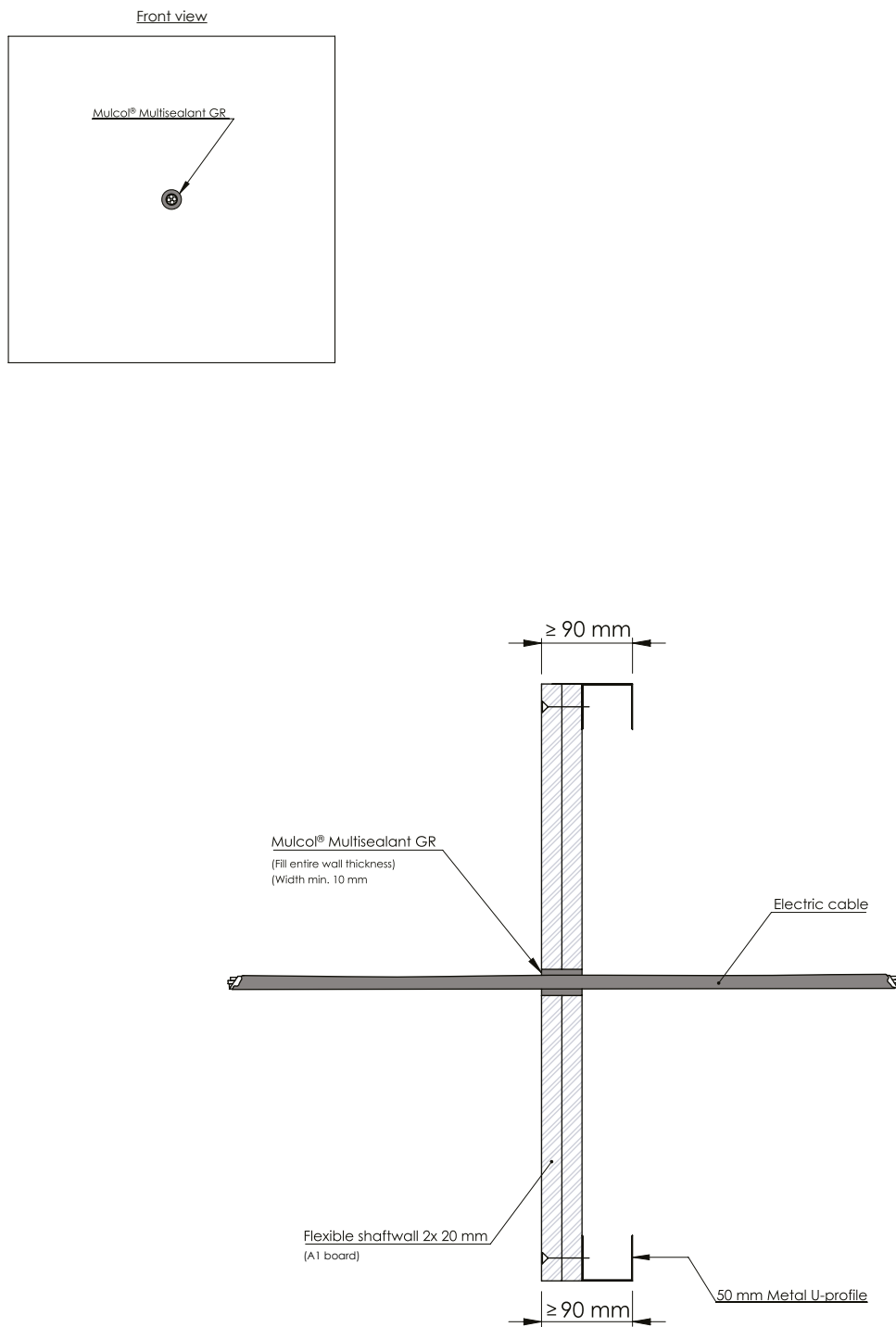


Drawing: RW150.E-PP-G2.15.10

Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness			
PE(-HD) / PE-X / ABS / SAN+PVC	≤ Ø 110	2.7	Multisealant GR ≥ 20 x 35 (wxd)	Stone wool (≥ 33 kg/m³)	EI 240 U/C
		2.7 - 10			EI 90 U/C
	≤ Ø 160	4.0 - 9.5			EI 180 U/C
PP	≤ Ø 110	2.7			EI 240 U/C
		2.7 - 10			EI 120 U/C
	≤ Ø 160	6.2			EI 180 U/C
		6.2 - 9.1			EI 120 U/C
PVC(-U/-C)	≤ Ø 110	2.7			EI 240 U/C
		2.7 - 10			EI 90 U/C
	≤ Ø 160	6.2			EI 180 U/C
		6.2 - 9.1			EI 120 U/C

A.3.1 Shaft walls - Cables, trays and conduits

A.3.1.1 Cables

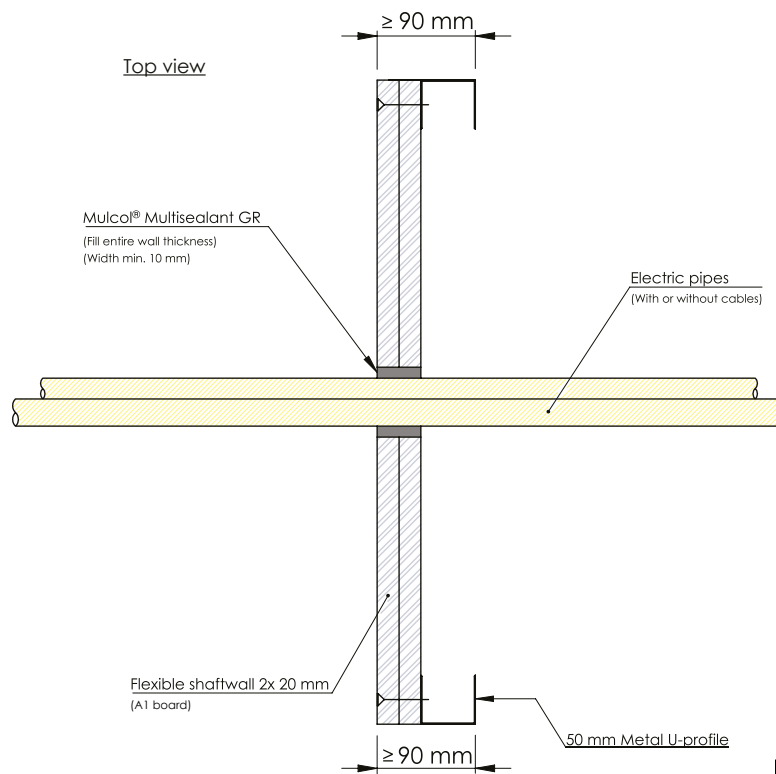
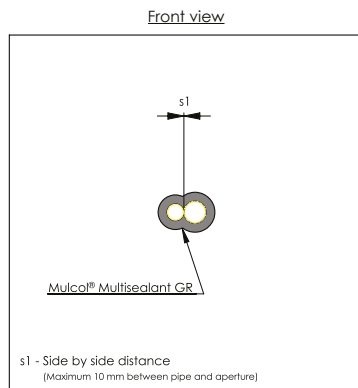


Drawing: FSW.E-EC-G1.17.10

Services	Sealing (mm)	Classification
Cables ≤ Ø 14 mm	Multisealant GR ≥ 10 x 40 (wxd)	EI 90

A.3.1 Shaft walls - Cables, trays and conduits

A.3.1.2 Multiple conduits with cables

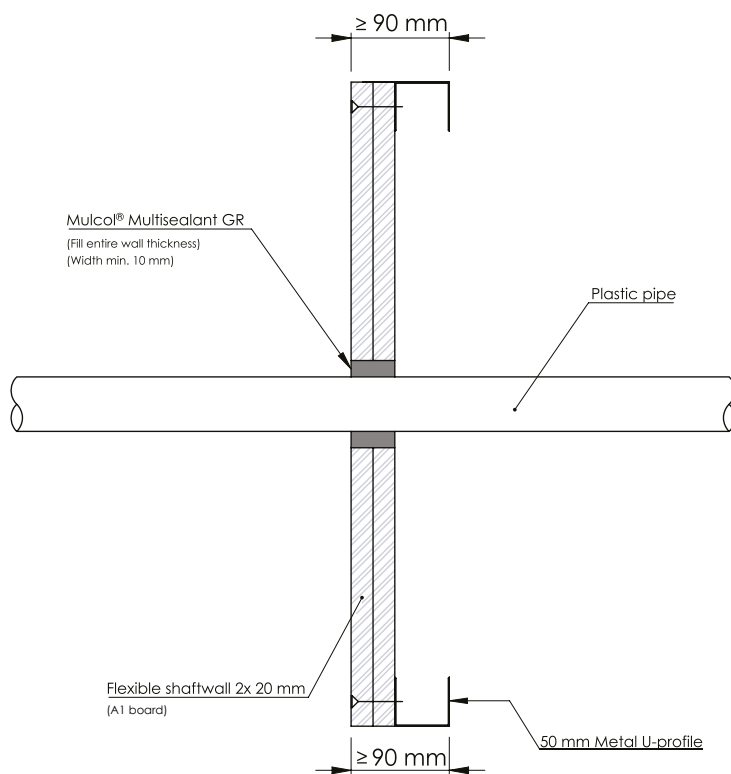
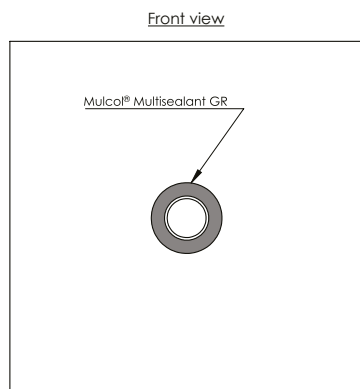


Drawing: FSW.E-EP2-G1.17.10

Services	Sealing (mm)	Classification
Plastic conduits ≤ Ø 19 mm, with or without cables	Multisealant GR ≥ 10 x 40 (wxd)	EI 90 U/C
Plastic conduits ≤ Ø 25 mm, with or without cables		EI 45 U/C

A.3.2 Shaft walls - Combustible pipes

A.3.2.1 Plastic pipes

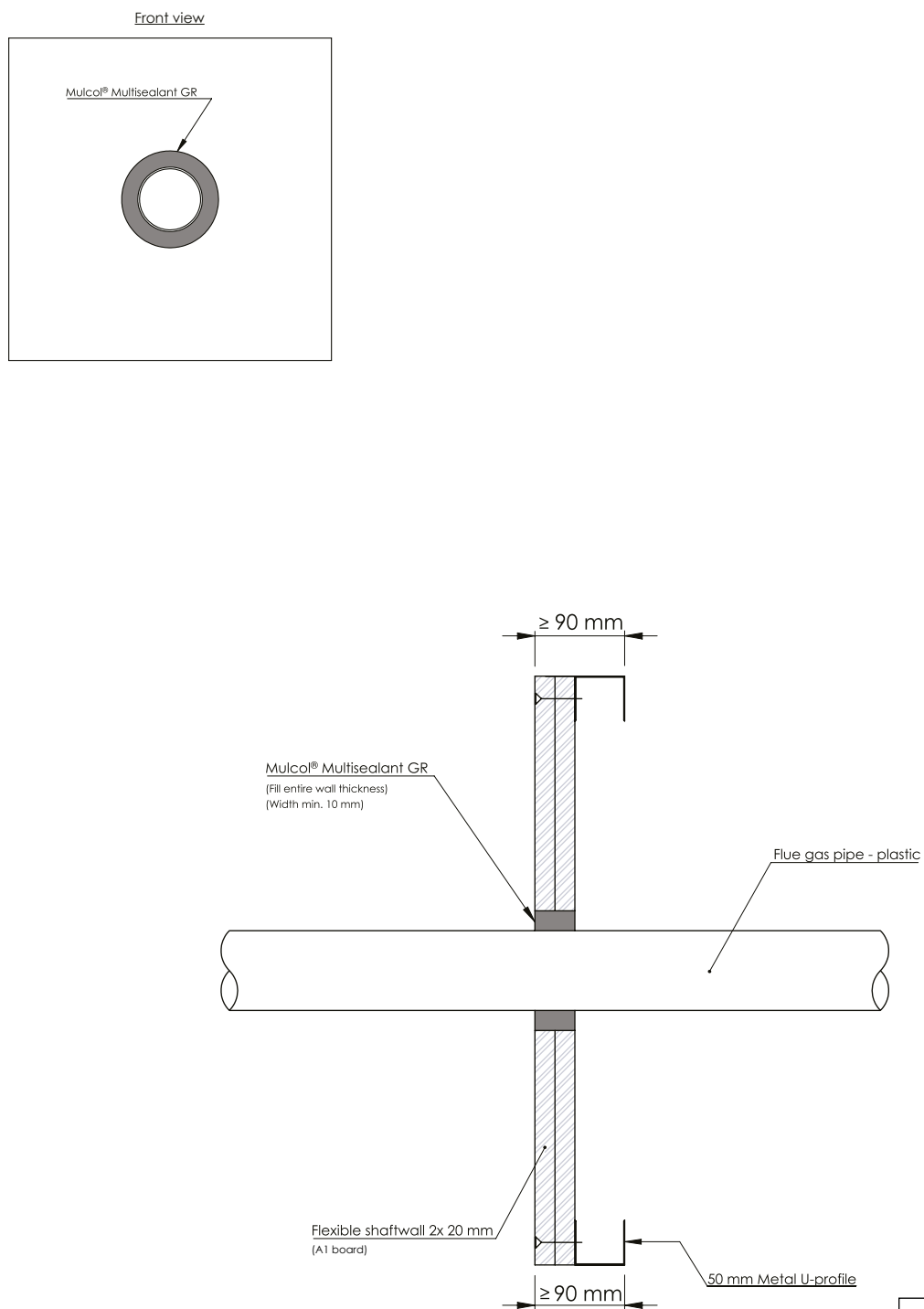


Drawing: FSW.E-PP-G1.17.10

Services	Pipe dimensions (mm)		Sealing (mm)	Classification
	Outer dimension	Wall thickness		
PE(-HD) / PE-X / ABS / SAN+PVC	$\leq \varnothing 50$	3.0	Multisealant GR $\geq 10 \times 40$ (wxd)	EI 45 U/U

A.3.2 Shaft walls - Combustible pipes

A.3.2.2 Plastic pipes - Flue gas pipes

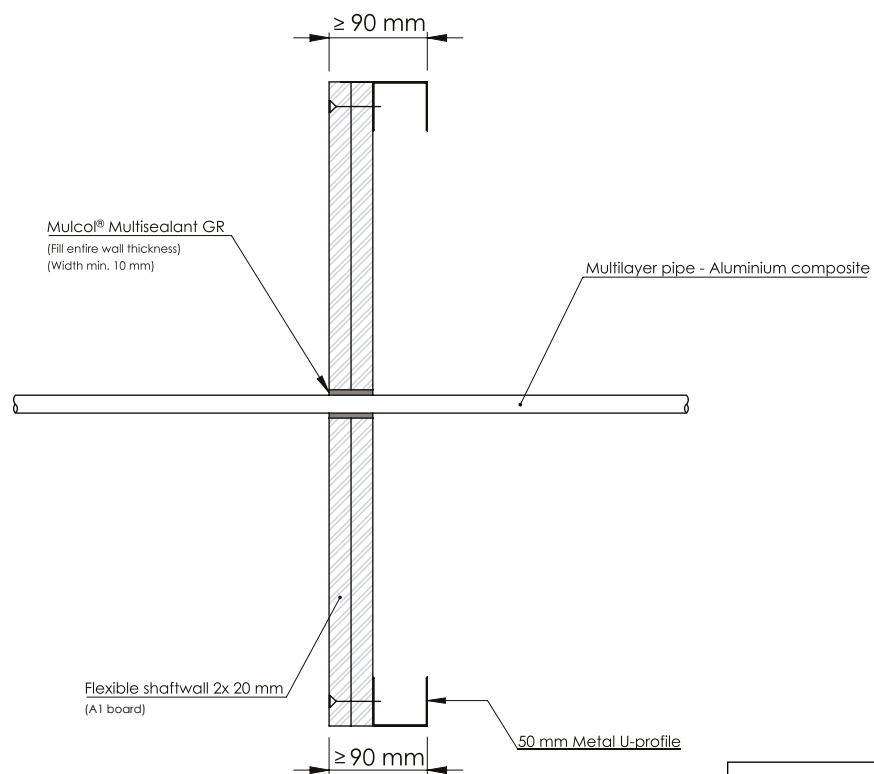
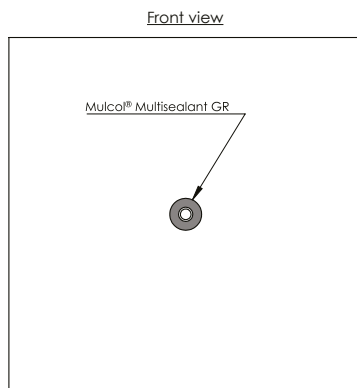


Drawing: FSW.E-RGA-G1.17.10

Services	Pipe dimensions (mm)		Sealing (mm)	Classification
	Outer dimension	Wall thickness		
Flue gas pipes	$\leq \text{Ø } 80$	2.2	Multisealant GR $\geq 10 \times 40$ (wxd)	EI 45 U/C

A.3.3 Shaft walls - Multilayer pipes (MLC)

A.3.3.1 Multilayer pipes (MLC)

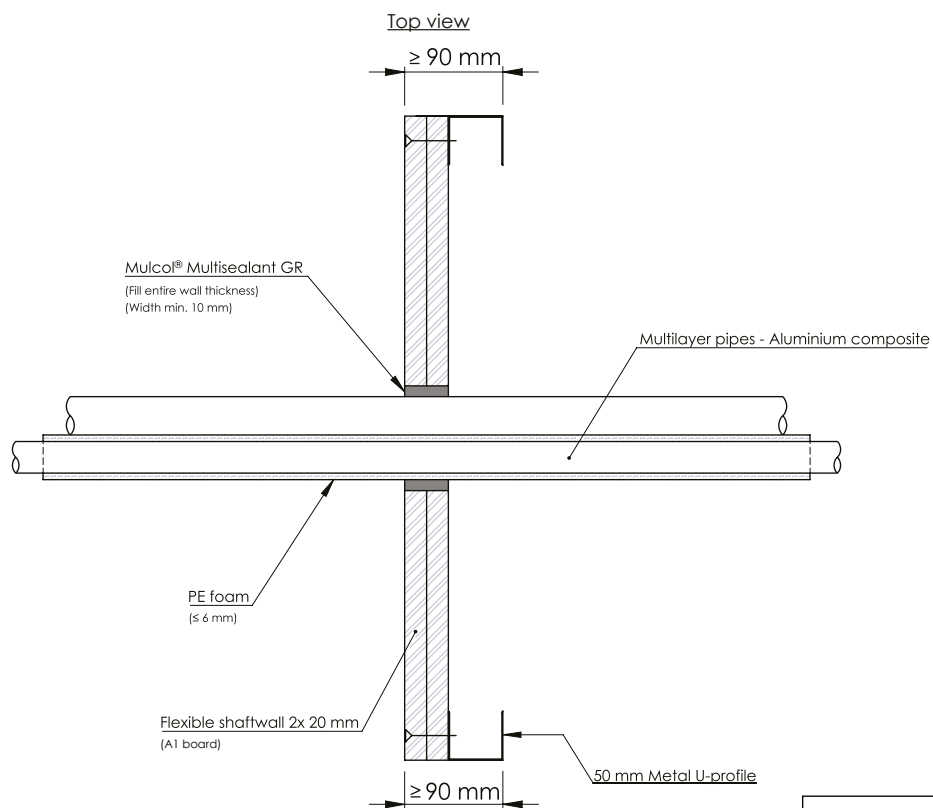
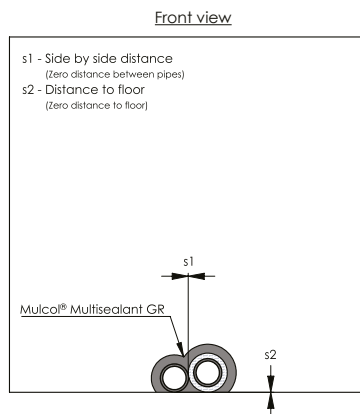


Drawing: FSW.E-MLA-G1.17.10

Services	Pipe dimensions (mm)		Sealing (mm)	Classification
	Outer dimension	Wall thickness		
Multilayer pipes (MLC)	≤ Ø 16	2.0	Multisealant GR ≥ 10 x 40 (wxd)	EI 60 U/C, E 90 U/C

A.3.3 Shaft walls - Multilayer pipes (MLC)

A.3.3.2 Multiple Multilayer pipes (MLC)

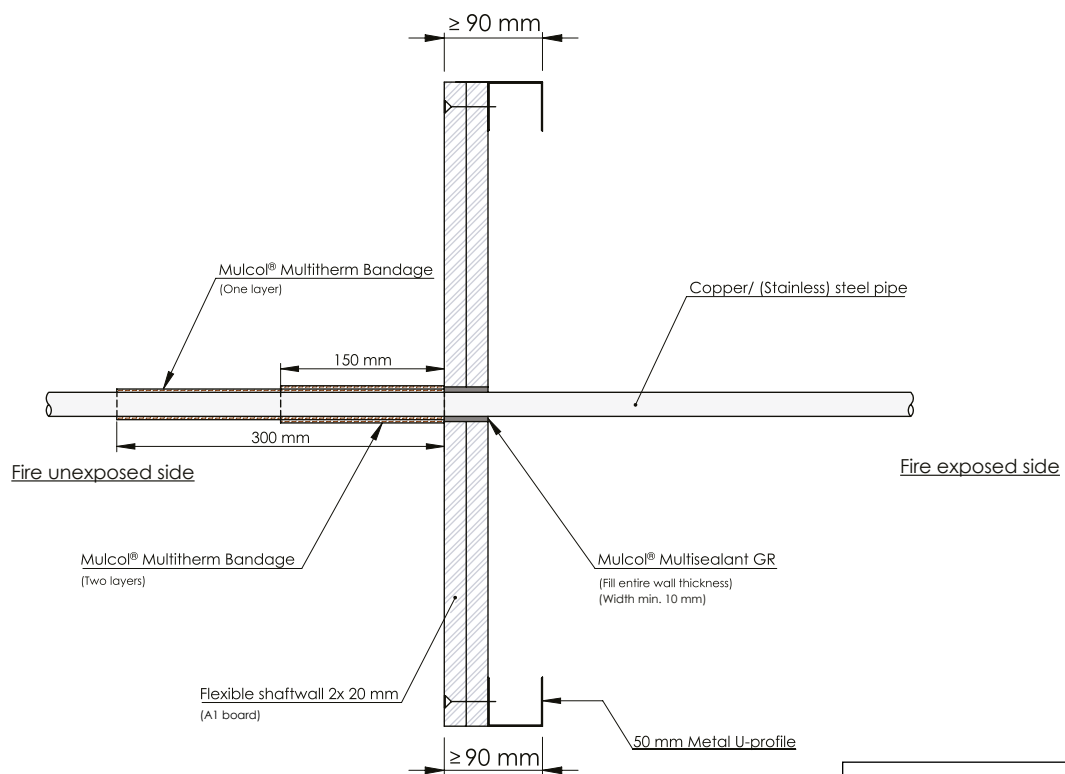
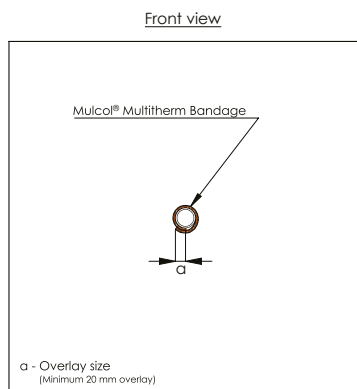


Drawing: FSW.E-MLP2-G1.17.40

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Multilayer pipes (MLC)	≤ Ø 32	3.0	PE foam	≤ 6	LS 300 / CS	Multisealant GR ≥ 10 x 40 (wxd)	EI 45 U/C, E 90 U/C
	≤ Ø 32	3.0	-	-	-		EI 90 U/C

A.3.4 Shaft walls - Metal pipes uninsulated

A.3.4.1 Copper and steel pipes - Multitherm Bandage

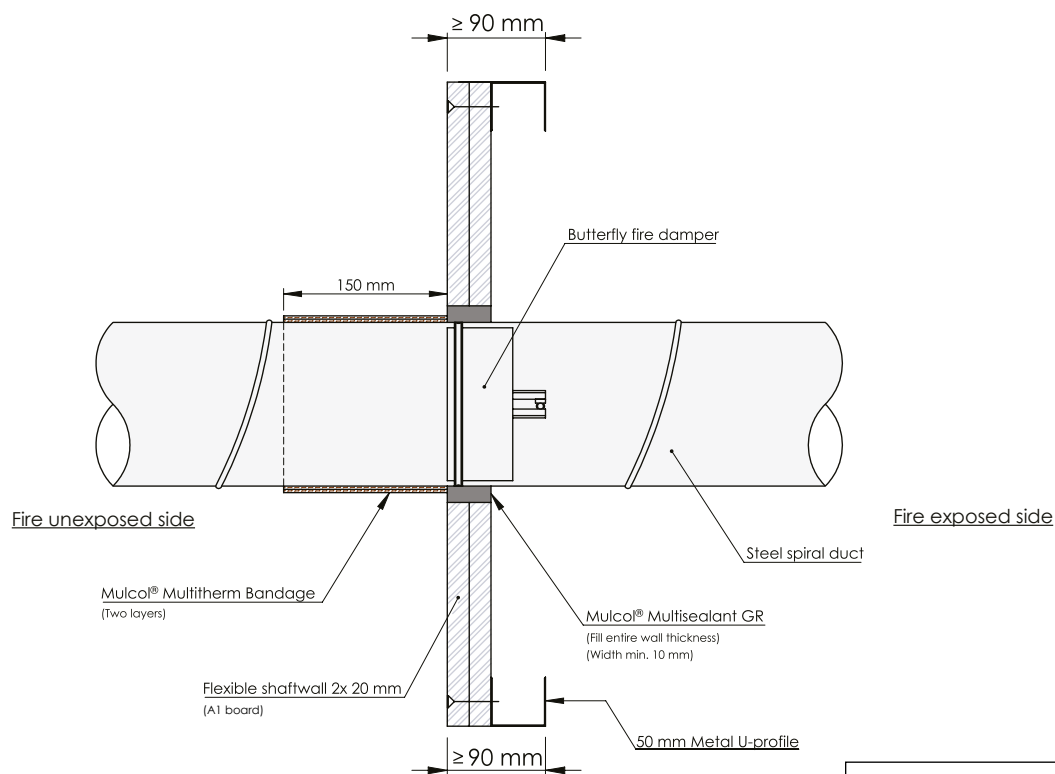
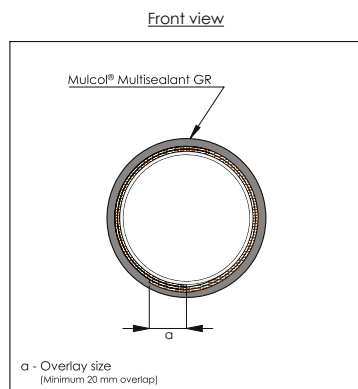


Drawing: FSW.E-CU-G1.17.92

Services	Pipe dimensions (mm)		Sealing (mm)	Multitherm Bandage	Classification
	Outer dimension	Wall thickness			
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	Multisealant GR ≥ 10 x 40 mm (wxd)	LI 150 two layers + LI 300 one layer	EI 60 C/U, E 90 C/U

A.3.4 Shaft walls - Metal pipes uninsulated

A.3.4.2 Steel spiral duct - Multitherm Bandage

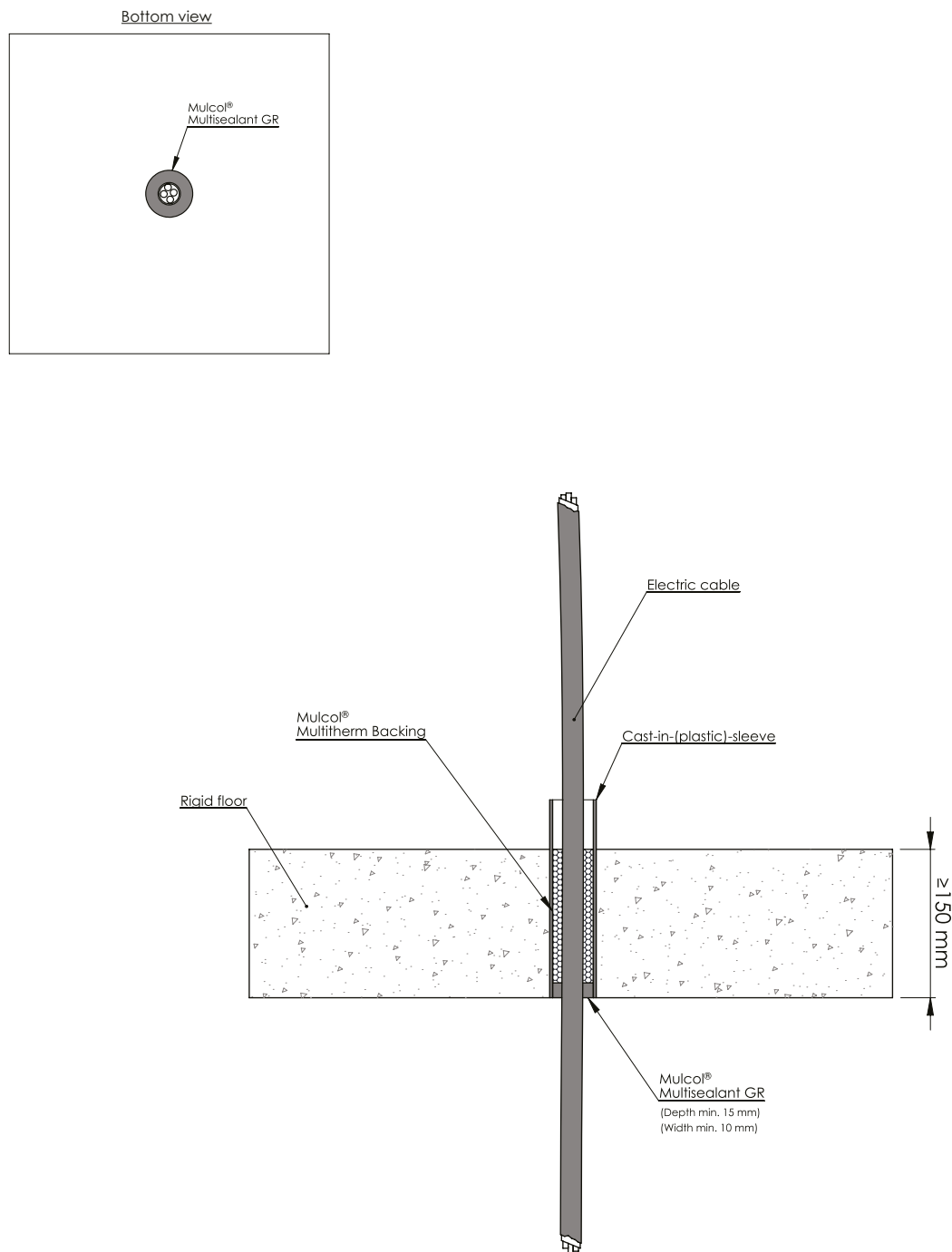


Drawing: FSW.E-ST-G1.17.92

Services	Pipe dimensions (mm)		Sealing (mm)	Multitherm Bandage	Classification
	Outer dimension	Wall thickness			
Steel spiral duct with butterfly fire damper	≤ Ø 150	0.4	Multisealant GR ≥ 10 x 40 mm (wxd)	LI 150 one layer	EI 20 U/U, E 90 U/U

B.1.1 Rigid floors - Cables, trays and conduits

B.1.1.1 Cables - Bottom of floor

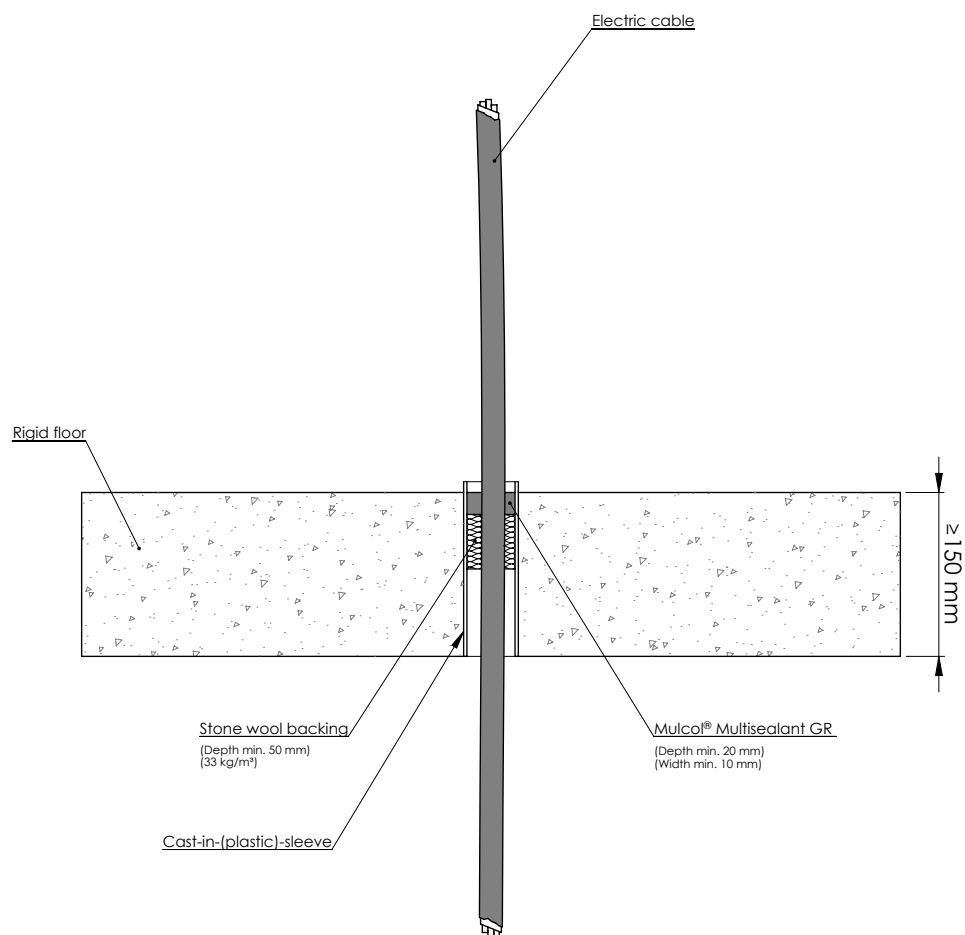
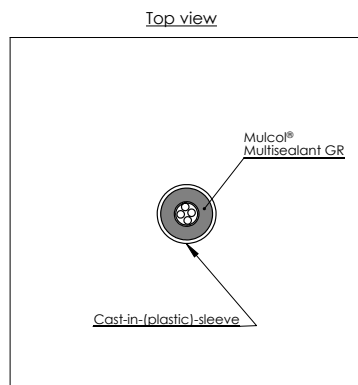


Drawing: RF.E-EC-G1.2.10

Services		Pipe dimensions (mm)	Sealing (mm)	Backing	Classification
		Outer dimension			
Cables ≤ Ø 25 mm YMvK 5G 25 mm ²	with or without plastic cast-in sleeve	≤ Ø 110	Multisealant GR ≥ 10 x 40 (wxd) bottom of floor	Multitherm backing fill entire depth	EI 60, E 120

B.1.1 Rigid floors - Cables, trays and conduits

B.1.1.2 Cables - Top of floor

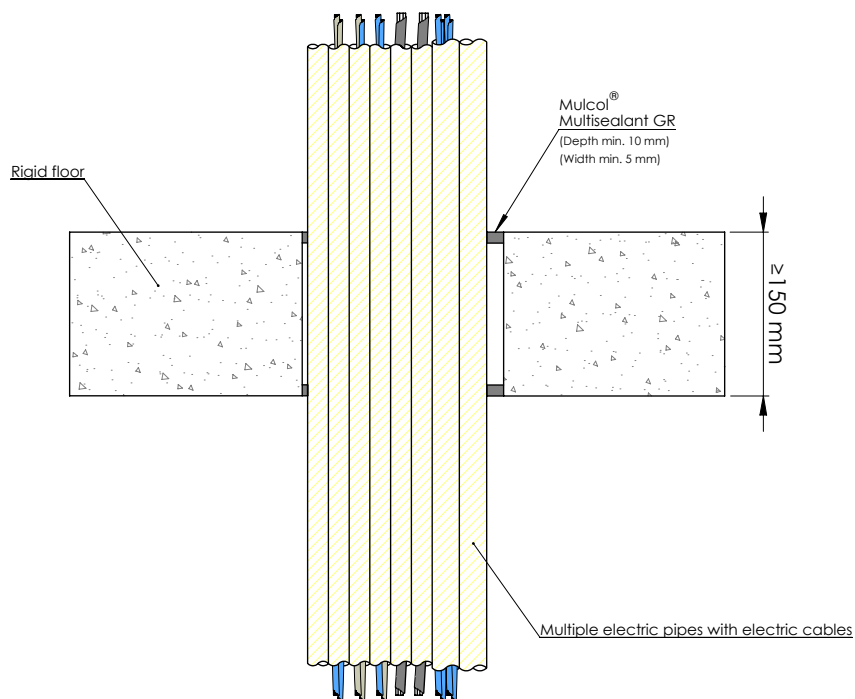
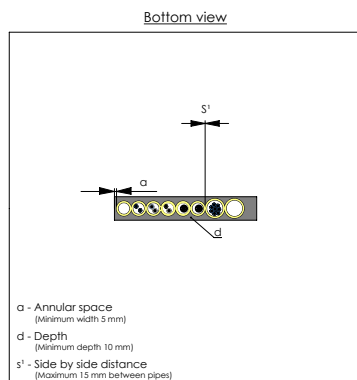


Drawing: RF-EC21-G3.12.10

Services		Pipe dimensions (mm)	Sealing (mm)	Backing	Classification
		Outer dimension			
Cables ≤ Ø 21 mm	with or without plastic cast-in sleeve	≤ Ø 50	Multisealant GR ≥ 10 x 20 (wxd) top of floor	≥ 50 mm stone wool (≥ 33 kg/m³)	EI 120

B.1.1 Rigid floors - Cables, trays and conduits

B.1.1.3 Multiple conduits with cables

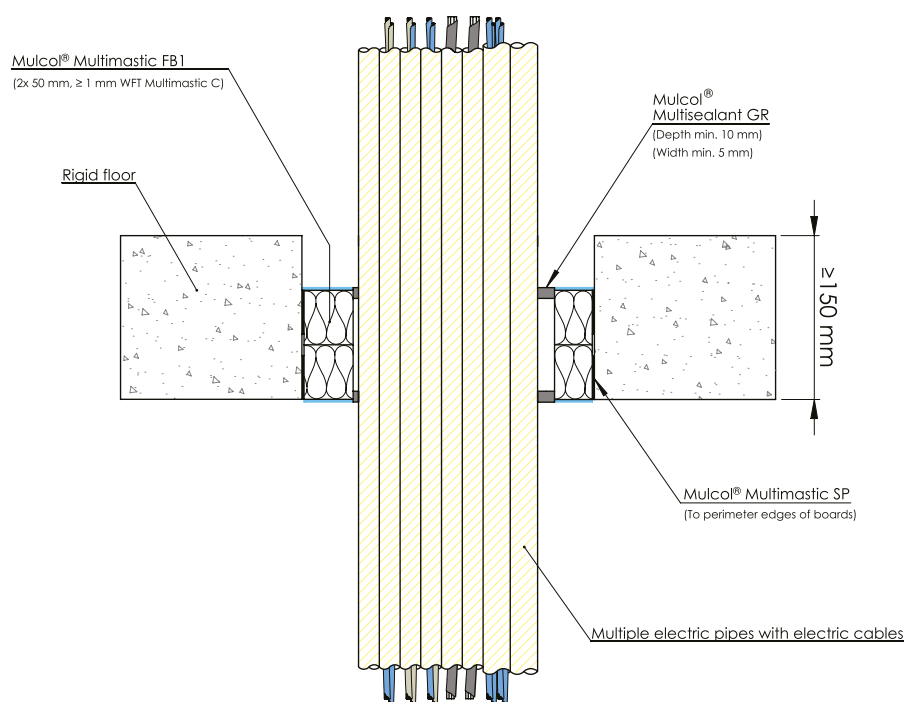
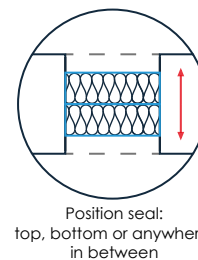
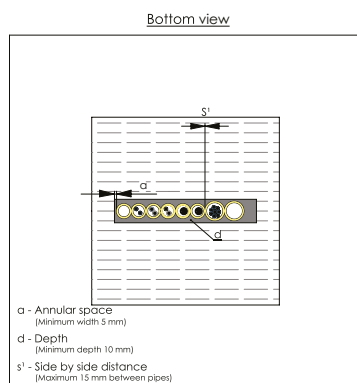


Drawing: RF.E-EP8-G2.1.10

Services	Sealing (mm)	Classification
Multiple plastic conduits ≤ Ø 25 mm, with or without cables max 8 pcs.	Multisealant GR ≥ 5 x 10 mm (wxd)	EI 90 U/U, E 120 U/U

B.1.1 Rigid floors - Cables, trays and conduits

B.1.1.4 Multiple conduits with cables - Multimastic FB1

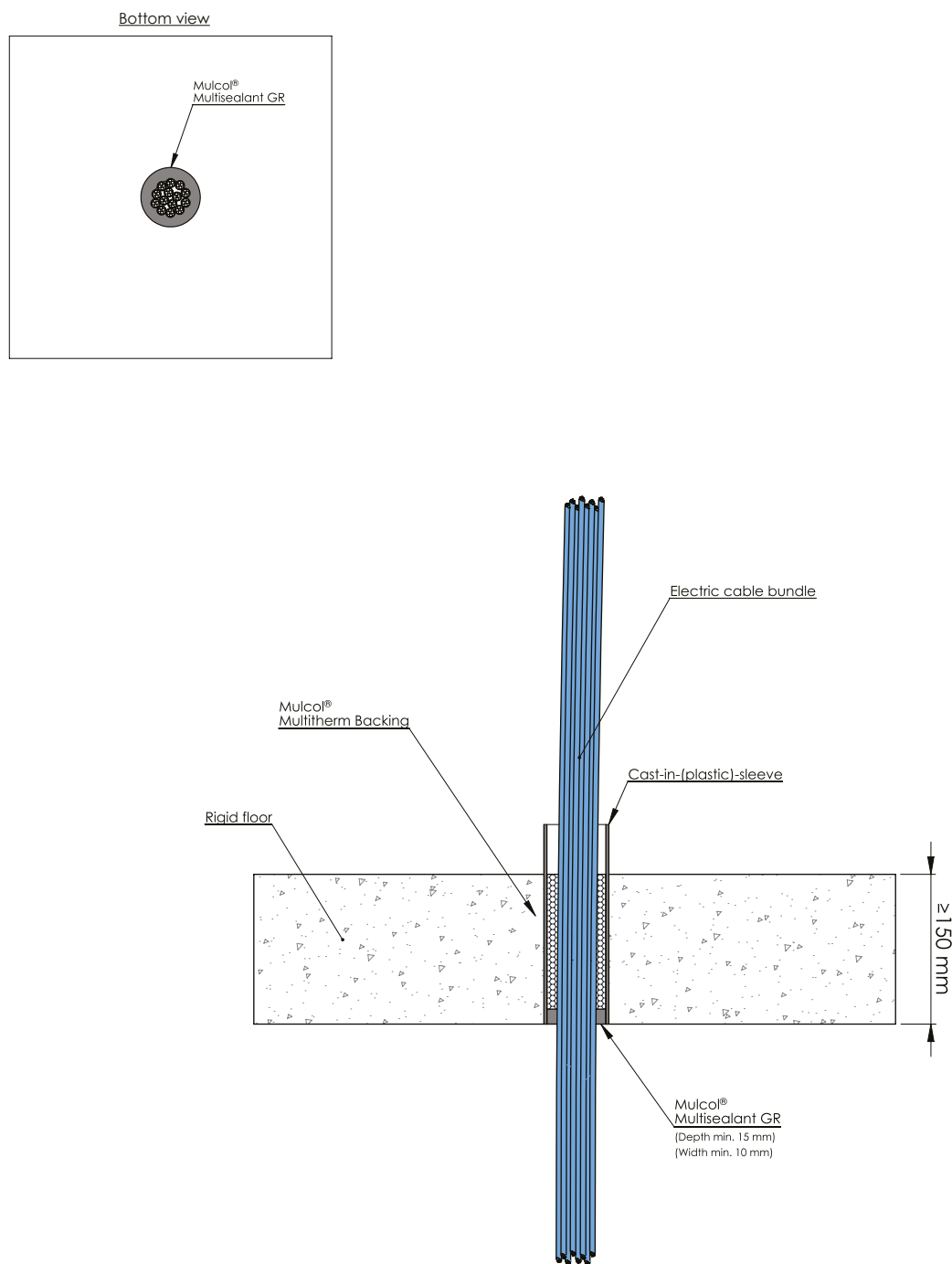


Drawing: PBrf.E-EP8-G2.1.10

Services	Sealing (mm)	Classification
Multiple plastic conduits ≤ Ø 25 mm, with or without cables max 8 pcs.	Multisealant GR ≥ 5 x 10 mm (wxd)	EI 90 U/U

B.1.1 Rigid floors - Cables, trays and conduits

B.1.1.5 Cable bundle - Bottom of floor

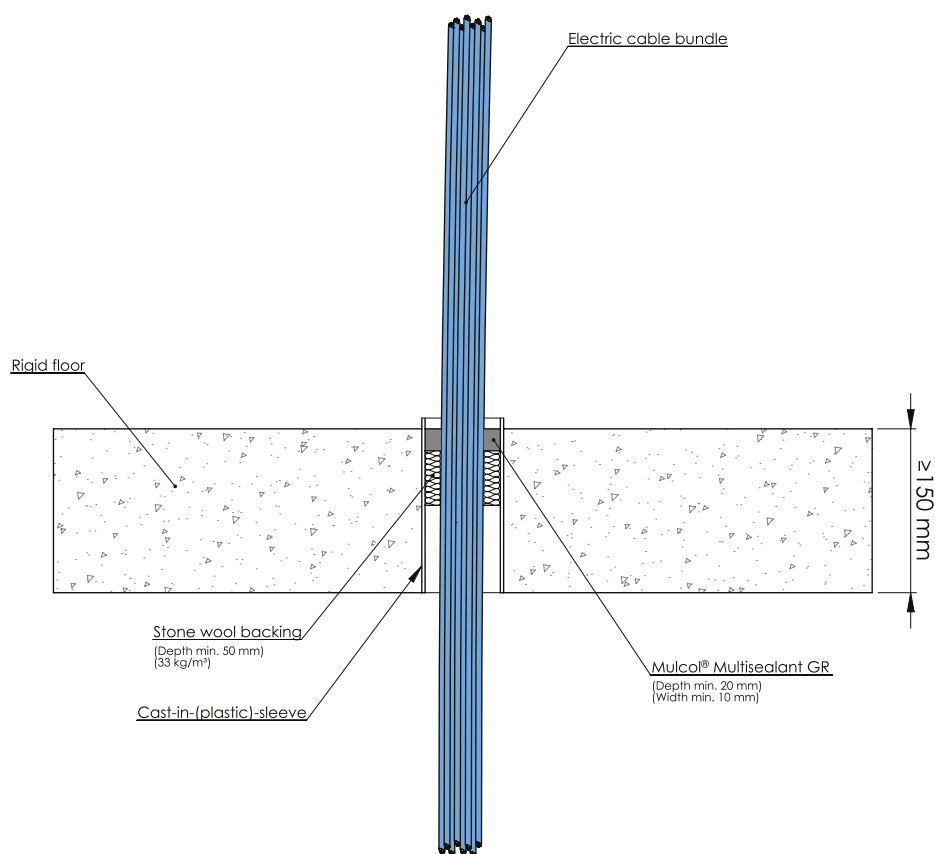
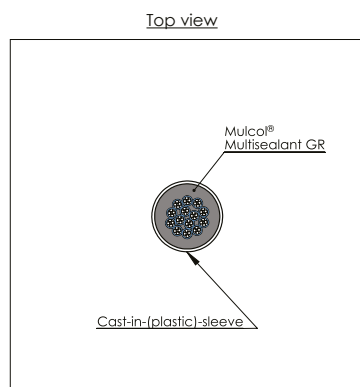


Drawing: RF.E-ECB-G1.2.10

Services		Pipe dimensions (mm)	Sealing (mm)	Backing	Classification
		Outer dimension			
Telecommunication cables ≤ Ø 21 mm in a tied bundle ≤ 28 pcs	with or without plastic cast-in sleeve	≤ Ø 75	Multisealant GR ≥ 10 x 15 (wxd)	Multitherm Backing fill entire depth	EI 120

B.1.1 Rigid floors - Cables, trays and conduits

B.1.1.6 Cable bundle - Top of floor

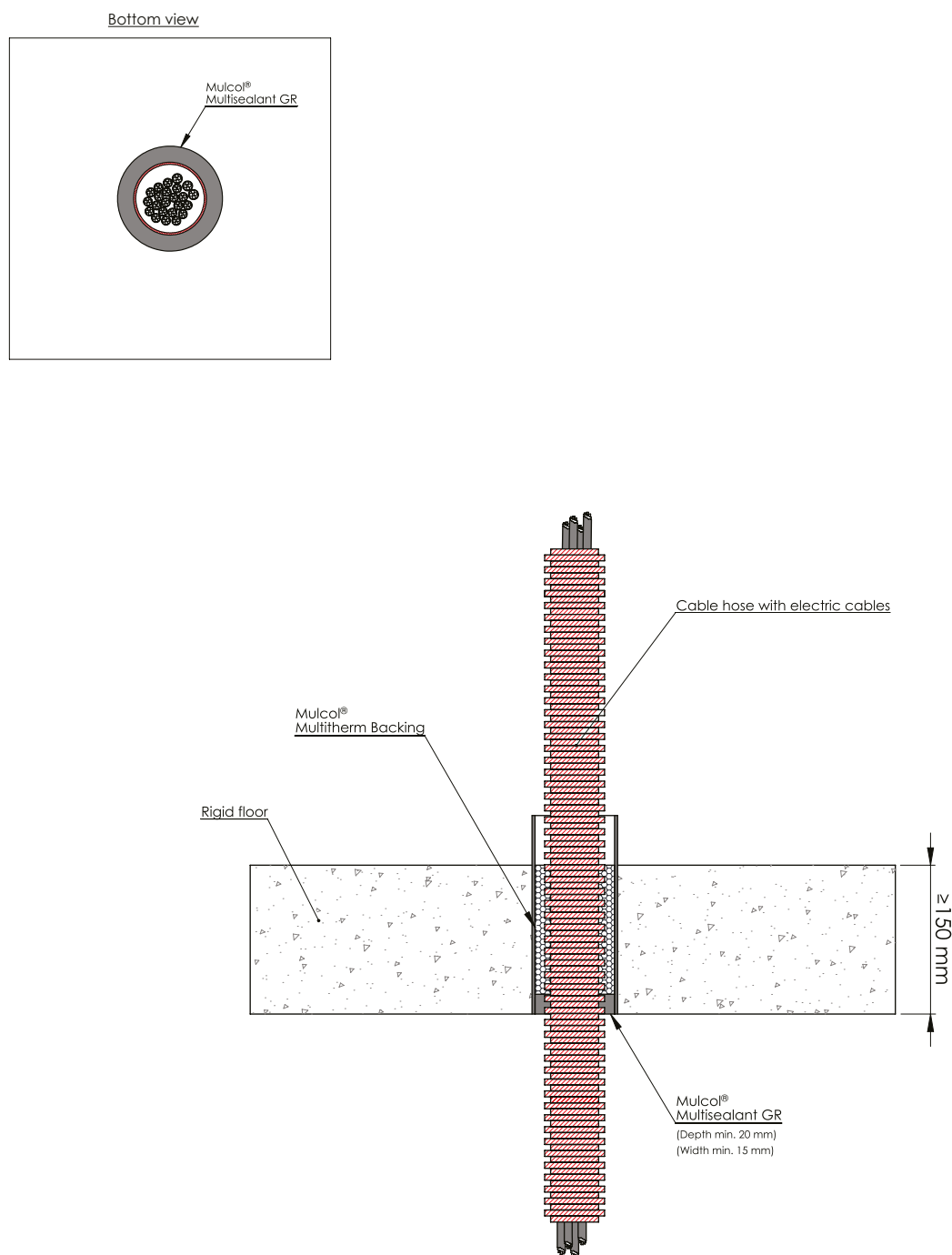


Drawing: RF.E-ECB-G3.12.10

Services		Pipe dimensions (mm)	Sealing (mm)	Backing	Classification
		Outer dimension			
Telecommunication cables ≤ Ø 21 mm in a tied bundle ≤ 40 pcs	with or without plastic cast-in sleeve	≤ Ø 75	Multisealant GR ≥ 10 x 20 (wxd)	≥ 50 mm stone wool (≥ 33 kg/m³)	EI 120

B.1.1 Rigid floors - Cables, trays and conduits

B.1.1.7 Flexible conduit with cables - Bottom of floor

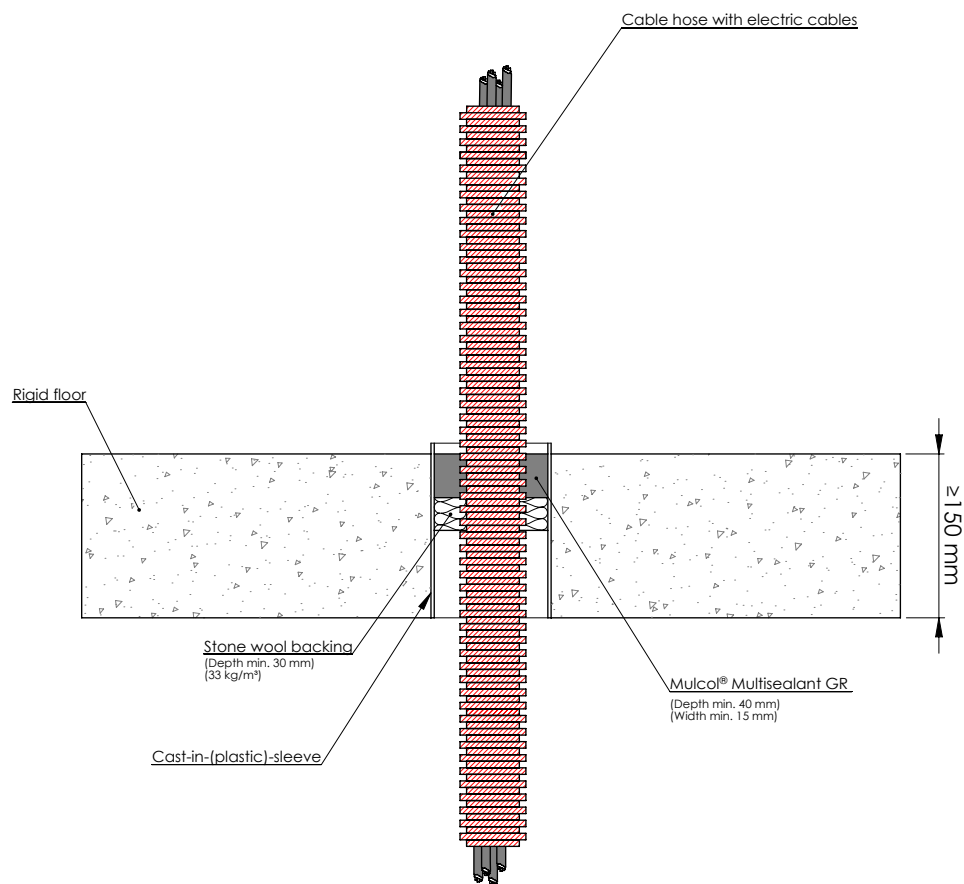
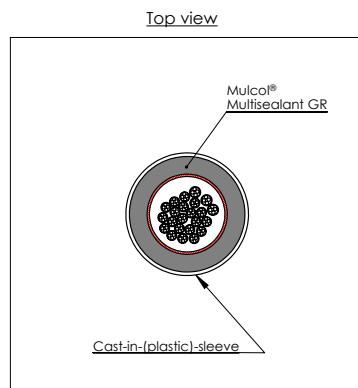


Drawing: RF.E-ECH-G1.4.30

Services		Pipe dimensions (mm)		Sealing (mm)	Backing	Classification
		Outer dimension	Wall thickness			
Ribbed PE-flexible-sleeve conduit ≤ Ø 50 mm with or without cables	with or without plastic cast-in sleeve	≤ Ø 110	3.2	Multisealant GR ≥ 15 x 20 (wxd)	Multitherm Backing fill entire depth	EI 90 U/U

B.1.1 Rigid floors - Cables, trays and conduits

B.1.1.8 Flexible conduit with cables - Top of floor



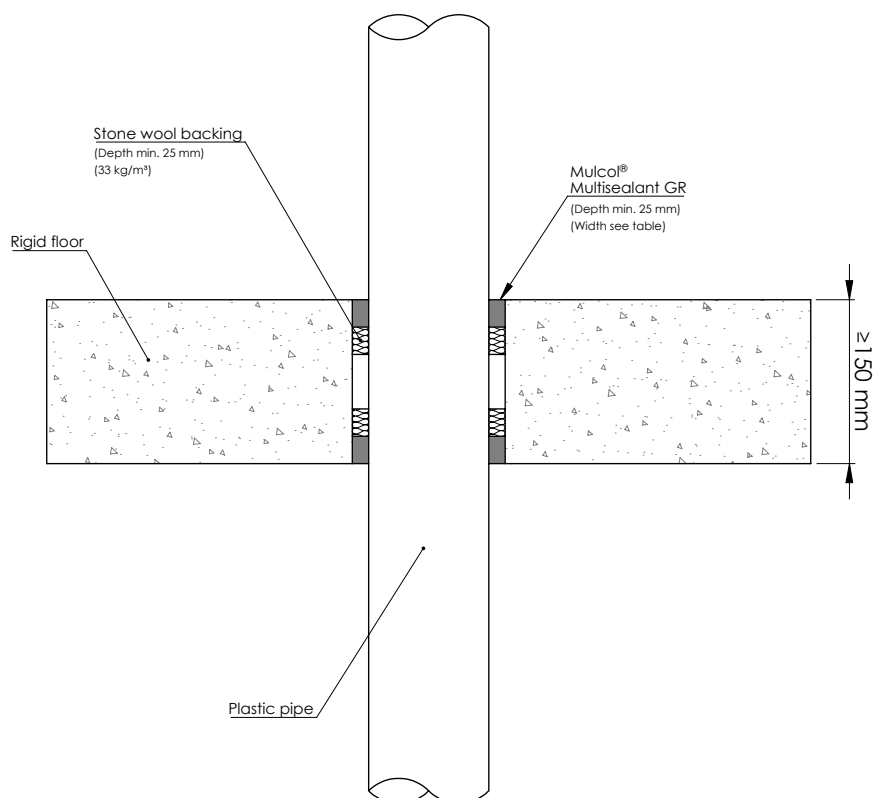
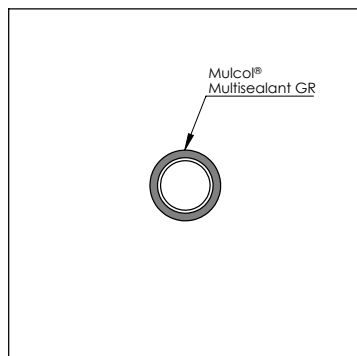
Drawing: RF-ECH63-G3.16.30

Services		Pipe dimensions (mm)	Sealing (mm)	Backing	Classification
		Outer dimension			
Ribbed PE-flexible-sleeve conduit ≤ Ø 50 mm with or without cables	with or without plastic cast-in sleeve	≤ Ø 90	Multisealant GR ≥ 15 x 40 (wxd)	≥ 30 mm stone wool (≥ 33 kg/m³)	EI 120 U/C

B.1.2 Rigid floors - Combustible pipes

B.1.2.1 Plastic pipes

Bottom view



Drawing: RF.E-PP-G2.5.10

Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness			
PE(-HD) / PE-X / ABS / SAN+PVC	≤ Ø 40	2.4 - 5.5	Multisealant GR ≥ 10 x 25 (wxd)	≥ 25 mm stone wool (≥ 33kg/m³)	EI 240 U/U
	≤ Ø 110	2.7 - 10	Multisealant GR ≥ 15 x 25 (wxd)		EI 120 U/C
		2.7 - 10			EI 90 U/U, E 120 U/U
		10			EI 240 U/U
	≤ Ø 160	4.9 - 14.6	Multisealant GR ≥ 20 x 25 (wxd)		EI 30 U/C, E 45 U/C
		14.6			EI 90 U/C

B.1.2 Rigid floors - Combustible pipes**B.1.2.1 Plastic pipes**

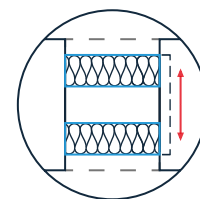
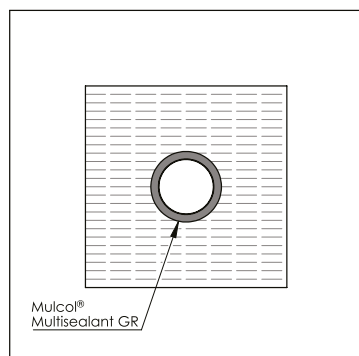
Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness			
PP	≤ Ø 40	2.3 - 5.5	Multisealant GR ≥ 10 x 25 (wxd)	≥ 25 mm stone wool (≥ 33kg/m³)	EI 120 U/C
		2.3 - 5.5			EI 20 U/U, E 60 U/U
		5.5			EI 240 U/U
	≤ Ø 110	2.7	Multisealant GR ≥ 15 x 25 (wxd)		EI 240 U/U
		2.7 - 10			EI 120 U/U, E 240 U/U
	≤ Ø 160	14.6	Multisealant GR ≥ 20 x 25 (wxd)		EI 60 U/C

Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness			
PVC(-U/-C)	≤ Ø 40	2.4 - 5.5	Multisealant GR ≥ 10 x 25 (wxd)	≥ 25 mm stone wool (≥ 33kg/m³)	EI 120 U/C
		5.5			EI 240 U/U
	≤ Ø 110	2.7 - 10	Multisealant GR ≥ 15 x 25 (wxd)		EI 90 U/U, E 120 U/U
		10			EI 120 U/U, E 240 U/U
	≤ Ø 160	4 - 14.6	Multisealant GR ≥ 20 x 25 (wxd)		EI 30 U/C
		14.6			EI 60 U/C

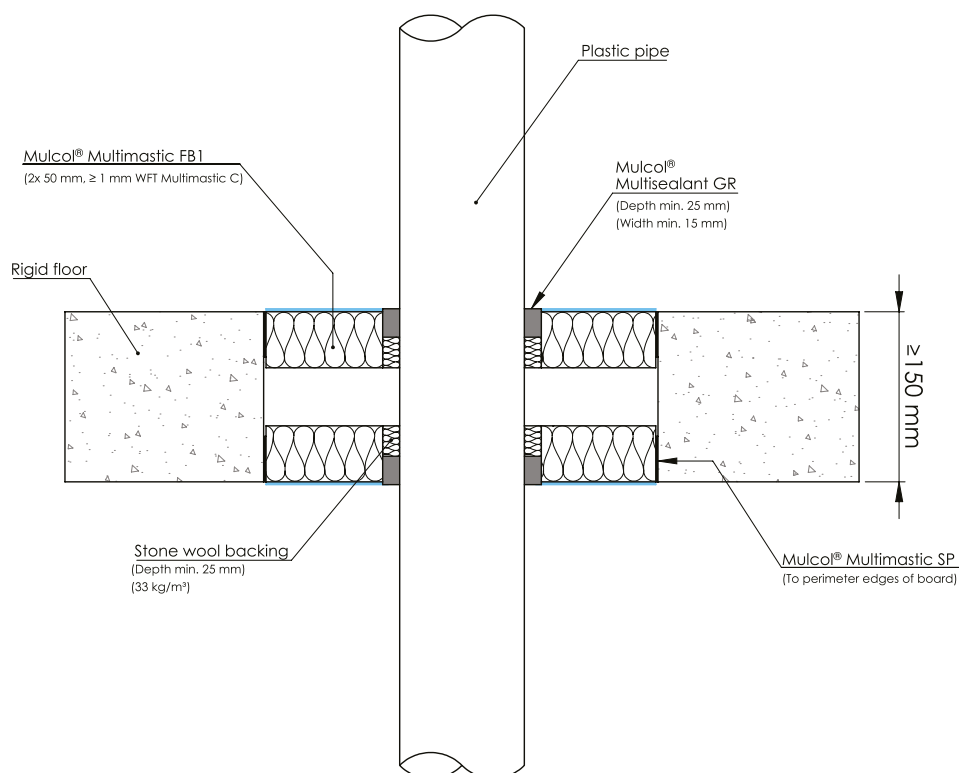
B.1.2 Rigid floors - Combustible pipes

B.1.2.2 Plastic pipes - Multimastic FB1

Bottom view



Position seal:
top, bottom or anywhere
in between



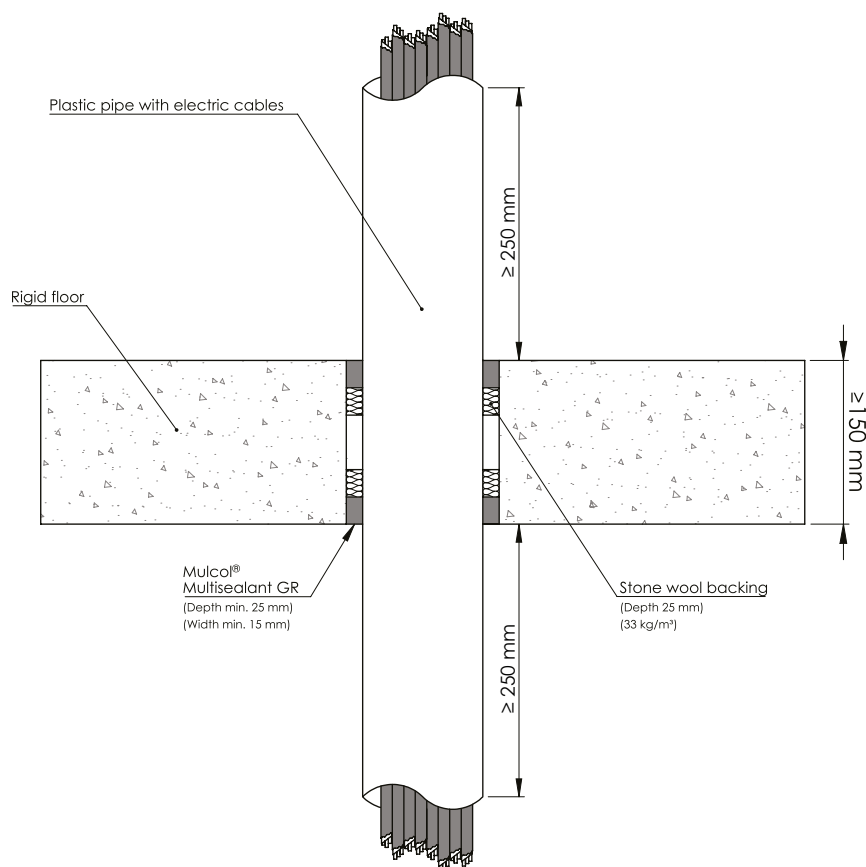
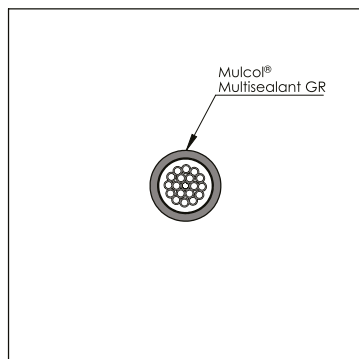
Drawing: PBrf.E-PP-MFB1-G2.5.10.C

Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness			
PE(-HD) / PE-X / ABS / SAN+PVC	≤ Ø 40	2.4 - 10	Multisealant GR ≥ 15 x 25 (wxd)	≥ 25 mm stone wool (≥ 33 kg/m³)	EI 120 U/U
	≤ Ø 110	2.7 - 10			
PP	≤ Ø 40	2.3 - 10			
	≤ Ø 110	2.7 - 10			
PVC(-U/-C)	≤ Ø 40	2.4 - 10			
	≤ Ø 110	2.7 - 10			

B.1.2 Rigid floors - Combustible pipes

B.1.2.3 Plastic pipes with cables

Bottom view

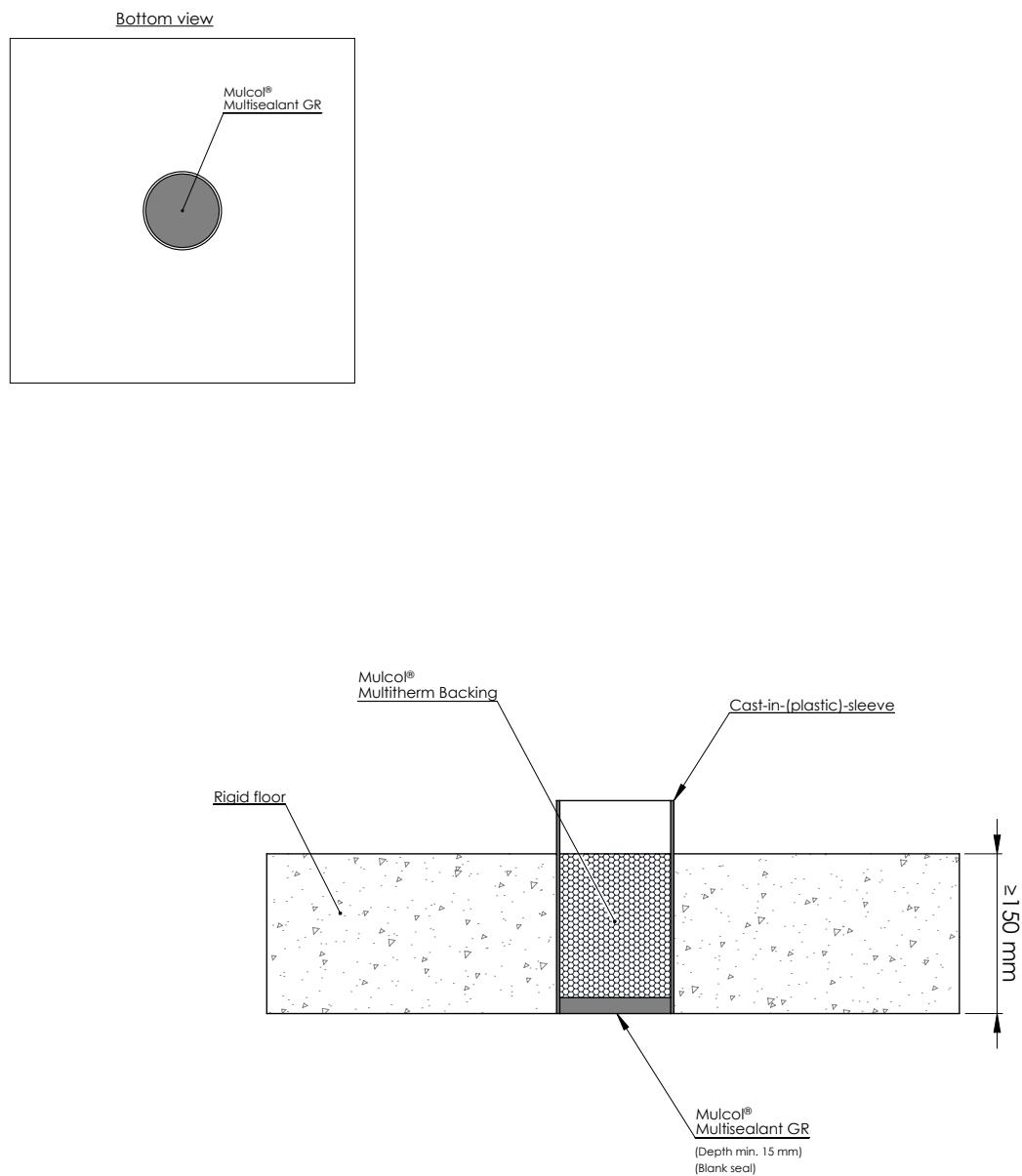


Drawing: RF.E-PPEC-G2.4.10

Services	Pipe dimensions (mm)			Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness				
PE(-HD) / PE-X / ABS / SAN+PVC	≤ Ø 40	2.4	Sheathed cables ≤ Ø 80 mm (single or bundled)	Multisealant GR ≥ 10 x 25 (wxd)	≥ 25 mm stone wool (≥ 33kg/m ³)	EI 120 U/C
	≤ Ø 110	2.7 - 10		Multisealant GR ≥ 15 x 25 (wxd)		
PP	≤ Ø 40	2.3	Cables ≤ Ø 21 mm in a tied bundle ≤ Ø 100 mm	Multisealant GR ≥ 10 x 25 (wxd)		
	≤ Ø 110	2.7 - 10		Multisealant GR ≥ 15 x 25 (wxd)		
PVC(-U/-C)	≤ Ø 110	2.7 - 10		Multisealant GR ≥ 15 x 25 (wxd)		

B.1.2 Rigid floors - Combustible pipes

B.1.2.4 Encased plastic pipes

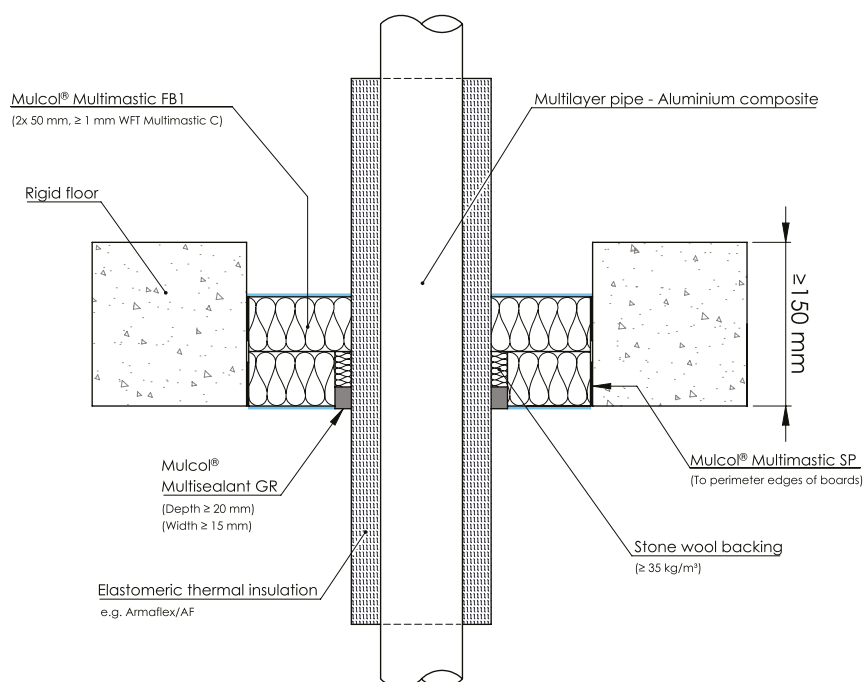
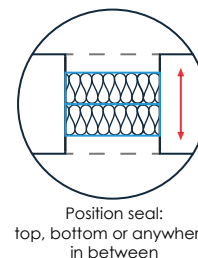
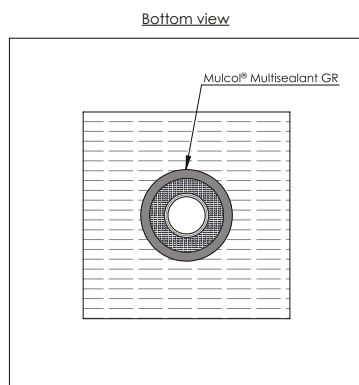


Drawing: RFmk.E-BS-G1.11.31

Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness			
PVC(-U/-C)	≤ Ø 110	≤ 3.2	Multisealant GR ≥ 15 depth	Multitherm Backing fill entire depth	EI 120

B.1.3 Rigid floors - Multilayer pipes (MLC) insulated

B.1.3.1 Multilayer pipes (MLC) - Elastomer LS 300 / CS - Multimastic FB1



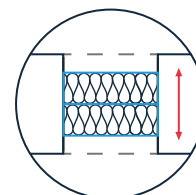
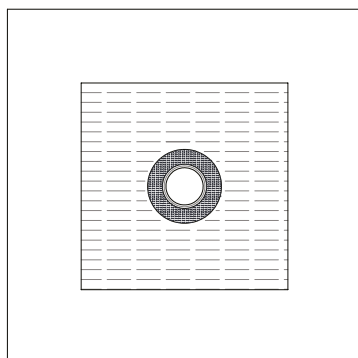
Drawing: PBrf.E-MLA-G1.4.22

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Multilayer pipe (MLC)	≤ Ø 20	2.0	ArmaFlex AF (min. class B-s3, d0 B _L -s3, d0)	9 - 32	LS 300 / CS	Multisealant GR ≥ 15 x 20 (wxd)	Stone wool (≥ 35 kg/m³)	EI 120 U/C
	≤ Ø 32	3.0						EI 90 U/C
	≤ Ø 40	3.5						E 120 U/C
	≤ Ø 50	4.0						EI 90 U/C
	≤ Ø 63	4.5						EI 90 U/C
	≤ Ø 75	6.0						

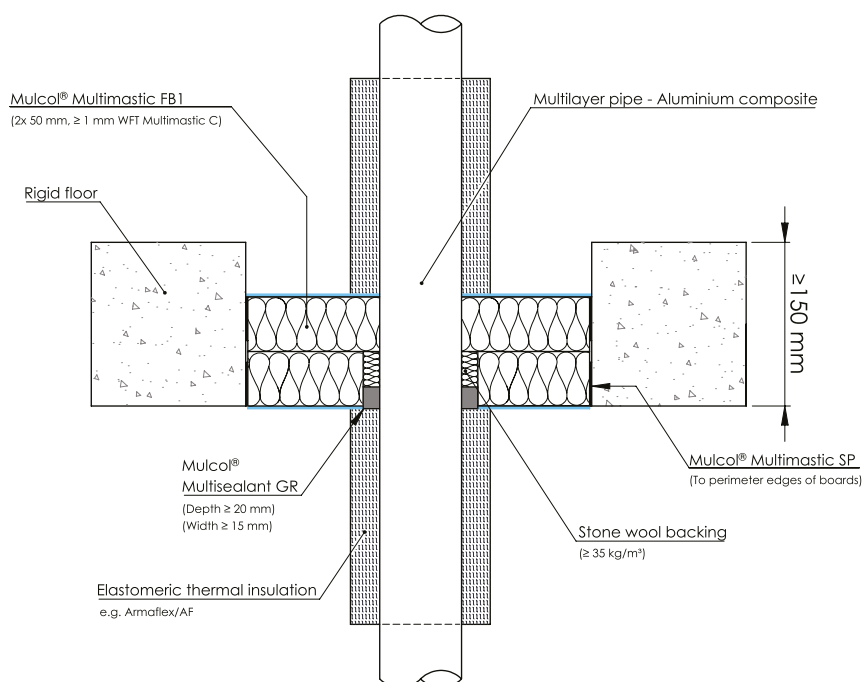
B.1.3 Rigid floors - Multilayer pipes (MLC) insulated

B.1.3.2 Multilayer pipes (MLC) - Elastomer LI 300 / CI - Multimastic FB1

Bottom view



Position seal:
top, bottom or anywhere
in between

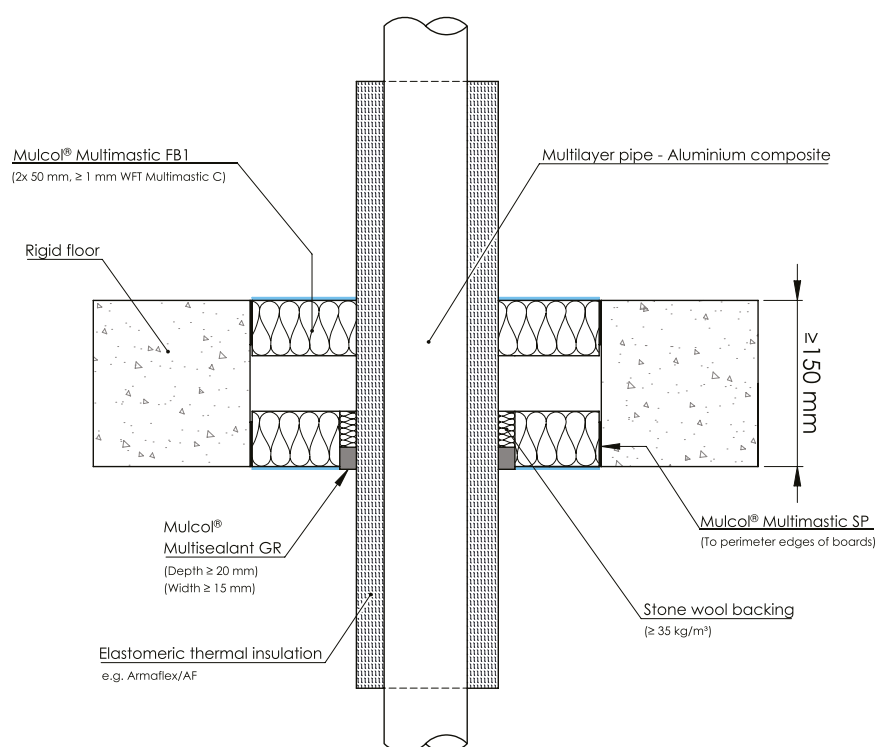
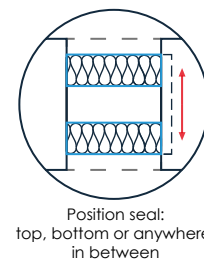
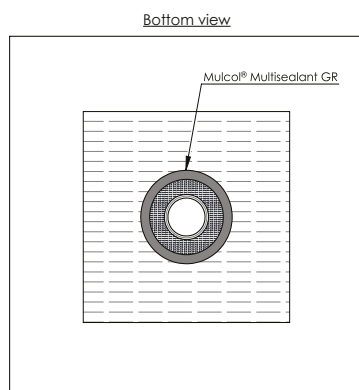


Drawing: PBrf.E-MLA-G1.4.22.LI

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Multilayer pipe (MLC)	≤ Ø 20	2.0	ArmaFlex AF (min. class B-s3, d0 B _L -s3, d0)	9 - 32	LI 300 / CI	Multisealant GR ≥ 15 x 20 (wxd)	Stone wool (≥ 35 kg/m ³)	EI 120 U/C
	≤ Ø 32	3.0						EI 90 U/C
	≤ Ø 40	3.5						E 120 U/C
	≤ Ø 50	4.0						EI 90 U/C
	≤ Ø 63	4.5						EI 90 U/C
	≤ Ø 75	6.0						

B.1.3 Rigid floors - Multilayer pipes (MLC) insulated

B.1.3.3 Multilayer pipes (MLC) - Elastomer LS 300 / CS - Multimastic FB1 cavity

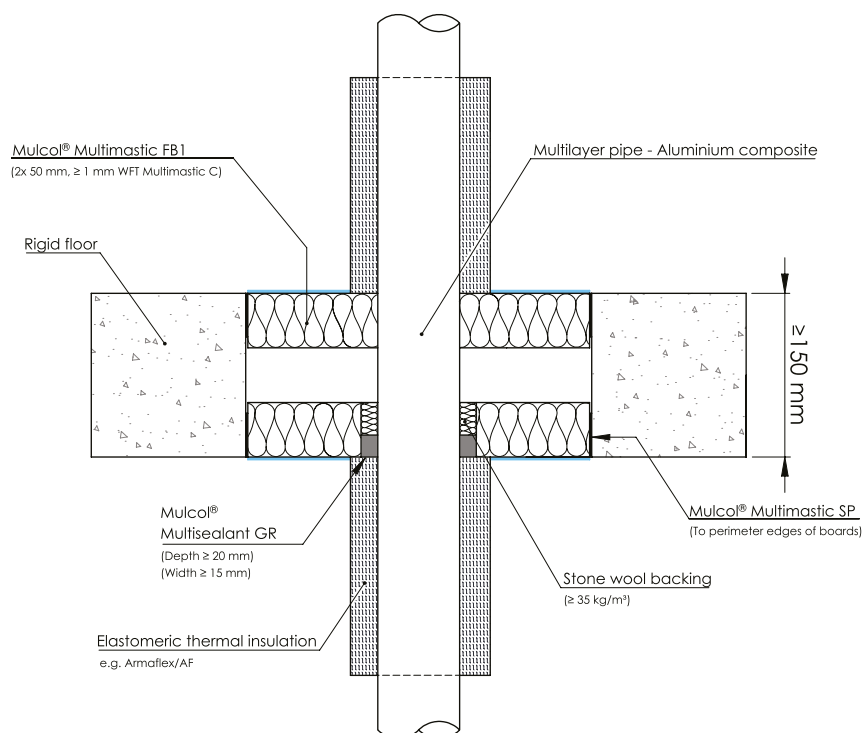
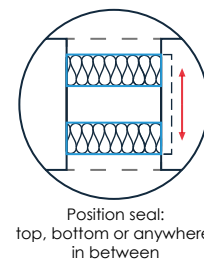
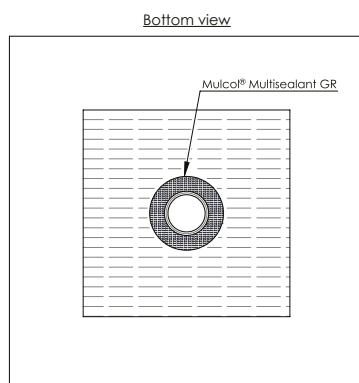


Drawing: PBrf.E-MLA-G1.4.22.C

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration		
Multilayer pipes (MLC)	≤ Ø 20	2.0	ArmaFlex AF (min. class B-s3, d0 B _L -s3, d0)	9 - 32	LS 400 / CS LI 400 / CI	Multisealant GR ≥ 15 x 20 (wxd)	EI 120 U/C
	≤ Ø 32	3.0					EI 90 U/C
	≤ Ø 40	3.5					E 120 U/C
	≤ Ø 50	4.0					EI 90 U/C
	≤ Ø 63	4.5					
	≤ Ø 75	6.0					

B.1.3 Rigid floors - Multilayer pipes (MLC) insulated

B.1.3.4 Multilayer pipes (MLC) - Elastomer LI 300 / CI - Multimastic FB1 cavity

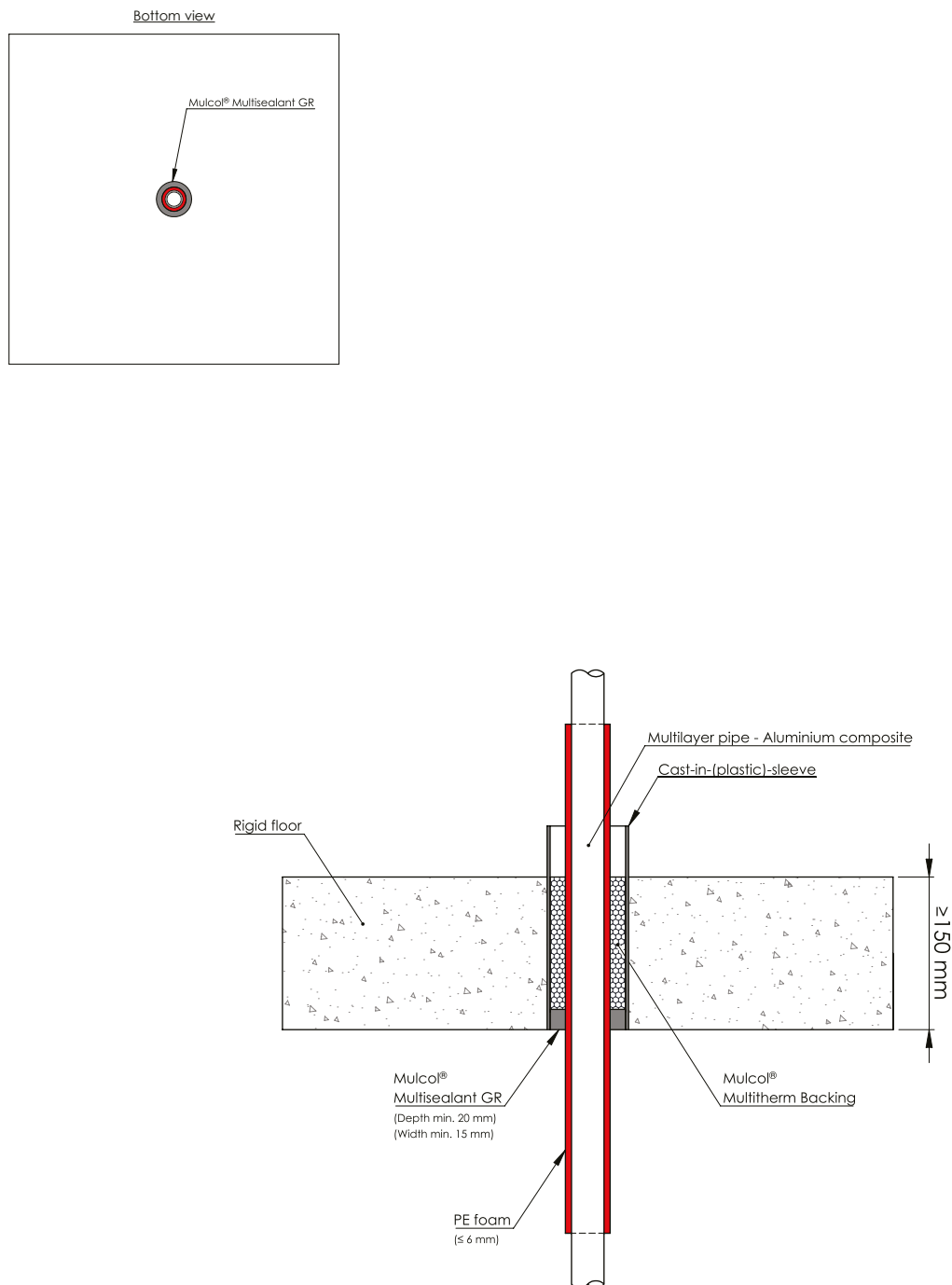


Drawing: PBrf.E-MLA-G1.4.22.C.LI

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Multilayer pipe (MLC)	≤ Ø 20	2.0	ArmaFlex AF (min. class B-s3, d0 B _L -s3, d0)	9 - 32	LI 300 / CI	Multisealant GR ≥ 15 x 20 (wxd)	Stone wool (≥ 35 kg/m³)	EI 120 U/C
	≤ Ø 32	3.0						EI 90 U/C
	≤ Ø 40	3.5						E 120 U/C
	≤ Ø 50	4.0						EI 90 U/C
	≤ Ø 63	4.5						EI 90 U/C
	≤ Ø 75	6.0						

B.1.3 Rigid floors - Multilayer pipes (MLC) insulated

B.1.3.5 Multilayer pipes (MLC) - PE foam LS 300 / CS

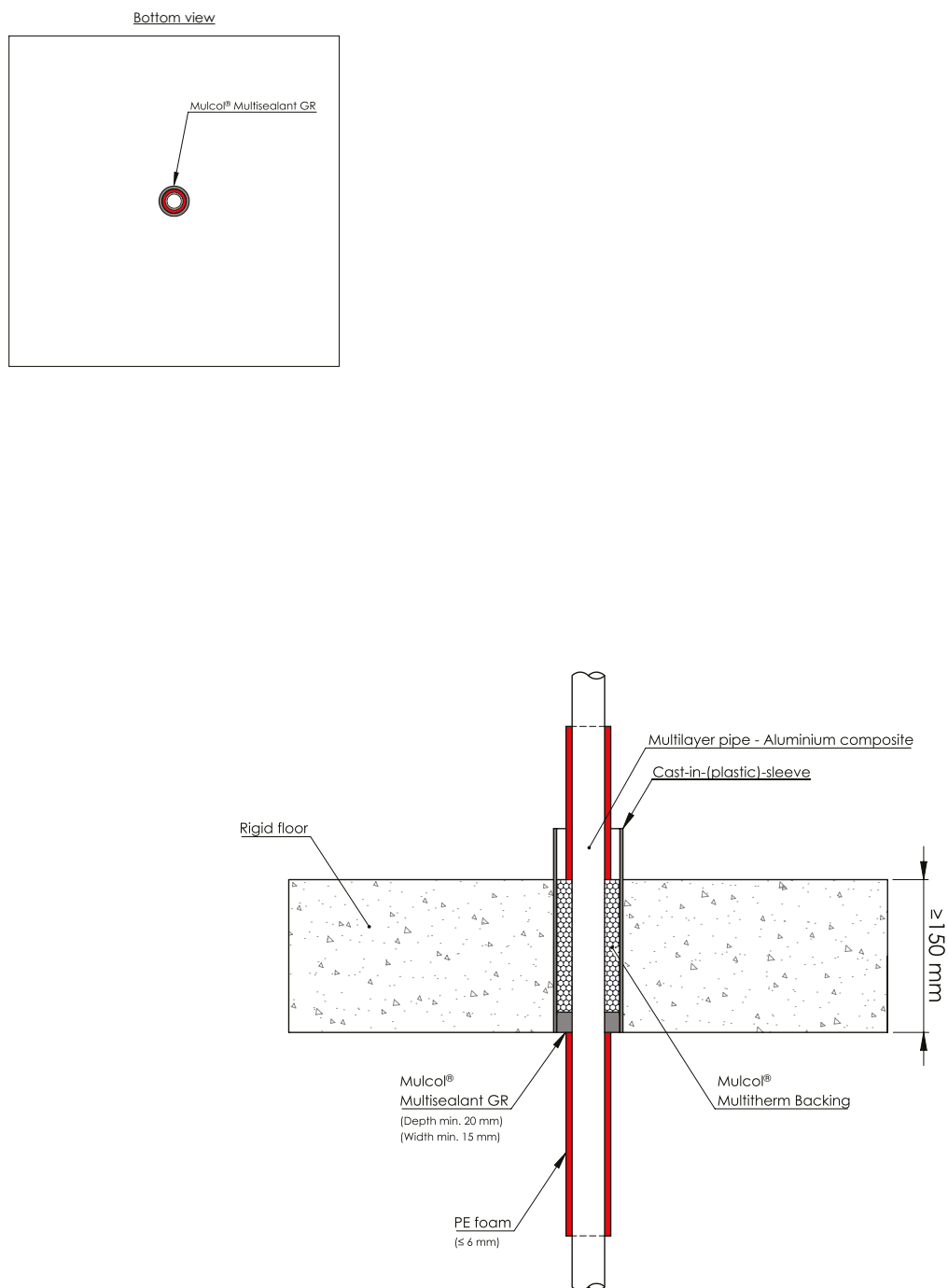


Drawing: RF.E-MLA_pr-G1.4.23

Services		Pipe dimensions (mm)		Insulation			Sealing (mm)	Backing	Classification
		Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Multilayer pipes (MLC)	with or without plastic cast-in sleeve ≤ Ø 110	≤ Ø 20	2.0	PE foam	≤ 6	LS 300 / CS	Multisealant GR ≥ 10 x 20 (wxd)	Multitherm backing fill entire depth	EI 120 U/C
		≤ Ø 25	3.5						
		≤ Ø 32	3.0						

B.1.3 Rigid floors - Multilayer pipes (MLC) insulated

B.1.3.6 Multilayer pipes (MLC) - PE foam LI 300 / CI

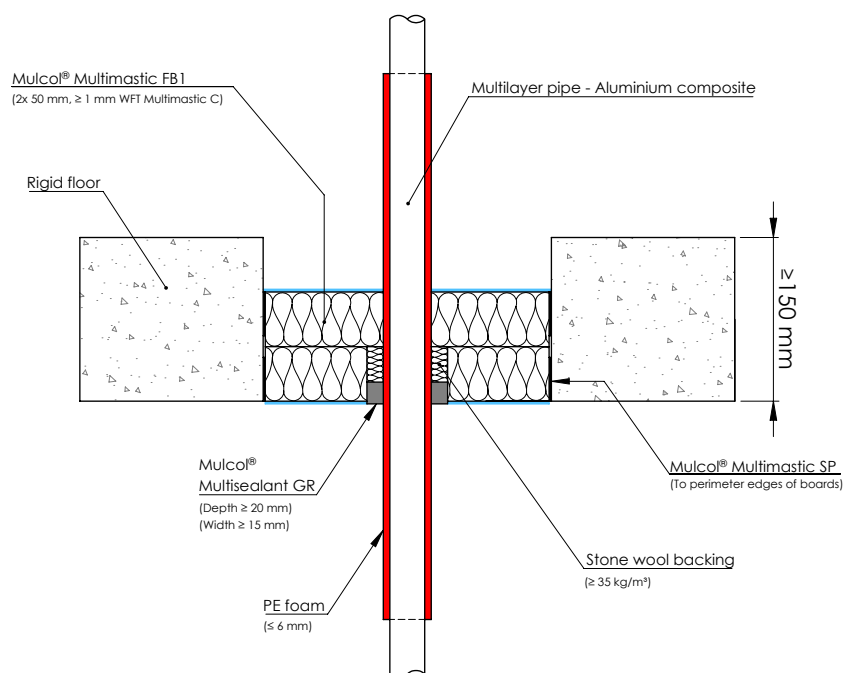
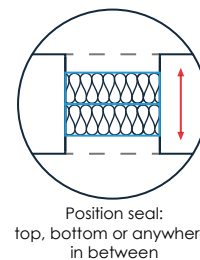
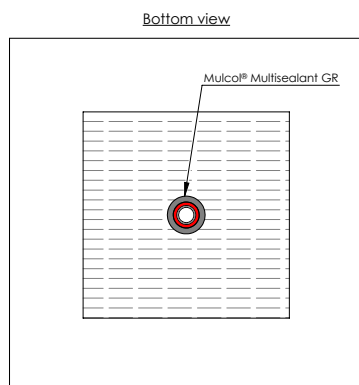


Drawing: RF.E-MLA_pr-G1.4.23.LI

Services		Pipe dimensions (mm)		Insulation			Sealing (mm)	Backing	Classification
		Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Multilayer pipes (MLC)	with or without plastic cast-in sleeve ≤ Ø 110	≤ Ø 20	2.0	PE foam	≤ 6	LI 300 / CI	Multisealant GR ≥ 10 x 20 (wxd)	Multitherm backing fill entire depth	EI 120 U/C
		≤ Ø 25	3.5						
		≤ Ø 32	3.0						

B.1.3 Rigid floors - Multilayer pipes (MLC) insulated

B.1.3.7 Multilayer pipes (MLC) - PE foam LS 300 / CS - Multimastic FB1

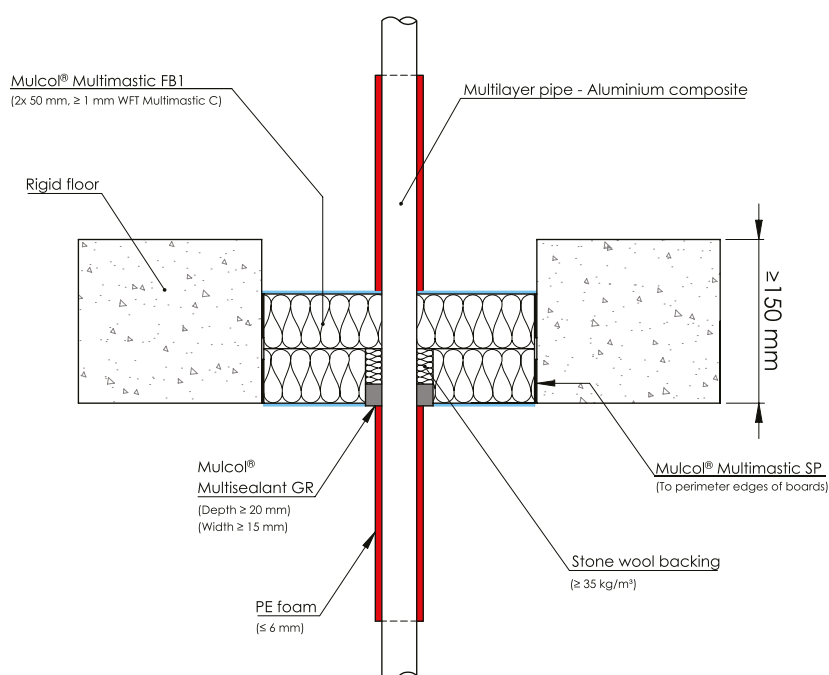
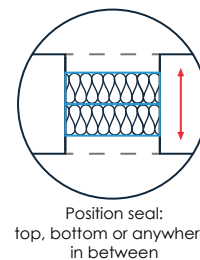
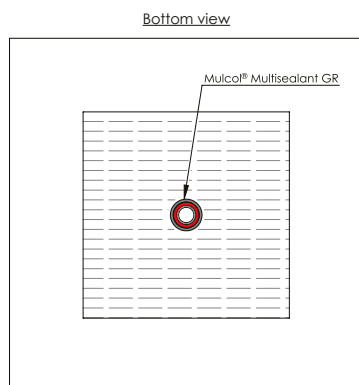


Drawing: PBrf.E-MLA_pr-G1.4.23

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Multilayer pipe (MLC)	≤ Ø 20	2.0	PE foam	≤ 6	LS 300 / CS	Multisealant GR ≥ 15 x 20 (wxd)	Stone wool (≥ 35 kg/m³)	EI 120 U/C
	≤ Ø 25	3.5						
	≤ Ø 32	3.0						

B.1.3 Rigid floors - Multilayer pipes (MLC) insulated

B.1.3.8 Multilayer pipes (MLC) - PE foam LI 300 / CI - Multimastic FB1

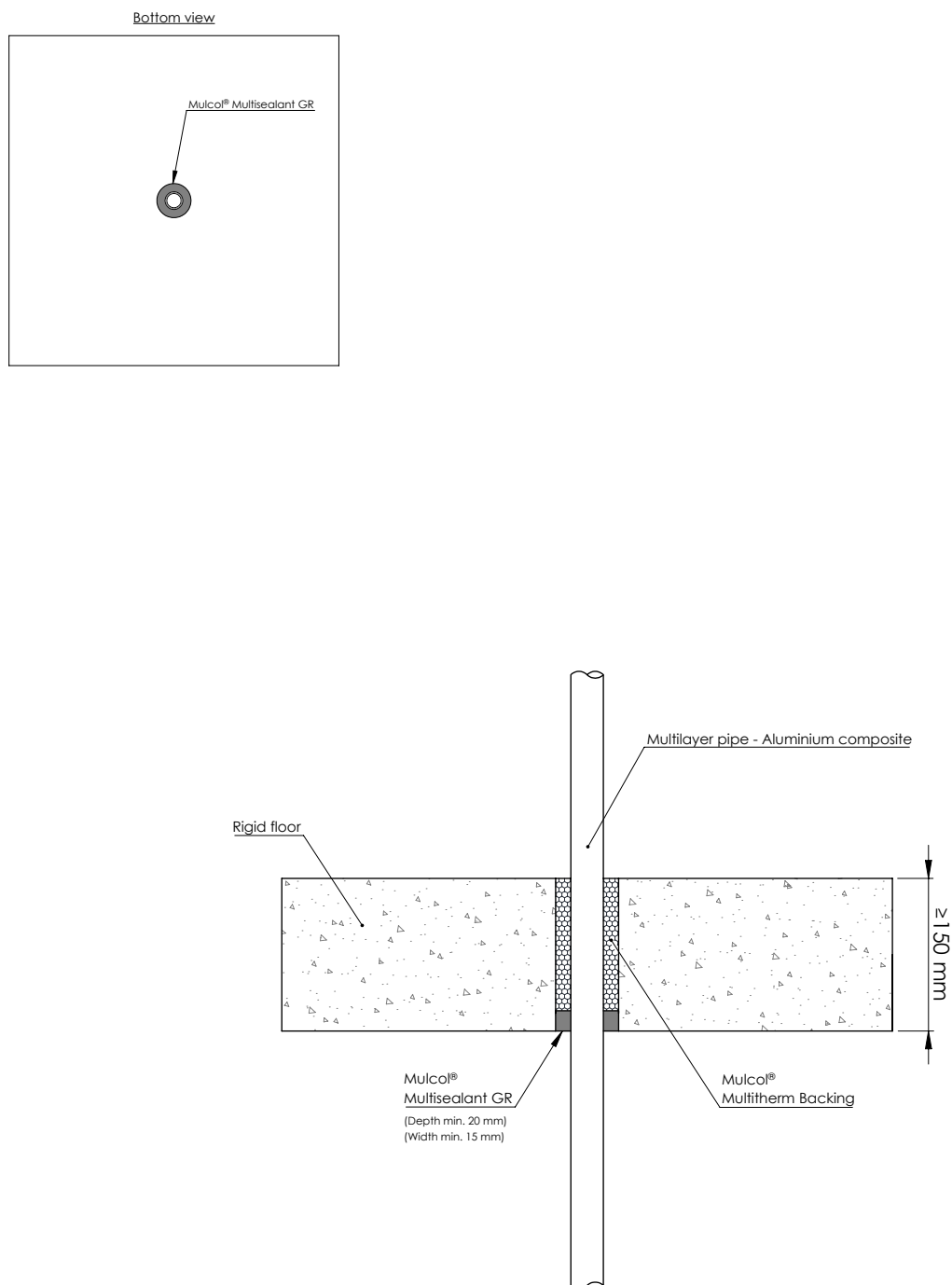


Drawing: PBrf.E-MLA_pr-G1.4.23.LI

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Multilayer pipe (MLC)	≤ Ø 20	2.0	PE foam	≤ 6	LI 300 / CI	Multisealant GR ≥ 15 x 20 (wxd)	Stone wool (≥ 35 kg/m ³)	EI 120 U/C
	≤ Ø 25	3.5						
	≤ Ø 32	3.0						

B.1.4 Rigid floors - Multilayer pipes (MLC) uninsulated

B.1.4.1 Multilayer pipes (MLC)

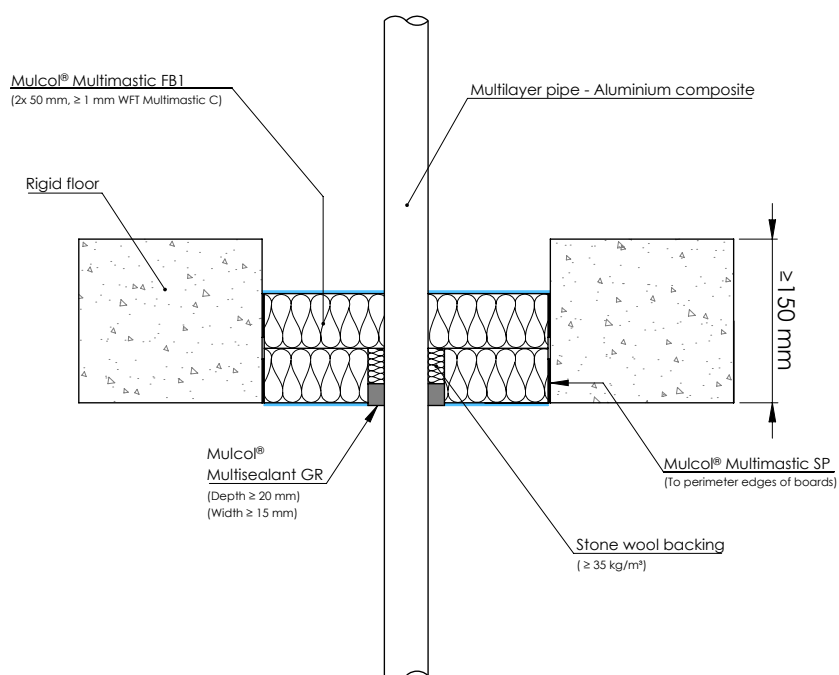
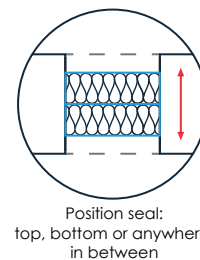
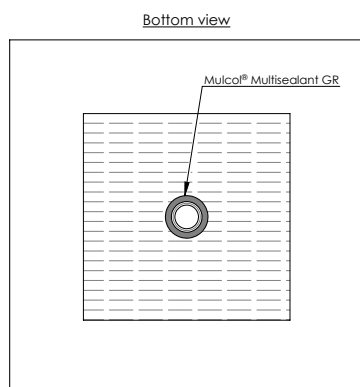


Drawing: RF.E-MLA-G1.4.10

Services		Pipe dimensions (mm)		Sealing (mm)	Backing	Classification
		Outer dimension	Wall thickness			
Multilayer pipes (MLC)	with or without plastic cast-in sleeve ≤ Ø 110 mm	≤ Ø 20	2.0	Multisealant GR ≥ 15 x 20 (wxd)	Multitherm backing fill entire depth	EI 120 U/C
		≤ Ø 25	3.5			
		≤ Ø 32	3.0			
		≤ Ø 40	3.5			
		≤ Ø 40	4.0			

B.1.4 Rigid floors - Multilayer pipes (MLC)

B.1.4.2 Multilayer pipes (MLC) - Multimastic FB1

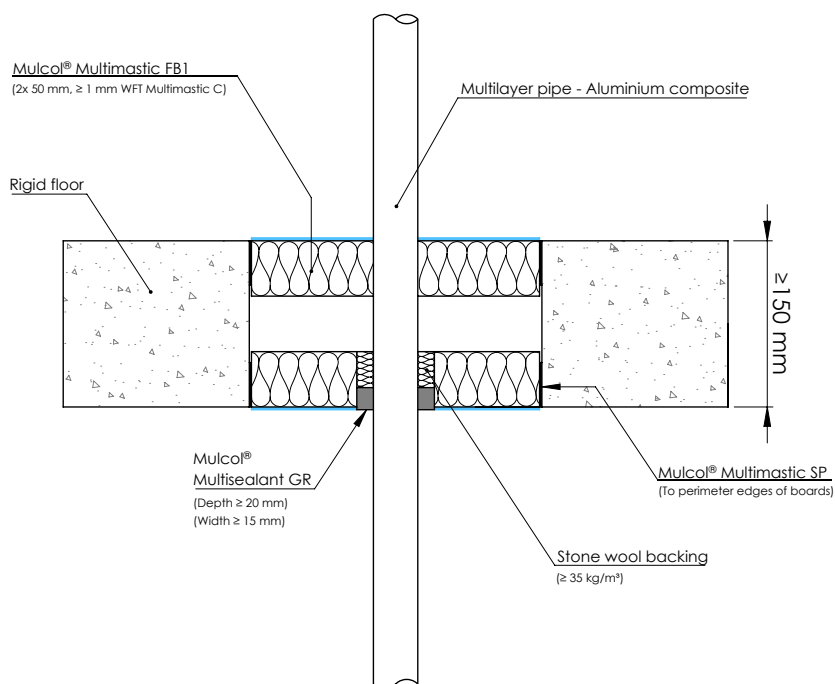
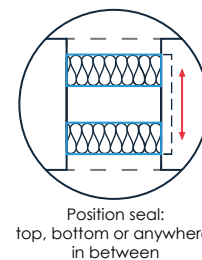
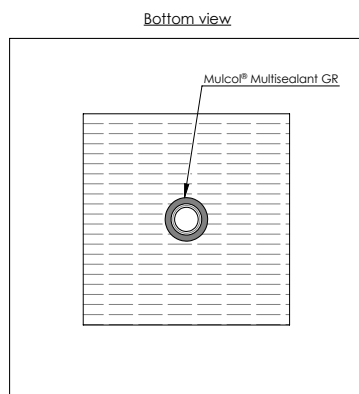


Drawing: PBrf.E-MLA-G1.4.10

Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness			
Multilayer pipes (MLC)	≤ Ø 20	2.0	Multisealant GR ≥ 15 x 25 (wxd)	Stone wool (≥ 35 kg/m³)	EI 120 U/C
	≤ Ø 25	3.5			
	≤ Ø 32	3.0			EI 90 U/C E 120 U/C
	≤ Ø 40	3.5 - 4.0			

B.1.4 Rigid floors - Multilayer pipes (MLC)

B.1.4.3 Multilayer pipes (MLC) - Multimastic FB1 cavity

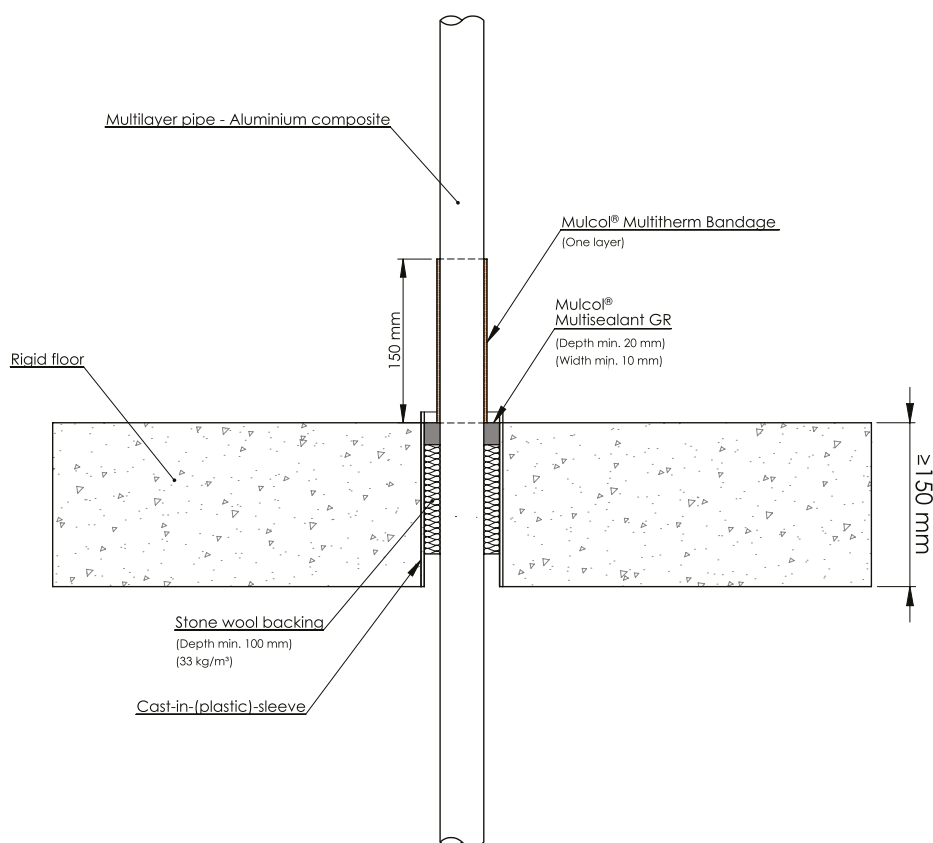
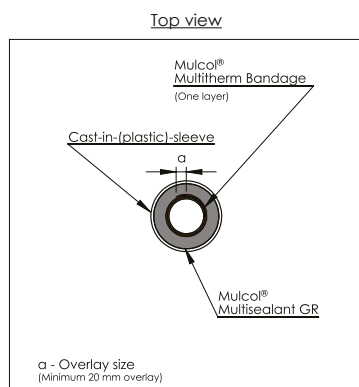


Drawing: PBrf.E-MLA-G1.4.10.C

Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness			
Multilayer pipes (MLC)	≤ Ø 20	2.0	Multisealant GR ≥ 15 x 25 (wxd)	Stone wool (≥ 35 kg/m³)	EI 120 U/C
	≤ Ø 25	3.5			
	≤ Ø 32	3.0			EI 90 U/C EI 120 U/C
	≤ Ø 40	3.5 - 4.0			

B.1.4 Rigid floors - Multilayer pipes (MLC)

B.1.4.4 Multilayer pipes (MLC) - Multitherm bandage

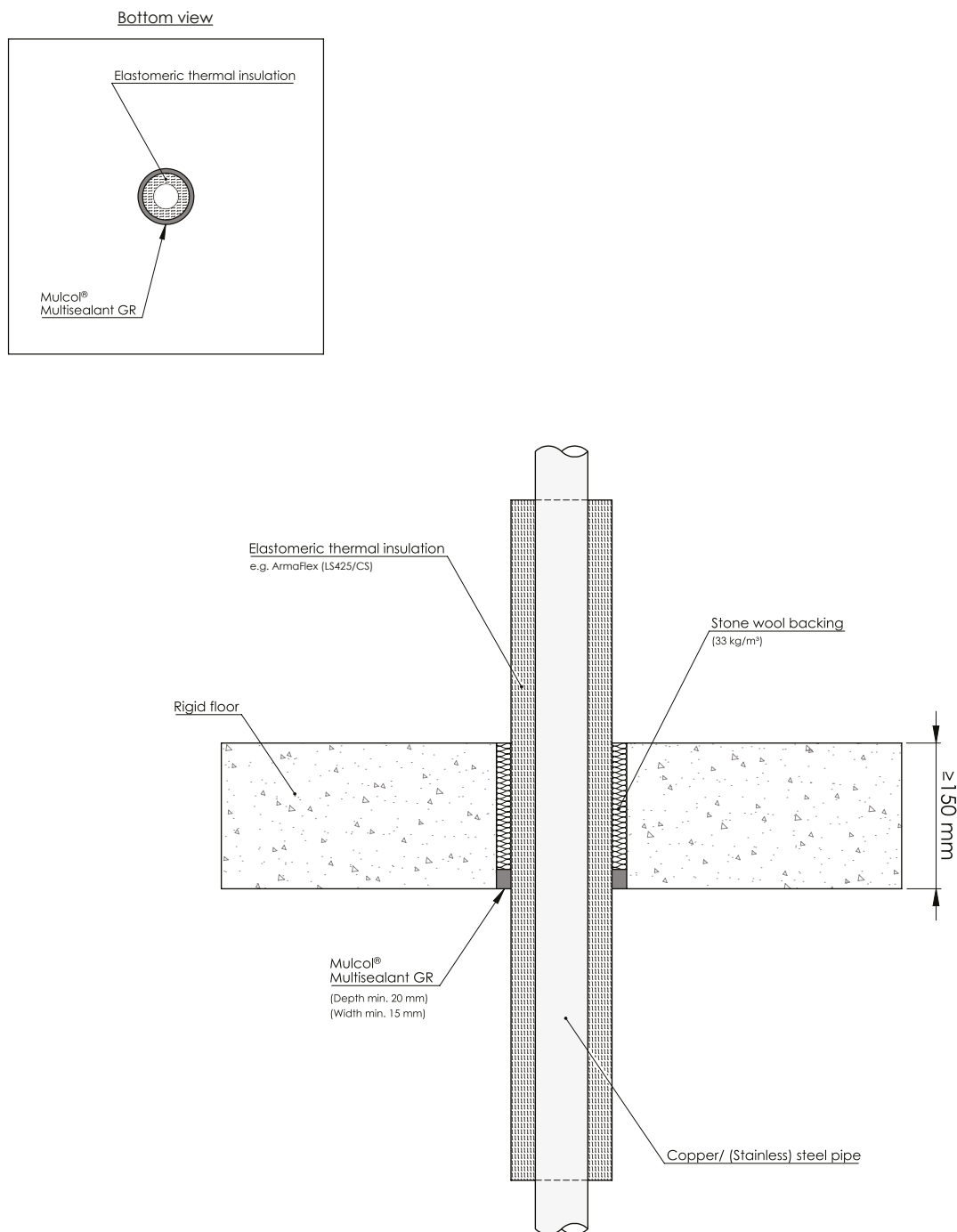


Drawing: RF.E-MLA-G3.18.92

Services		Pipe dimensions (mm)	Sealing (mm)	Backing	Multitherm Bandage	Classification
		Outer dimension				
Multilayer pipes (MLC)	with or without plastic cast-in sleeve ≤ Ø 75 mm	≤ Ø 40	Multisealant GR ≥ 15 x 20 (wxd)	≥ 100 mm stone wool (≥ 33 kg/m³)	LI 150 one layer top of floor	EI 120 U/C

B.1.5 Rigid floors - Metal pipes insulated elastomer

B.1.5.1 Copper and steel pipes - Elastomer LS 450 / CS

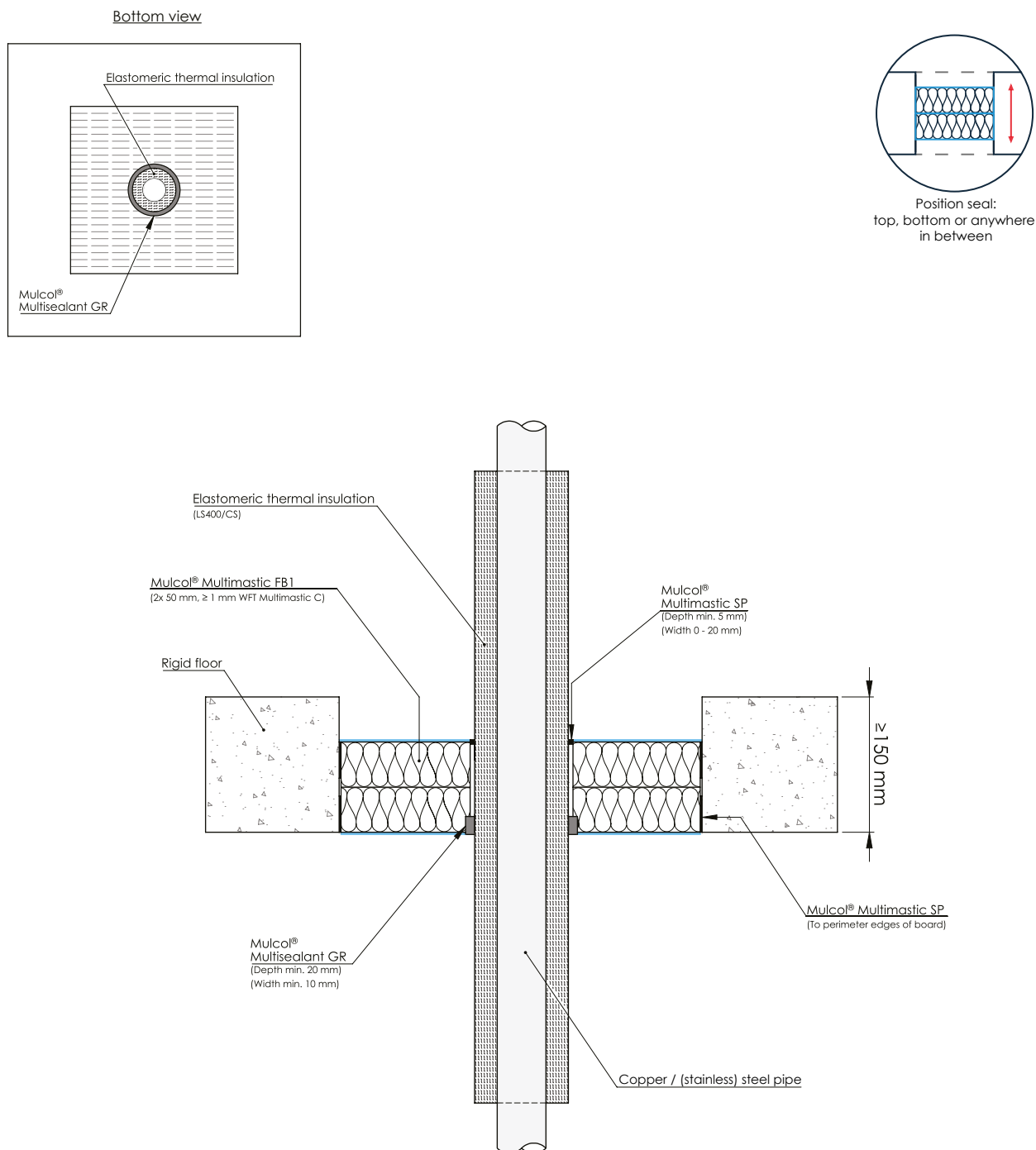


Drawing: RF.E-CU-G1.4.22_LS425

Services	Pipe dimensions (mm)		Insulation			Sealing (mm)	Backing	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Copper / (stainless) steel / cast iron	≤ Ø 54	≥ 1.5	ArmaFlex AF (min. class B-s3, d0 B _L -s3, d0)	25	LS 450 / CS	Multisealant GR ≥ 10 x 20 (wxd)	Stone wool fill entire depth (≥ 33 kg/m³)	EI 60 C/U E 120 C/U
				25	CS			EI 120 C/U
(Stainless) Steel / cast iron	≤ Ø 168.3	≥ 4.5		25	LS 450 / CS			EI 60 C/U E 90 C/U

B.1.5 Rigid floors - Metal pipes insulated elastomer

B.1.5.2 Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB1



Drawing: PBrf.E-CU-MFB1-G2.4.22

Services	Pipe dimensions (mm)		Insulation			Product (mm)	Sealing (mm)	Classification		
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration					
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex AF (min. class B-s3, d0 B _L -s3, d0)	8.5	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	Multimastic SP 0-20 x ≥ 5 (wxd) top of floor	EI 60 C/U, E 120 C/U		
				8.5 - 33.5				EI 60 C/U, E 90 C/U		
	≤ Ø 54	≥ 1.5		13.5	CS			EI 120 C/U		
				13.5 - 38	LS 400 / CS			EI 90 C/U, E 120 C/U		
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		8.5 - 35				LS 400 / CS	EI 120 C/U	
				≤ Ø 114.3	≥ 3.6				15	CS
			15 - 43						LS 400 / CS	

B.1.5 Rigid floors - Metal pipes insulated elastomer

B.1.5.2 Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB1

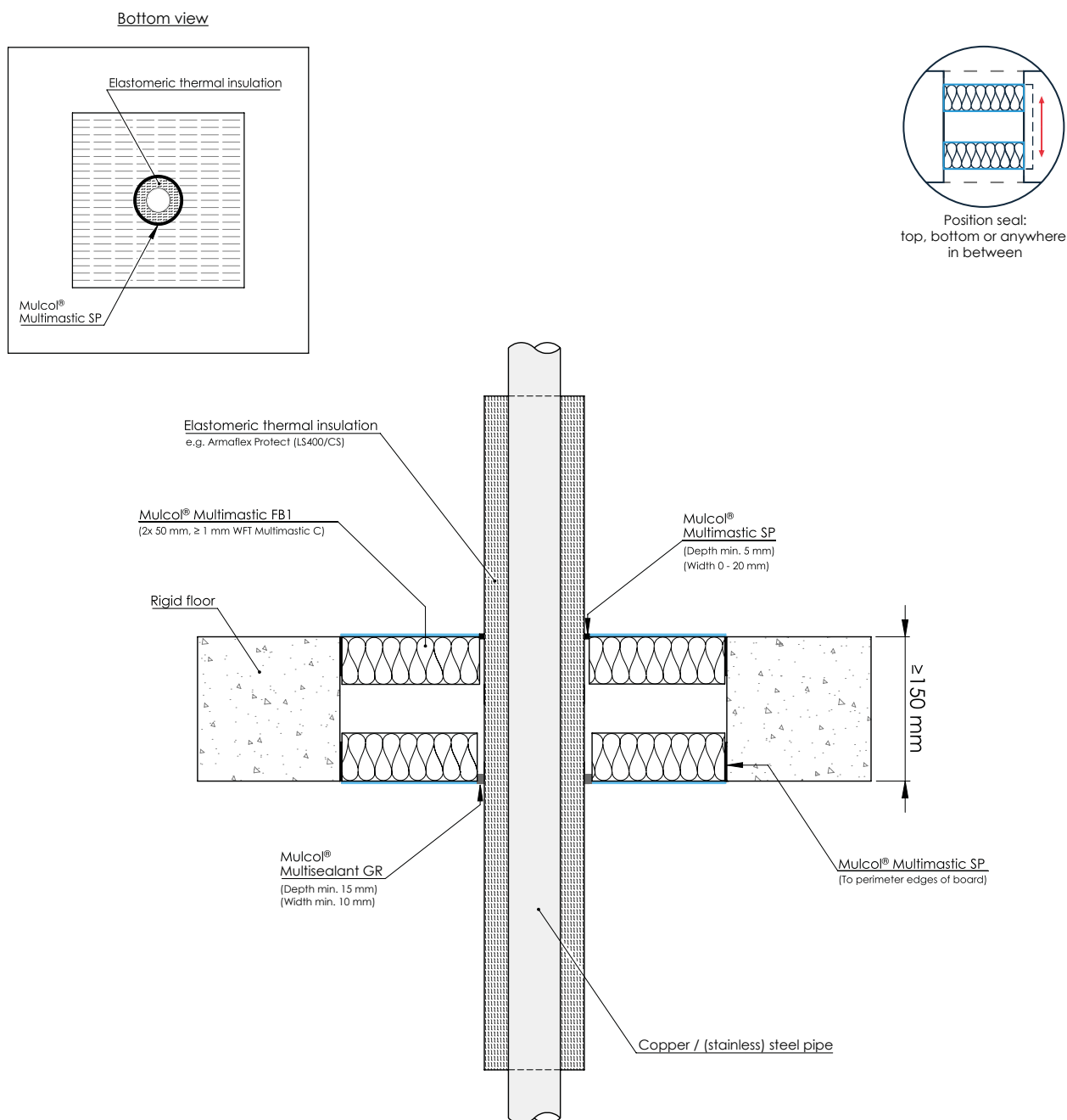
Services	Pipe dimensions (mm)		Insulation			Product (mm)	Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3	Kaiflex KK (min. class B-s2, d0 B _L -s2, d0)	8.5	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	Multimastic SP 0-20 x ≥ 5 (wxd) top of floor	EI 60 C/U E 120 C/U

Services	Pipe dimensions (mm)		Insulation			Product (mm)	Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex NH (min. class D-s3, d0 D _L -s3, d0)	9 - 25	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	Multimastic SP 0-20 x ≥ 5 (wxd) top of floor	EI 120 C/U
	≤ Ø 54	≥ 1.5		13	LS 400 / CS			EI 90 C/U
				13 - 25	LS 400 / CS			
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		9 - 25	LS 400 / CS			EI 120 C/U
	≤ Ø 114.3	≥ 3.6		19 - 25	LS 400 / CS			

Services	Pipe dimensions (mm)		Insulation			Product (mm)	Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex Ultima (min. class B-s1, d0 B _L -s1, d0)	9 - 25	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd)	Multimastic SP 0-20 x ≥ 5 (wxd) top of floor	EI 60 C/U E 120 C/U
				25 - 32				EI 90 C/U E 120 C/U
				13 - 32				EI 60 C/U E 120 C/U
	≤ Ø 54	≥ 1.5		13 - 32	CS			EI 90 C/U E 120 C/U
				32	EI 90 C/U			
				(Stainless) Steel / cast iron	≤ Ø 26.9			≥ 2.3
25	EI 90 C/U E 120 C/U							
13								
≤ Ø 114.3	≥ 3.6	13 - 32			EI 60 C/U E 120 C/U			

B.1.5 Rigid floors - Metal pipes insulated elastomer

B.1.5.3 Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB1 cavity



Drawing: PBrf.E-CU-MFB1-G2.2.22.LS.C

Services	Pipe dimensions (mm)		Insulation			Product (mm)	Sealing (mm)	Classification	
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration				
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex AF (min. class B-s3, d0 B _L -s3, d0)	8.5	LS 400 / CS	Multisealant GR ≥ 10 x 15 (wxd)	Multimastic SP 0-20 x ≥ 5 (wxd) top of floor	EI 60 C/U E 120 C/U	
				8.5 - 33.5				EI 60 C/U E 90 C/U	
	≤ Ø 54	≥ 1.5		13.5	CS			EI 120 C/U	
				13.5 - 38	LS 400 / CS			EI 90 C/U E 120 C/U	
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		8.5 - 35	CS			EI 120 C/U	
	≤ Ø 114.3	≥ 3.6		15				EI 90 C/U E 120 C/U	
				15 - 43	LS 400 / CS				

B.1.5 Rigid floors - Metal pipes insulated elastomer

B.1.5.3 Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB1

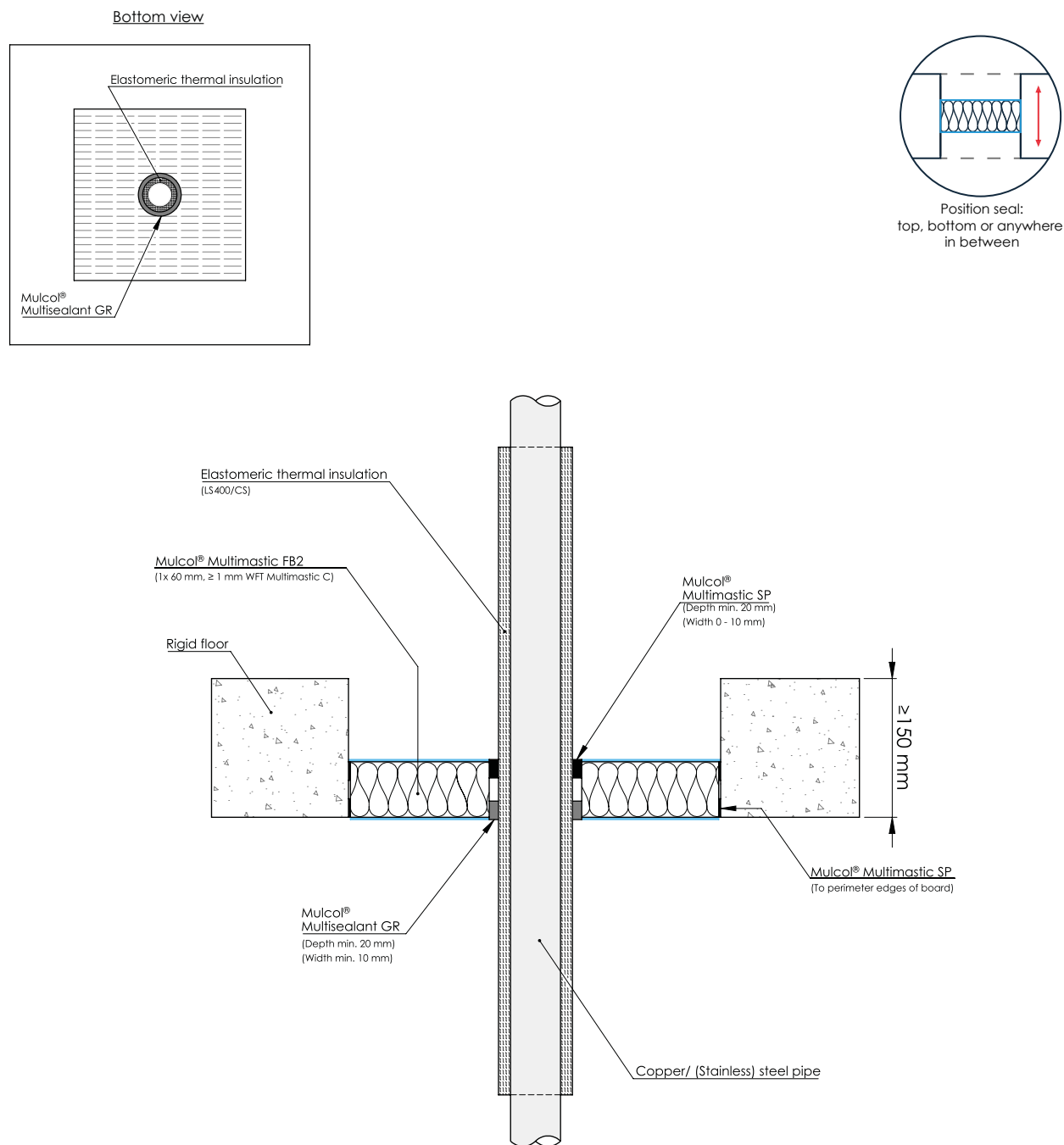
Services	Pipe dimensions (mm)		Insulation			Product (mm)	Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
(Stainless) Steel / cast iron	$\leq \varnothing 26.9$	≥ 2.3	Kaiflex KK min. class B-s2, d0 B _L -s2, d0	8.5	LS 400 / CS	Multisealant GR $\geq 10 \times 15$ (wxd)	Multimastic SP 0-20 x ≥ 5 (wxd) top of floor	EI 60 C/U E 120 C/U

Services	Pipe dimensions (mm)		Insulation			Product (mm)	Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex NH (min. class D-s3, d0 D _L -s3, d0)	9 - 25	LS 400 / CS	Multisealant GR ≥ 10 x 15 (wxd)	Multimastic SP 0-20 x ≥ 5 (wxd) top of floor	EI 120 C/U
	≤ Ø 54	≥ 1.5		13	LS 400 / CS			EI 90 C/U
				13 - 25	LS 400 / CS			
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		9 - 25	LS 400 / CS			EI 120 C/U
	≤ Ø 114.3	≥ 3.6	19 - 25	LS 400 / CS				

Services	Pipe dimensions (mm)		Insulation			Product (mm)	Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex Ultima (min. class B-s1, d0 B _L -s1, d0)	9 - 25	LS 400 / CS	Multisealant GR ≥ 10 x 15 (wxd)	Multimastic SP 0-20 x ≥ 5 (wxd) top of floor	EI 60 C/U E 120 C/U
				25 - 32				EI 90 C/U E 120 C/U
	≤ Ø 54	≥ 1.5		13 - 32				CS
				13 - 32	EI 90 C/U E 120 C/U			
				32	LS 400 / CS			EI 90 C/U
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		9 - 25				EI 60 C/U E 90 C/U
				25				EI 90 C/U E 120 C/U
				13				
	≤ Ø 114.3	≥ 3.6		13 - 32	EI 60 C/U E 120 C/U			

B.1.5 Rigid floors - Metal pipes insulated elastomer

B.1.5.4 Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB2



Drawing: PBrf.E-CU-MFB2-G2.4.22.LS

Services	Pipe dimensions (mm)		Insulation			Product (mm)	Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex AF (min. class B-s3, d0 B _L -s3, d0)	8.5 - 35	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd) bottom of floor	Multimastic SP 0-10 x ≥ 20 (wxd) top of floor	EI 60 C/U
				33,5				EI 120 C/U
				13.5				EI 60 C/U
(Stainless) Steel / cast iron	≤ Ø 54	≥ 1.5		13.5 - 38				EI 45 C/U
				8.5 - 35				E 120 C/U
	≤ Ø 26.9	≥ 2.3		33.5				EI 60 C/U
				13.5				EI 90 C/U
	≤ Ø 114.3	≥ 3.6		15 - 43				EI 120 C/U
								EI 60 C/U E 120 C/U

B.1.5 Rigid floors - Metal pipes insulated elastomer**B.1.5.4 Copper and steel pipes - Elastomer LS 400 / CS - Multimastic FB2**

Services	Pipe dimensions (mm)		Insulation			Product (mm)	Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
(Stainless) Steel / cast iron	$\leq \varnothing 26.9$	≥ 2.3	Kaiflex KK (min. class B-s2, d0 B _L -s2, d0)	8.5	LS 400 / CS	Multisealant GR $\geq 10 \times 20$ (wxd) bottom of floor	Multimastic SP 0-20 x ≥ 10 (wxd) top of floor	EI 45 C/U

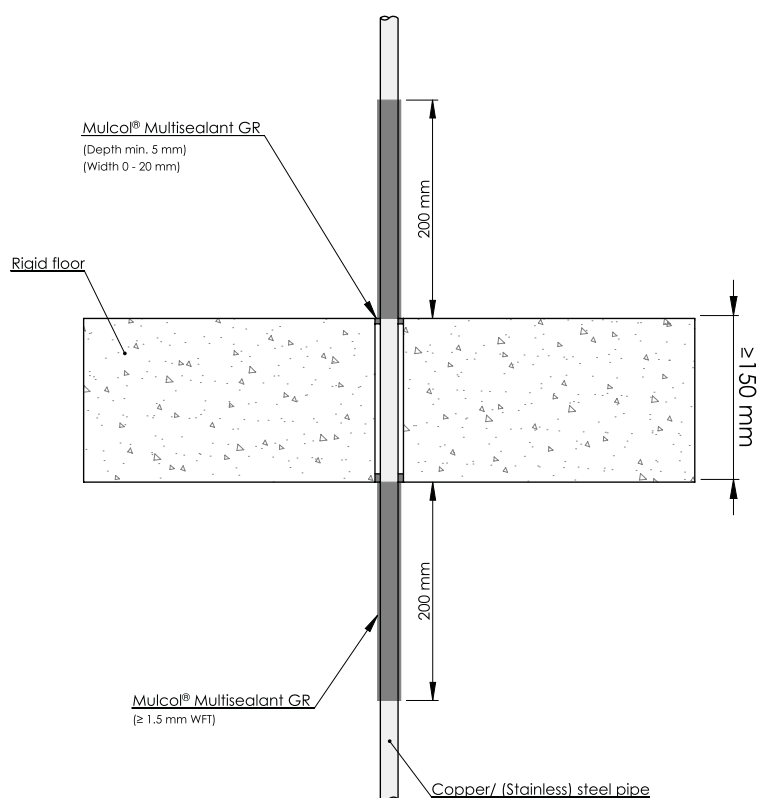
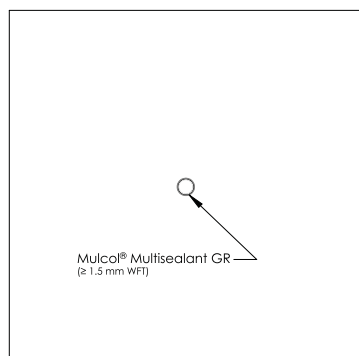
Services	Pipe dimensions (mm)		Insulation			Product (mm)	Sealing (mm)	Classification
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex NH (min. class D-s3, d0 D _L -s3, d0)	9 - 25	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd) bottom of floor	Multimastic SP 0-20 x ≥ 10 (wxd) top of floor	EI 60 C/U E 90 C/U
	≤ Ø 54	≥ 1.5		13 - 25				EI 60 C/U
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		9 - 25				EI 30 C/U
	≤ Ø 26.9	≥ 2.3		25				EI 60 C/U E 120 C/U
	≤ Ø 114.3	≥ 3.6		19				EI 30 C/U E 120 C/U
				19 - 25				EI 45 C/U E 120 C/U

Services	Pipe dimensions (mm)		Insulation			Product (mm)	Sealing (mm)	Classification				
	Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration							
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	ArmaFlex Ultima (min. class B-s1, d0 B _L -s1, d0)	9 - 25	LS 400 / CS	Multisealant GR ≥ 10 x 20 (wxd) bottom of floor	Multimastic SP 0-20 x ≥ 10 (wxd) top of floor	EI 30 C/U E 120 C/U				
				25 - 32				EI 60 C/U E 120 C/U				
	≤ Ø 54	≥ 1.5		13 - 32				EI 45 C/U E 120 C/U				
				32				EI 90 C/U				
(Stainless) Steel / cast iron	≤ Ø 26.9	≥ 2.3		9 - 25								EI 60 C/U E 120 C/U
				25								EI 90 C/U E 120 C/U
	≤ Ø 114.3	≥ 3.6		13								EI 120 C/U
				13 - 32								EI 60 C/U E 120 C/U

B.1.6 Rigid floors - Metal pipes uninsulated

B.1.6.1 Copper and steel pipes

Bottom view

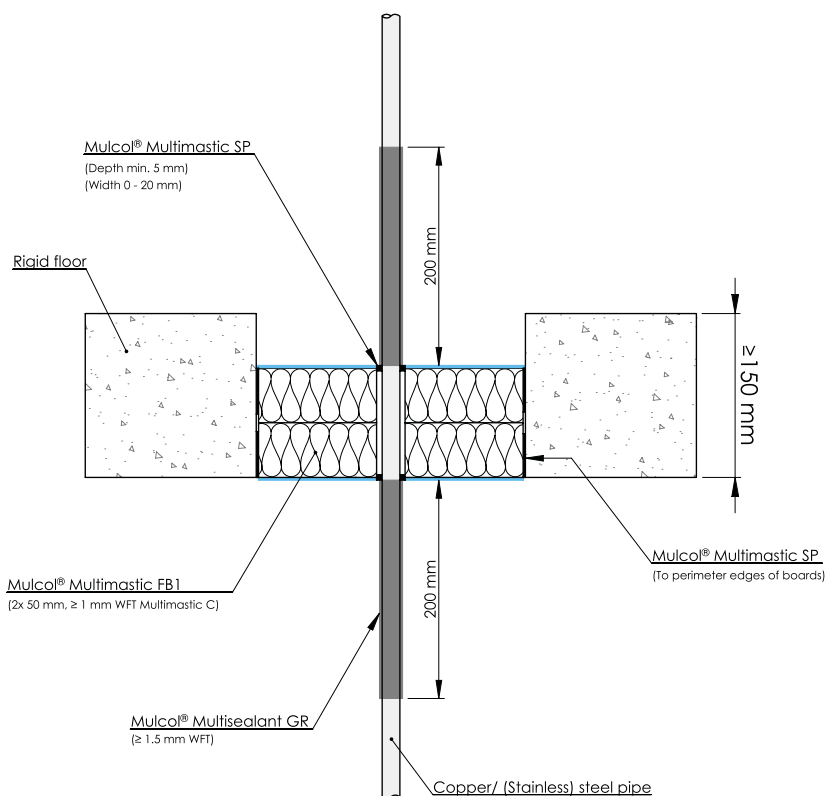
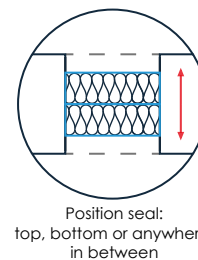
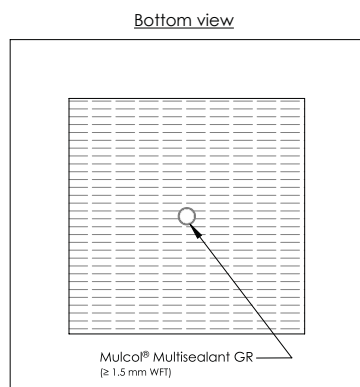


Drawing: RF-CU-GRC-G2.0.10

Services	Pipe dimensions (mm)		Coating	Sealing (mm)	Classification
	Outer dimension	Wall thickness			
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.0	Coat back 200 mm ≥ 1.5 mm WFT Multisealant GR	Multisealant GR 0-20 x ≥ 5 (wxd)	EI 120 C/U
(Stainless) steel / cast iron	≤ Ø 15				
	≤ Ø 42.4	≥ 3.2			
	≤ Ø 60.3	≥ 3.65			

B.1.6 Rigid floors - Metal pipes uninsulated

B.1.6.2 Copper and steel pipes - Multimastic FB1



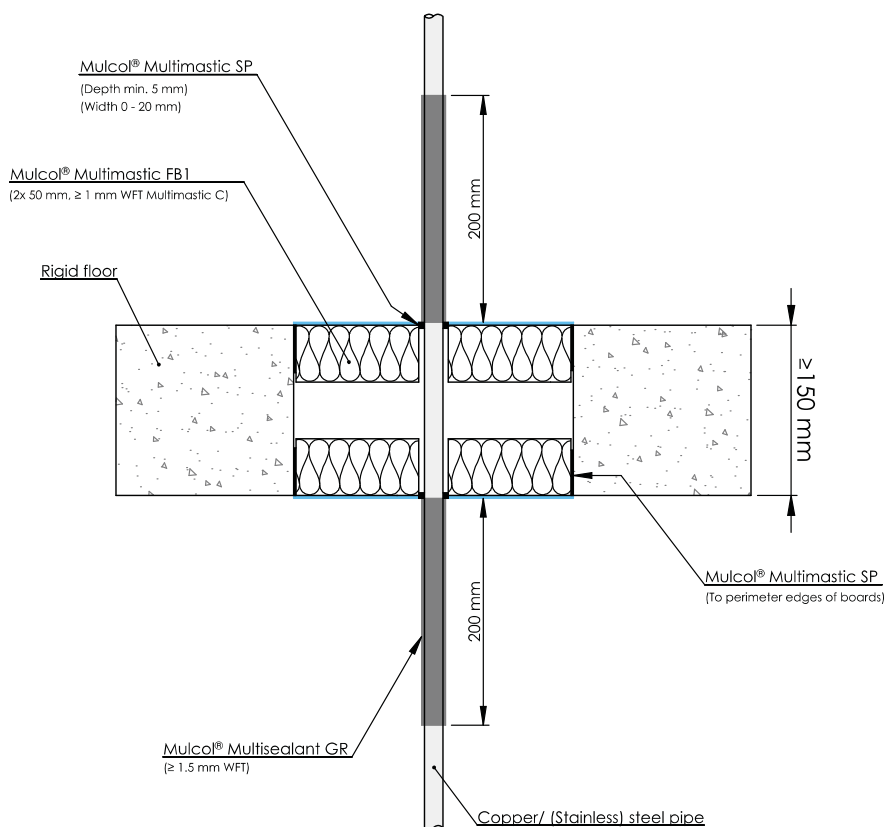
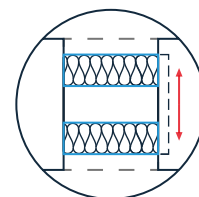
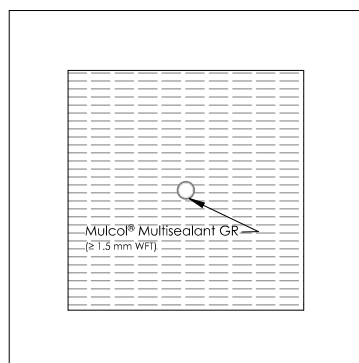
Drawing: PBrf.E-CU-MFB1-GRC.1.10

Services	Pipe dimensions (mm)		Coating	Sealing (mm)	Classification
	Outer dimension	Wall thickness			
Copper / (stainless) steel / cast iron	≤ Ø 15	≥ 1.0	Coat back 200 mm ≥ 1.5 mm WFT Multisealant GR	Multimastic SP 0-20 x ≥ 5 (wxd)	EI 60 C/U, E 90 C/U
(Stainless) steel / cast iron	≤ Ø 42.4	≥ 3.2			

B.1.6 Rigid floors - Metal pipes uninsulated

B.1.6.3 Copper and steel pipes - Multimastic FB1 cavity

Bottom view

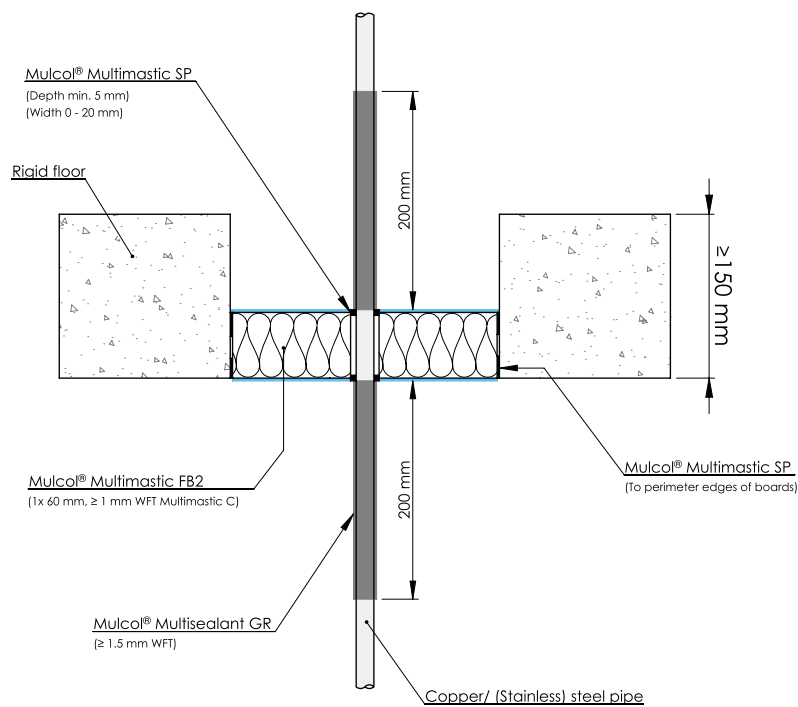
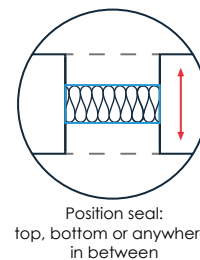
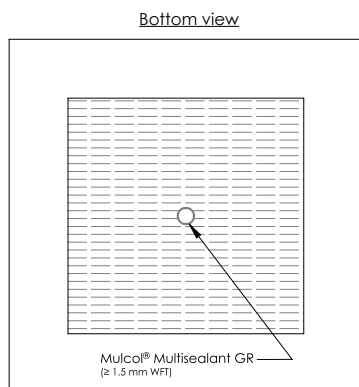


Drawing: PBrf.E-CU-MFB1-GRC.1.10.C

Services	Pipe dimensions (mm)		Coating	Sealing (mm)	Classification
	Outer dimension	Wall thickness			
Copper	≤ Ø 15	≥ 1.0	Coat back 200 mm ≥ 1.5 mm WFT Multisealant GR	Multimastic SP 0-20 x ≥ 5 (wxd)	EI 60 C/U, E 120 C/U
(Stainless) Steel / cast iron					EI 120 C/U
	≤ Ø 42.4	≥ 3.2			

B.1.6 Rigid floors - Metal pipes uninsulated

B.1.6.4 Copper and steel pipes - Multimastic FB2

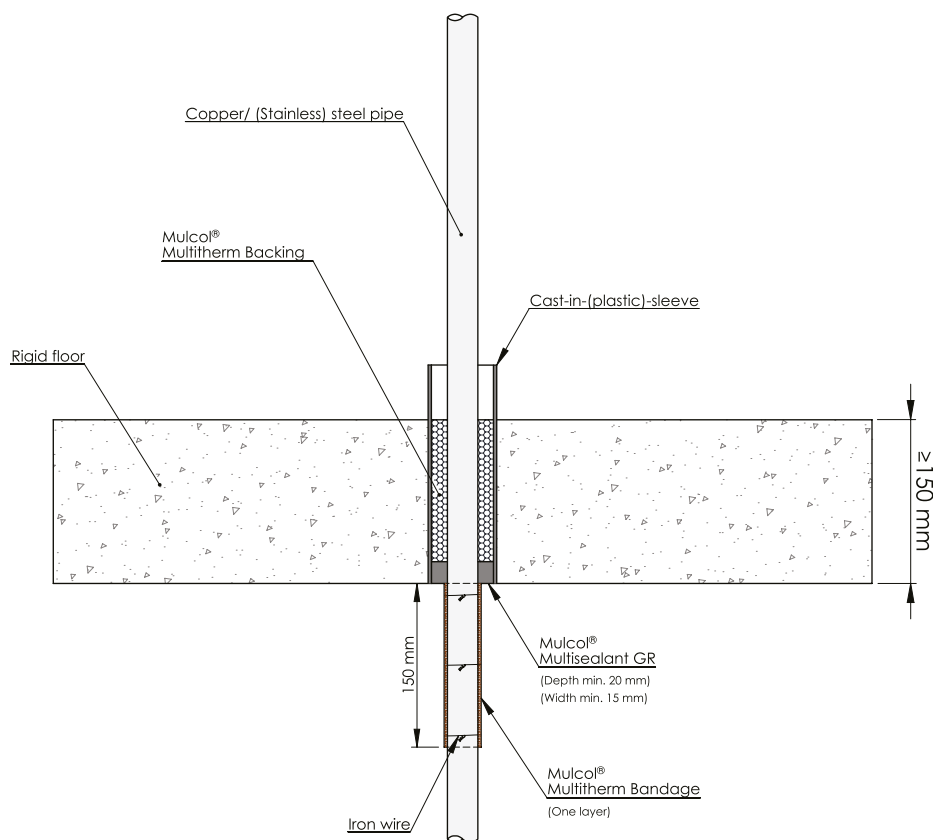
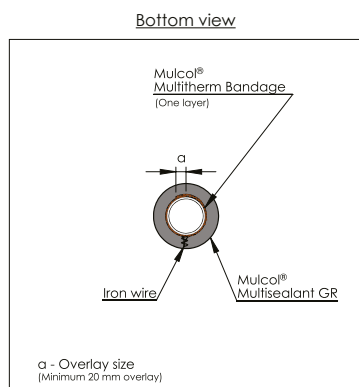


Drawing: PBrf.E-CU-MFB2-GRC.1.10

Services	Pipe dimensions (mm)		Coating	Sealing (mm)	Classification
	Outer dimension	Wall thickness			
Copper / (stainless) steel / cast iron	≤ Ø 15	≥ 1.0	Coat back 200 mm ≥ 1.5 mm WFT Multisealant GR	Multimastic SP 0-20 x ≥ 5 (wxd)	EI 60 C/U, E 90 C/U
(Stainless) steel / cast iron	≤ Ø 42.4	≥ 3.2			

B.1.6 Rigid floors - Metal pipes uninsulated

B.1.6.5 Copper and steel pipes - Multitherm bandage - Bottom of floor

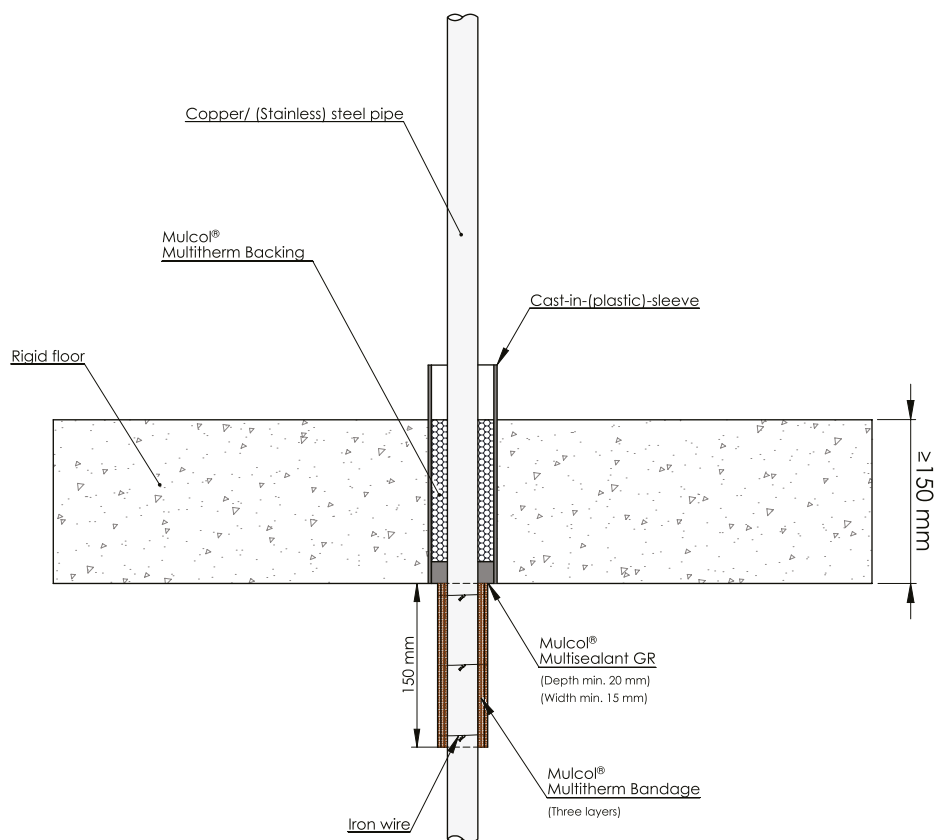
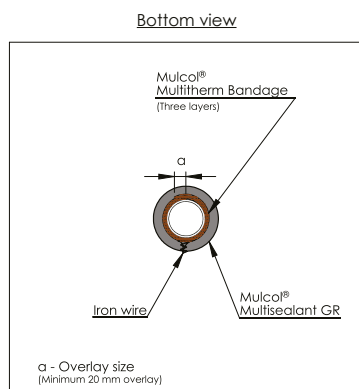


Drawing: RF.E-CU-G1.4.90

Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Multitherm Bandage	Classification
	Outer dimension	Wall thickness				
Copper / (stainless) steel / cast iron	≤ Ø 35	≥ 1.5	Multisealant GR ≥ 15 x 20 (wxd) bottom of floor	Multitherm backing fill entire depth	LI 150 one layer (three wires) bottom of floor	EI 30 C/U, E 120 C/U

B.1.6 Rigid floors - Metal pipes uninsulated

B.1.6.6 Copper and steel pipes - Multitherm Bandage - Bottom of floor

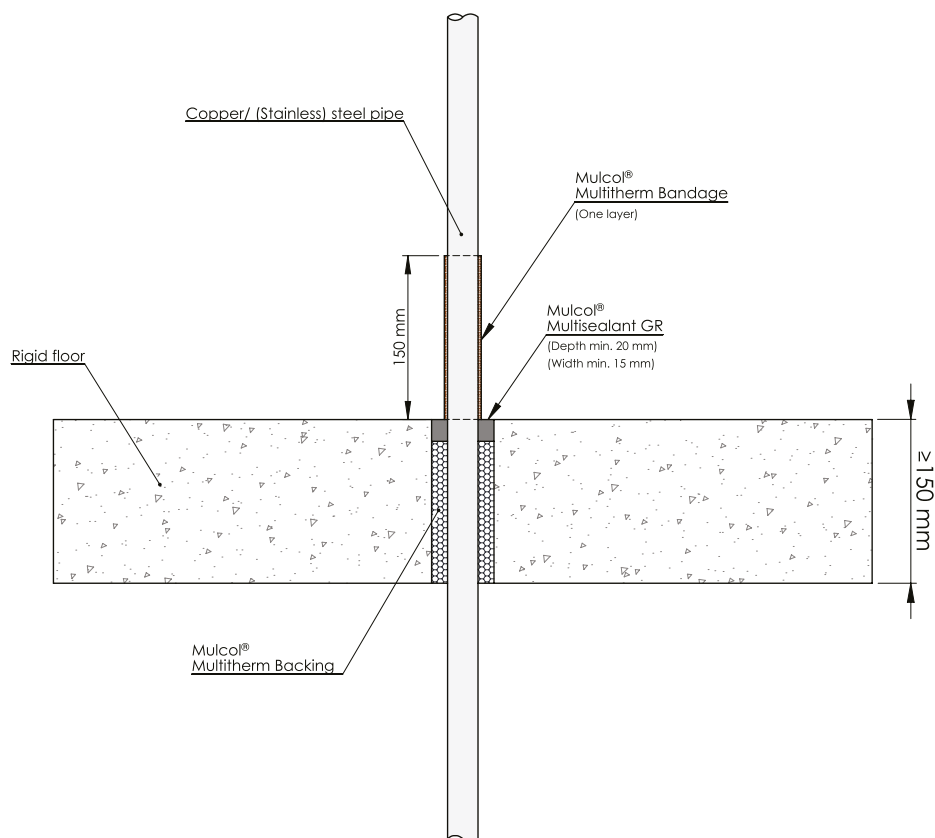
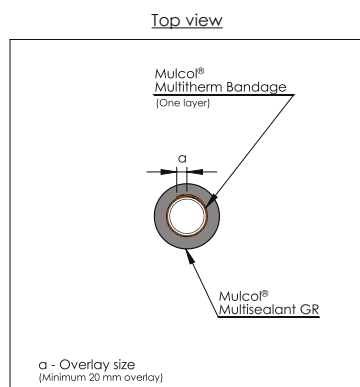


Drawing: RF.E-CU-G1.4.92

Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Multitherm Bandage	Classification
	Outer dimension	Wall thickness				
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.1	Multisealant GR ≥ 15 x 20 (wxd) bottom of floor	Multitherm backing fill entire depth	LI 150 three layers (three wires) bottom of floor	EI 60 C/U, E 120 C/U

B.1.6 Rigid floors - Metal pipes uninsulated

B.1.6.7 Copper and steel pipes - Multitherm Bandage - Top of floor

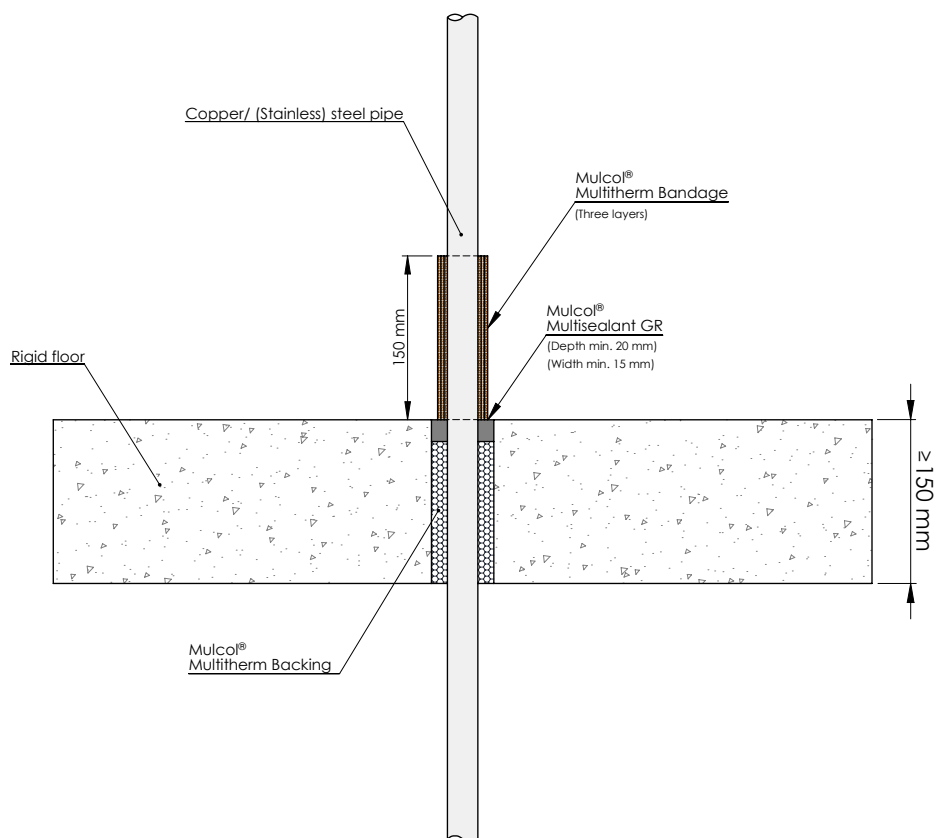
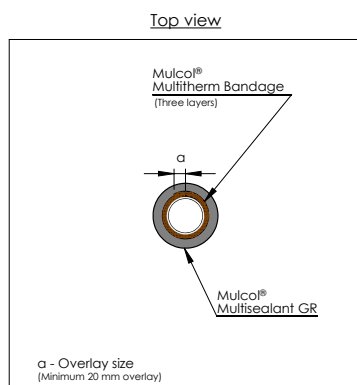


Drawing: RF.E-CU-G3.4.90

Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Multitherm Bandage	Classification
	Outer dimension	Wall thickness				
Copper / (stainless) steel / cast iron	≤ Ø 35	≥ 1.5	Multisealant GR ≥ 15 x 20 (wxd) top of floor	Multitherm backing fill entire depth	LI 150 one layer top of floor	EI 30 C/U, E 120 C/U

B.1.6 Rigid floors - Metal pipes uninsulated

B.1.6.8 Copper and steel pipes - Multitherm bandage - Top of floor



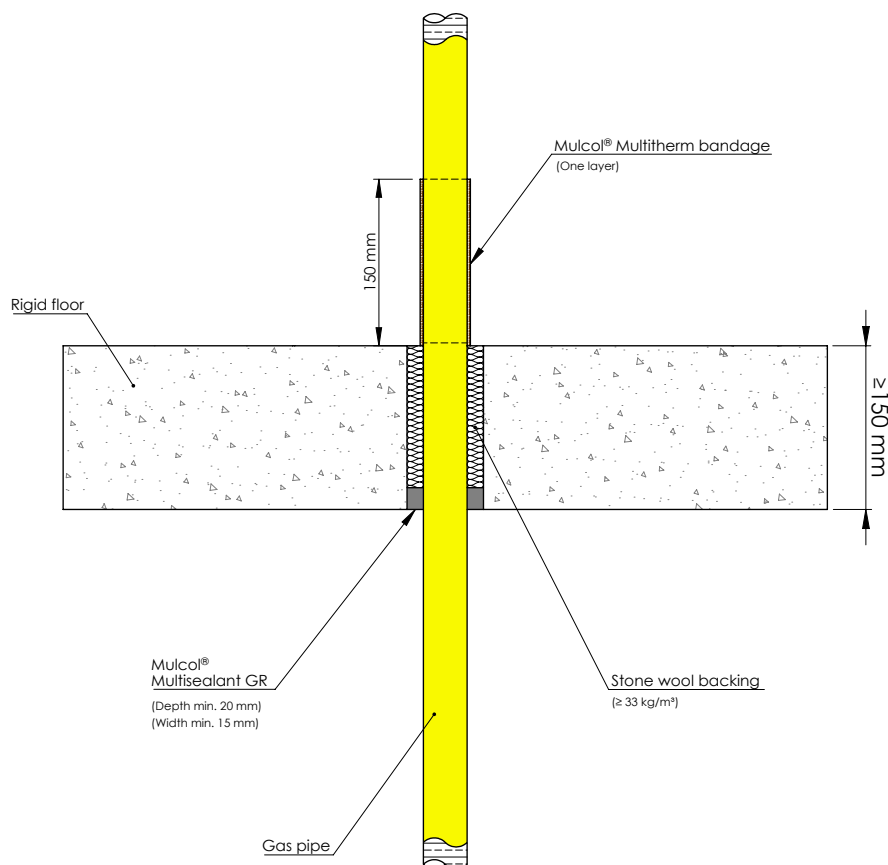
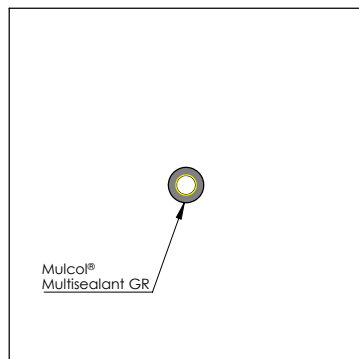
Drawing: RF.E-CU-G3.4.92

Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Multitherm Bandage	Classification
	Outer dimension	Wall thickness				
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.1	Multisealant GR ≥ 15 x 20 (wxd) top of floor	Multitherm backing fill entire depth	LI 150 three layers top of floor	EI 60 C/U, E 120 C/U

B.1.7 Rigid floors - Gas pipes

B.1.7.1 Corrugated stainless steel tube gas (CSST) pipes - Multitherm Bandage

Bottom view



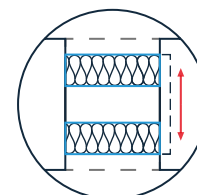
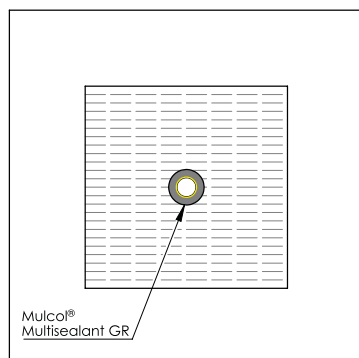
Drawing: RF.E-GFS-G1.4.90

Services	Number of pipes	Product	Sealing (mm)	Backing	Classification
CFS CSST gas pipe $\leq \varnothing 20$ mm	≤ 2	Multisealant GR (bottom of floor) & Multitherm Bandage (top of floor)	Multisealant GR $\geq 20 \times 15$ (wxd) top of floor	Stone wool fill entire depth (≥ 35 kg/m ³)	EI 120 U/C
CFS CSST gas pipe $\leq \varnothing 41$ mm	1				

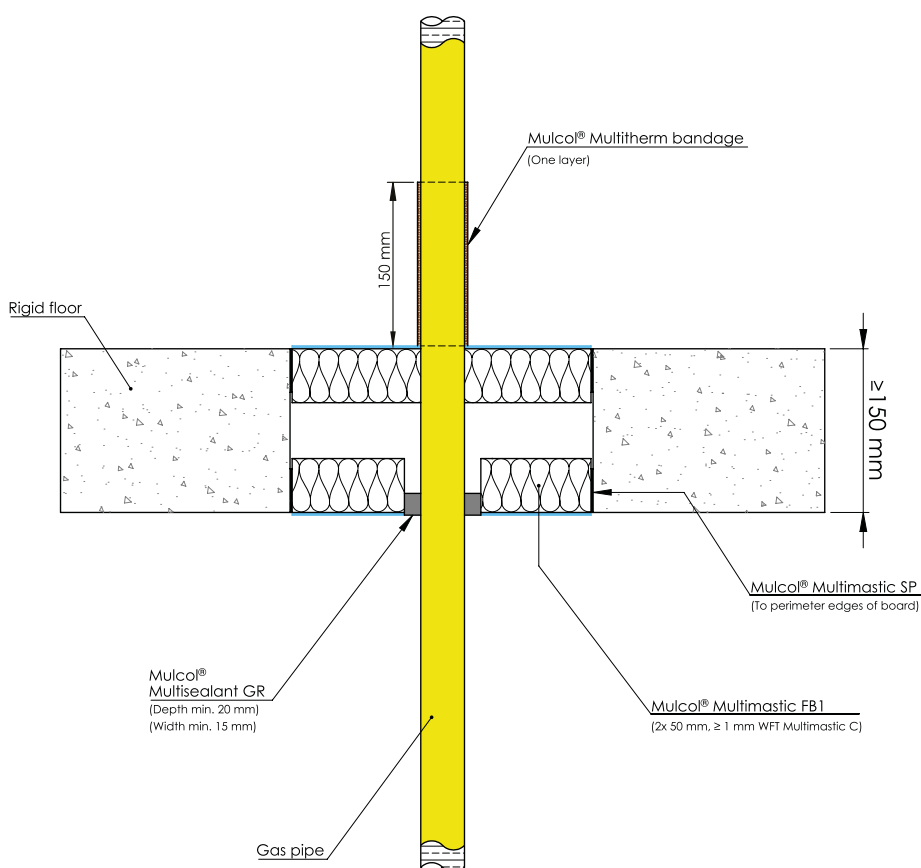
B.1.7 Rigid floors - Gas pipes

B.1.7.2 Corrugated stainless steel tube gas (CSST) pipes - Multimastic FB1 - Multitherm Bandage

Bottom view



Position seal:
top, bottom or anywhere
in between

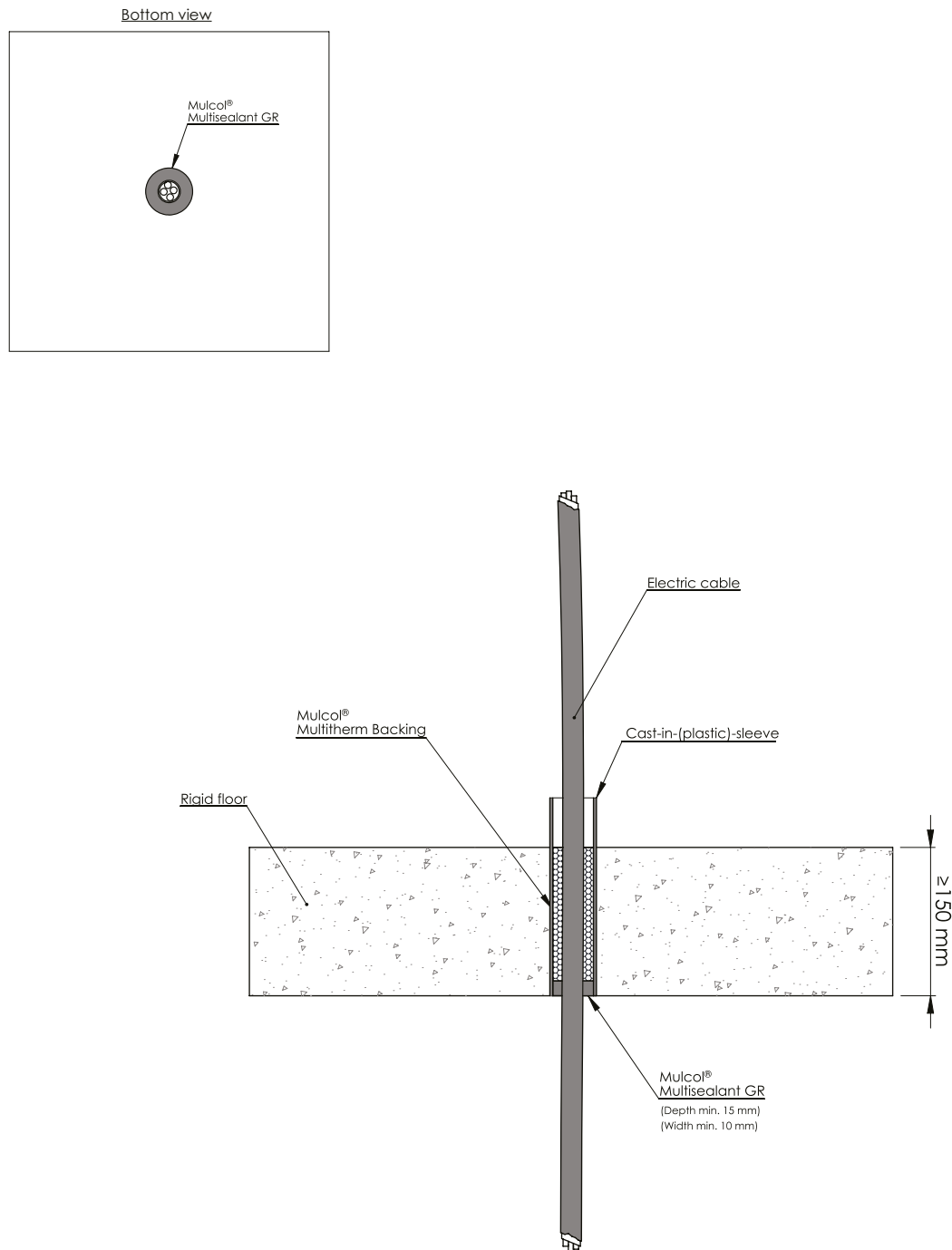


Drawing: PBrf.E-GFS-MFB1-B3.1.10.C

Services	Number of pipes	Product	Sealing (mm)	Classification
CFS CSST gas pipe DN 15	≤ 2	Multisealant GR (bottom of floor) & Multitherm Bandage (top of floor)	Multisealant GR ≥ 15 x 20 (wxd) bottom of floor	EI 120 U/C
CFS CSST gas pipe DN 32	1			

B.1.8 Rigid floors - Electrical room services

B.1.8.1 Cables - Bottom of floor

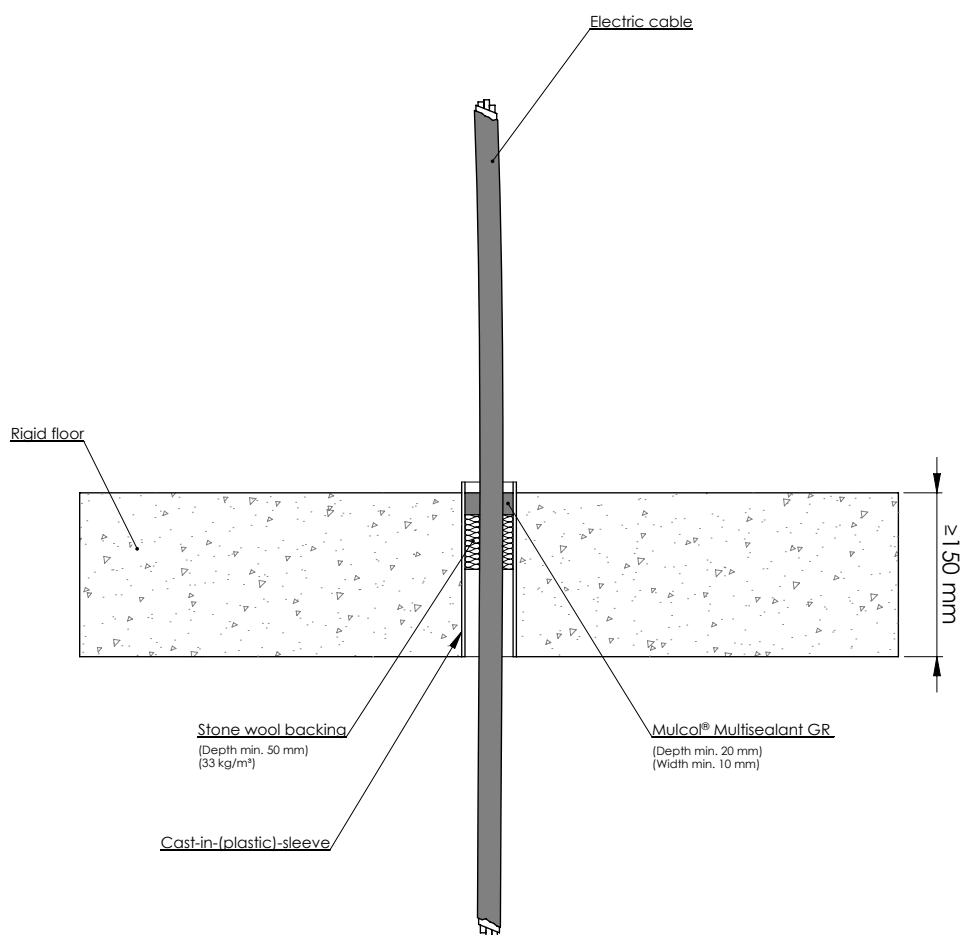
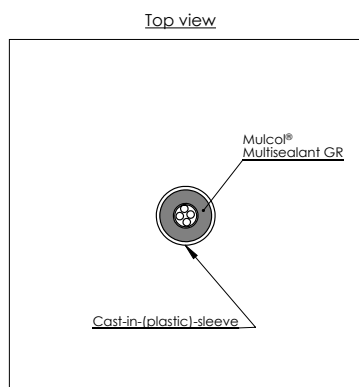


Drawing: RF.E-EC-G1.2.10

Services		Pipe dimensions (mm)	Sealing (mm)	Backing	Classification
		Outer dimension			
Cables ≤ Ø 25 mm YMvK 5G 25 mm ²	with or without plastic cast-in sleeve	≤ Ø 110	Multisealant GR ≥ 10 x 40 (wxd) bottom of floor	Multitherm backing fill entire depth	EI 60, E 120

B.1.8 Rigid floors - Electrical room services

B.1.8.2 Cables - Top of floor

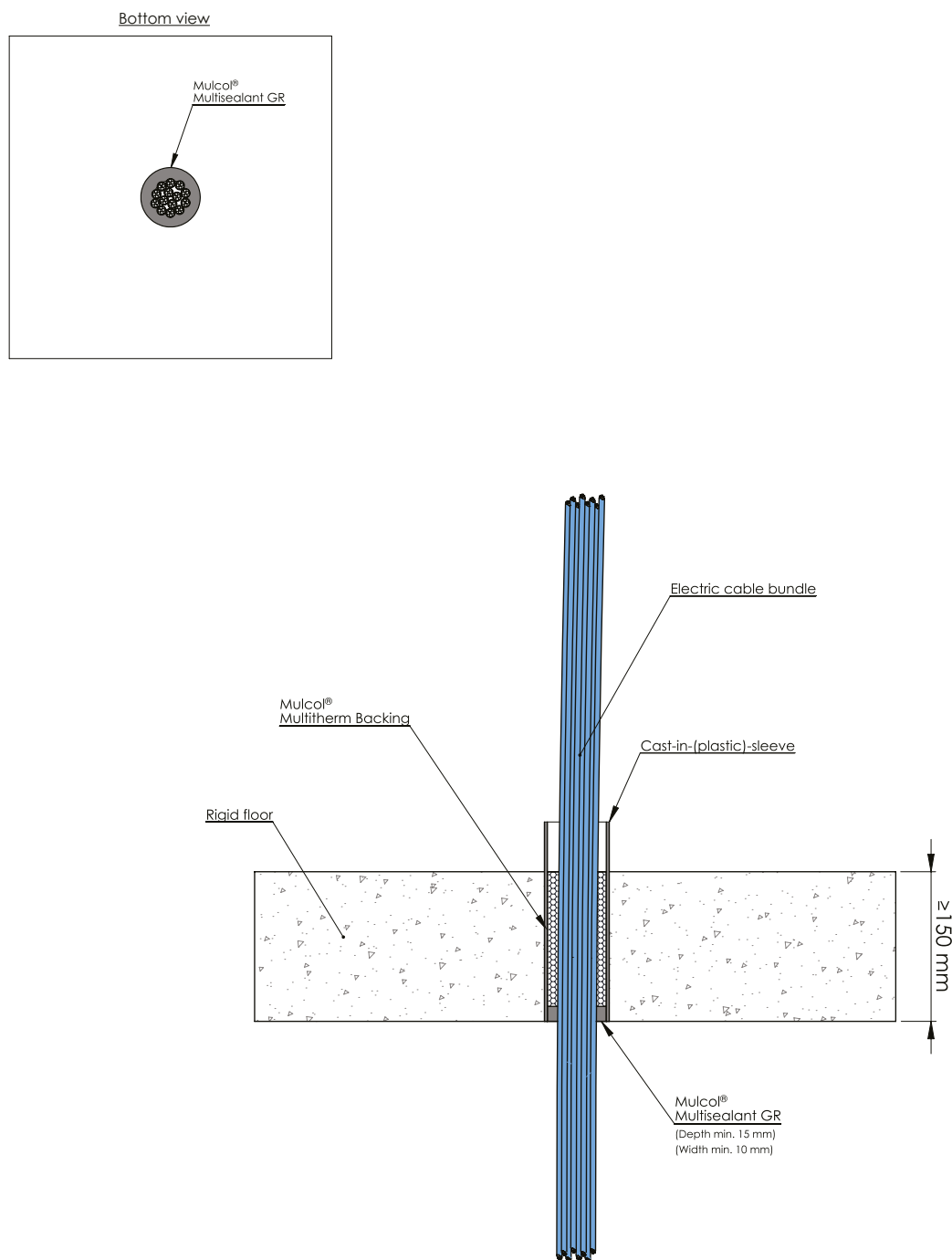


Drawing: RF-EC21-G3.12.10

Services		Pipe dimensions (mm)	Sealing (mm)	Backing	Classification
		Outer dimension			
Cables ≤ Ø 21 mm	with or without plastic cast-in sleeve	≤ Ø 50	Multisealant GR ≥ 10 x 20 (wxd) top of floor	≥ 50 mm stone wool (≥ 33 kg/m³)	EI 120

B.1.8 Rigid floors - Electrical room services

B.1.8.3 Cable bundle - Bottom of floor

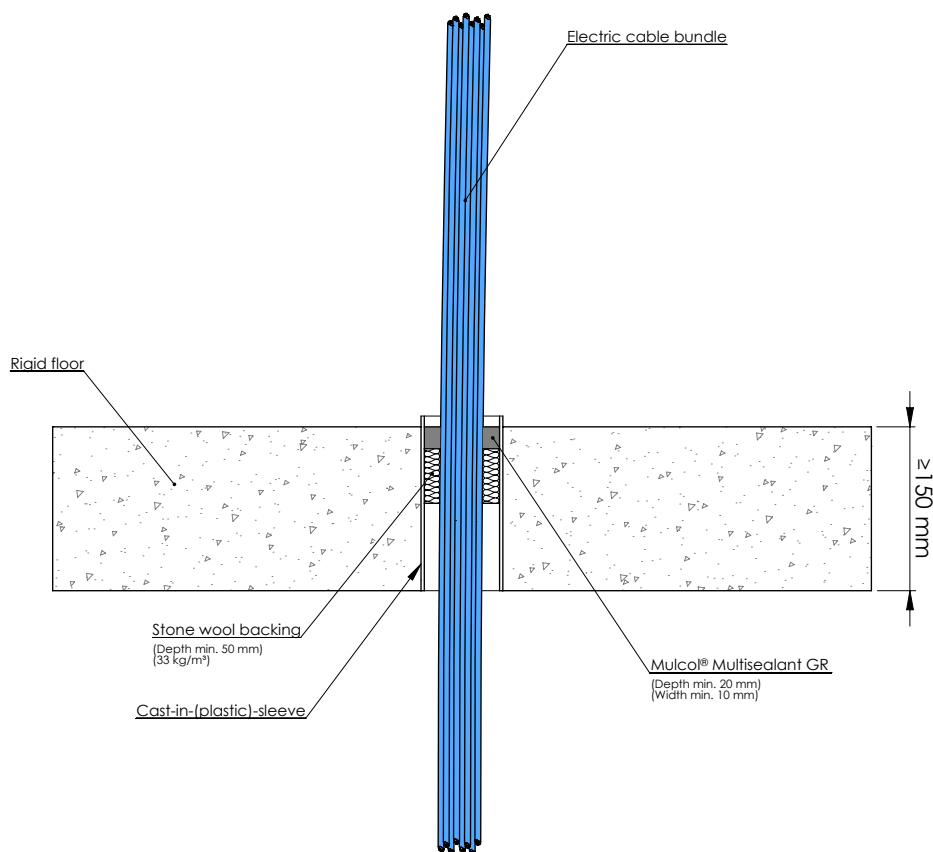
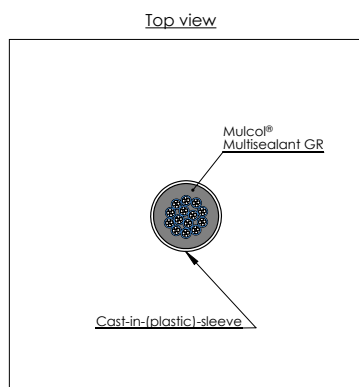


Drawing: RF.E-ECB-G1.2.10

Services		Pipe dimensions (mm)	Sealing (mm)	Backing	Classification
		Outer dimension			
Telecommunication cables ≤ Ø 21 mm in a tied bundle ≤ Ø 80 mm	with or without plastic cast-in sleeve	≤ Ø 110	Multisealant GR ≥ 10 x 15 (wxd)	Multitherm Backing fill entire depth	EI 120

B.1.8 Rigid floors - Electrical room services

B.1.8.4 Cable bundle - Top of floor

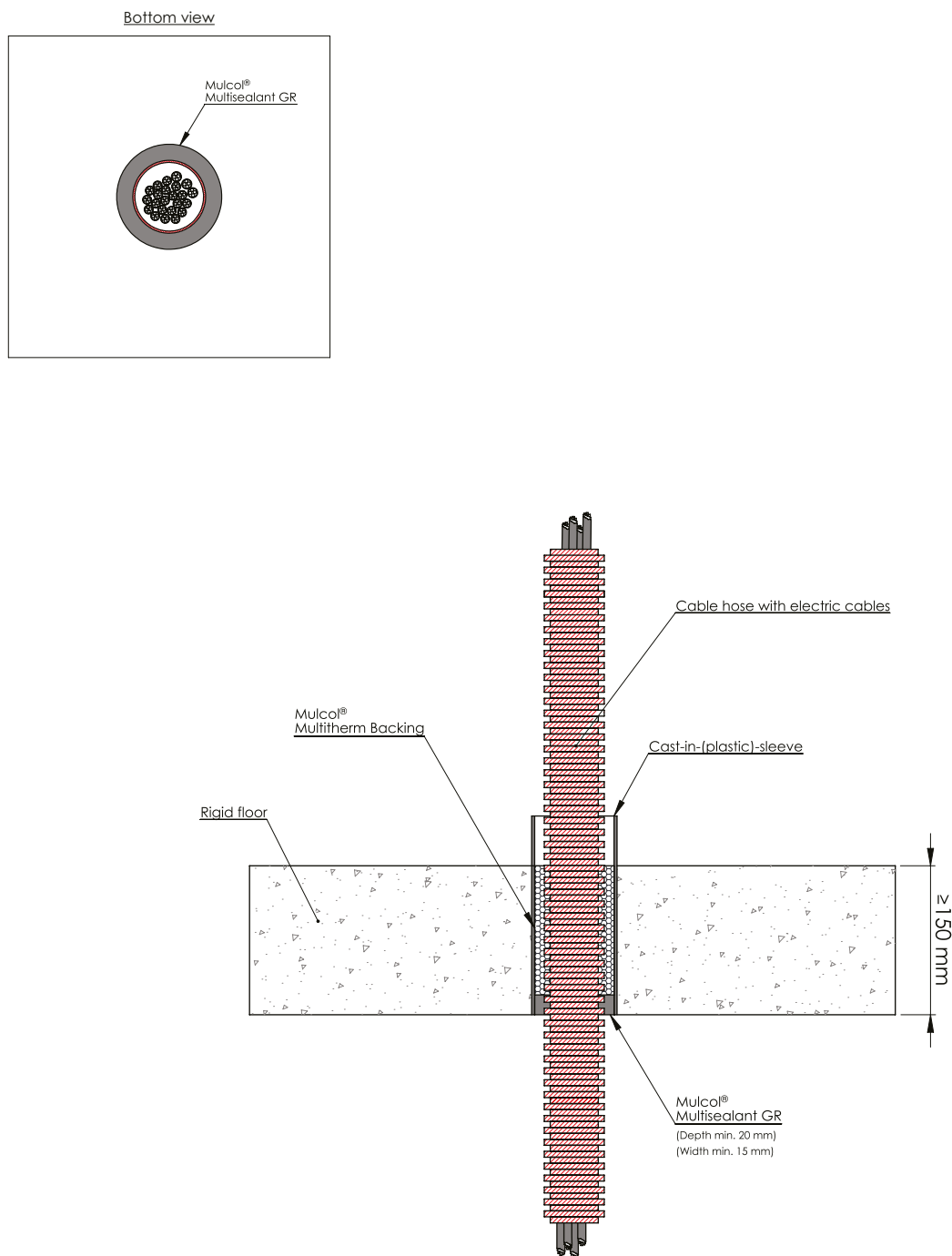


Drawing: RF-ECB-G3.12.10

Services		Pipe dimensions (mm)	Sealing (mm)	Backing	Classification
		Outer dimension			
Telecommunication cables ≤ Ø 21 mm in a tied bundle ≤ 40 pcs	with or without plastic cast-in sleeve	≤ Ø 75	Multisealant GR ≥ 10 x 20 (wxd)	≥ 50 mm stone wool (≥ 33 kg/m³)	EI 120

B.1.8 Rigid floors - Electrical room services

B.1.8.5 Flexible conduit with cables - Bottom of floor

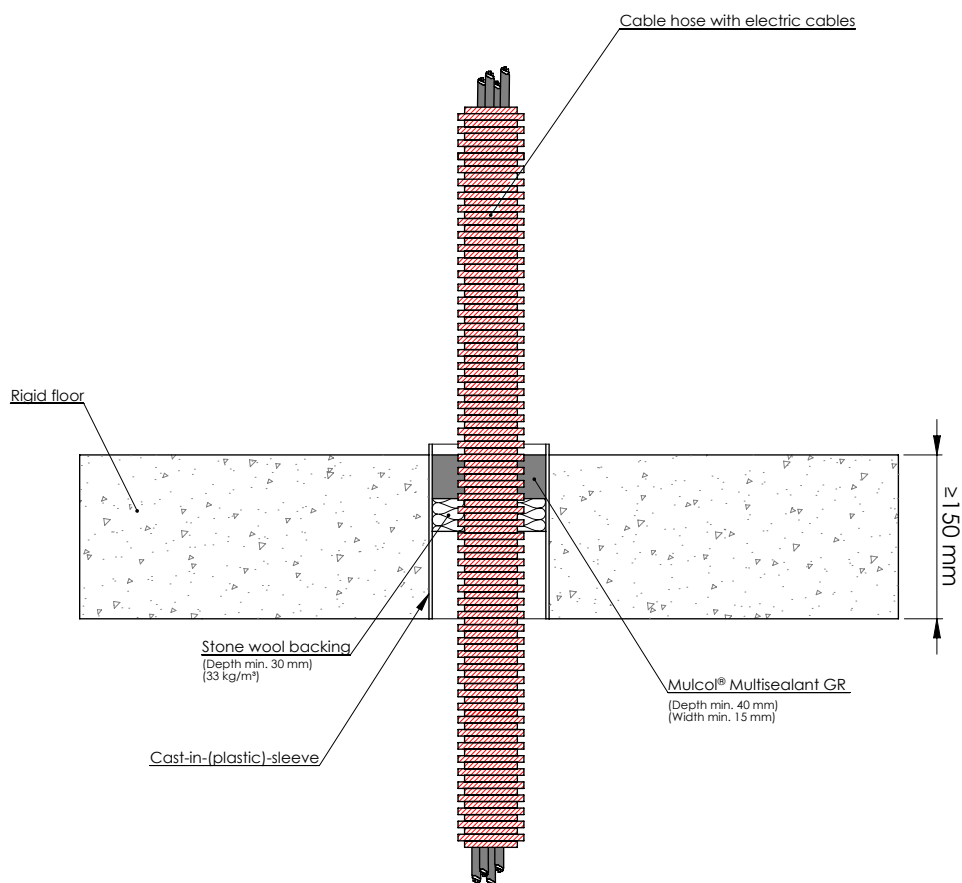
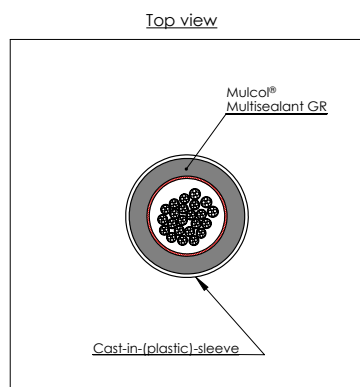


Drawing: RF.E-ECH-G1.4.30

Services		Pipe dimensions (mm)		Sealing (mm)	Backing	Classification
		Outer dimension	Wall thickness			
Ribbed PE-flexible-sleeve conduit ≤ Ø 50 mm with or without cables	with or without plastic cast-in sleeve	≤ Ø 110	3.2	Multisealant GR ≥ 15 x 20 (wxd)	Multitherm Backing fill entire depth	EI 90 U/U

B.1.8 Rigid floors - Electrical room services

B.1.8.6 Flexible conduit with cables - Top of floor

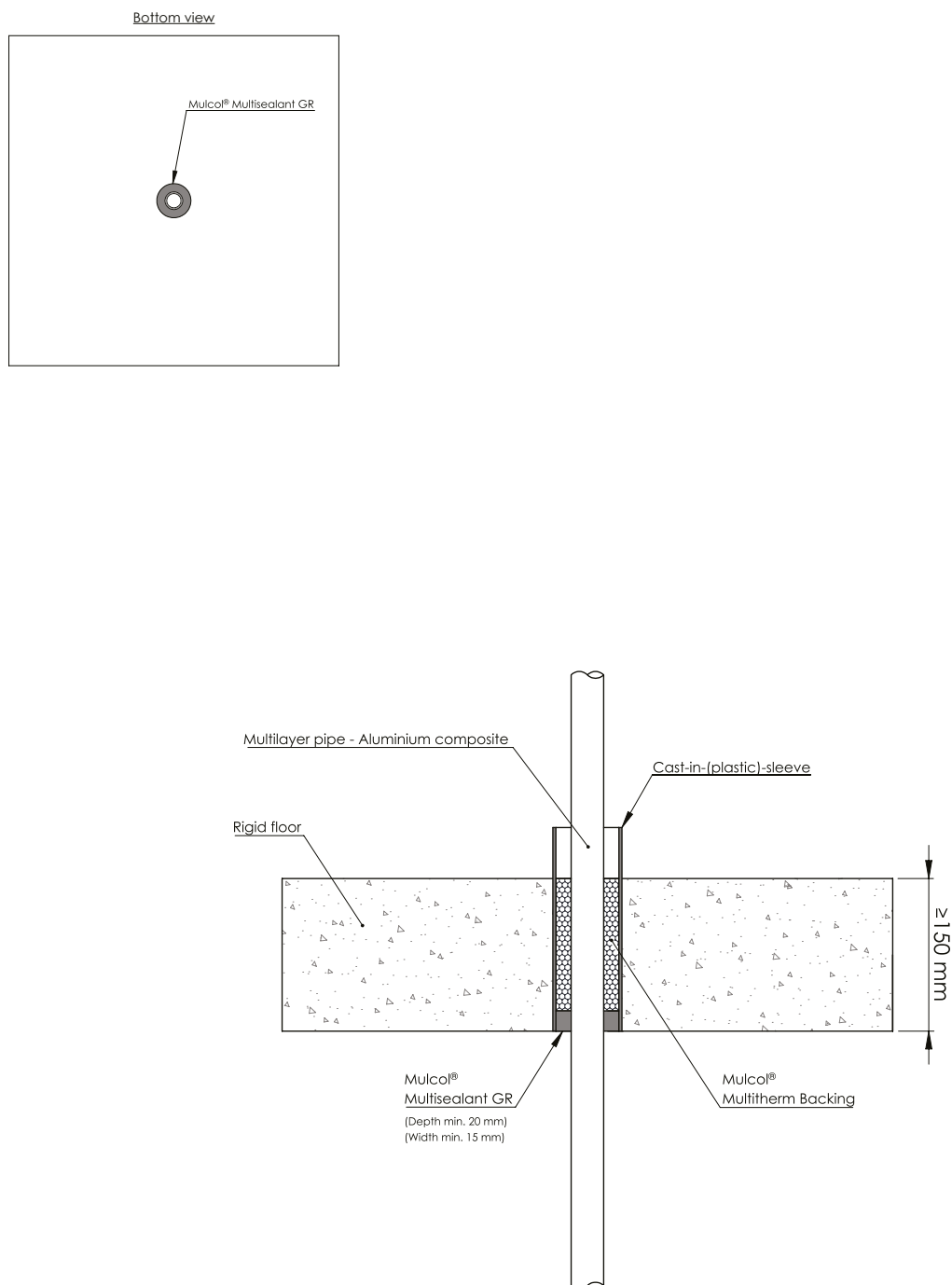


Drawing: RF-ECH63-G3.16.30

Services		Pipe dimensions (mm)	Sealing (mm)	Backing	Classification
		Outer dimension			
Ribbed PE-flexible-sleeve conduit ≤ Ø 50 mm with or without cables	with or without plastic cast-in sleeve	≤ Ø 90	Multisealant GR ≥ 15 x 40 (wxd)	≥ 30 mm stone wool (≥ 33 kg/m³)	EI 120 U/C

B.1.8 Rigid floors - Electrical room services

B.1.8.7 Multilayer pipes (MLC)

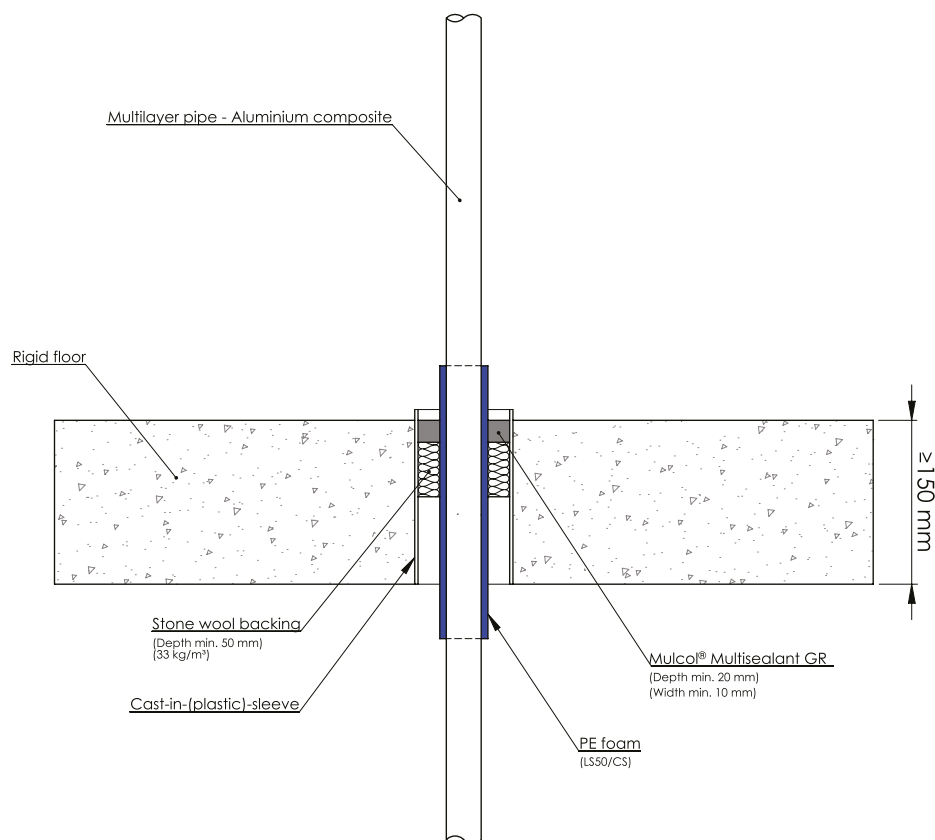
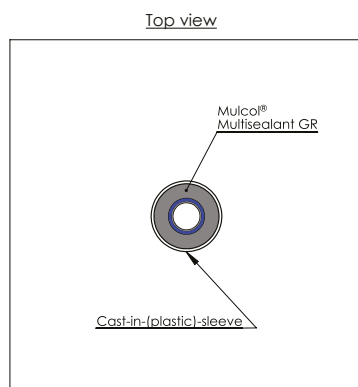


Drawing: RF.E-MLA-G1.4.10

Services		Pipe dimensions (mm)		Sealing (mm)	Backing	Classification
		Outer dimension	Wall thickness			
Multilayer pipes (MLC)	with or without plastic cast-in sleeve	≤ Ø 20	2.0	Multisealant GR ≥ 15 x 20 (wxd)	Multitherm backing fill entire floor	EI 120 U/C
		≤ Ø 32	3.0			
		≤ Ø 40	3.5 - 4.0			

B.1.8 Rigid floors - Electrical room services

B.1.8.8 Multilayer pipes (MLC) - PE foam

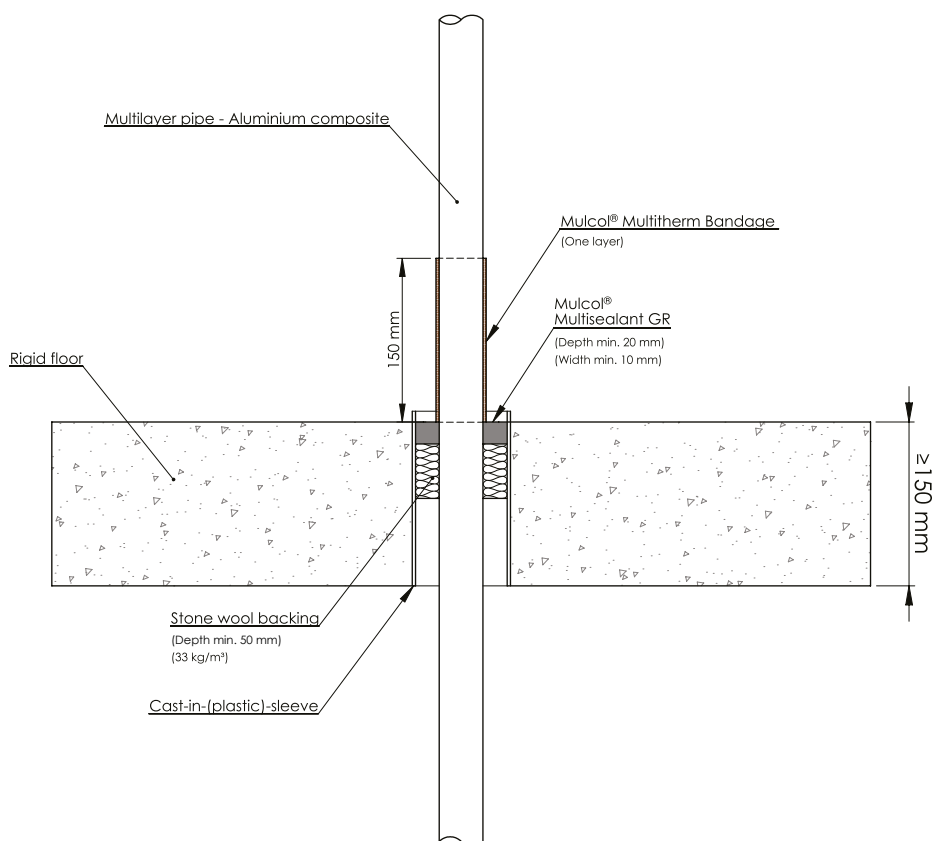
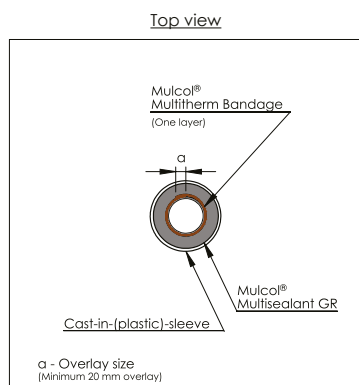


Drawing: RF.E-pr_MLA-G3.4.10

Services		Pipe dimensions (mm)		Insulation			Sealing (mm)	Backing	Classification
		Outer dimension	Wall thickness	Type	Thickness (mm)	Configuration			
Multilayer pipes (MLC)	with or without plastic cast-in sleeve ≤ Ø 90	≤ Ø 32	3.0	PE foam	≤ 6	LS 50 / CS LI 50 / CI	Multisealant GR ≥ 10 x 20 (wxd)	≥ 50 mm stone wool (≥ 33 kg/m³)	EI 120 U/C

B.1.8 Rigid floors - Electrical room services

B.1.8.9 Multilayer pipes (MLC) - Multitherm Bandage

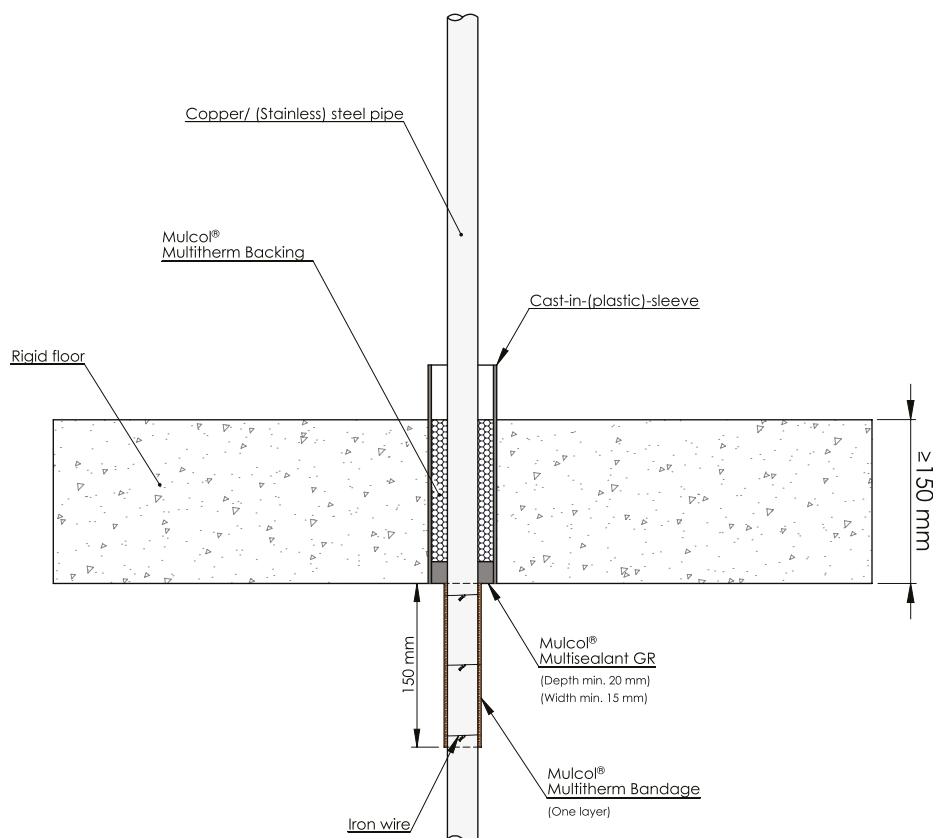
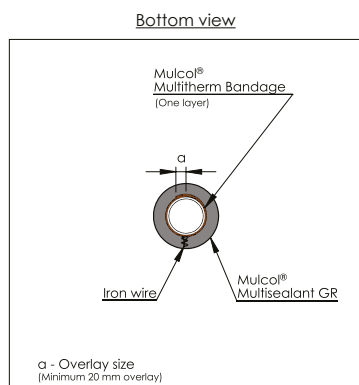


Drawing: RF.E-MLA-G3.18.92

Services		Pipe dimensions (mm)		Sealing (mm)	Backing	Multitherm Bandage	Classification
		Outer dimension	Wall thickness				
Multilayer pipes (MLC)	with or without plastic cast-in sleeve ≤ Ø 75 mm	≤ Ø 40	3.5	Multisealant GR ≥ 10 x 20 (wxd)	≥ 50 mm stone wool (≥ 33 kg/m³)	LI 150 one layer top of floor	EI 120 U/C

B.1.8 Rigid floors - Metal pipes uninsulated

B.1.8.10 Copper and steel pipes - Multitherm Bandage - Bottom of floor

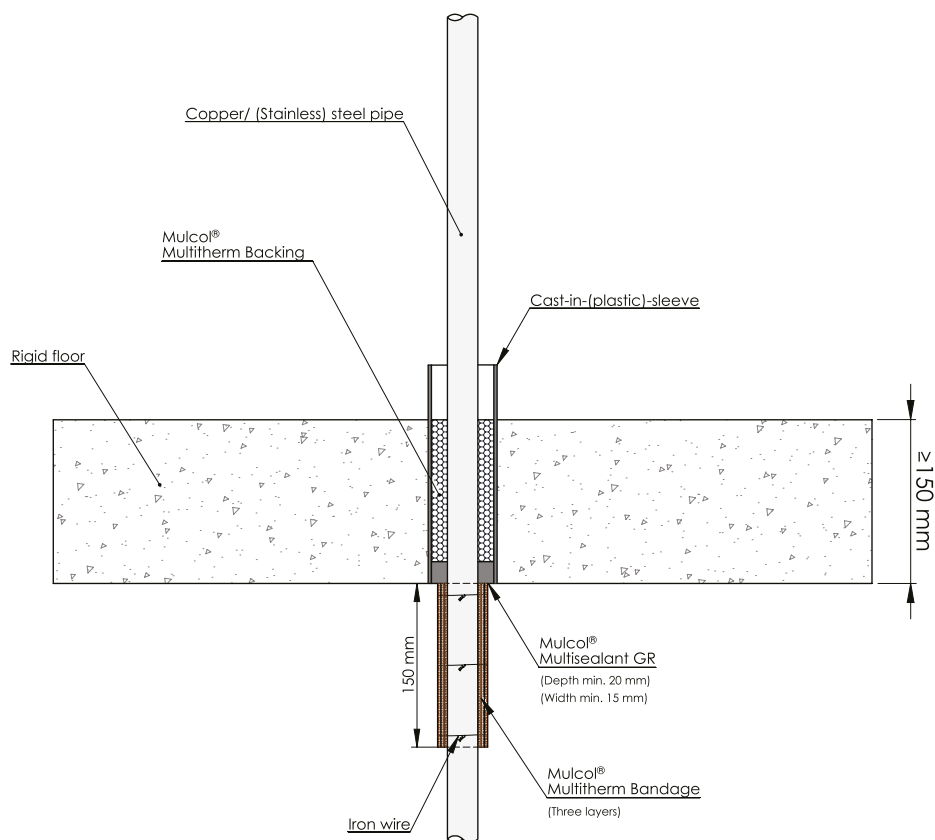
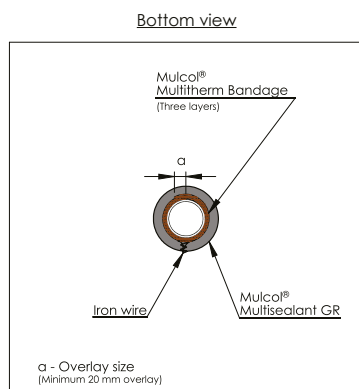


Drawing: RF.E-CU-G1.4.90

Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Multitherm Bandage	Classification
	Outer dimension	Wall thickness				
Copper / (stainless) steel / cast iron	≤ Ø 35	≥ 1.5	Multisealant GR ≥ 15 x 20 (wxd) bottom of floor	Multitherm backing fill entire depth	LI 150 one layer (three wires) bottom of floor	EI 30 C/U, E 120 C/U

B.1.8 Rigid floors - Metal pipes uninsulated

B.1.8.10 Copper and steel pipes - Multitherm Bandage - Bottom of floor

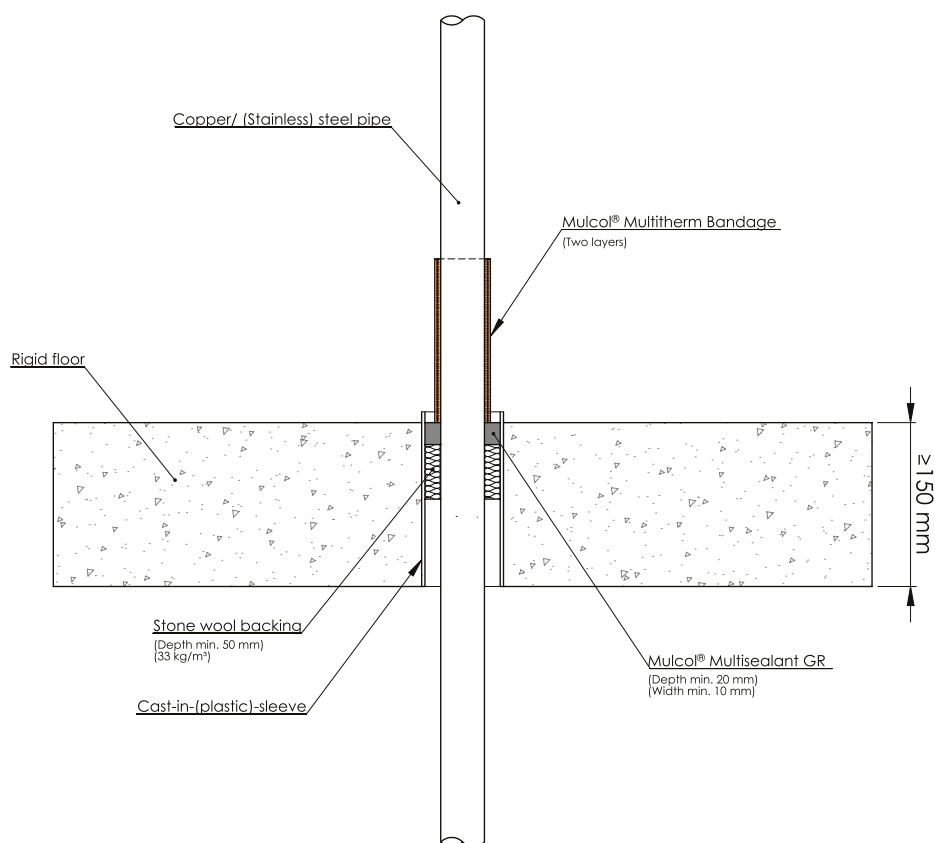
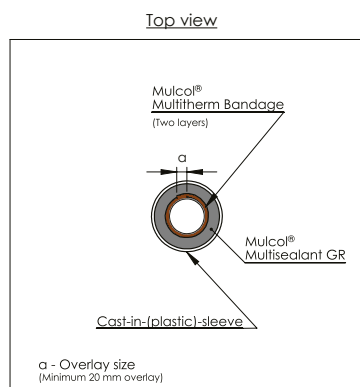


Drawing: RF.E-CU-G1.4.92

Services	Pipe dimensions (mm)		Sealing (mm)	Backing	Multitherm Bandage	Classification
	Outer dimension	Wall thickness				
Copper / (stainless) steel / cast iron	≤ Ø 22	≥ 1.1	Multisealant GR ≥ 15 x 20 (wxd) bottom of floor	Multitherm backing fill entire depth	LI 150 three layers (three wires) bottom of floor	EI 60 C/U, E 120 C/U

B.1.8 Rigid floors - Metal pipes uninsulated

B.1.8.11 Copper and steel pipes - Multitherm Bandage - Top of floor

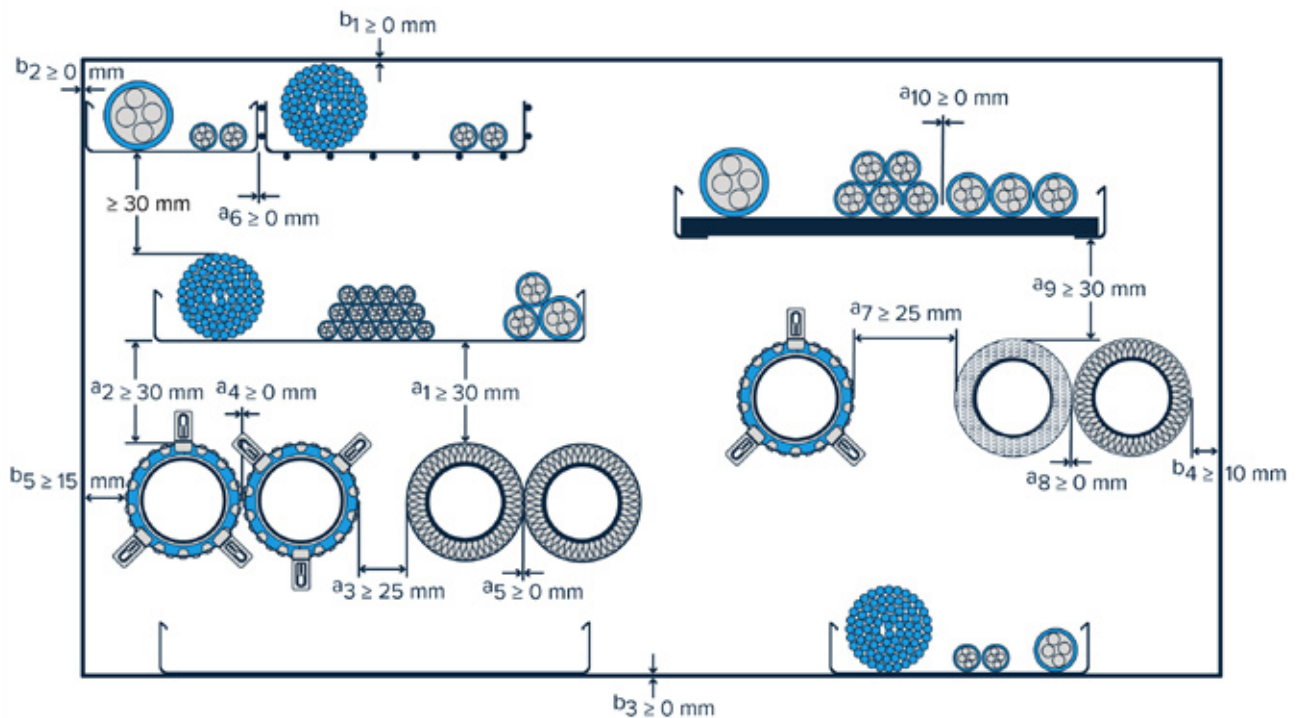


Drawing: RF.mk.E-CU-B3-G3.4.10

Services		Pipe dimensions (mm)		Sealing (mm)	Backing	Multitherm Bandage	Classification
		Outer dimension	Wall thickness				
Copper / (stainless) steel / cast iron	with or without plastic cast-in sleeve	≤ Ø 35	≥ 1.5	Multisealant GR ≥ 15 x 20 (wxd)	≥ 50 mm stone wool (≥ 33 kg/m³)	LI 150 one layer top of floor	EI 120 U/C

C.1 Flexible and rigid wall - General

C.1.1 Mutual distances & distance to first support



Mutual distances – Mulcol® Multisealant GR

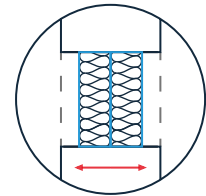
- a_1 Distance between cables/cable trays and metal pipes
- a_2 Distance between cables/cable trays and plastic pipes
- a_3 Distance between metal pipes and plastic pipes
- a_4 Distance between plastic pipes
- a_5 Distance between metal pipes with non-combustible insulation
- a_6 Distance between cable trays
- a_7 Distance between plastic pipes and pipes with combustible insulation
- a_8 Distance between pipes with non-combustible insulation and pipes with combustible insulation
- a_9 Distance between cables/cable trays and pipes with combustible insulation
- a_{10} Distance between cables stacked together or in a row
- b_1 Distance between cables/cable trays and the upper seal edge
- b_2 Distance between cables/cable trays and the side seal edge
- b_3 Distance between cables/cable tray and the lower seal edge
- b_4 Distance between metal pipes and all seal edges
- b_5 Distance between plastic pipes and all seal edges

Service support construction

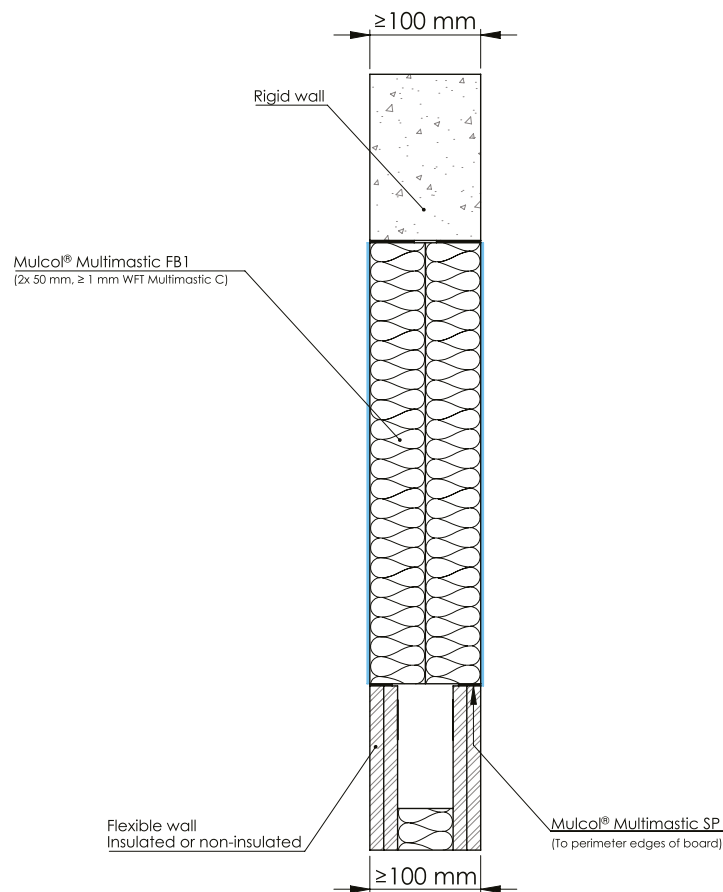
First support for all services at 450 mm, except cable trays at 250 mm.

C.1.2 Flexible and rigid wall - Maximum seal dimensions

C.1.2.1 Multimastic FB1 - 2x 50 mm no aperture framing



Position seal:
right, left or anywhere
in between

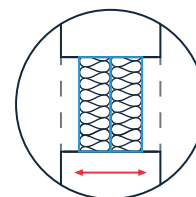


Drawing: PBfw.E-BS-MFB1.2.10

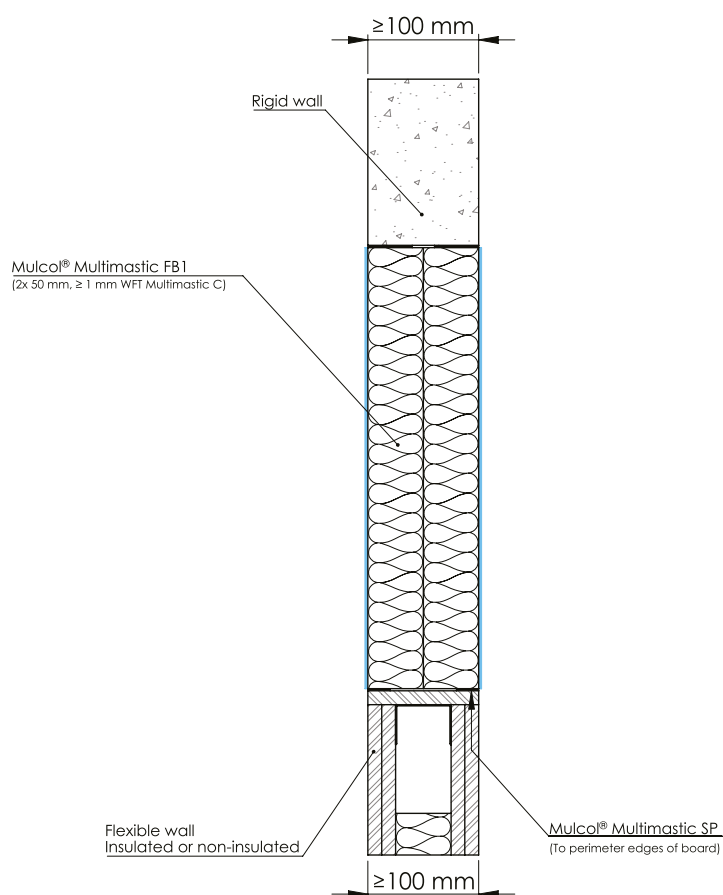
Services	Classification
Maximum seal size 1500 x 2500 mm (width x height or height x width) With a maximum surface of 3 m ²	EI 60
Maximum circular seal size Ø 1954 mm	
Maximum seal size 1200 x 1200 mm With a maximum surface of 1.44 m ²	EI 60, E 90
Maximum circular seal size Ø 1334 mm	
Maximum seal size 625 x 475 mm (w x h) With a maximum surface of 0.24 m ²	EI 120
Maximum circular seal size Ø 550 mm	

C.1.2 Flexible and rigid wall - General - Maximum seal dimensions

C.1.2.2 Multimastic FB1 - 2x 50 mm with aperture framing



Position seal:
right, left or anywhere
in between

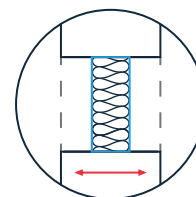


Drawing: PBfw.E-BS-A-MFB1.2.10

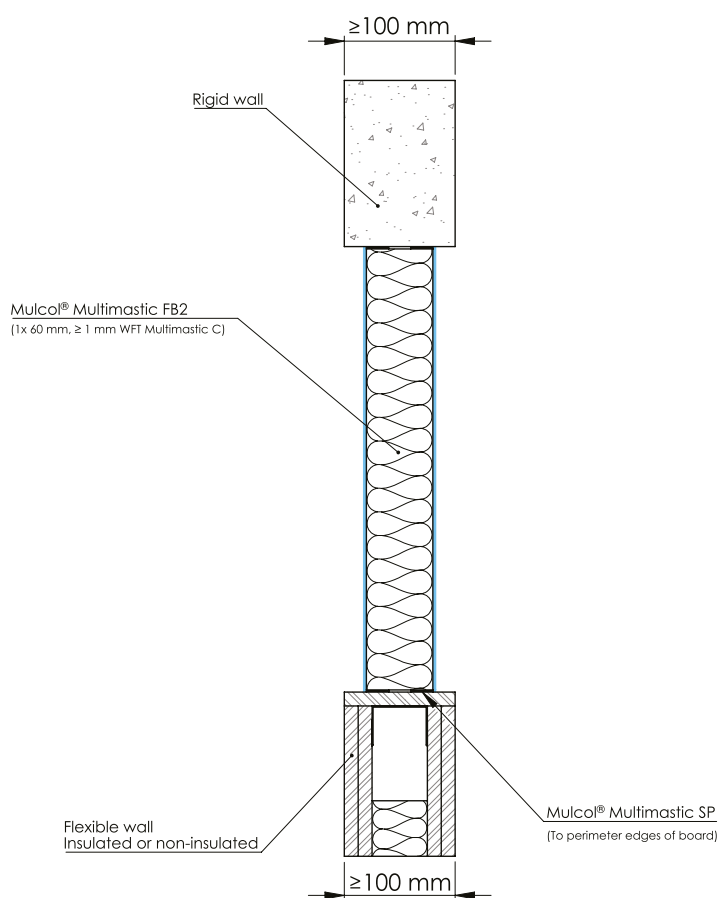
Services	Classification
Maximum seal size 1500 x 2500 mm (width x height or height x width) With a maximum surface of 3 m ²	EI 120
Maximum circular seal size Ø 1954 mm	
Maximum seal size 1200 x 2000 mm (width x height or height x width) With a maximum surface of 2.44 m ²	EI 180
Maximum circular seal size Ø 1748 mm	

C.1.2 Flexible and rigid wall - General - Maximum seal dimensions

C.1.2.3 Maximum seal dimensions - Multimastic FB2 - 1x 60 mm with aperture framing



Position seal:
right, left or anywhere
in between

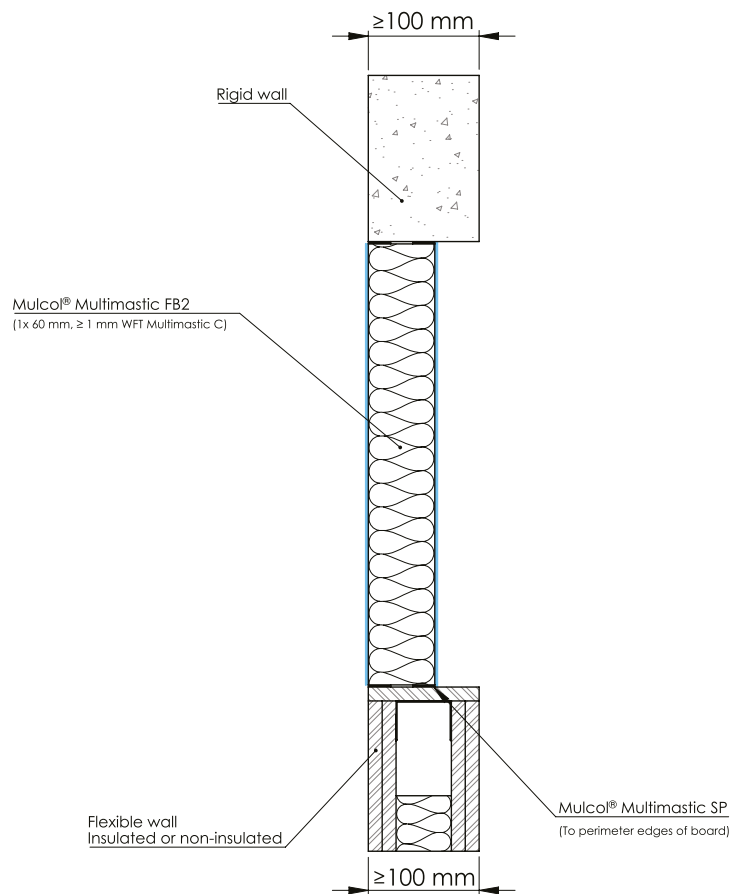


Drawing: PBfw.E-BS-MFB2.1.10

Services	Classification
Maximum seal size 1200 x 2000 mm (width x height or height x width) With a maximum surface of 2.4 m ²	EI 60
Maximum circular seal size Ø 1748 mm	
Maximum seal size 1500 x 1500 mm With a maximum surface of 1.72 m ²	
Maximum seal size 1200 x 1200 mm With a maximum surface of 1.44 m ²	EI 60, E 90
Maximum circular seal size Ø 1334 mm	
Maximum seal size 563 x 525 mm (width x height or height x width) With a maximum surface of 0.24 m ²	EI 90
Maximum circular seal size Ø 548 mm	
Maximum seal size 450 x 420 mm (width x height or height x width) With a maximum surface of 0.19 m ²	EI 120
Maximum circular seal size Ø 491 mm	

C.1.2 Flexible and rigid wall - General - Maximum seal dimensions

C.1.2.4 Maximum seal dimensions - Multimastic FB2 - 1x 60 mm with aperture framing

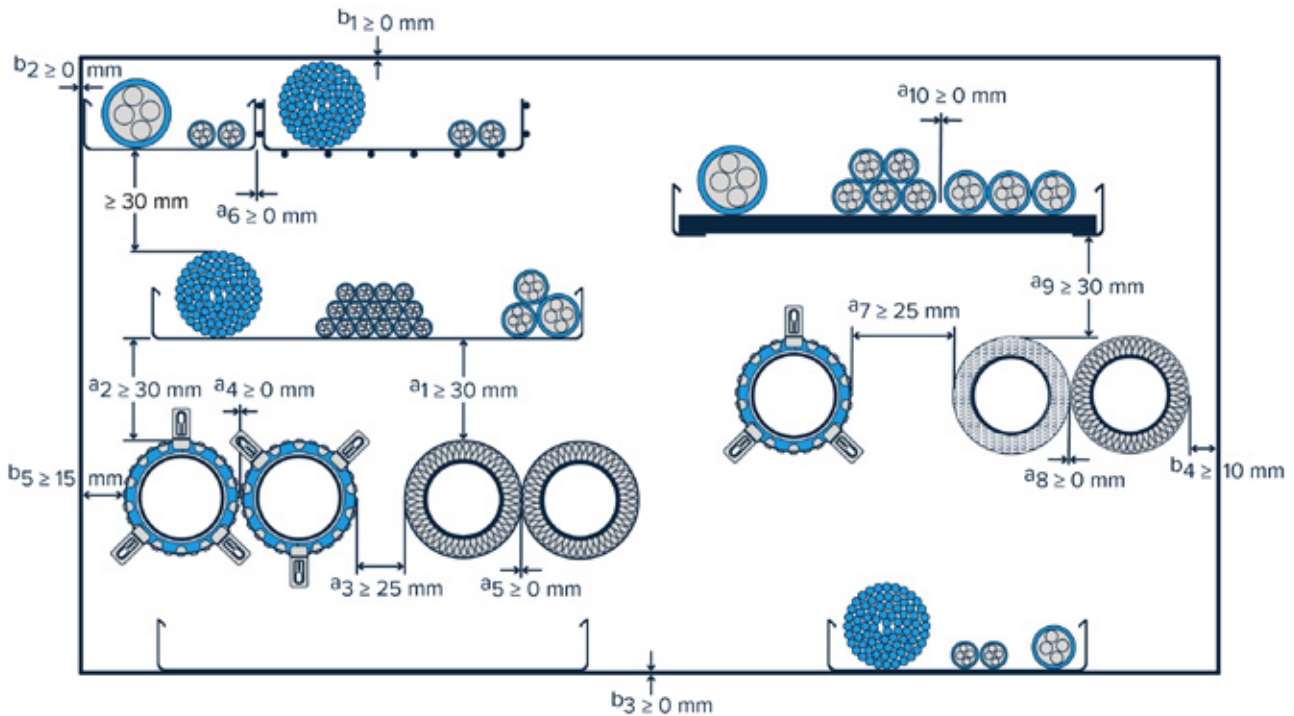


Drawing: PBfw.E-BS-fs-MFB2.1.10

Services	Classification
Maximum seal size 1200 x 2000 mm (width x height or height x width) With a maximum surface of 2.4 m ²	EI 60
Maximum circular seal size Ø 1748 mm	
Maximum seal size 425 x 265 mm (width x height or height x width) With a maximum surface of 0.11 m ²	EI 90, E 120
Maximum circular seal size Ø 379 mm	
Maximum seal size 531 x 331 mm (width x height or height x width) With a maximum surface of 0.14 m ²	EI 60, E 120
Maximum circular seal size Ø 423 mm	

C.2 Rigid floor - General

C.2.1 Mutual distances & distance to first support



Mutual distances – Mulcol® Multisealant GR

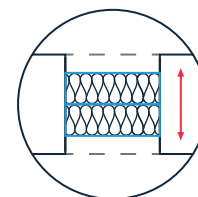
- a_1 Distance between cables/cable trays and metal pipes
- a_2 Distance between cables/cable trays and plastic pipes
- a_3 Distance between metal pipes and plastic pipes
- a_4 Distance between plastic pipes
- a_5 Distance between metal pipes with non-combustible insulation
- a_6 Distance between cable trays
- a_7 Distance between plastic pipes and pipes with combustibile insulation
- a_8 Distance between pipes with non-combustible insulation and pipes with combustibile insulation
- a_9 Distance between cables/cable trays and pipes with combustibile insulation
- a_{10} Distance between cables stacked together or in a row
- b_1 Distance between cables/cable trays and the upper seal edge
- b_2 Distance between cables/cable trays and the side seal edge
- b_3 Distance between cables/cable tray and the lower seal edge
- b_4 Distance between metal pipes and all seal edges
- b_5 Distance between plastic pipes and all seal edges

Service support construction

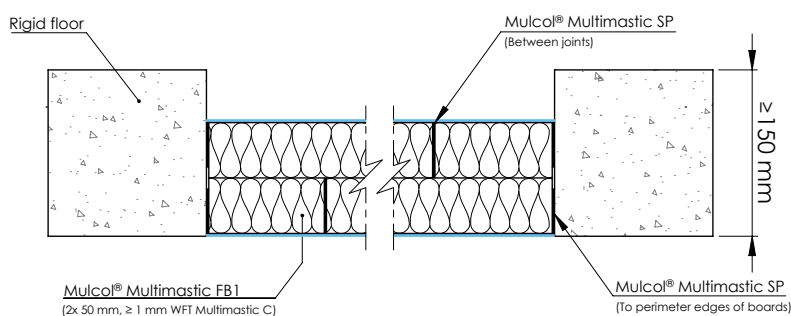
First support for all services at 450 mm, except cable trays at 250 mm.

C.2.2 Rigid floor - Maximum seal dimensions

C.2.2.1 Maximum seal dimensions - Multimastic FB1 - 2x 50 mm no cavity



Position seal:
top, bottom or anywhere
in between

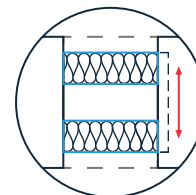


Drawing: PBrf.E-BS-MFB1.2.10

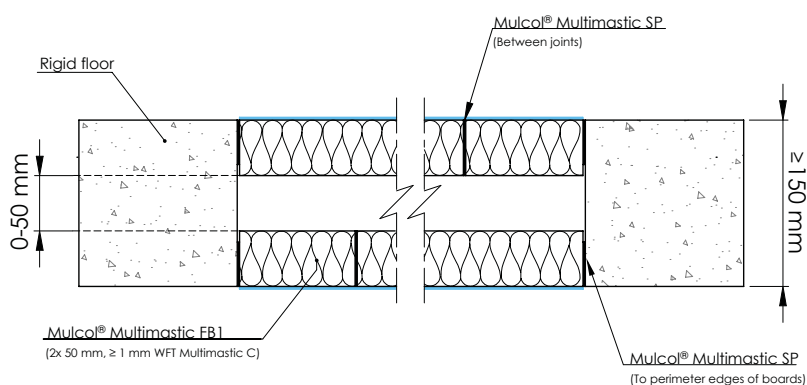
Services	Classification
Maximum seal size 1200 x 1200 mm Maximum seal size 9000 x 900 mm	EI 90, E 120
Maximum circular seal size Ø 1334 mm	
Maximum seal size 600 x 400 mm	EI 120
Maximum circular seal size Ø 553 mm	
Maximum seal size 450 x 450 mm	EI 240
Maximum circular seal size Ø 508 mm	

C.2.2 Rigid floor - General - Maximum seal dimensions

C.2.2.2 Maximum seal dimensions - Multimastic FB1 - 2x 50 mm cavity



Position seal:
top, bottom or anywhere
in between

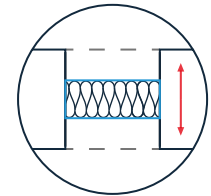


Drawing: PBrf.E-BS-MFB1.2.10.C

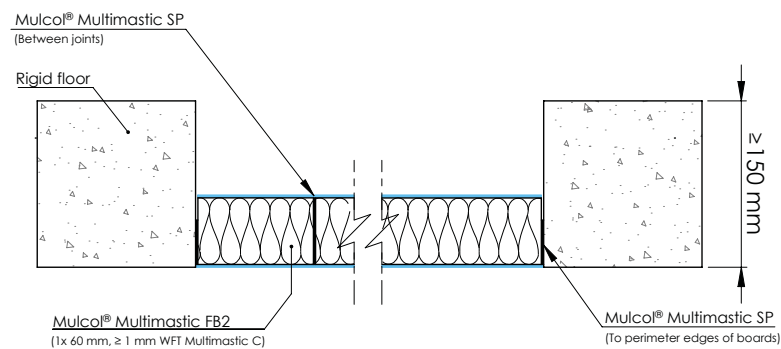
Services	Classification
Maximum seal size 1200 x 1200 mm Maximum seal size 9000 x 900 mm	EI 90, E 120
Maximum circular seal size Ø 1334 mm	
Maximum seal size 1200 x 600 mm Maximum seal size 9000 x 600 mm	EI 120
Maximum circular seal size Ø 957 mm	
Maximum seal size 450 x 450 mm Maximum circular seal size Ø 508 mm	EI 240

C.2.2 Rigid floor - General - Maximum seal dimensions

C.2.2.3 Maximum seal dimensions - Multimastic FB2 - 1x 60 mm



Position seal:
top, bottom or anywhere
in between



Drawing: PBrf.E-BS-MFB2.1.10

Services	Classification
Maximum seal size 1200 x 1200 mm	EI 90, E 120
Maximum seal size 9000 x 900 mm	
Maximum circular seal size Ø 1334 mm	

C.3 Wall configurations

C.3.1 Allowed wall configurations

The use of Mulcol® Multisealant GR is allowed in all double sided flexible wall constructions (with or without insulation) of the same or higher fire resistance classification in accordance with EN 13301-2, with a lining made of gypsum boards (EN 520) or Calcium Silicate boards which are CE marked for the application as lining of flexible wall, if their construction is in accordance with the rules given below.

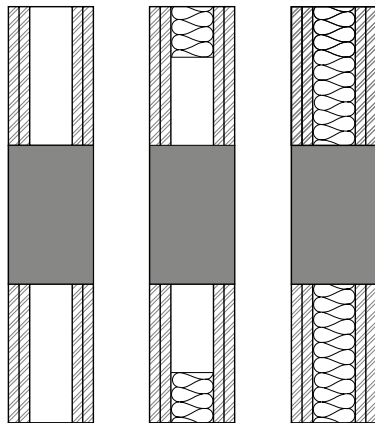
Field of direct application rules for double-sided flexible wall constructions:

- flexible wall constructions as shown in solutions given in Annex A of this document;
- flexible wall constructions with the same or higher number of board layers of the same or higher board thickness on each side of the wall, with insulation of any type or without insulation;
- flexible wall constructions with a reduced number of board layers but the same or higher board thickness on each side of the wall as tested, with insulation of any type or without insulation;
- flexible wall constructions with timber studs, no part of the penetration seal closer than 100 mm to any stud or nogging piece, the cavity closed between the penetration seal and the stud/nogging piece with minimum 100 mm of insulation of class A1 or A2 in accordance with EN 13301-1;
- rigid constructions of an overall thickness equal to or greater than that given in the solutions in Annex A and a minimum density of 350 kg/m³. In case of hollow brick wall the same rules regarding aperture framing apply as for double-sided flexible walls.

Allowed constructions (not limited by):

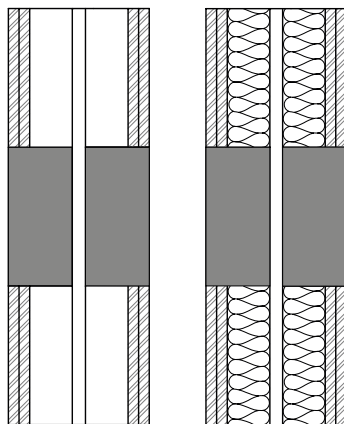
Flexible walls, not insulated, partially removed insulation or fully insulated with any type of insulation.

e.g.:



Double stud walls, separated by ≥ 0 mm, not insulated, partially insulated or fully insulated with any type of insulation.

e.g.:



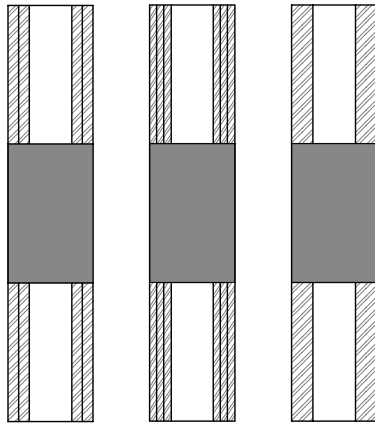
C.3 Wall configurations

C.3.1 Allowed wall configurations

Walls with a reduced number of board layers but the same or higher overall lining thickness on each side of the wall as shown in the solutions in Annex A.

Walls with a higher number of board layers, where individual boards are thinner yet the overall lining thickness is at least that of shown in the solutions in Annex A.

e.g.:



Rigid walls with a density of $\geq 350 \text{ kg/m}^3$

e.g.:

