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European Technical Assessment

**ETA 16/0985
of 17/04/2019**

Technical Assessment Body issuing the ETA and designated according to Article 29 of the Regulation (EU) No 305/2011: UL International (UK) Ltd

Trade name of the construction product

MULCOL® MULTIMASTIC C SYSTEM

Product family to which the construction product belongs

Fire Stopping and Sealing Product:
• Penetration Seals

Manufacturer

Mulcol International BV
Arnesteinweg 18
4338 PD Middelburg
The Netherlands



Manufacturing plant(s)

A/003

This European Technical Assessment contains

56 pages including 1 Annex which forms 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

This version replaces

ETA 16/0985 dated 25/01/2017

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I. **SPECIFIC PARTS OF THE EUROPEAN TECHNICAL ASSESSMENT**

1 **Technical description of the product**

- 1) Mulcol® Multimastic FB is a mineral wool board coated with waterborne Mulcol® Multimastic C ablative firestop coating based on a sustainable polymer system used to reinstate the fire resistance performance of wall and floor constructions where they have been provided with apertures for the penetration of single or multiple services.
- 2) The Mulcol® Multimastic FB is supplied coated on one face, referenced FB1, or on both faces, referenced FB2. The board or boards are then cut to allow the penetration of the required services, before being inserted into the aperture in the wall or floor.
- 3) Mulcol® Multiwraps are required to be used in conjunction with Mulcol® Multimastic FB depending upon the required application and classification (see Annex B). Mulcol® Multiwraps are the subject of a separate ETA 16/0564.
- 4) The applicant has submitted a written declaration that Mulcol® Multimastic FB and Mulcol® Multimastic C do not contain substances which have to be classified as dangerous according to Directive 67/548/EEC and Regulation (EC) No 1272/2008 and listed in the "Indicative list on dangerous substances" of the EGDS - taking into account the installation conditions of the construction product and the release scenarios resulting from there.
In addition to the specific clauses relating to dangerous substances contained in this European technical Assessment, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the Construction Products Regulation, these requirements need also to be complied with, when and where they apply.

2 **Specification of the intended 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.

- 1) The intended use of Mulcol® Multimastic C System is to reinstate the fire resistance performance of flexible wall, rigid wall and floor constructions where they are penetrated by various cables, metallic pipes, composite pipes and plastic pipes.
- 2) The specific elements of construction that the Mulcol® Multimastic C System may be used to provide a penetration seal in, are as follows:
 - a. Flexible walls: The wall must have a minimum thickness of 75 mm and comprise steel studs lined on both faces with minimum 1 layer of 12.5 mm thick boards. Apertures are not required to be lined.
 - b. Rigid walls: The wall must have a minimum thickness of 75 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 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 650 kg/m³.

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

- 3) The Mulcol® Multimastic C System may be used to provide a penetration seal with cables, cable trays, metallic pipes, composite pipes and plastic pipes, with and without insulation, with mixed services within the same seal/aperture (for details see Annex A).
- 4) The Mulcol® Multimastic C System consists of the Mulcol® Multimastic FB boards, Mulcol® Multimastic C firestop coating and the Mulcol® Multimastic SP firestop mastic.
- 5) The total amount of cross sections of (mixed) services (including insulation) should not exceed 60% of the penetration area.
- 6) Mulcol® Multimastic FB coated boards, provided with Mulcol® Multimastic C firestop coating of WFT 1 mm, are sealed within the construction using Mulcol® Multimastic SP mastic. Mulcol® Multimastic C firestop coating has to be applied with an overlap of \geq 25 mm on the construction and the penetration(s) have to be applied with 0,3 mm WFT thickness of Mulcol® Multimastic C firestop coating over a minimum length of 50 mm.
- 7) The Mulcol® Multimastic C System may be used to seal apertures in the separating element of unlimited width by 1200 mm high in a wall (uninterrupted separating studs will be required at 2400 mm centres or less in flexible walls), and 2400 mm by 1200 mm in a floor. The minimum permitted separation between adjacent seals/apertures is 200 mm. Services should be a minimum of 25 mm from seal edges. Services within Mulcol® Multimastic C System seal do not require a minimum separation, except pipes where pipe insulation penetrates the seal and plastic pipe penetrations which should be a minimum of 30 mm from other services in the aperture.
- 8) Services in floors shall be supported at 250 mm from the top face. Services in walls shall be supported at 270 mm from both faces of the wall.
- 9) The provisions made in this European Technical Assessment are based on an assumed working life of the Mulcol® Multimastic FB of 25 years, provided that the conditions laid down in the product datasheet for the packaging/transport/ storage/installation/use/repair are met. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.
- 10) Type Y₁: Intended for use at temperatures below 0°C with exposure to UV but no exposure to rain. Includes lower classes Y₂, Z₁, Z₂.

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

Product-type: Coated board and Coating		Intended use: Penetration Seal
Basic requirement for construction work	Essential characteristic	Performance
BWR 2 Safety in case of fire		
EN 13501-1	Reaction to fire	Class F (untested)
EN 13501-2	Resistance to fire	Annex A
BWR 3 Hygiene, health and environment		
EN 1026:2000	Air permeability	No performance determined
EAD 350454-00-1104, Annex C	Water permeability	No performance determined
Declaration of manufacturer & EN 16516	Content, emission and/or release of dangerous substances	Use categories: IA1, S/W3 Declaration of manufacturer
BWR 4 Safety in use		
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 and serviceability	Y ₁
BWR 5 Protection against noise		
EN 10140-1,2,4,5/ EN ISO 717-1	Airborne sound insulation	No performance determined
BWR 6 Energy economy and heat retention		
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 12572, EN 12086, EN ISO 10456	Water vapour permeability	No performance determined

4 ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE (HEREINAFTER AVCP) SYSTEM APPLIED, WITH REFERENCE TO ITS LEGAL BASE

According to the decision 1999/454/EC – 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 89/106/EEC as regards 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/JOLIndex.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 8th April 2013 relating to the European technical assessment ETA 16/0985 issued on 17/04/2019 which is part of the technical documentation of this European technical approval. The "Control Plan" is laid down in the context of the factory production control system operated by the manufacturer and deposited at UL International (UK) Ltd.

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

¹ Official Journal of the European Communities L178/52 of 14/7/1999

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. cable trays)

(b) Installation instruction:

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

6 Issued on:

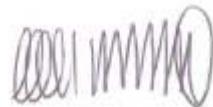
17th April 2019

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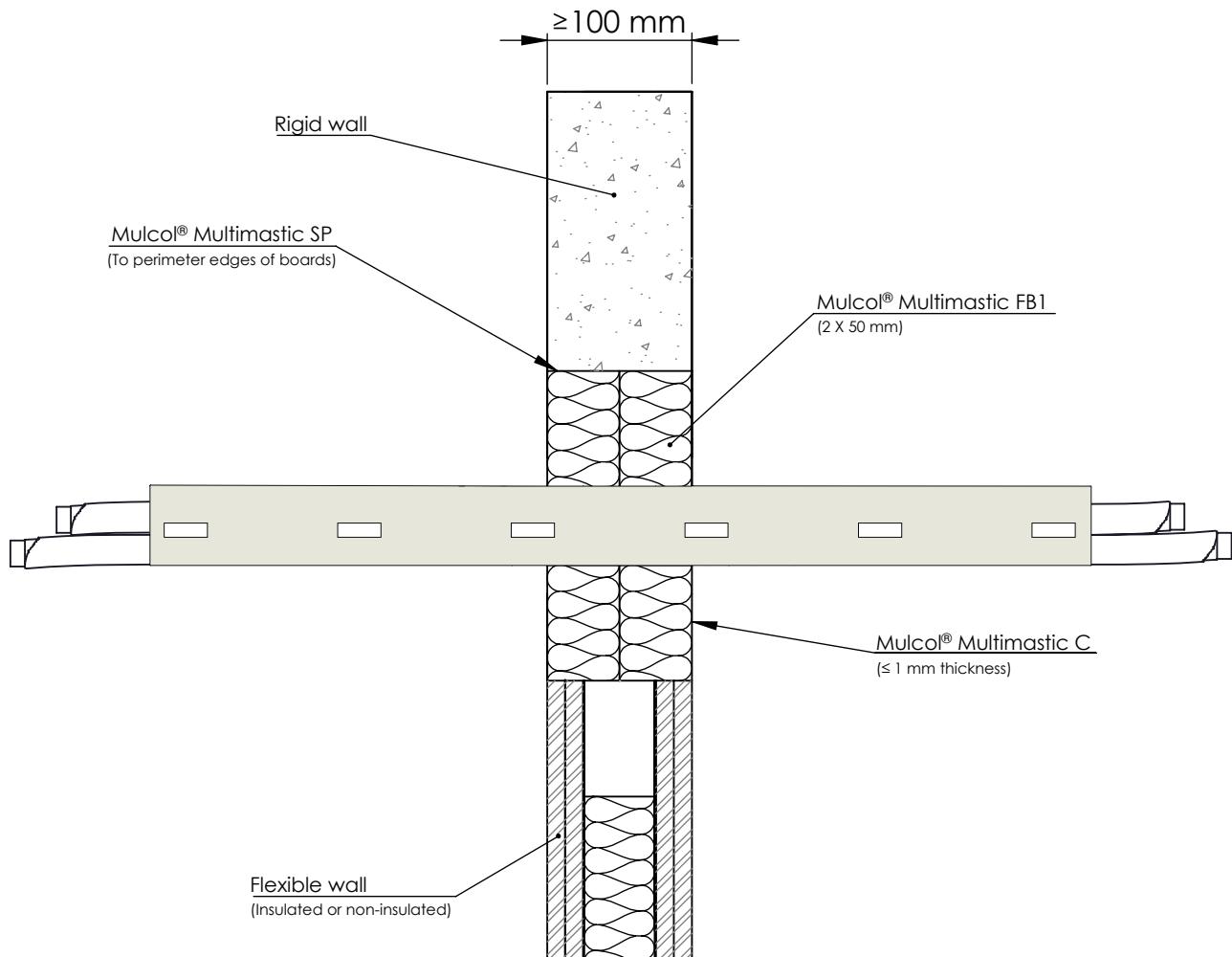
For and on behalf of UL International (UK) Ltd.

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

Fire test cable penetration seal
Mulcol® Multimastic C System
Rigid/Flexible wall construction according to I.2.2



American projection	Scale : 1:15	Company : Mulcol International B.V.	FW-CT-MC1.2.10
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4



Note: Multi-penetration including insulated metal pipes within the same seal - Separation between seals 100 mm

A 1.1 Multimastic FB1 - 2x50 mm - with cables, trays and conduits

Services	Classification	Position Mulcol® Multimastic FB1	Maximum seal	Minimum between seals	Minimum from seal edge
Blank seals	EI 120				
Single electrical cables up to Ø 21 mm	E 120, EI 60				
Electrical cables up to Ø 80 mm (single, bundled and on trays)	EI 60				
Cables up to Ø 21 mm in tied bundles up to Ø 100 mm	EI 60				
Steel cable trays (perforated and non-perforated) & ladders	EI 60				
Unsheathed wires up to Ø 24 mm	E 60, EI 30				
PVC conduit up to Ø 16 mm	EI 60 C/U				
		Both sides of the wall	2400 x 1200 mm	200 mm	25 mm

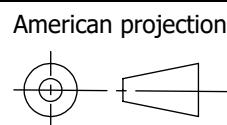
Annex A - Resistance to fire classification - Mulcol® Multimastic C System

Fire test pipe penetration seal
Mulcol® Multimastic C System

Rigid/Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

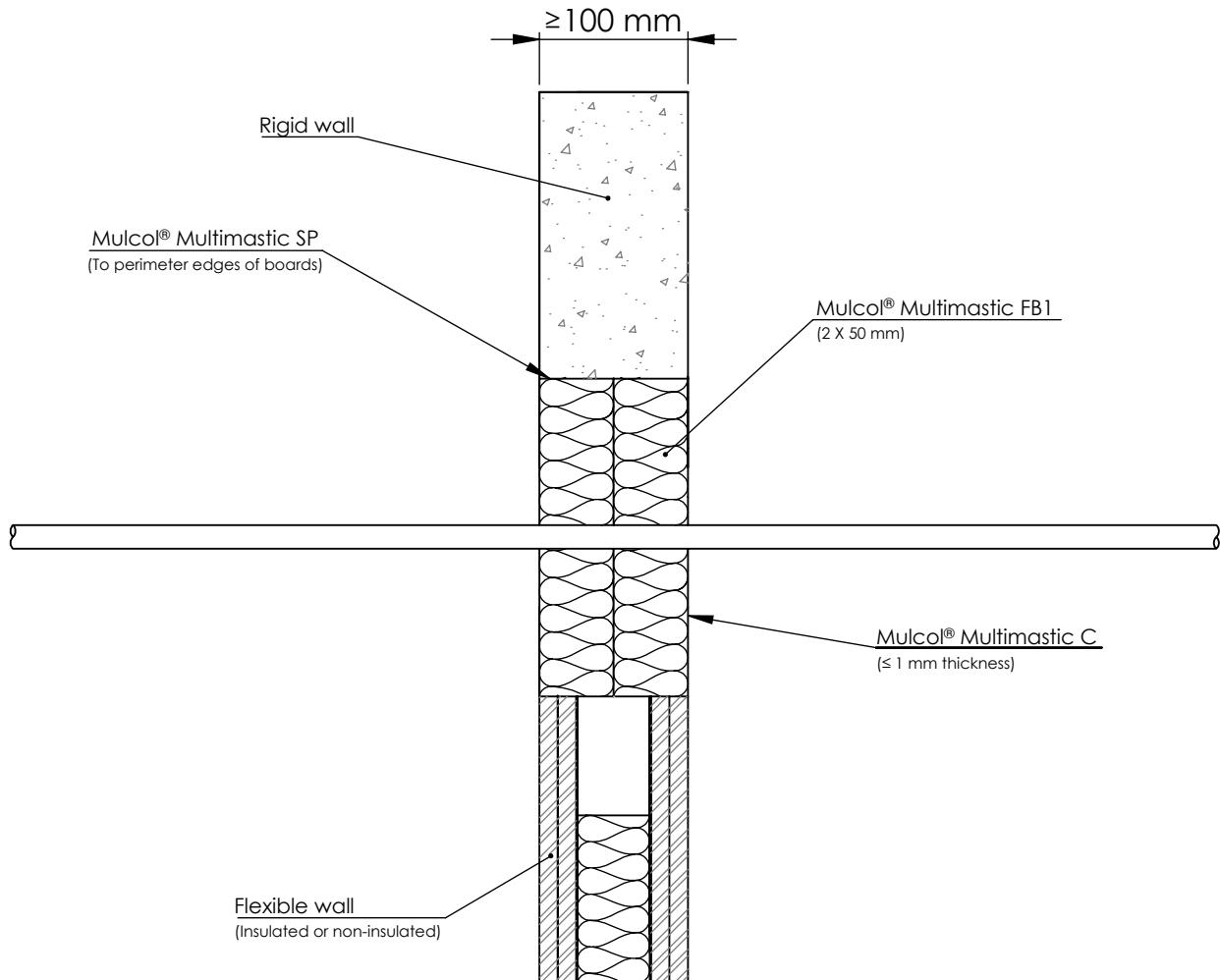
Company : Mulcol International B.V.

FW-CT-MC1.2.10

Department : Research & Development

A4

Draftsman : R.M.



A 1.1.1 Multimastic FB1 - 2x50 mm - with steel and copper conduits

Services	Classification	Position Mulcol® Multimastic FB1	Maximum seal	Minimum between seals	Minimum from seal edge
Steel conduit up to Ø 16 mm	EI 60 C/U	Both sides of the wall	2400 x 1200 mm	200 mm	25 mm
Copper conduit up to Ø 16 mm	E 60 C/U, EI 45 C/U				

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

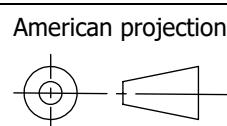
Fire test cable penetration seal

Mulcol® Multimastic C System

Rigid/Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:15

Unit of measure : mm

Date : 13-6-2017

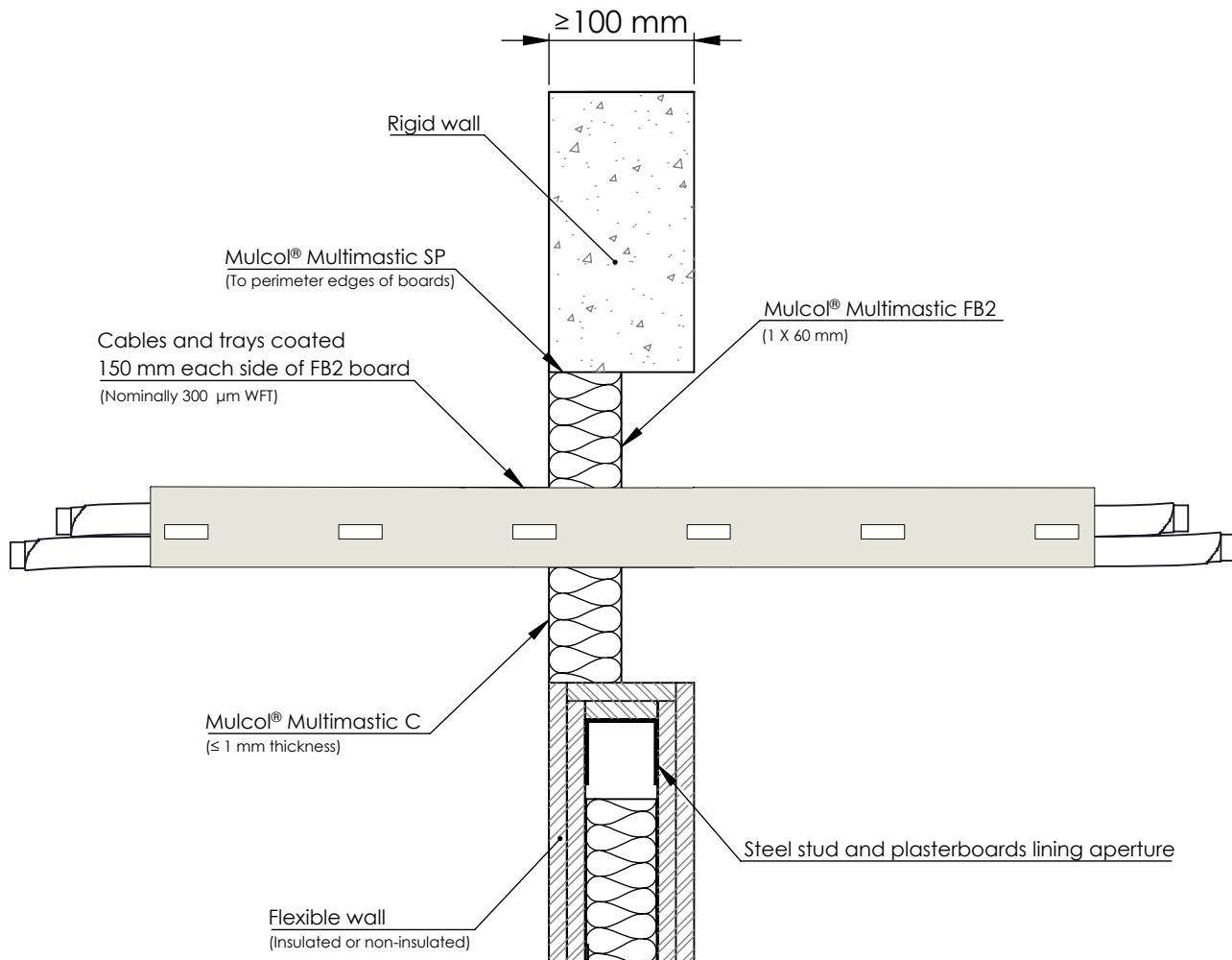
Company : Mulcol International B.V.

FW-CT-MC2.2.10

Department : Research & Development

A4

Draftsman : R.M.



A 1.2 Multimastic FB2 - 1x60 mm - with cables and trays

Services	Classification	Position Mulcol® Multimastic FB2	Maximum seal	Minimum between seals	Minimum from seal edge
Electrical cables up to \varnothing 80 mm (single, bundled and on trays)	EI 60	Either side of the wall (or anywhere in between)	1200 x 600 mm	200 mm	25 mm
Cables up to \varnothing 21 mm in tied bundles up to \varnothing 100 mm					
Steel cable trays (perforated) & ladders					
Unsheathed wires up to \varnothing 24 mm	E 60, EI 45				

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

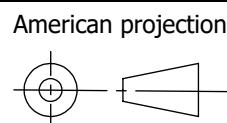
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid/Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:15

Unit of measure : mm

Date : 16-6-2016

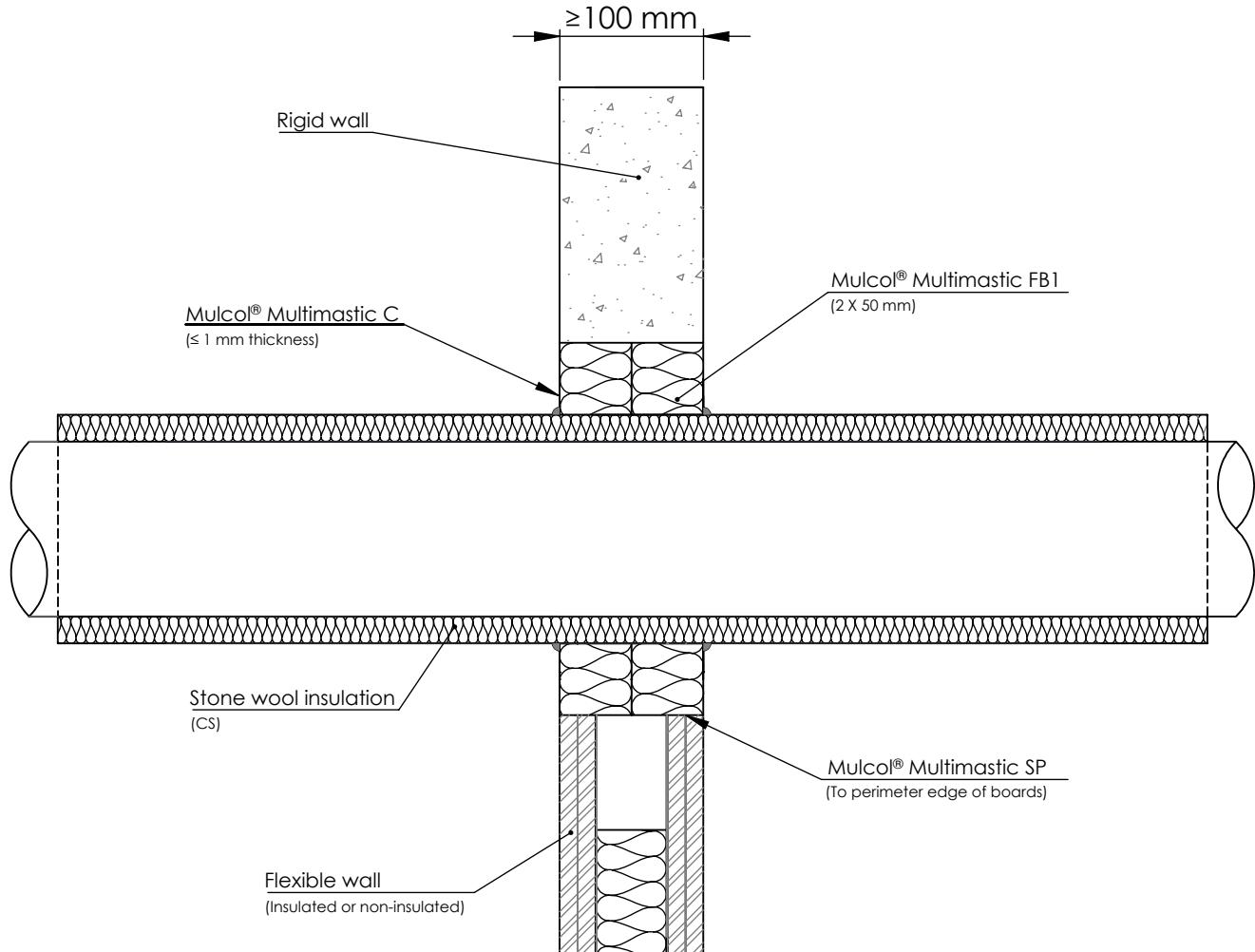
Company : Mulcol International B.V.

FW-ST-MC1.2.20

Department : Research & Development

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Draftsman : R.M.



A 1.3 Multimastic FB1 - 2x50 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB1	Insulation	Maximum seal	Minimum from seal edge
Steel pipe Ø 40 mm / 1-14.2 mm wall th.			20 mm Stone wool insulation, 80 kg/m³		
Steel pipe Ø 40 mm / 1-14.2 mm wall th.					
Steel pipe Ø 50 mm / 1.2-14.2 mm wall th.					
Steel pipe Ø 60 mm / 1.4-14.2 mm wall th.					
Steel pipe Ø 75 mm / 1.6-14.2 mm wall th.					
Steel pipe Ø 90 mm / 1.9-14.2 mm wall th.					
Steel pipe Ø 100 mm / 2.1-14.2 mm wall th.					
Steel pipe Ø 115 mm / 2.4-14.2 mm wall th.					
Steel pipe Ø 140 mm / 2.9-14.2 mm wall th.					
Steel pipe Ø 165 mm / 3.4-14.2 mm wall th.					
Steel pipe Ø 180 mm / 3.6-14.2 mm wall th.					
Steel pipe Ø 200 mm / 4.0-14.2 mm wall th.					
Steel pipe Ø 219 mm / 4.3-14.2 mm wall th.					
Steel pipe Ø 250 mm / 5.0-14.2 mm wall th.					
Steel pipe Ø 300 mm / 5.9-14.2 mm wall th.					
Steel pipe Ø 324 mm / 6.35-14.2 mm wall th.					
See graph on page 12 for intermediate sizes					

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

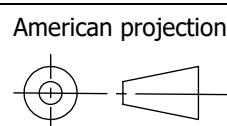
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid/Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

FW-ST-MC1.2.20

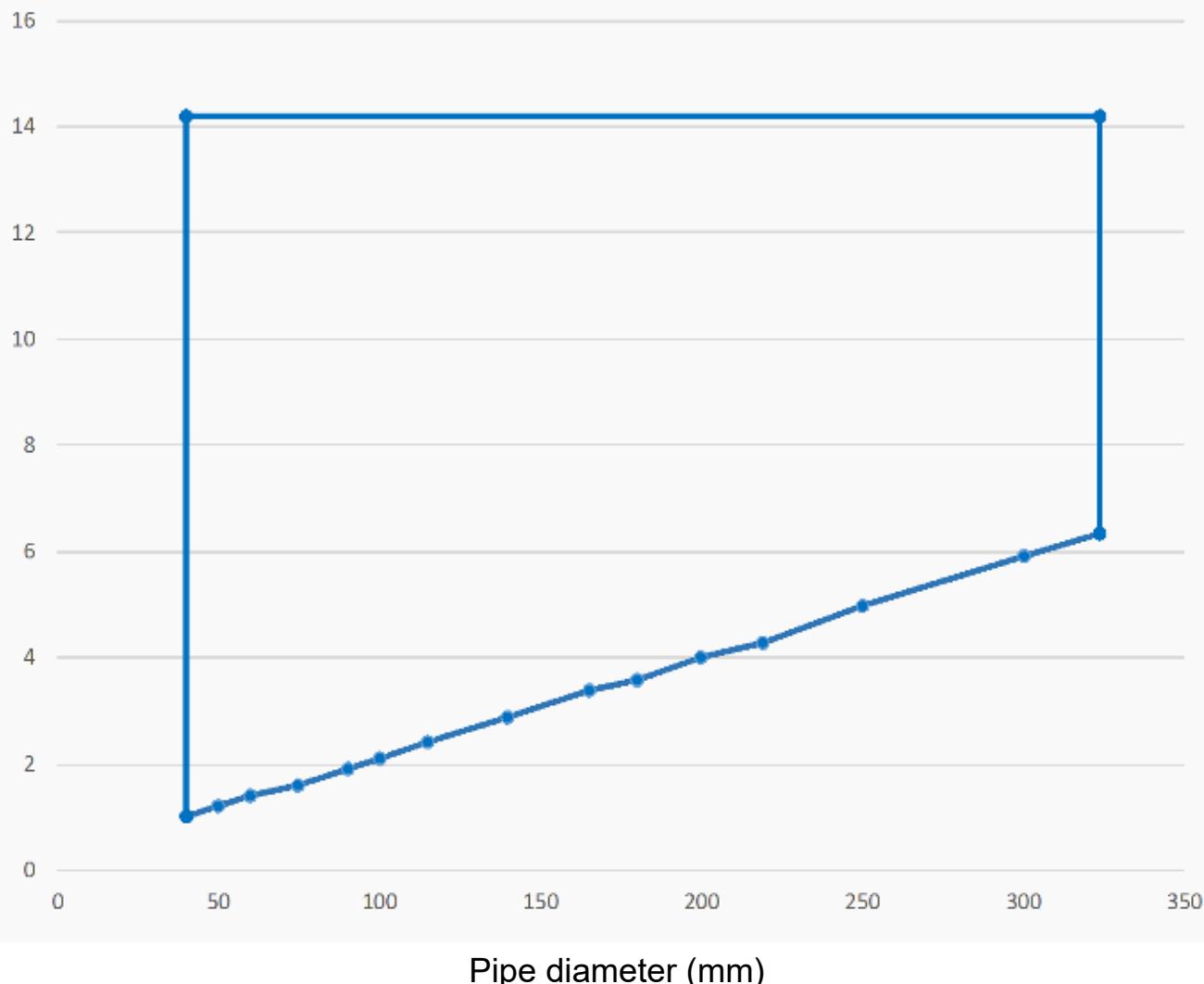
Department : Research & Development

A4

Draftsman : R.M.

Pipe wall thickness (mm)

Intermediate sizes



Annex A - Resistance to fire classification - Mulcol® Multimastic C System

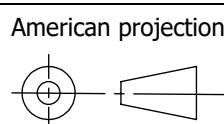
Fire test pipe penetration seal

Mulcol® Multimastic C System

Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:15

Unit of measure : mm

Date : 13-6-2017

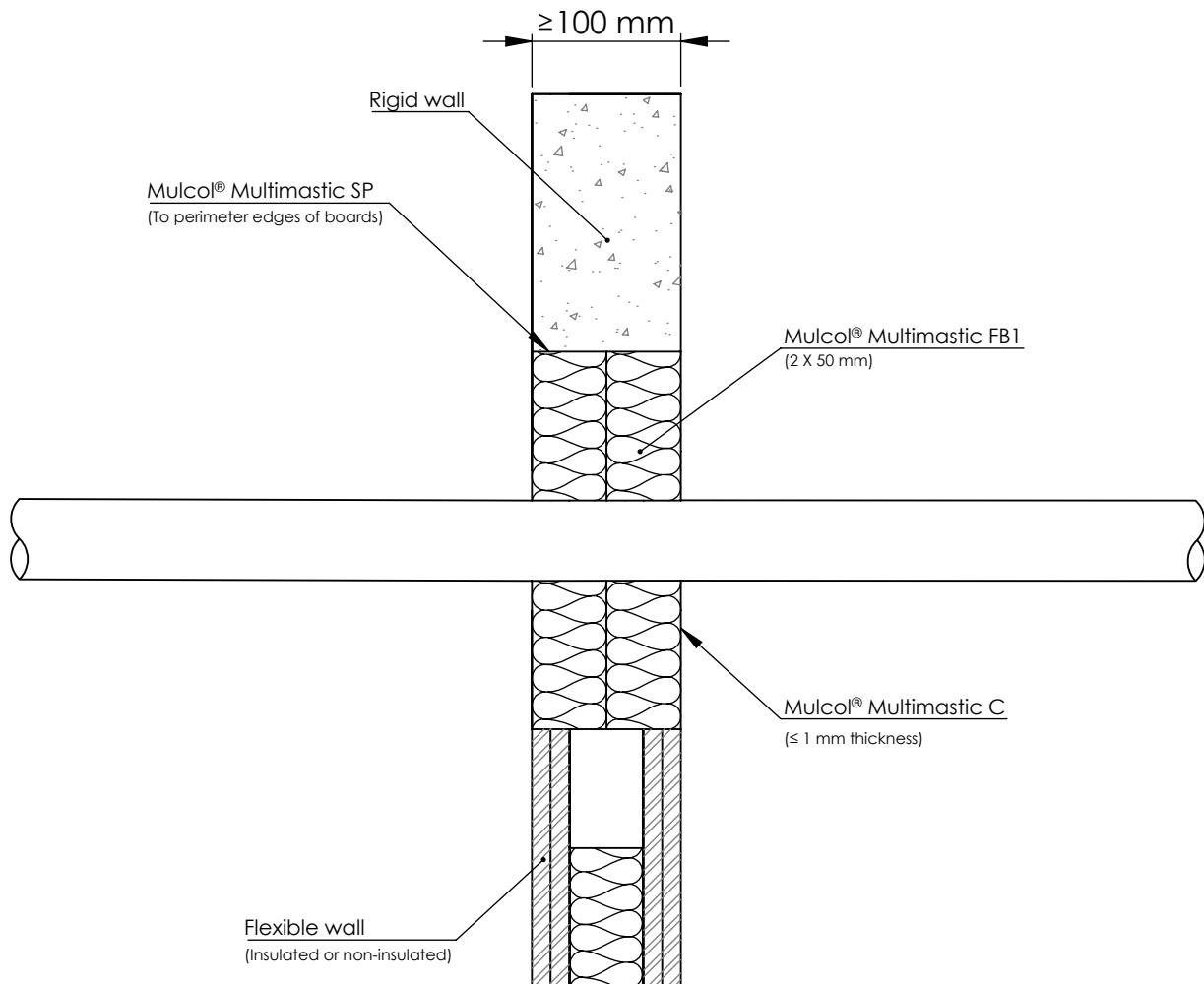
Company : Mulcol International B.V.

FW-ST-MC1.2.20

Department : Research & Development

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Draftsman : R.M.



A 1.3.1 Multimastic FB1 - 2x50 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB1	Insulation	Maximum seal	Minimum from seal edge
Steel pipe Ø 4 mm / 1-14.2 mm wall thickness	EI 120 C/U	Both sides of the wall	None	Unlimited width x 1200 mm height (See section 2. 5)	30 mm
Steel pipe Ø 22 mm / 2-14.2 mm wall thickness	E 120 C/U, EI 60 C/U				
Steel pipe Ø 114 mm / 11 mm wall thickness	E 90 C/U, EI 20 C/U				

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

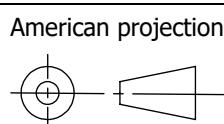
Fire test pipe penetration seal

Mulcol® Multimastic C System

Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:15

Unit of measure : mm

Date : 13-6-2017

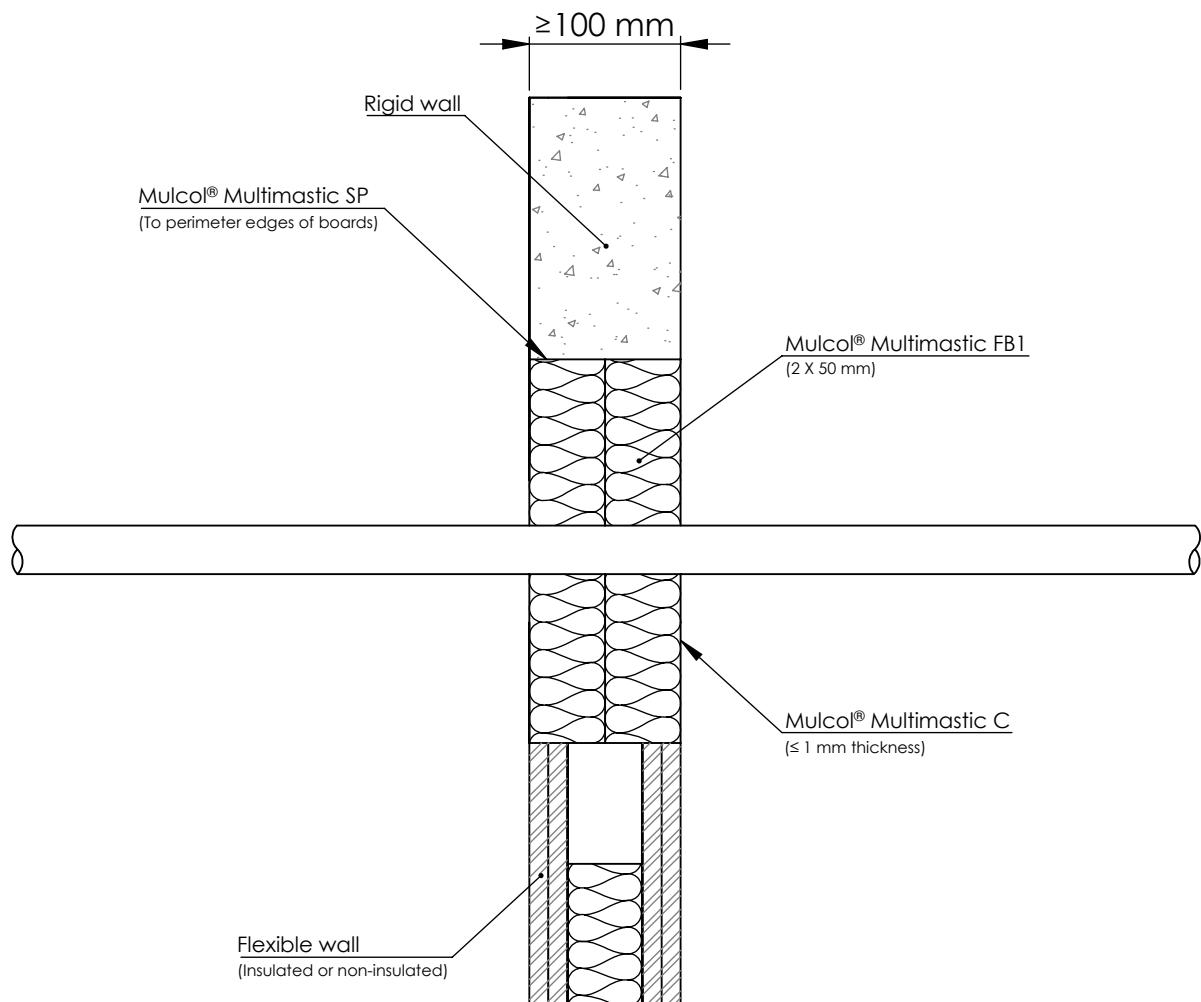
Company : Mulcol International B.V.

FW-PVC-MC1.2.20

Department : Research & Development

A4

Draftsman : R.M.



A 1.4 Multimastic FB1 - 2x50 mm - with combustible pipes

Services	Classification	Position Mulcol® Multimastic FB1	Insulation	Maximum seal	Minimum from seal edge
PVC-U pipe Ø 6 mm / 1.0 mm wall thickness	EI 120 U/C	Both sides of the wall	None	Unlimited width x 1200 mm height (See section 2.5)	30
PVC-U pipe Ø 6-32 mm / 1.8-2.4 mm wall thickness	E 90 U/C, EI 60 U/C				
PVC-U pipe Ø 32 mm / 2.4 mm wall thickness	EI 90 U/C				
PE pipe Ø 20 mm / 2.0 mm wall thickness	E 120 U/C, EI 90 U/C				
PE pipe Ø 20-32 mm / 2.0-3.0 mm wall thickness	EI 60 U/C				
PE pipe Ø 32 mm / 3.0 mm wall thickness	EI 90 U/C				
PP pipe Ø 20 mm / 2.2 mm wall thickness	E 120 U/C, EI 60 U/C				
PP pipe Ø 32 mm / 1.8 mm wall thickness					

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

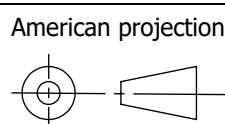
Fire test pipe penetration seal

Mulcol® Multimastic C System

Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:15

Unit of measure : mm

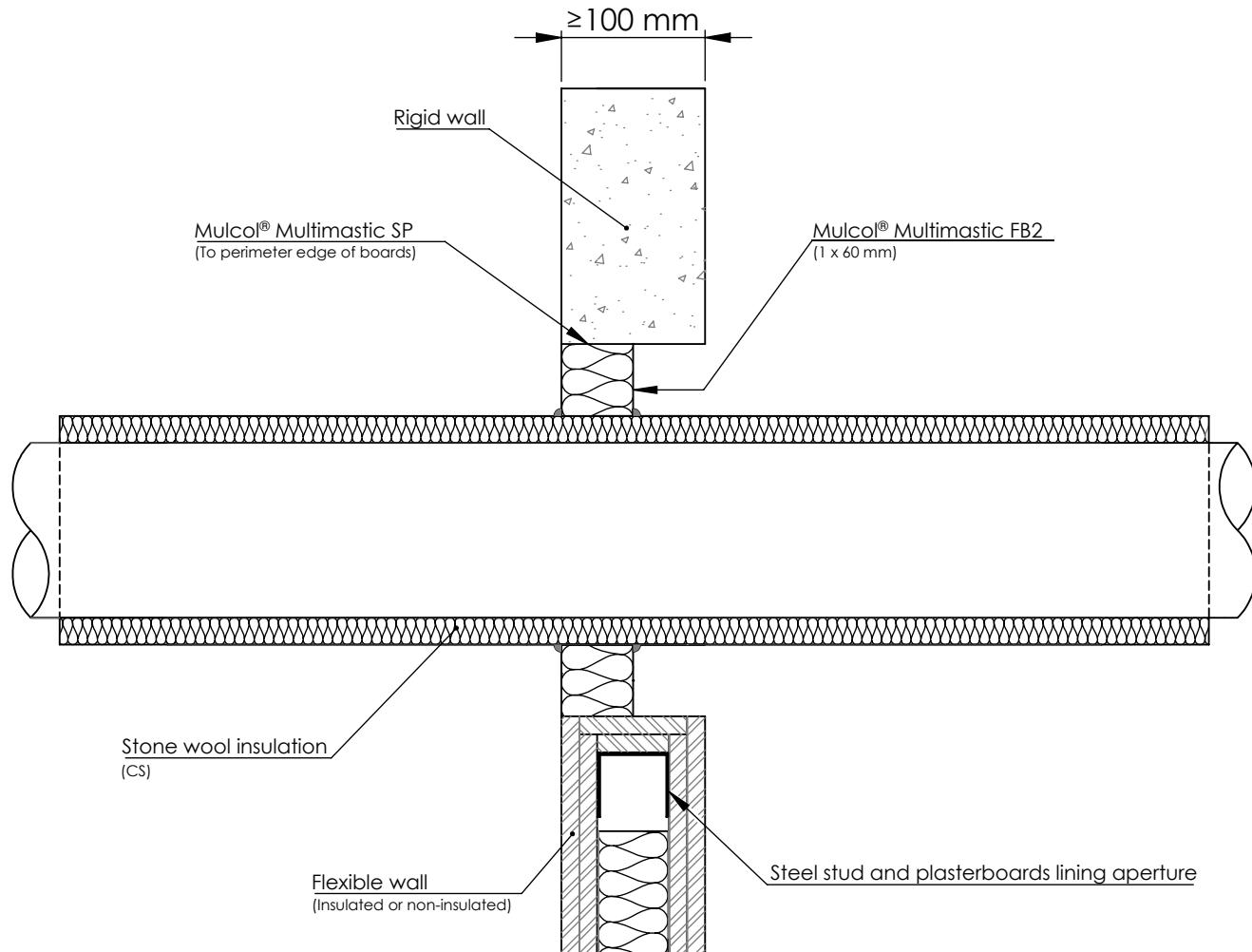
Date : 13-6-2017

Company : Mulcol International B.V.

FW-ST-MC2.2.20

Department : Research & Development

A4



A 1.5 Multimastic FB2 - 1x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge
Steel pipe Ø 40 mm / 1-14.2 mm wall th.			20 mm Stone wool insulation, 80 kg/m³		
Steel pipe Ø 40 mm / 1-14.2 mm wall th.					
Steel pipe Ø 50 mm / 1.7-14.2 mm wall th.					
Steel pipe Ø 60 mm / 1.8-14.2 mm wall th.					
Steel pipe Ø 75 mm / 2.1-14.2 mm wall th.					
Steel pipe Ø 90 mm / 2.3-14.2 mm wall th.					
Steel pipe Ø 100 mm / 2.5-14.2 mm wall th.					
Steel pipe Ø 115 mm / 2.8-14.2 mm wall th.					
Steel pipe Ø 140 mm / 3.2-14.2 mm wall th.					
Steel pipe Ø 165 mm / 3.6-14.2 mm wall th.					
Steel pipe Ø 180 mm / 3.9-14.2 mm wall th.					
Steel pipe Ø 200 mm / 4.2-14.2 mm wall th.					
Steel pipe Ø 219 mm / 4.5-14.2 mm wall th.					
Steel pipe Ø 250 mm / 5.0-14.2 mm wall th.					
Steel pipe Ø 300 mm / 5.9-14.2 mm wall th.					
Steel pipe Ø 324 mm / 6.35-14.2 mm wall th.					
See graph on page 16 for intermediate sizes					

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

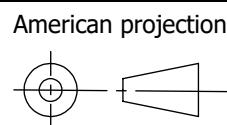
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid/Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

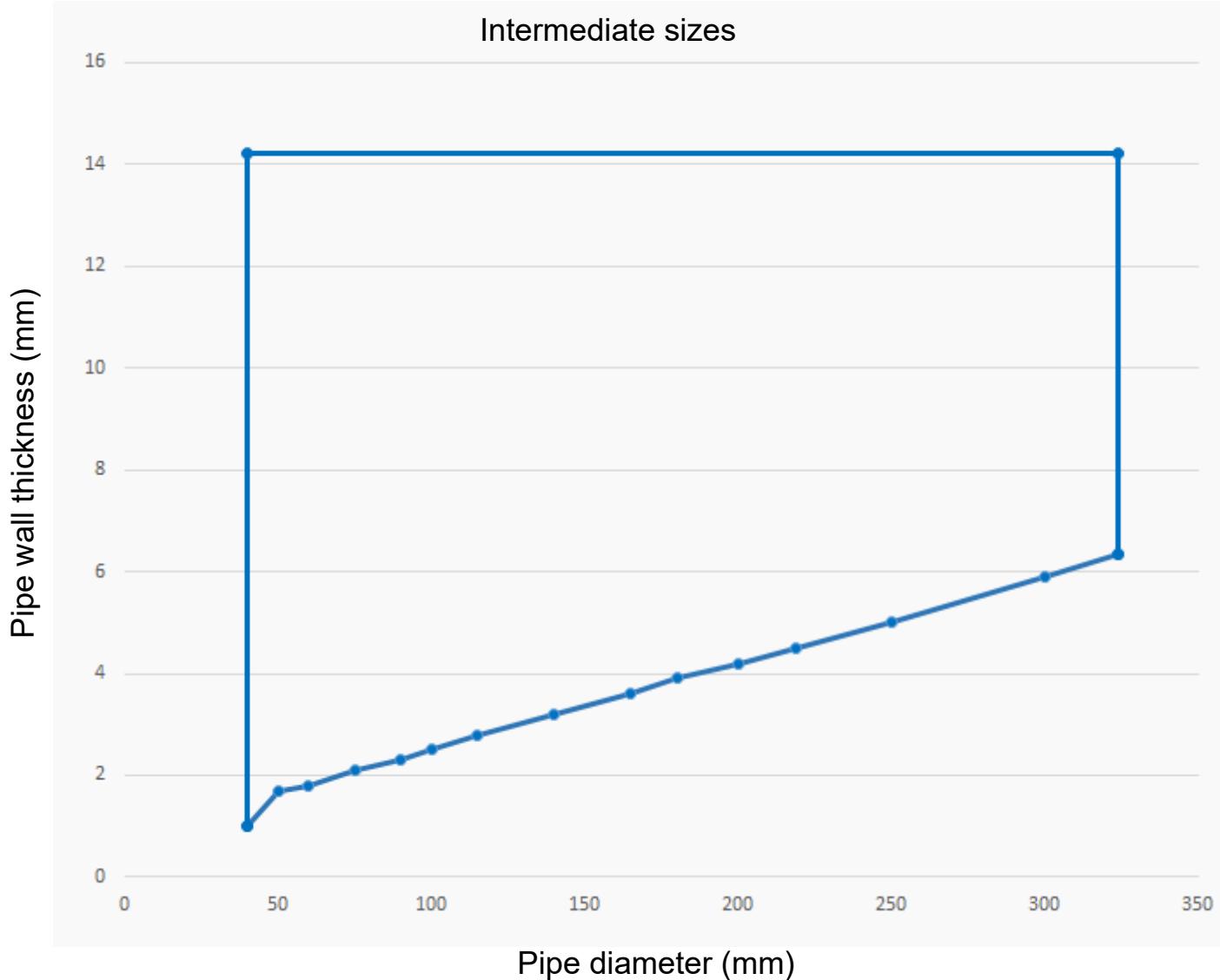
Company : Mulcol International B.V.

FW-ST-MC1.2.20

Department : Research & Development

A4

Draftsman : R.M.



Annex A - Resistance to fire classification - Mulcol® Multimastic C System

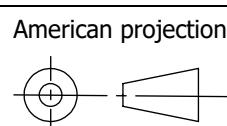
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid/Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:15

Unit of measure : mm

Date : 10-2-2017

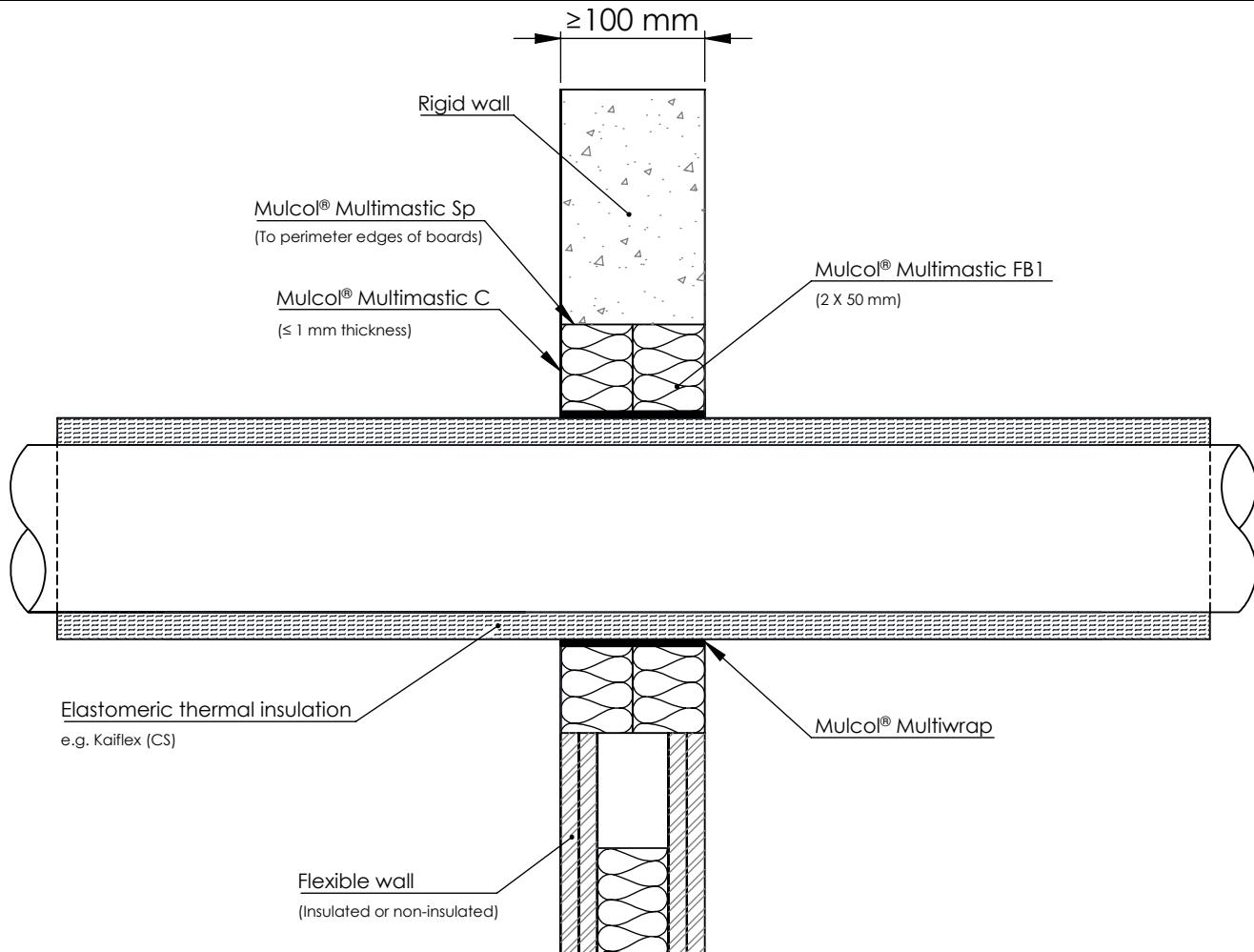
Company : Mulcol International B.V.

FW-ST-MC1.2.22

Department : Research & Development

A4

Draftsman : R.M.



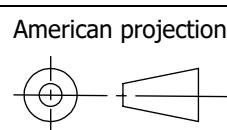
A 1.6 Multimastic FB1 - 2x50 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB1	Insulation	Mulcol® MultiWrap	Minimum from seal edge
Steel pipe Ø 40 mm / 1-14.2 mm wall th.			32 mm elastomeric insulation min. class B-s3, d0 or PE Foam insulation		
Steel pipe Ø 40 mm / 1-14.2 mm wall th.					
Steel pipe Ø 50 mm / 1.2-14.2 mm wall th.					
Steel pipe Ø 60 mm / 1.6-14.2 mm wall th.					
Steel pipe Ø 75 mm / 2.-14.2 mm wall th.					
Steel pipe Ø 90 mm / 2.4-14.2 mm wall th.					
Steel pipe Ø 100 mm / 2.7-14.2 mm wall th.					
Steel pipe Ø 115 mm / 3.1-14.2 mm wall th.					
Steel pipe Ø 140 mm / 3.8-14.2 mm wall th.					
Steel pipe Ø 165 mm / 4.5-14.2 mm wall th.					
Steel pipe Ø 180 mm / 3.6-14.2 mm wall th.					
Steel pipe Ø 200 mm / 4.0-14.2 mm wall th.					
Steel pipe Ø 219 mm / 4.3-14.2 mm wall th.					
Steel pipe Ø 250 mm / 5.0-14.2 mm wall th.					
Steel pipe Ø 300 mm / 5.9-14.2 mm wall th.					
Steel pipe Ø 324 mm / 6.35-14.2 mm wall th.					
EI 90 C/U					
Both sides of the wall Unlimited width x 1200 mm height (See section 2. 5)					
32-50 mm elastomeric insulation min. class B-s3, d0 or PE Foam insulation					
50 x 5.4 mm (3 layers) one fitted flush to each face of seal					
30 mm					

See graph on page 18 for intermediate sizes

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

Fire test pipe penetration seal
Mulcol® Multimastic C System
Rigid/Flexible wall construction according to I.2.2



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

FW-ST-MC1.2.22

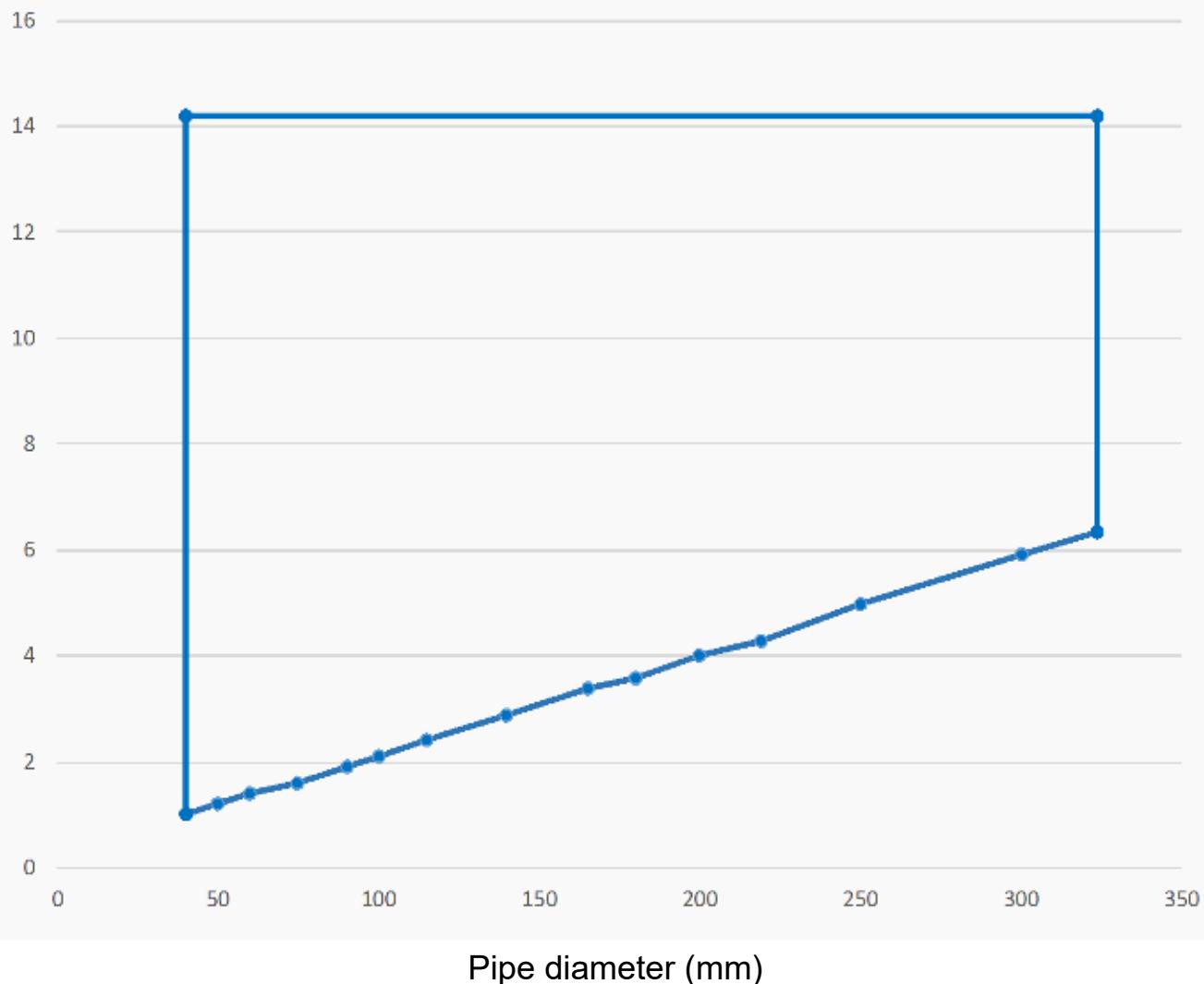
Department : Research & Development

A4

Draftsman : R.M.

Pipe wall thickness (mm)

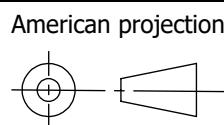
Intermediate sizes



Annex A - Resistance to fire classification - Mulcol® Multimastic C System

Fire test pipe penetration seal
 Mulcol® Multimastic C System
 Rigid/Flexible wall construction according to I.2.2

MULCOL
FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 10-2-2017

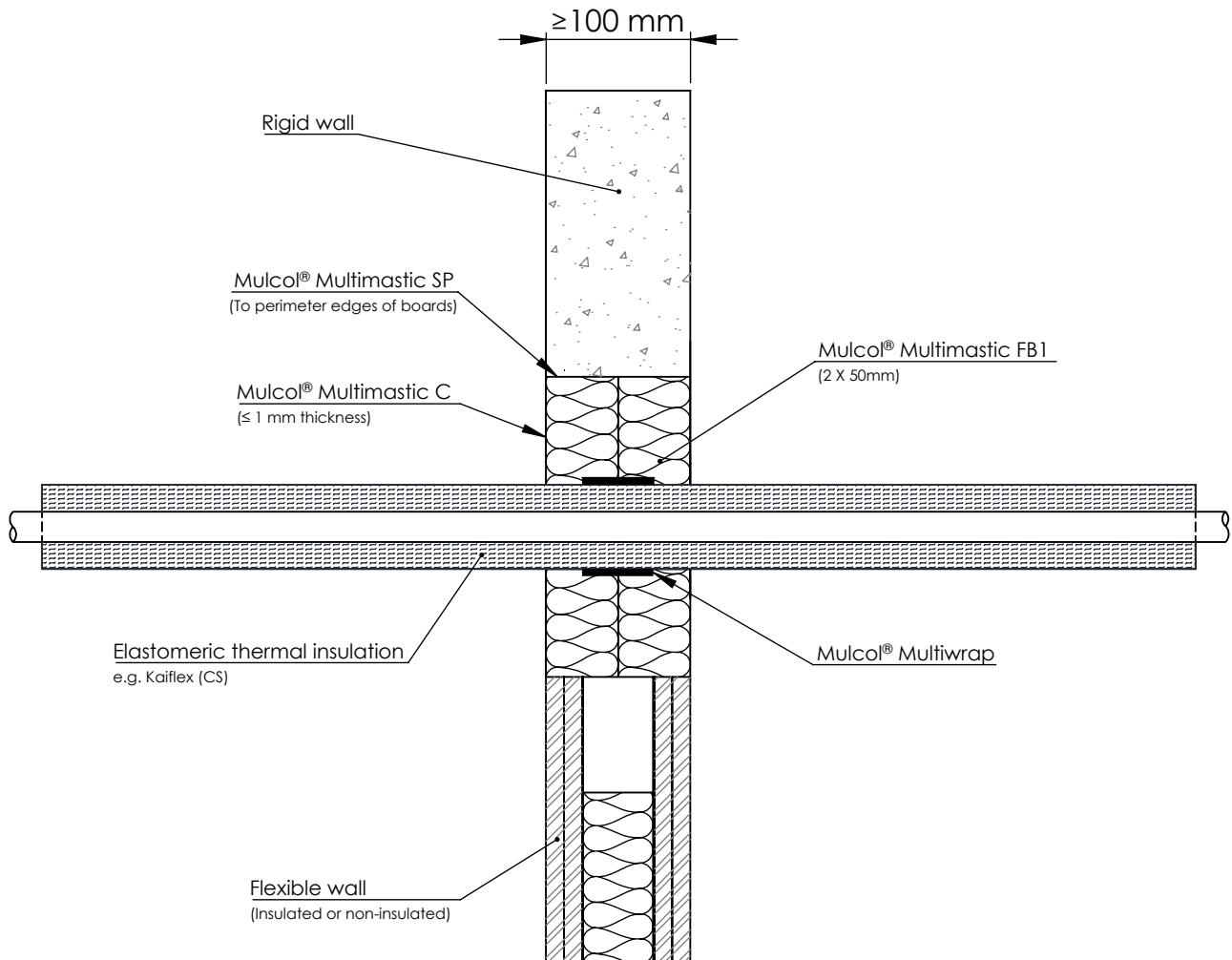
Company : Mulcol International B.V.

FW-ST-MC1.2.22

Department : Research & Development

A4

Draftsman : R.M.



A 1.6.1 Multimastic FB1 - 2x50 mm - with (stainless) steel pipes

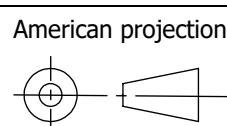
Services	Classification	Position Mulcol® Multimastic FB1	Insulation	Mulcol® Multiwrap	Minimum from seal edge
Steel pipe Ø 40 mm / 1-14.2 mm wall th.	EI 120 U/C	Both sides of the wall Unlimited width x 1200 mm height (See section 2. 5)	13 mm Kaiflex ST insulation	50 x 1.8 mm (1 layer) Centrally fitted	25 mm

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

Fire test pipe penetration seal
Mulcol® Multimastic C System
Rigid/Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:15

Unit of measure : mm

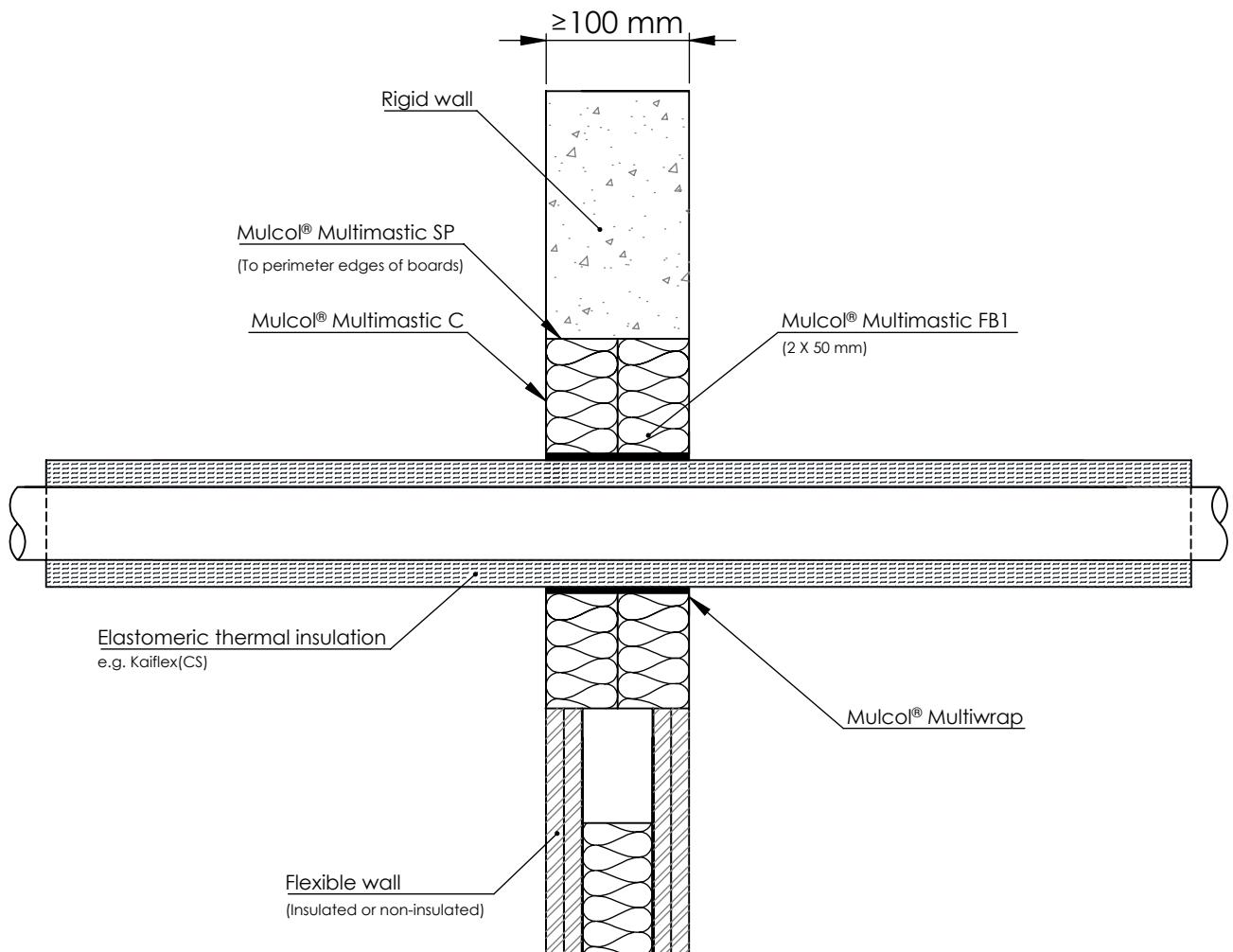
Date : 10-2-2017

Company : Mulcol International B.V.

FW-ST-MC1.2.22

Department : Research & Development

A4



A 1.6.2 Multimastic FB1 - 2x50 mm - with copper and (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB1	Insulation	Mulcol® Multiwrap	Minimum from seal edge
Copper pipe Ø 12 mm / 1 mm wall th.	EI 120 C/U		9 mm Kaiflex ST insulation		
Copper pipe Ø 12-54 mm / 1-1.2 mm wall th.	E 120 C/U, EI 90 C/U		9-13 mm Kaiflex ST insulation		
	E 120 C/U, EI 60 C/U		13-25 mm Kaiflex ST insulation		
Steel pipe Ø 40 mm / 1-14.2 mm wall th.		Both sides of the wall Unlimited width x 1200 mm hight (See section 2. 5)		50 x 3.6 mm (2 layers) one fitted flush to each face of seal	25 mm
Steel pipe Ø 50 mm / 1.3-14.2 mm wall th.					
Steel pipe Ø 60 mm / 1.6-14.2 mm wall th.					
Steel pipe Ø 75 mm / 2.-14.2 mm wall th.					
Steel pipe Ø 90 mm / 2.4-14.2 mm wall th.					
Steel pipe Ø 100 mm / 2.7-14.2 mm wall th.					
Steel pipe Ø 115 mm / 3.1-14.2 mm wall th.					
Steel pipe Ø 140 mm / 3.8-14.2 mm wall th.					
Steel pipe Ø 165 mm / 4.5-14.2 mm wall th.					

See graph on page 21 for intermediate sizes

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

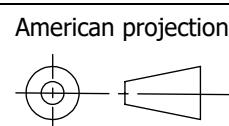
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid/Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

FW-ST-MC1.2.22

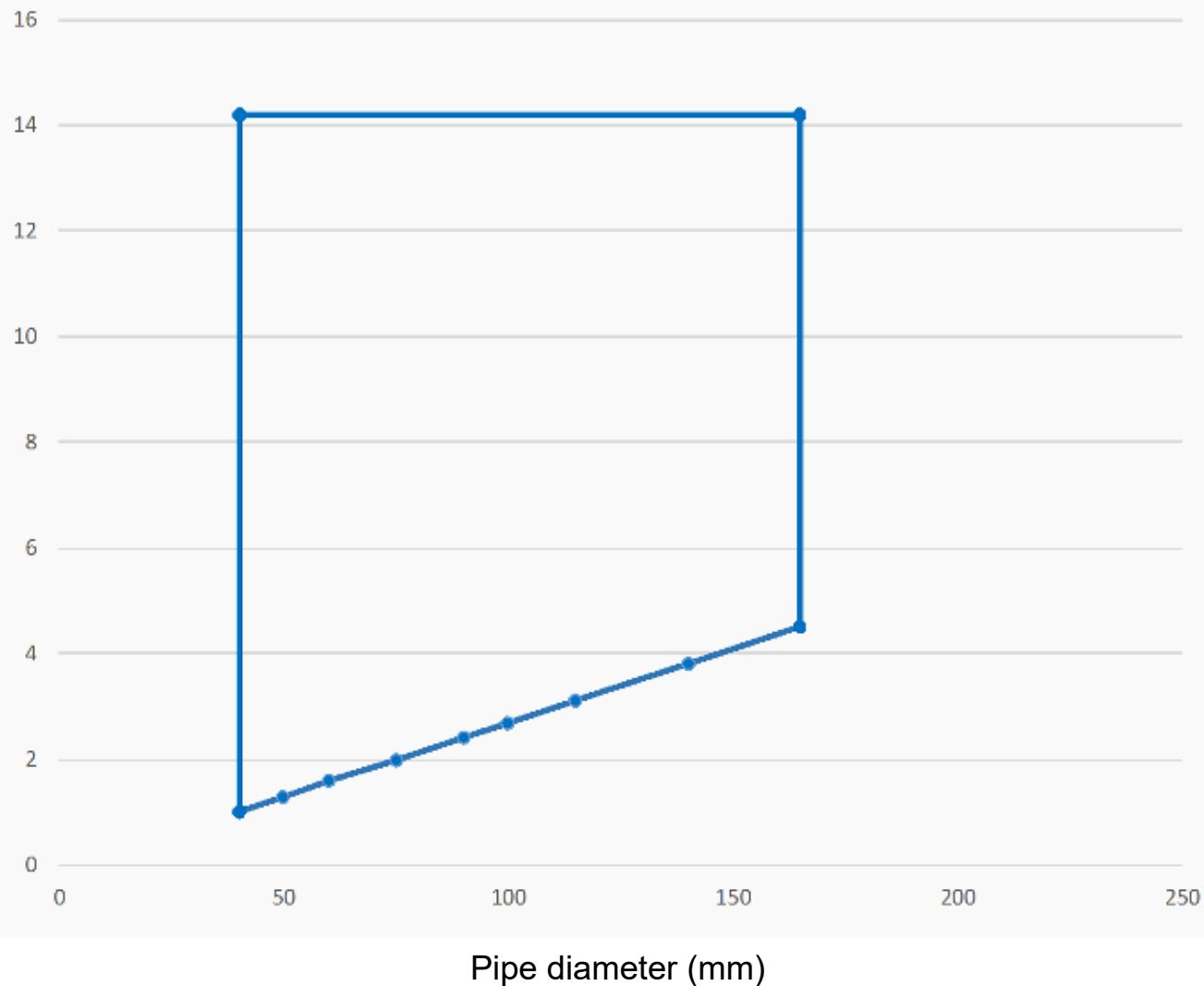
Department : Research & Development

A4

Draftsman : R.M.

Pipe wall thickness (mm)

Intermediate sizes



Annex A - Resistance to fire classification - Mulcol® Multimastic C System

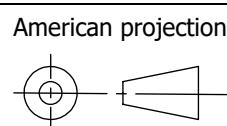
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid/Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

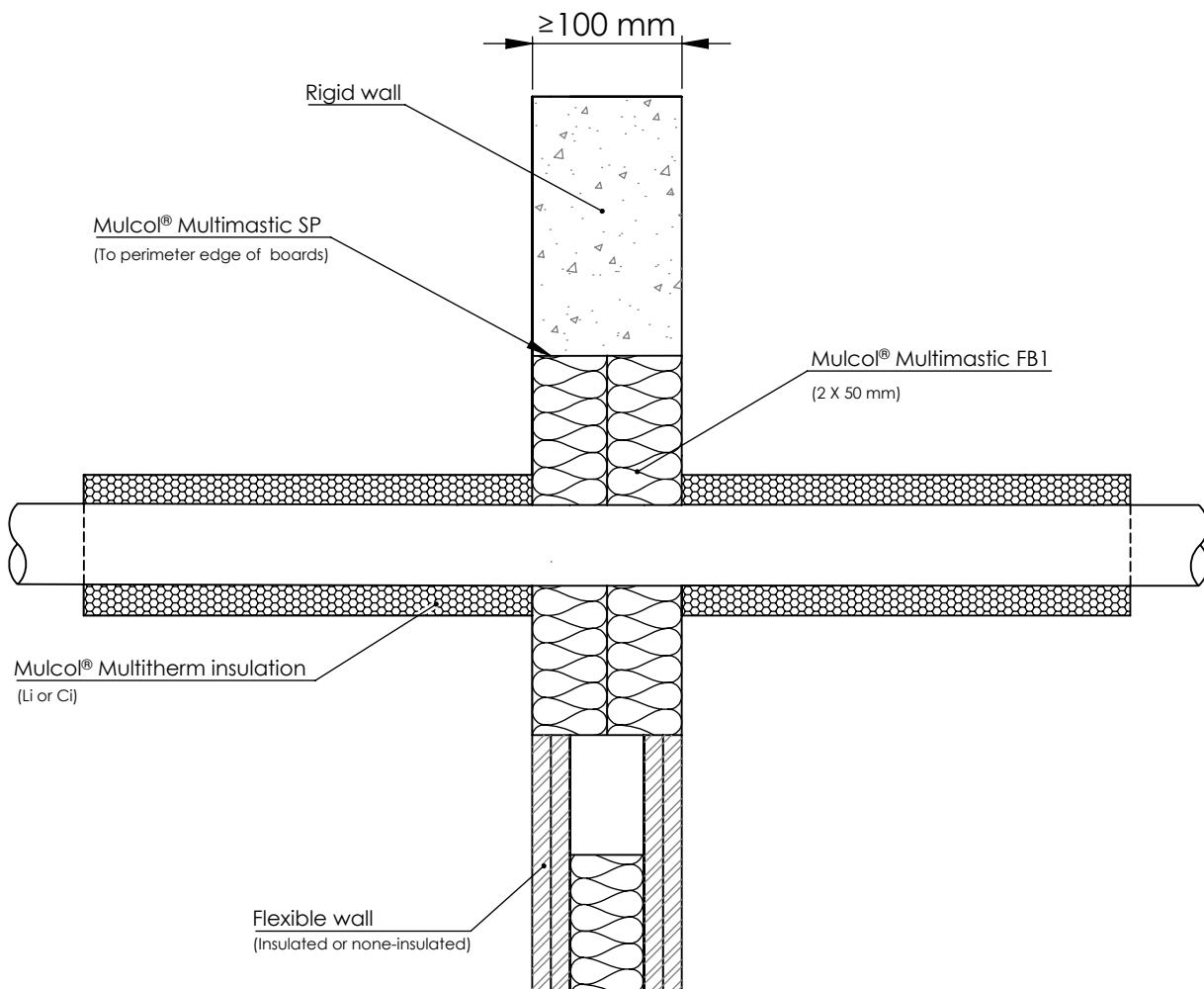
Company : Mulcol International B.V.

FW-MLA-MC1.2.20

Department : Research & Development

A4

Draftsman : R.M.



A 1.7 Multimastic FB1 - 2x50 mm - with copper and alupex composite pipes

Services	Classification	Position Mulcol® Multimastic FB1	Insulation	Maximum seal	Minimum from seal edge
Copper pipe up to Ø 54 mm / 1-14.2 mm wall th.	EI 120 C/C	Both sides of the wall	20 mm stone wool 80 kg/m³	Unlimited width x 1200 mm hight (See section 2. 5)	25 mm
Alupex composite pipe Ø 75 mm / 7.5 mm wall th.	EI 60 C/U		600 mm length of 25 mm Mulcol® Multitherm insulation		

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

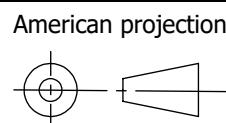
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid/Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

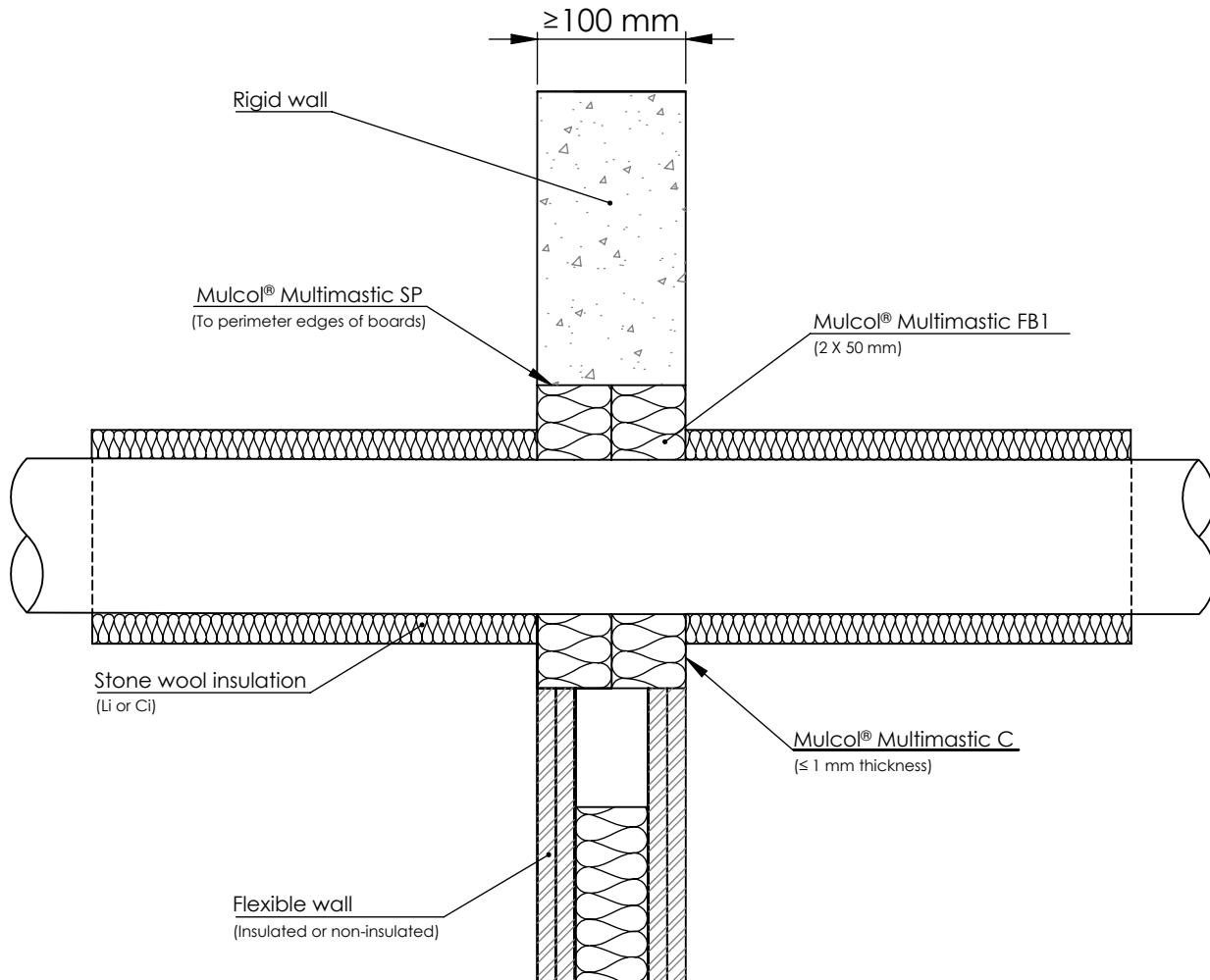
Company : Mulcol International B.V.

FW-ST-MC1.2.20

Department : Research & Development

A4

Draftsman : R.M.



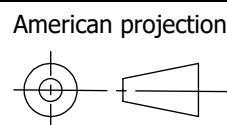
A 1.7.1 Multimastic FB1 - 2x50 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB1	Insulation	Maximum seal	Minimum from seal edge
Steel pipe Ø 40 mm / 1-14.2 mm wall th.	EI 120 C/U		500 mm length of 20 mm Stone wool insulation, 80 kg/m³		
Steel pipe Ø 40 mm / 1-14.2 mm wall th.					
Steel pipe Ø 50 mm / 1.2-14.2 mm wall th.					
Steel pipe Ø 60 mm / 1.4-14.2 mm wall th.					
Steel pipe Ø 75 mm / 1.7-14.2 mm wall th.					
Steel pipe Ø 90 mm / 2-14.2 mm wall th.					
Steel pipe Ø 100 mm / 2.2-14.2 mm wall th.					
Steel pipe Ø 115 mm / 2.5-14.2 mm wall th.					
Steel pipe Ø 140 mm / 3-14.2 mm wall th.					
Steel pipe Ø 165 mm / 3.5-14.2 mm wall th.					
Steel pipe Ø 180 mm / 3.8-14.2 mm wall th.					
Steel pipe Ø 200 mm / 4.2-14.2 mm wall th.					
Steel pipe Ø 219 mm / 4.5-14.2 mm wall th.					
See graph on page 24 for intermediate sizes					

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

Fire test pipe penetration seal
Mulcol® Multimastic C System

Rigid wall/Flexible construction according to I.2.2



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

FW-ST-MC1.2.20

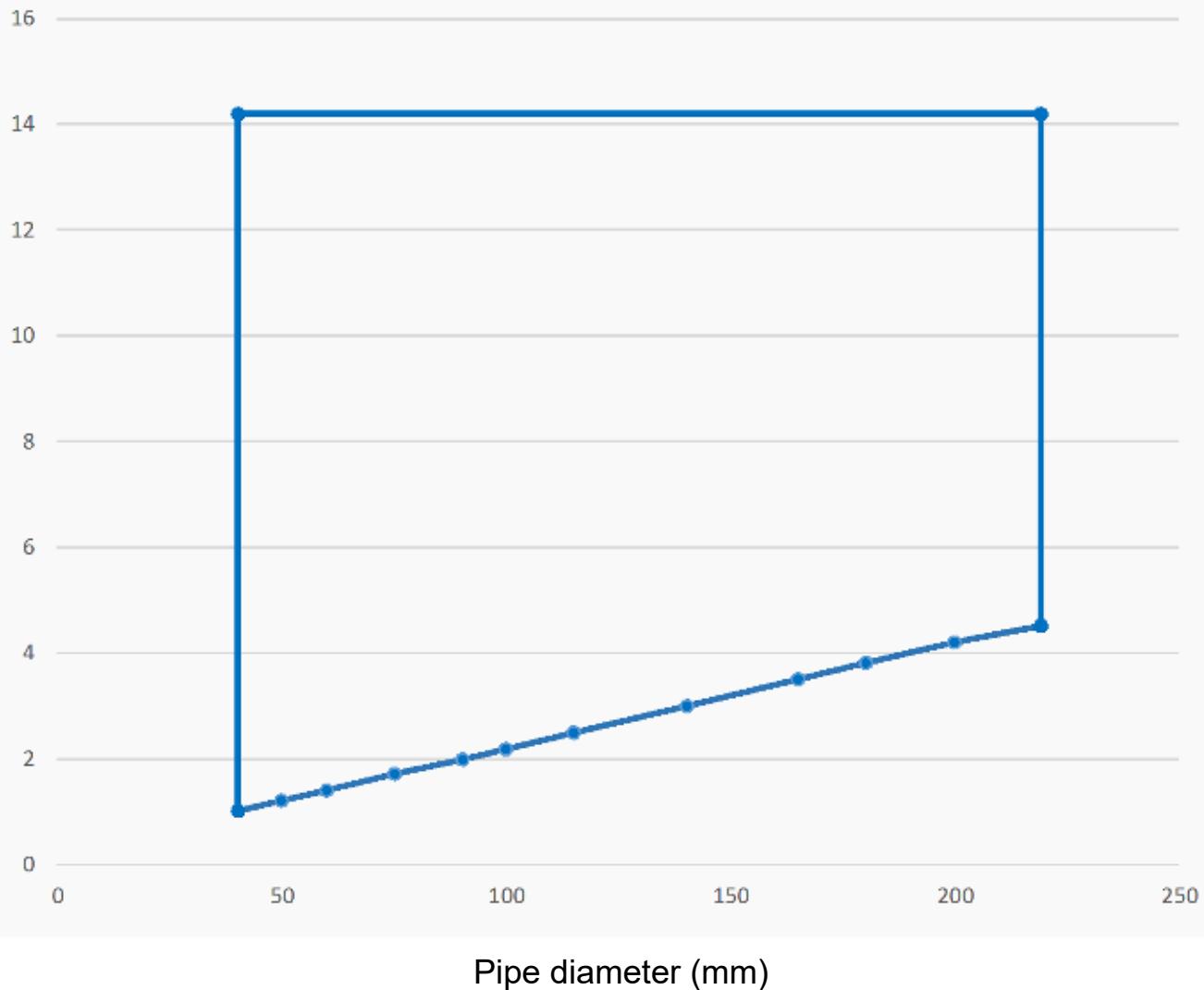
Department : Research & Development

Draftsman : R.M.

A4

Pipe wall thickness (mm)

Intermediate sizes



Annex A - Resistance to fire classification - Mulcol® Multimastic C System

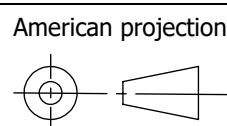
Fire test cable penetration seal

Mulcol® Multimastic C System

Rigid/Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

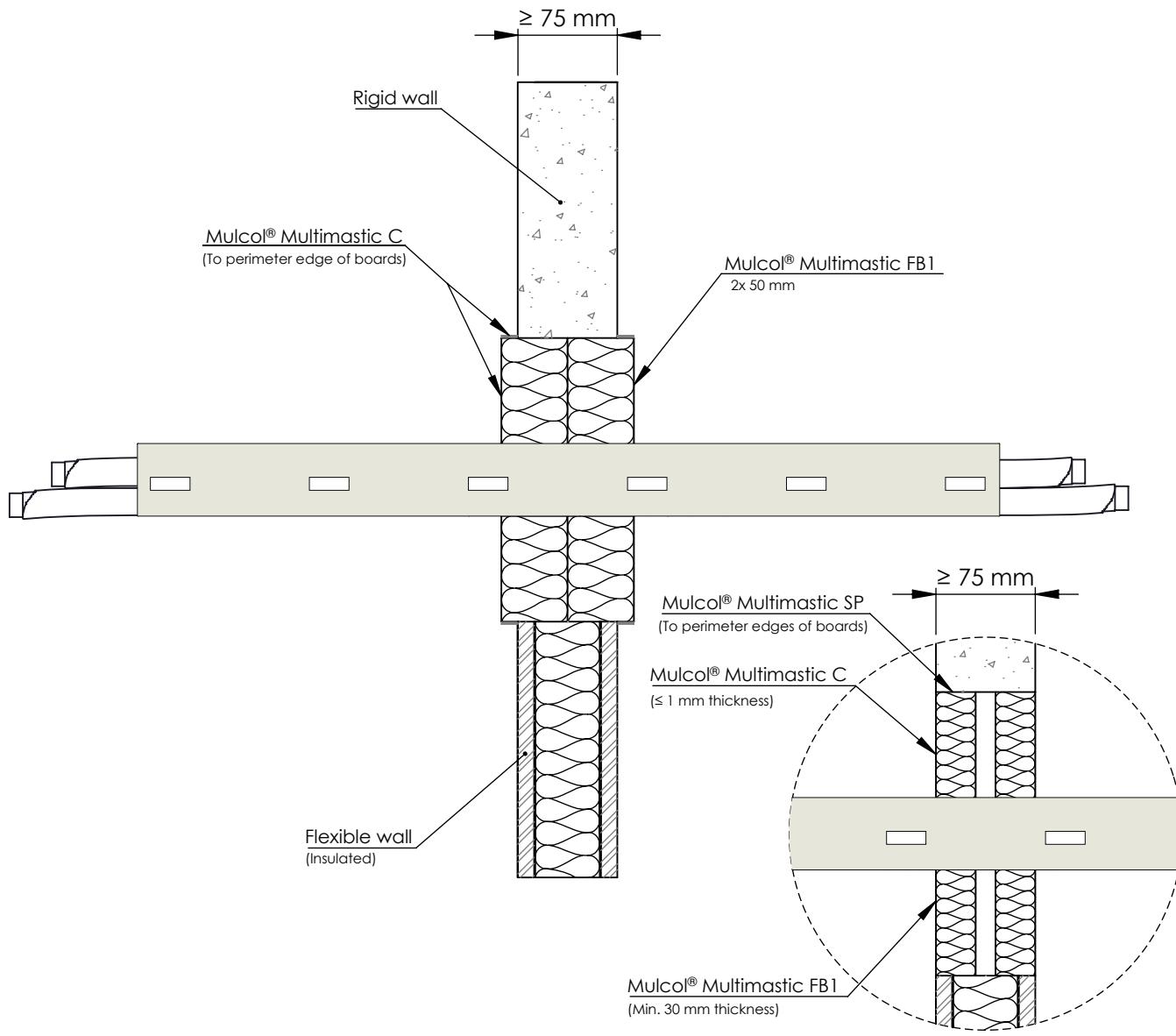
Company : Mulcol International B.V.

FW-CT-MC1.2.10

Department : Research & Development

A4

Draftsman : R.M.



Detail: Option B

A 2.1 Multimastic FB1 - 2x50 mm - with cables and trays

Services	Classification	Position Mulcol® Multimastic FB1	Maximum seal	Minimum between seals	Minimum from seal edge
Electrical cables up to Ø 21 mm (single, bundled and on trays)	EI 45				
Electrical cables up to Ø 80 mm (single, bundled and on trays)					
Cables up to Ø 21 mm in tied bundles up to Ø 100 mm	E 45, EI 30				
Steel cable trays (perforated and non-perforated) & ladders					
Unsheathed wires up to Ø 24 mm	E 45, EI 20				
uPVC pipe Ø 6 mm / 1.0 mm wall th.					
uPVC pipe Ø 32 mm / 1.8 mm wall th.	EI 45 U/C				

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

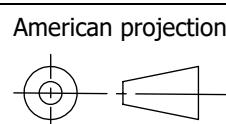
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid/Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

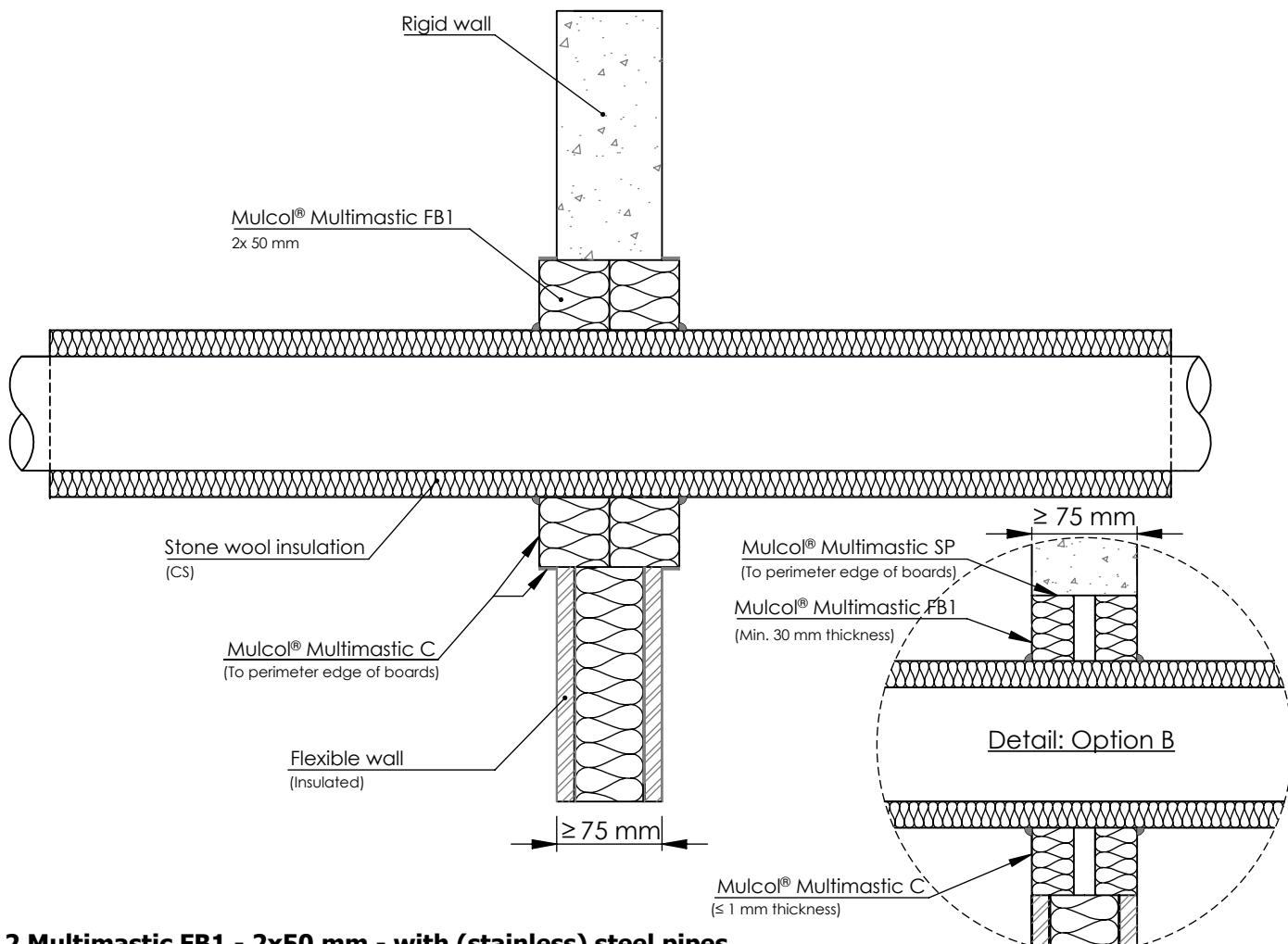
Company : Mulcol International B.V.

FW-ST-MC1.2.20

Department : Research & Development

A4

Draftsman : R.M.



A 2.2 Multimastic FB1 - 2x50 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB1	Insulation	Maximum seal	Minimum from seal edge
Steel pipe Ø 4 mm / 0.7-14.2 mm wall th.	EI 45 C/U		None		
Steel pipe Ø 22 mm / 2.0-14.2 mm wall th.	E 45 C/U, EI 30 C/U		20 mm Stone wool insulation, 80 kg/m³		
Steel pipe Ø 40 mm / 1-14.2 mm wall th.					
Steel pipe Ø 40 mm / 1-14.2 mm wall th.					
Steel pipe Ø 50 mm / 1.7-14.2 mm wall th.					
Steel pipe Ø 60 mm / 1.8-14.2 mm wall th.					
Steel pipe Ø 75 mm / 2.1-14.2 mm wall th.					
Steel pipe Ø 90 mm / 2.3-14.2 mm wall th.					
Steel pipe Ø 100 mm / 2.5-14.2 mm wall th.					
Steel pipe Ø 115 mm / 2.8-14.2 mm wall th.					
Steel pipe Ø 140 mm / 3.2-14.2 mm wall th.					
Steel pipe Ø 165 mm / 3.6-14.2 mm wall th.					
Steel pipe Ø 180 mm / 3.9-14.2 mm wall th.					
Steel pipe Ø 200 mm / 4.2-14.2 mm wall th.					
Steel pipe Ø 219 mm / 4.5-14.2 mm wall th.					
Steel pipe Ø 250 mm / 5.0-14.2 mm wall th.					
Steel pipe Ø 300 mm / 5.9-14.2 mm wall th.					
Steel pipe Ø 324 mm / 6.35-14.2 mm wall th.					
See graph on page 27 for intermediate sizes					

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

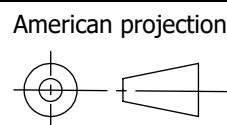
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid/Flexible wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

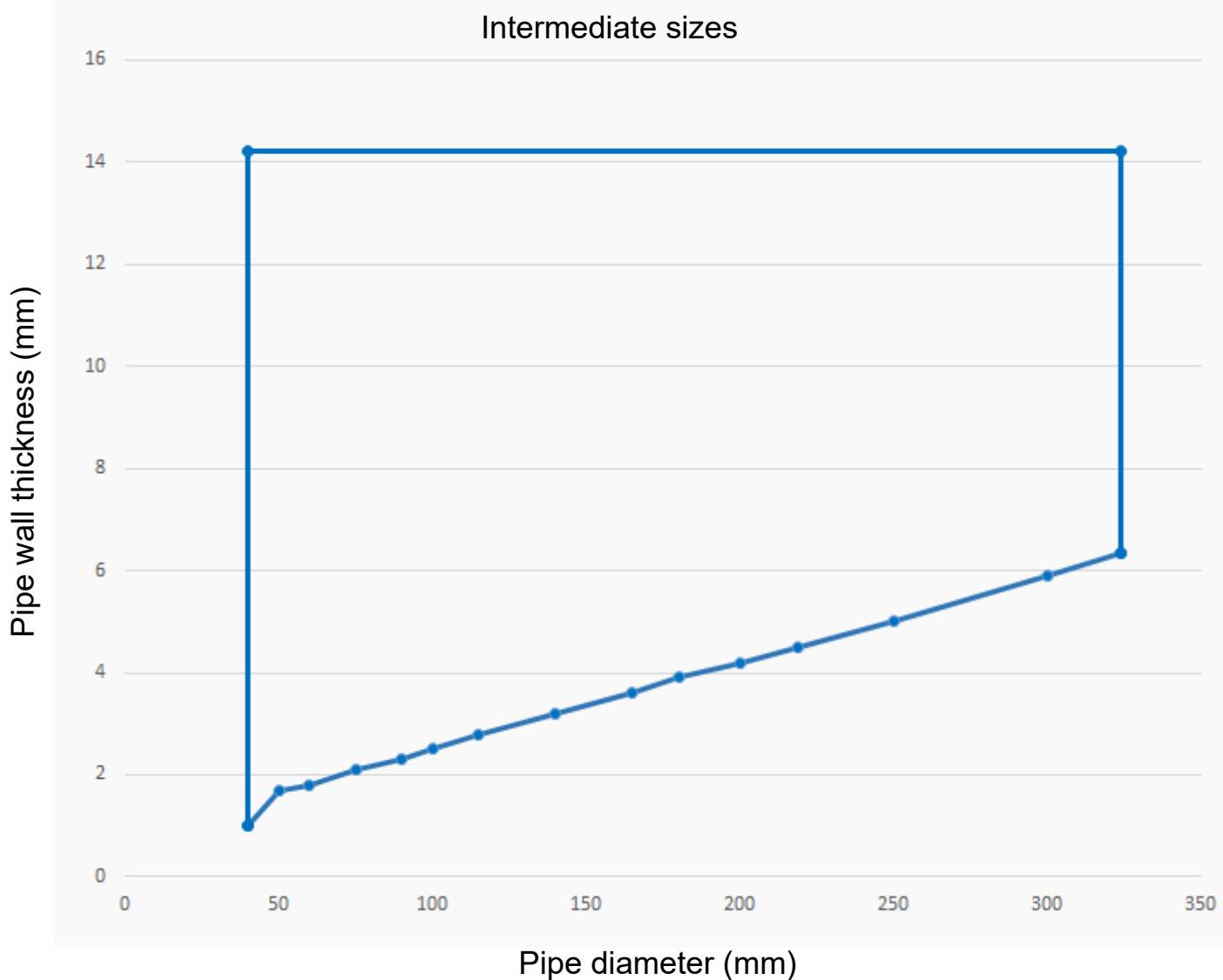
Company : Mulcol International B.V.

FW-ST-MC1.2.20

Department : Research & Development

A4

Draftsman : R.M.



Annex A - Resistance to fire classification - Mulcol® Multimastic C System

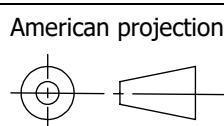
Fire test cable penetration seal

Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

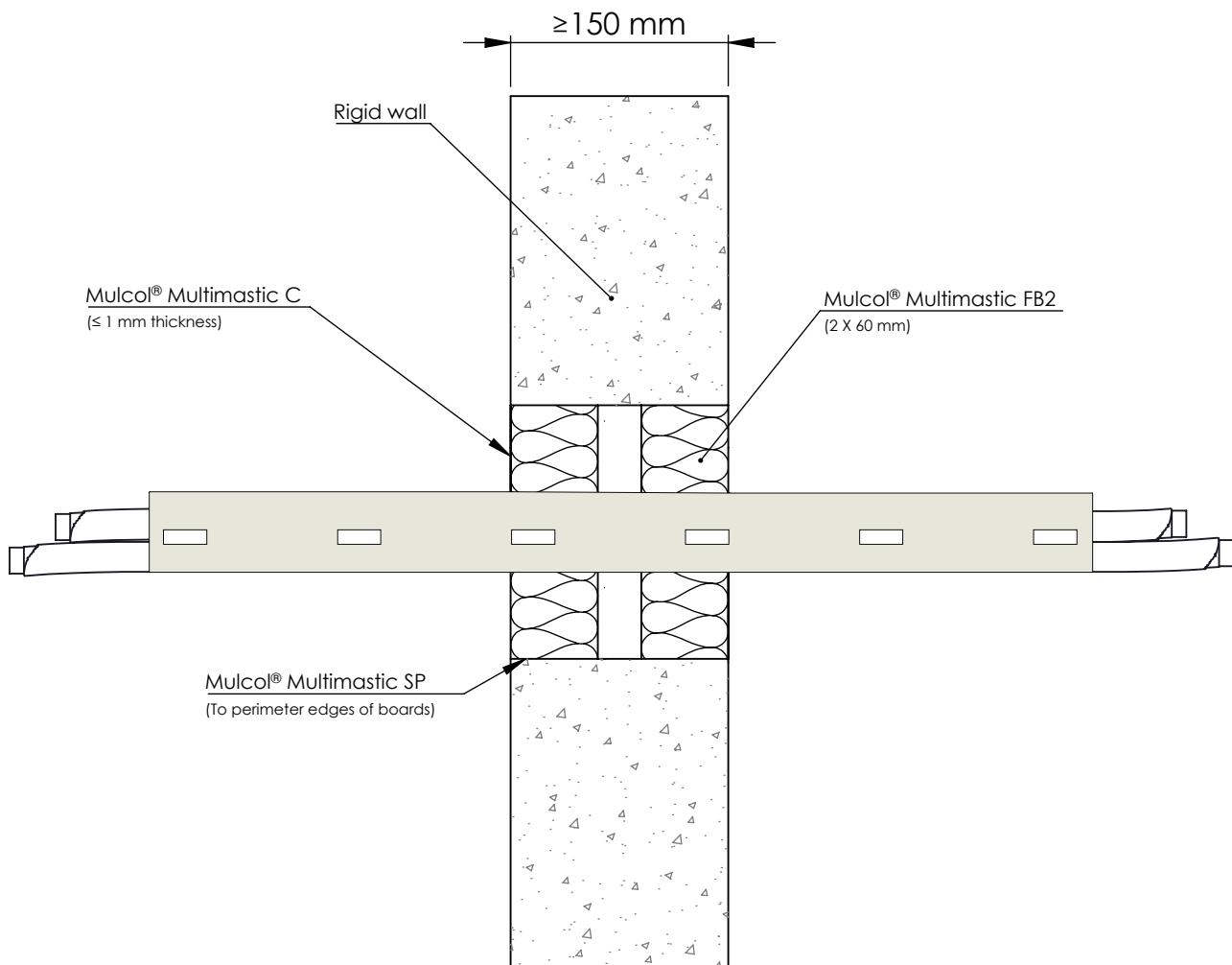
Company : Mulcol International B.V.

RW-CT-MC2.2.10

Department : Research & Development

A4

Draftsman : R.M.



A 3.1 Multimastic FB2 - 2x60 mm - with cables and trays

Services	Classification	Position Mulcol® Multimastic FB2	Maximum seal	Minimum from seal edge
Blank seals	EI 240	Both sides of the wall	1200 x 1200 mm	25 mm
Blank seals	E 240, EI 180			
Single electrical cables up to Ø 21 mm	E 240, EI 180			
Single or bundled electrical cables up to Ø 21 mm, with or without trays	E 240, EI 180			
Electrical cables up to Ø 80 mm (single, bundled and on trays)	E 180, EI 60			
Cables up to Ø 21 mm in tied bundles up to Ø 100 mm	E 180, EI 120			
Steel cable trays (perforated and non-perforated) & ladders	E 180, EI 60			
PVC conduit up to Ø 16 mm	EI 180 C/U			

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

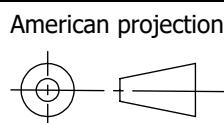
Fire test cable penetration seal

Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

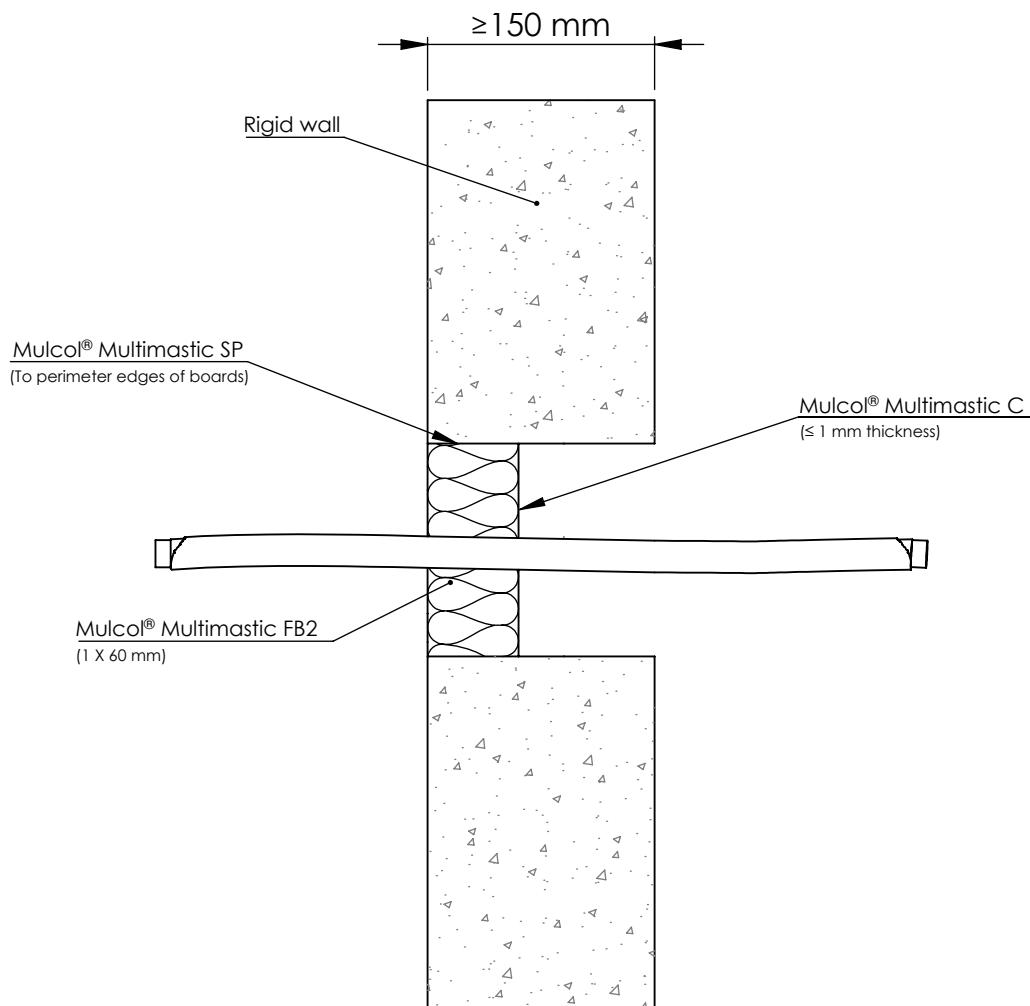
Company : Mulcol International B.V.

RW-EC-MC2.1.10

Department : Research & Development

A4

Draftsman : R.M.



A 3.2 Multimastic FB2 - 1x60 mm - with cables

Services	Classification	Position Mulcol® Multimastic FB2	Maximum seal	Minimum from seal edge
Blank seals	E 240, EI 90	Either side of the wall (or anywhere in between)	Unlimited width x 1200 mm height (See section 2. 5)	25 mm
Single electrical cables up to Ø21 mm	E 240, EI 90			
Single A1 cable = 5 X 1.5 mm ² core HD603.3 electrical cable with PVC insulation, PVC sheath and Ø14 mm	EI 240			
Single A2 cable = 5 X 1.5 mm ² core HD22.4 electrical cable with EPR insulation, PO sheath and Ø11.2-14.2 mm	EI 240		70 x 70 mm	
Single A3 cable = 5 X 1.5 mm ² core HD604.5 electrical cable with XLPE insulation, EVA sheath and Ø13 mm	EI 240			

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

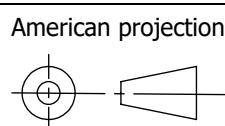
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

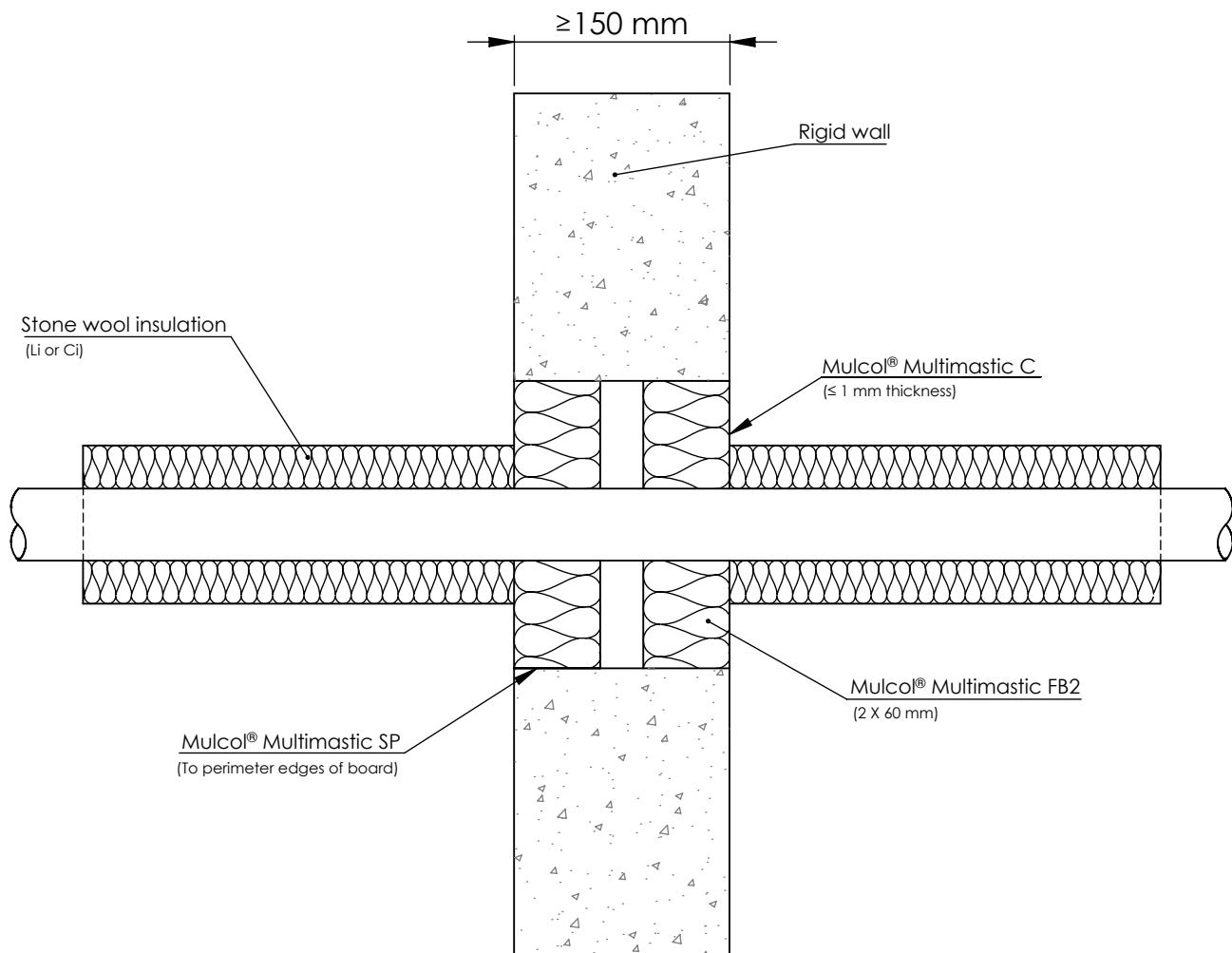
Company : Mulcol International B.V.

RW-ST-MC2.2.20

Department : Research & Development

Draftsman : R.M.

A4



A 3.3 Multimastic FB2 - 2x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.	EI 240 C/U		1000 mm length of 20 mm Stone wool insulation, 80 kg/m³	1200 x 1200 mm	25 mm
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.	E 240 C/U, EI 180 C/U				
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.					
Steel pipe Ø 50 mm / 1.7-14.2 mm wall th.					
Steel pipe Ø 60 mm / 1.9-14.2 mm wall th.					
Steel pipe Ø 75 mm / 2.2-14.2 mm wall th.					
Steel pipe Ø 90 mm / 2.5-14.2 mm wall th.					
Steel pipe Ø 100 mm / 2.7-14.2 mm wall th.					
Steel pipe Ø 115 mm / 3.0-14.2 mm wall th.					
Steel pipe Ø 140 mm / 3.5-14.2 mm wall th.					
Steel pipe Ø 165 mm / 3.9-14.2 mm wall th.					
Steel pipe Ø 180 mm / 4.2-14.2 mm wall th.					
Steel pipe Ø 200 mm / 4.6-14.2 mm wall th.					
Steel pipe Ø 219 mm / 5.0-14.2 mm wall th.					
See graph on page 31 for intermediate sizes					

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

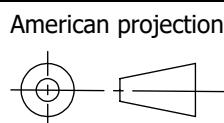
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

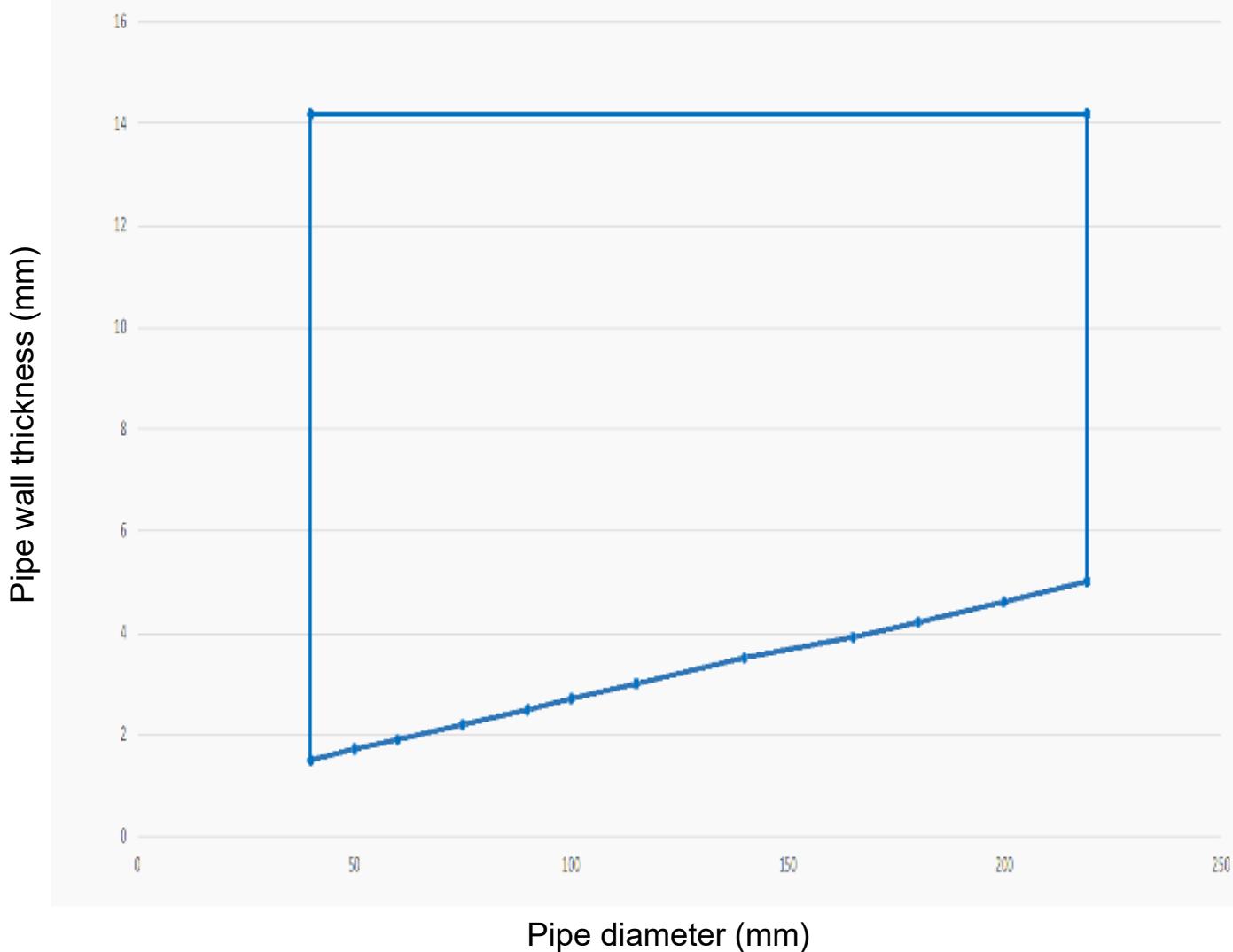
RW-ST-MC2.2.20

Department : Research & Development

Draftsman : R.M.

A4

Intermediate sizes

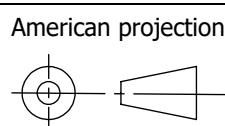


Annex A - Resistance to fire classification - Mulcol® Multimastic C System

Fire test pipe penetration seal
Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL
FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

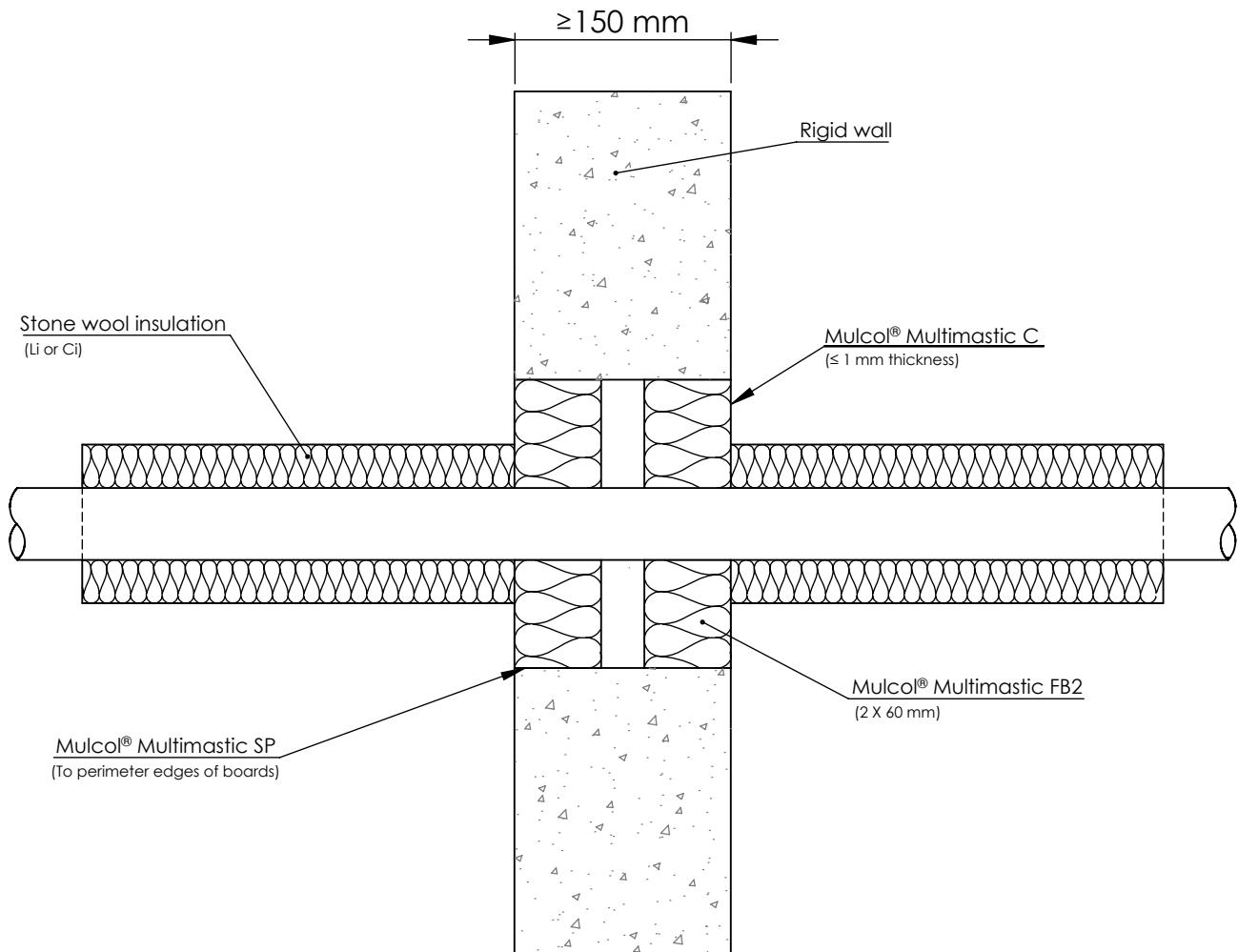
Company : Mulcol International B.V.

RW-ST-MC2.2.20

Department : Research & Development

A4

Draftsman : R.M.



A 3.3.1 Multimastic FB2 - 2x60 mm - with alupex composite pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge
Alupex composite pipe Ø 16 mm / 2.25 mm wall thickness	EI 240 U/C	Both sides of the wall	1000 mm length of 20 mm Stone wool insulation, 80 kg/m³	1200 x 1200 mm	25 mm
Alupex composite pipe Ø 16 mm / 2.25 mm wall thickness	E 240 U/C, EI 180 U/C			Unlimited width x 1200 mm height (See section 2. 5)	25 mm

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

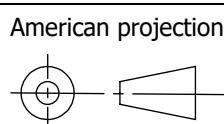
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

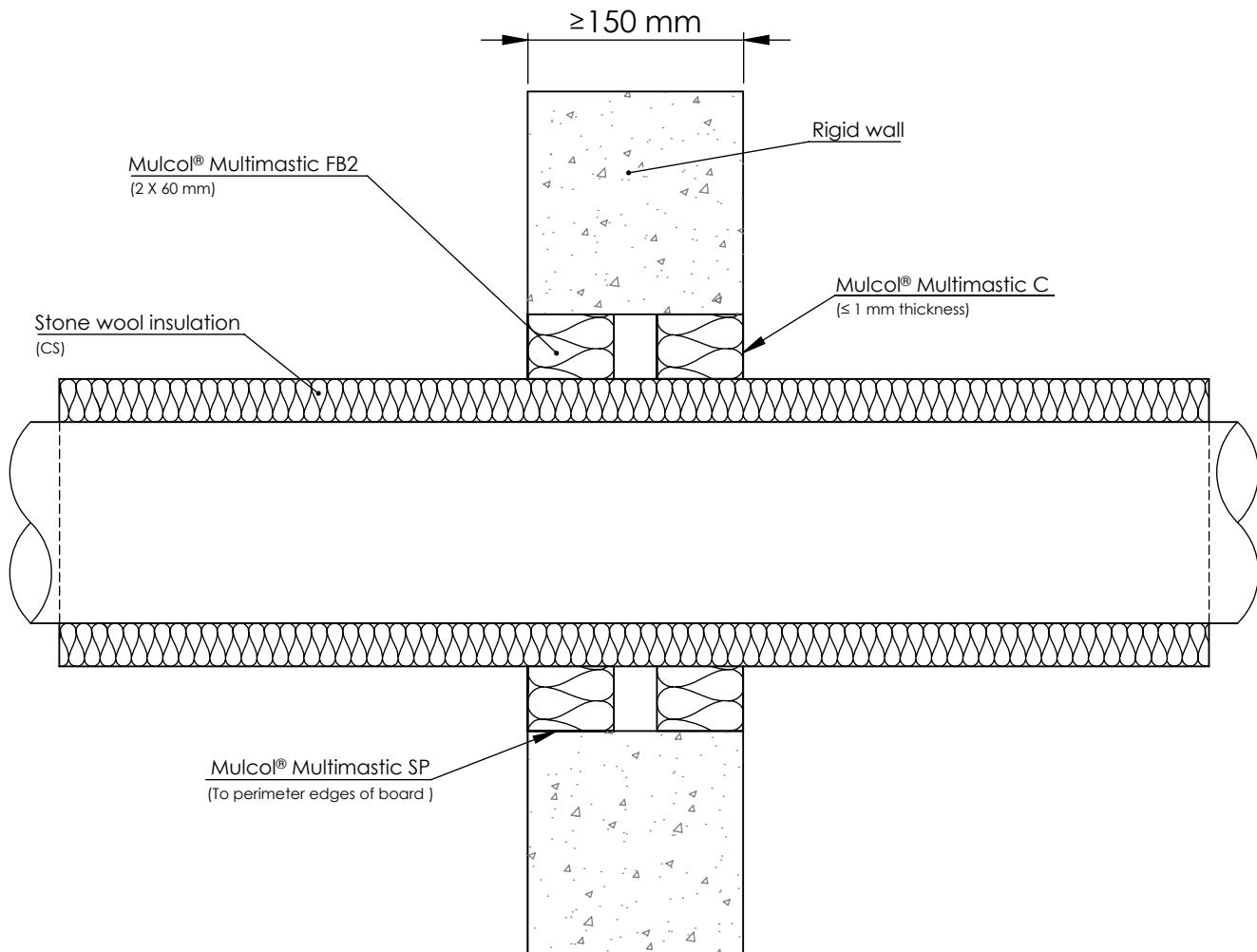
Company : Mulcol International B.V.

RW-ST-MC2.2.20

Department : Research & Development

A4

Draftsman : R.M.



A 3.4 Multimastic FB2 - 2x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge
Steel pipe Ø 40 mm / 1.0-14.2 mm wall th.			1000 mm length of 20 mm Stone wool insulation, 80 kg/m³		
Steel pipe Ø 40 mm / 1.0-14.2 mm wall th.					
Steel pipe Ø 50 mm / 1.2-14.2 mm wall th.					
Steel pipe Ø 60 mm / 1.4-14.2 mm wall th.					
Steel pipe Ø 75 mm / 1.6-14.2 mm wall th.					
Steel pipe Ø 90 mm / 1.9-14.2 mm wall th.					
Steel pipe Ø 100 mm / 2.1-14.2 mm wall th.					
Steel pipe Ø 115 mm / 2.4-14.2 mm wall th.	E 240 C/U, EI 180 C/U	Both sides of the wall	1000 mm length of 30-80 mm Stone wool insulation, 80 kg/m³	Unlimited width x 1200 mm height (See section 2.5)	30 mm
Steel pipe Ø 140 mm / 2.9-14.2 mm wall th.					
Steel pipe Ø 165 mm / 3.4-14.2 mm wall th.					
Steel pipe Ø 180 mm / 3.6-14.2 mm wall th.					
Steel pipe Ø 200 mm / 4.0-14.2 mm wall th.					
Steel pipe Ø 219 mm / 4.3-14.2 mm wall th.					
Steel pipe Ø 250 mm / 5.0-14.2 mm wall th.					
Steel pipe Ø 300 mm / 5.9-14.2 mm wall th.					
Steel pipe Ø 324 mm / 6.35-14.2 mm wall th.					

See graph on page 34 for intermediate sizes

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

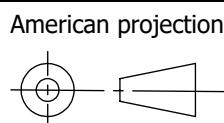
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

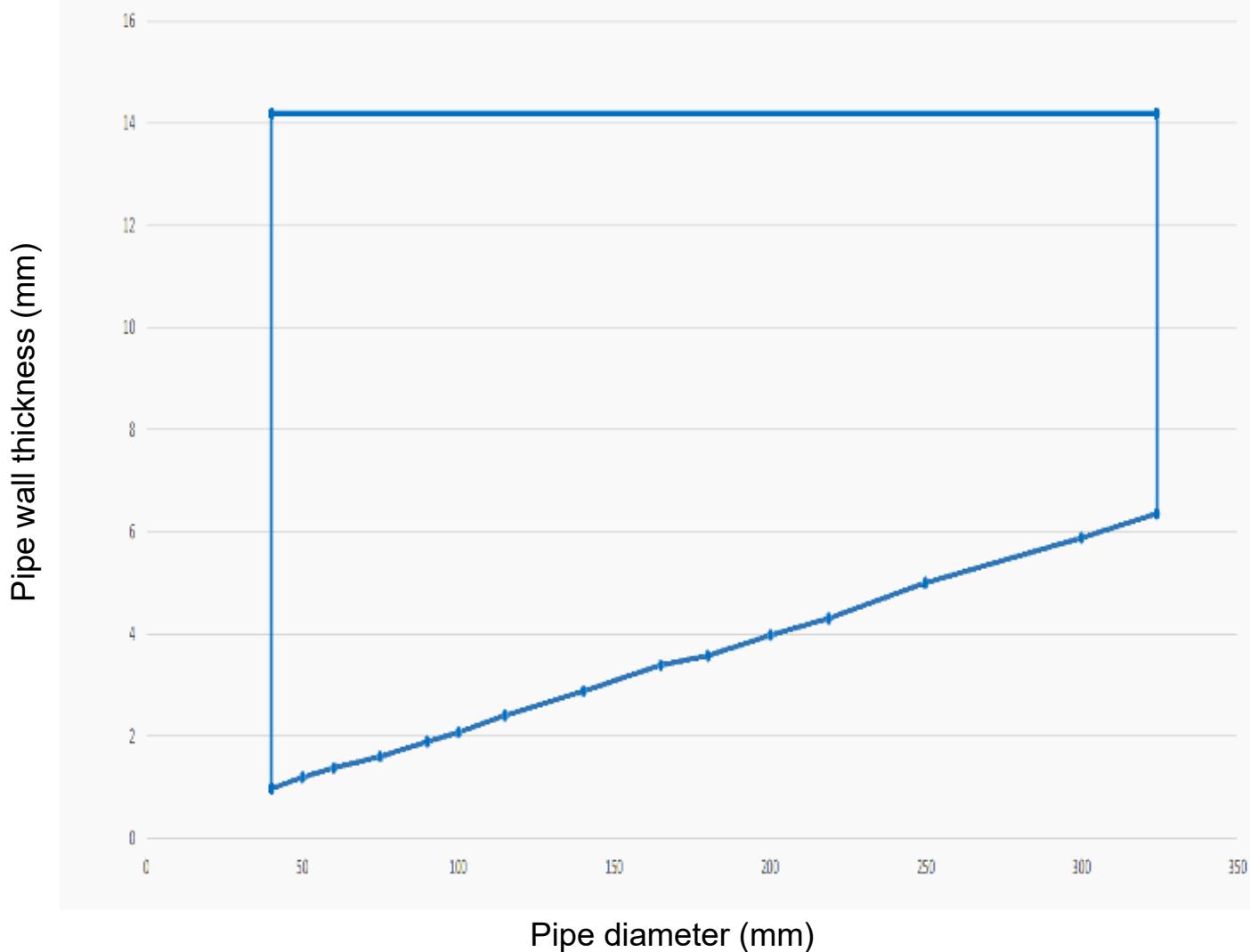
RW-ST-MC2.2.20

Department : Research & Development

Draftsman : R.M.

A4

Intermediate sizes



Annex A - Resistance to fire classification - Mulcol® Multimastic C System

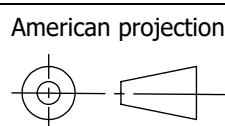
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

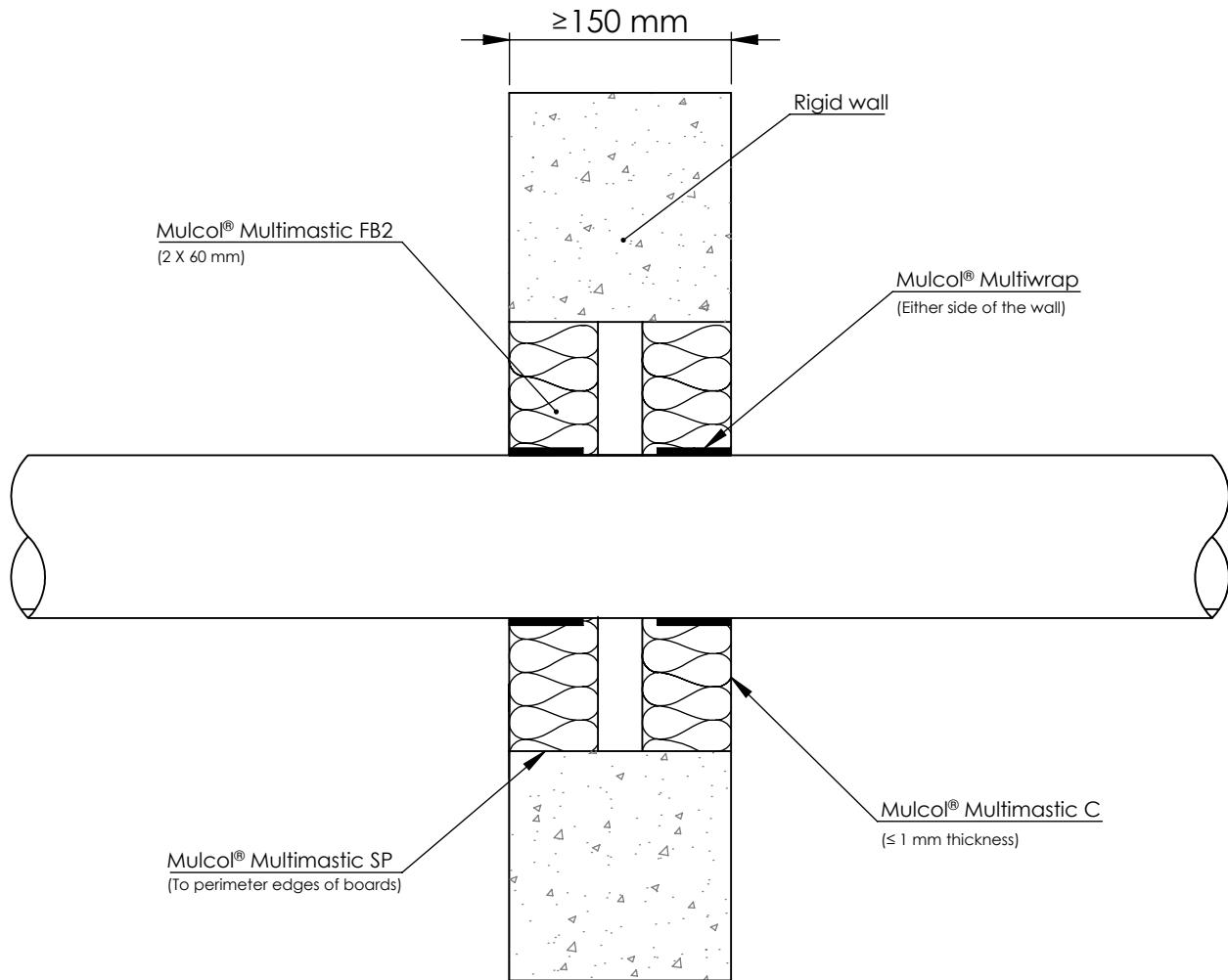
Company : Mulcol International B.V.

RW-PP-MC2.2.10

Department : Research & Development

A4

Draftsman : R.M.



A 3.5 Multimastic FB2 - 2x60 mm - with combustible pipes

Services	Classification	Position Mulcol® Multimastic FB2	Mulcol® Multiwrap	Minimum from seal edge
PVC-U pipe up to Ø 40 mm / 1.9-3.0 mm wall thickness	EI 240 U/C	Either side of the wall	50 X 1.8 mm (1 layer) Either side of the wall	25 mm
PE pipe up to Ø 40 mm / 2.4-4.6 mm wall thickness			50 X 3.6 mm (2 layers) Either side of the wall	
PP pipe up to Ø 40 mm / 1.8-5.5 mm wall thickness			50 X 7.2 mm (4 layers) Either side of the wall	
PVC-U pipe up to Ø 110 mm / 2.7-6.6 mm wall thickness			50 X 10.8 mm (6 layers) Either side of the wall	
PE pipe up to Ø 110 mm / 3.4-10.0 mm wall thickness				
PVC-U pipe up to Ø 125 mm / 4.7-7.4 mm wall thickness				
PE pipe up to Ø 125 mm / 3.9-7.4 mm wall thickness				
PVC-U pipe up to Ø 160 mm / 4.0-9.5 mm wall thickness				
PE pipe up to Ø 160 mm / 4.9-9.5 mm wall thickness				

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

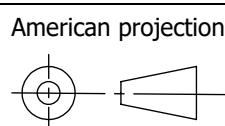
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

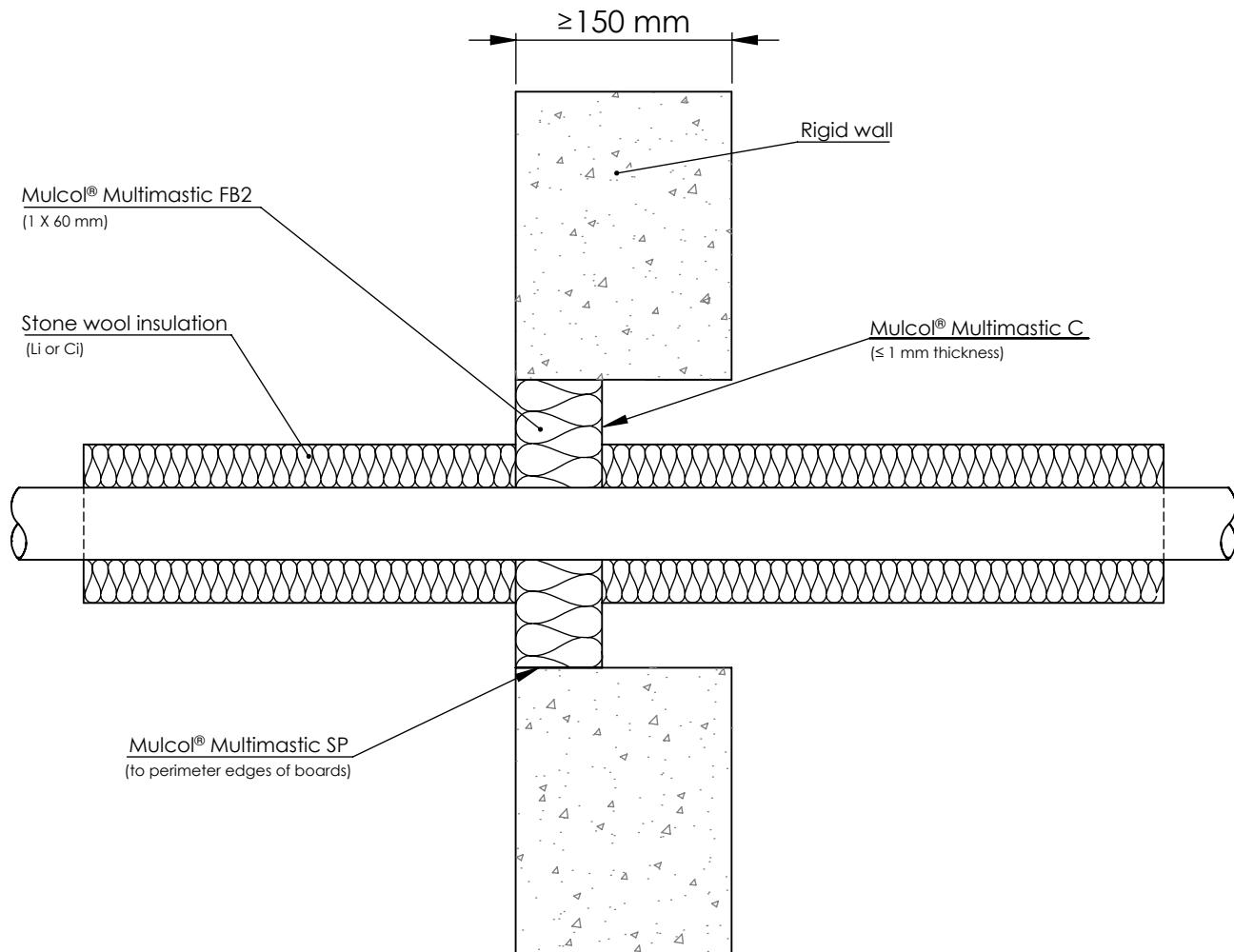
Company : Mulcol International B.V.

RW-ST-MC2.1.20

Department : Research & Development

A4

Draftsman : R.M.



A 3.6 Multimastic FB2 - 1x60 mm - with copper pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge
Copper pipe up to \varnothing 12 mm / 0.9-14.2 mm wall th.	EI 240 C/U	Either side of the wall	1000 mm length of 20 mm Stone wool insulation, 80 kg/m ³	70 x 70 mm	25 mm
Copper pipe up to \varnothing 54 mm / 0.9-14.2 mm wall th.	E 240 C/U, EI 120 C/U			115 x 115 mm	
Copper pipe up to \varnothing 54 mm / 0.9-14.2 mm wall th.	E 240 C/U, EI 90 C/U			Unlimited width x 1200 mm height (See section 2. 5)	

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

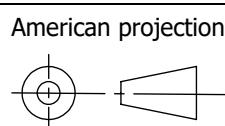
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

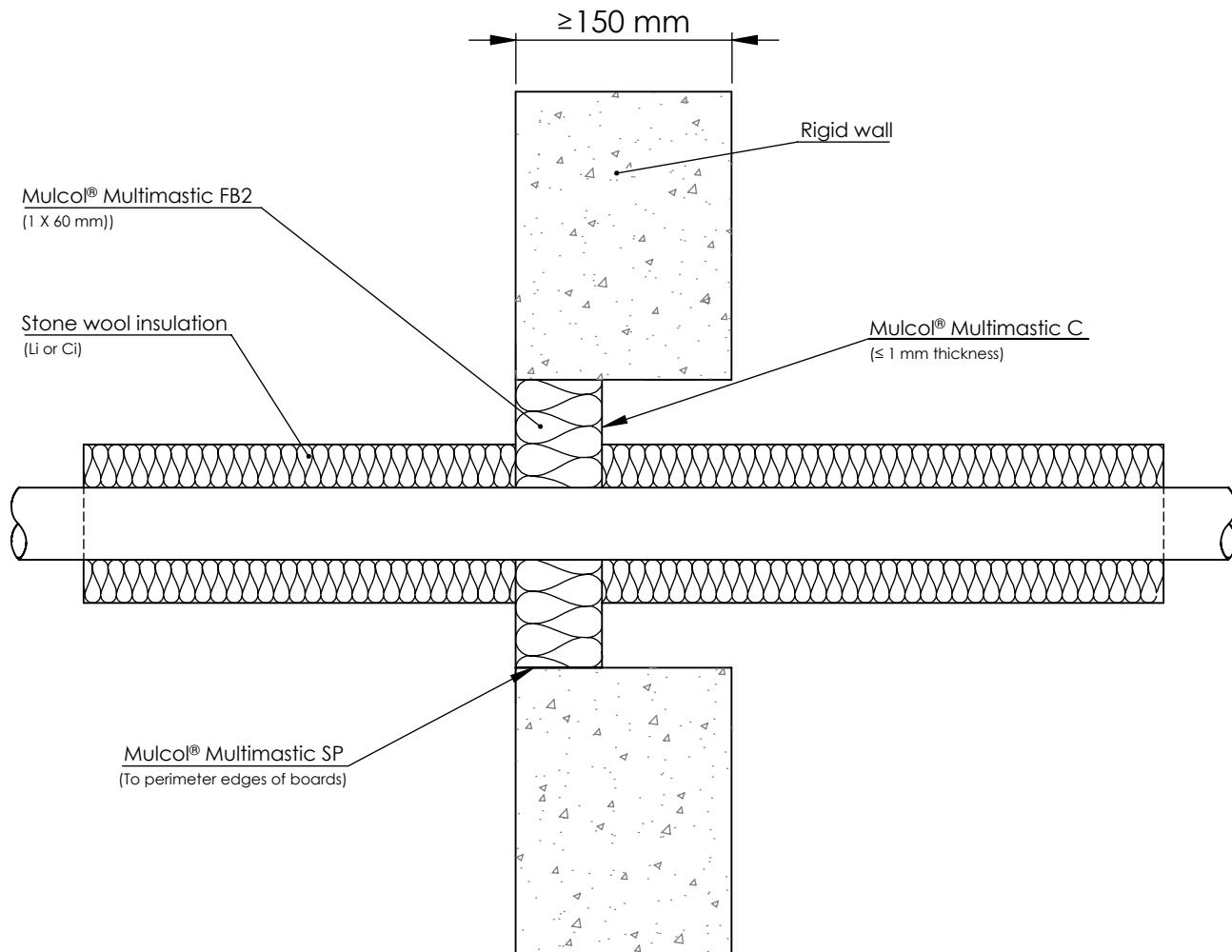
Company : Mulcol International B.V.

RW-ST-MC2.1.20

Department : Research & Development

A4

Draftsman : R.M.



A 3.6.1 Multimastic FB2 - 1x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge		
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.	EI 240 C/U	Either side of the wall	1000 mm length of 20 mm Stone wool insulation, 80 kg/m³	280 x 280 mm	25 mm		
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.			1000 mm length of 30 mm Stone wool insulation, 80 kg/m³				
Steel pipe Ø 50 mm / 1.7-14.2 mm wall th.							
Steel pipe Ø 60 mm / 1.9-14.2 mm wall th.							
Steel pipe Ø 75 mm / 2.2-14.2 mm wall th.							
Steel pipe Ø 90 mm / 2.5-14.2 mm wall th.							
Steel pipe Ø 100 mm / 2.7-14.2 mm wall th.							
Steel pipe Ø 115 mm / 3.0-14.2 mm wall th.							
Steel pipe Ø 140 mm / 3.5-14.2 mm wall th.							
Steel pipe Ø 165 mm / 3.9-14.2 mm wall th.							
Steel pipe Ø 180 mm / 4.2-14.2 mm wall th.							
Steel pipe Ø 200 mm / 4.6-14.2 mm wall th.							
Steel pipe Ø 219 mm / 5.0-14.2 mm wall th.							

See graph on page 39 for intermediate sizes

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

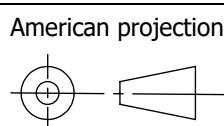
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

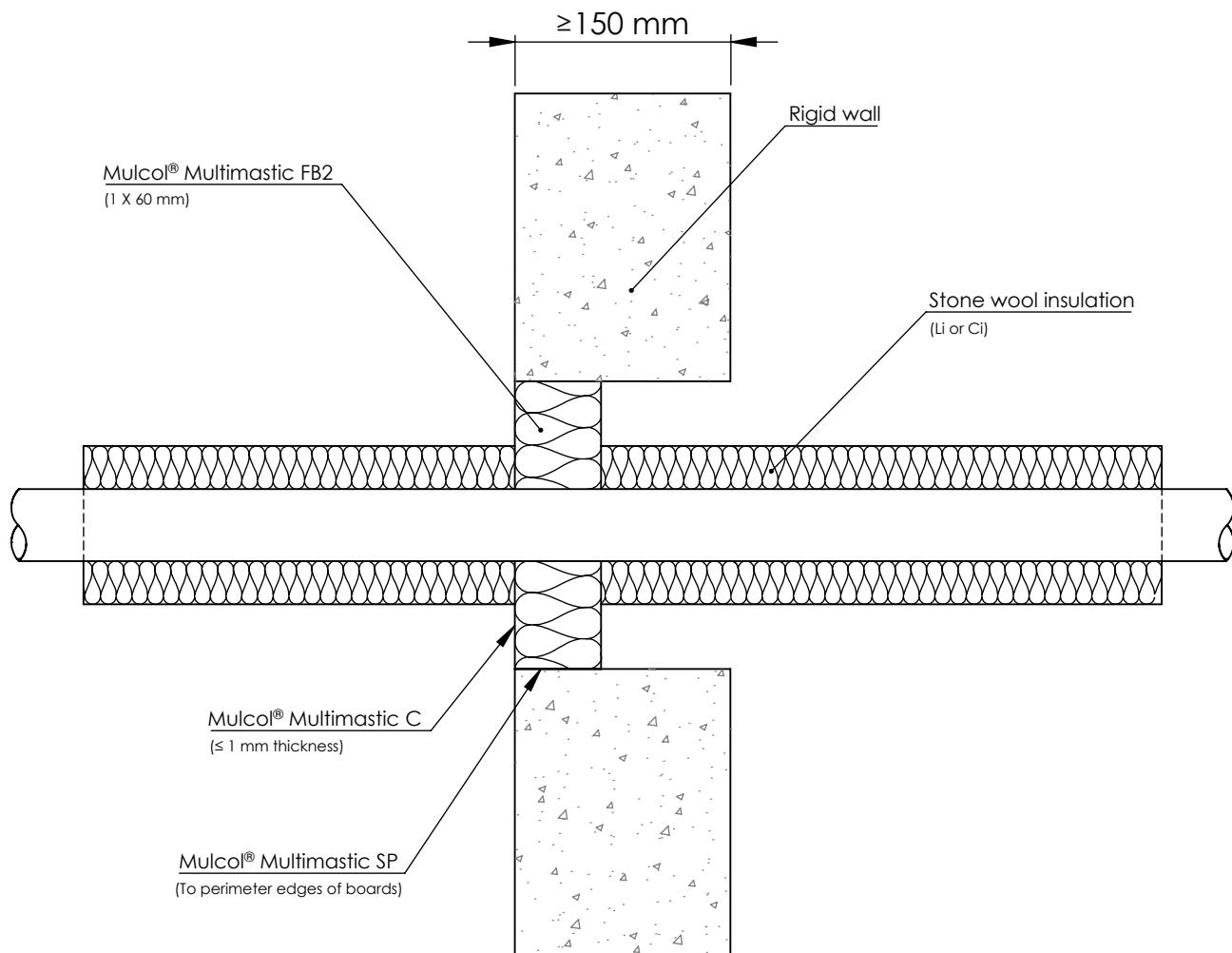
Company : Mulcol International B.V.

RW-ST-MC2.1.20

Department : Research & Development

A4

Draftsman : R.M.



A 3.6.2 Multimastic FB2 - 1x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.			1000 mm length of 20 mm Stone wool insulation, 80 kg/m³		
Steel pipe Ø 50 mm / 1.7-14.2 mm wall th.					
Steel pipe Ø 60 mm / 1.9-14.2 mm wall th.					
Steel pipe Ø 75 mm / 2.2-14.2 mm wall th.					
Steel pipe Ø 90 mm / 2.5-14.2 mm wall th.					
Steel pipe Ø 100 mm / 2.7-14.2 mm wall th.					
Steel pipe Ø 115 mm / 3.0-14.2 mm wall th.					
Steel pipe Ø 140 mm / 3.5-14.2 mm wall th.					
Steel pipe Ø 165 mm / 3.9-14.2 mm wall th.					
Steel pipe Ø 180 mm / 4.2-14.2 mm wall th.					
Steel pipe Ø 200 mm / 4.6-14.2 mm wall th.					
Steel pipe Ø 219 mm / 5.0-14.2 mm wall th.					
Steel pipe Ø 325 mm / 6.35-14.2 mm wall th.	E 120 C/U, EI 90 C/U	Either side of the wall	1000 mm length of 30 mm Stone wool insulation, 80 kg/m³	Unlimited width x 1200 mm height (See section 2. 5)	25 mm

See graph on page 39 for intermediate sizes

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

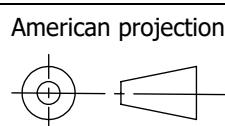
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

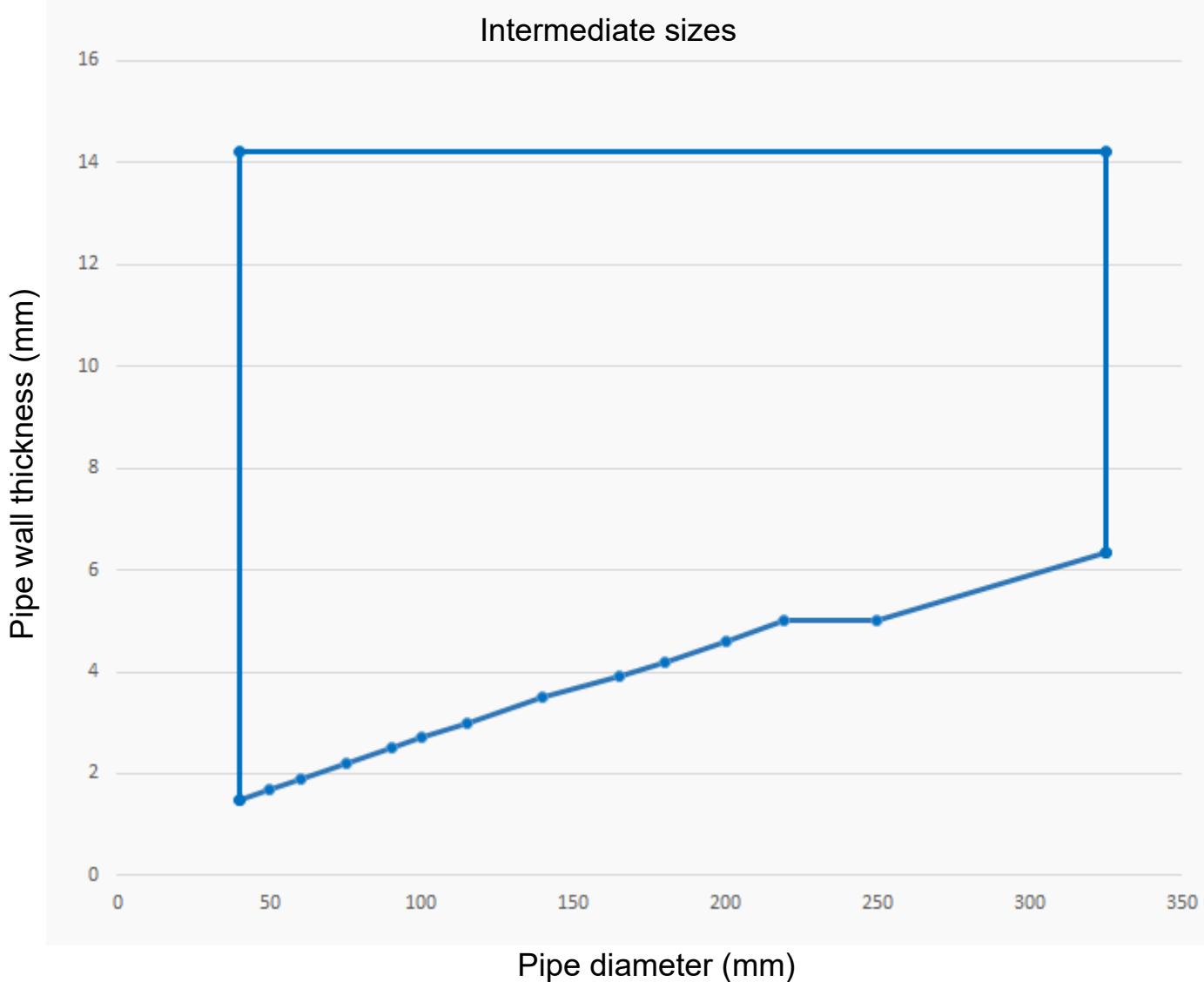
Company : Mulcol International B.V.

RW-ST-MC2.1.20

Department : Research & Development

A4

Draftsman : R.M.



Annex A - Resistance to fire classification - Mulcol® Multimastic C System

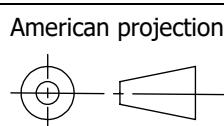
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

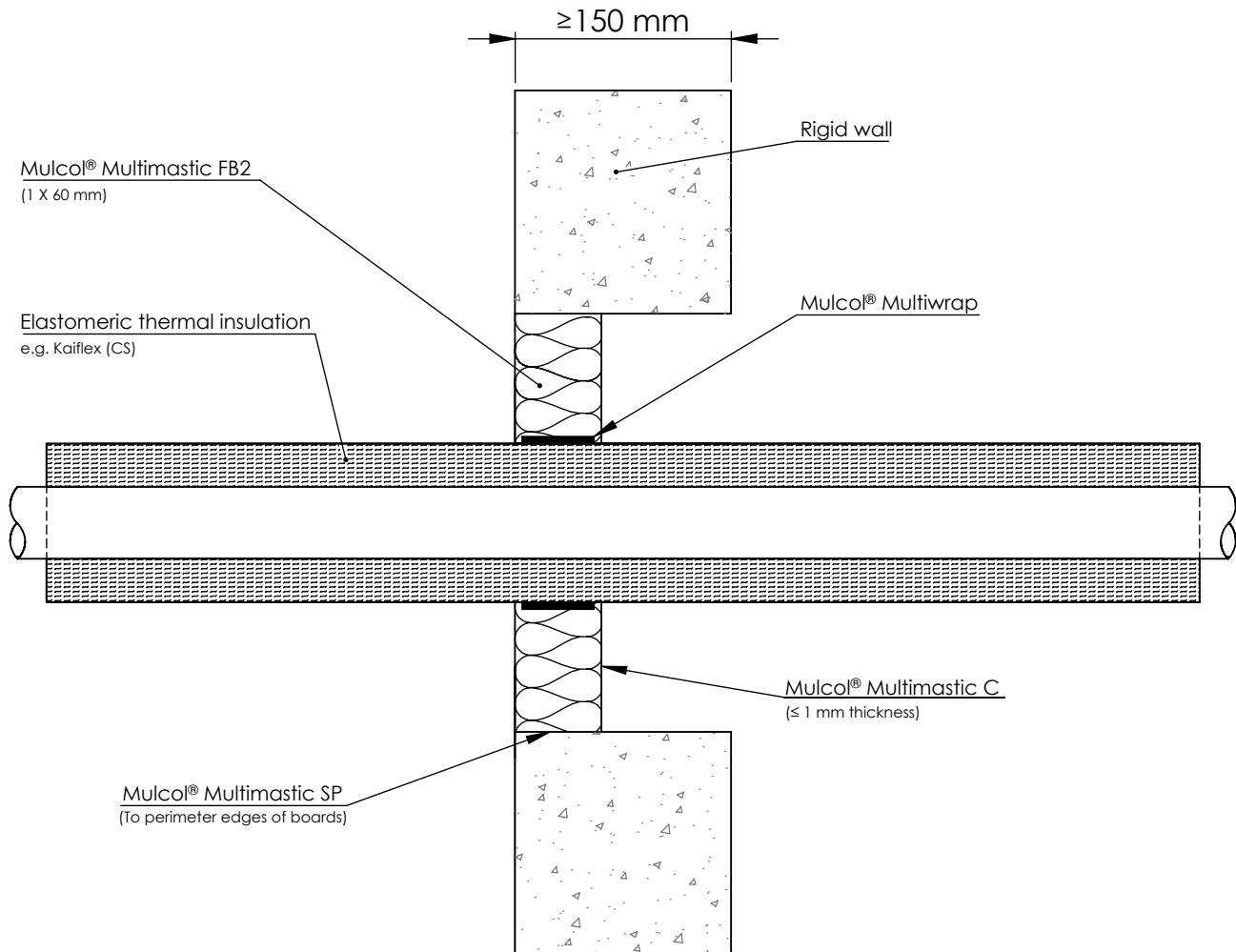
Company : Mulcol International B.V.

RW-ST-MC2.1.22

Department : Research & Development

A4

Draftsman : R.M.



A 3.7 Multimastic FB2 - 1x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Mulcol® Multiwrap	Minimum from seal edge
Steel pipe Ø 165 mm / 4.5-14.2 mm wall th.	E 120 U/C, EI 45 U/C	Either side of the wall	9-25 mm Kaiflex ST/KK insulation	50 X 1.8 mm (1 layer) centrally fitted	25 mm

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

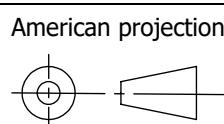
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

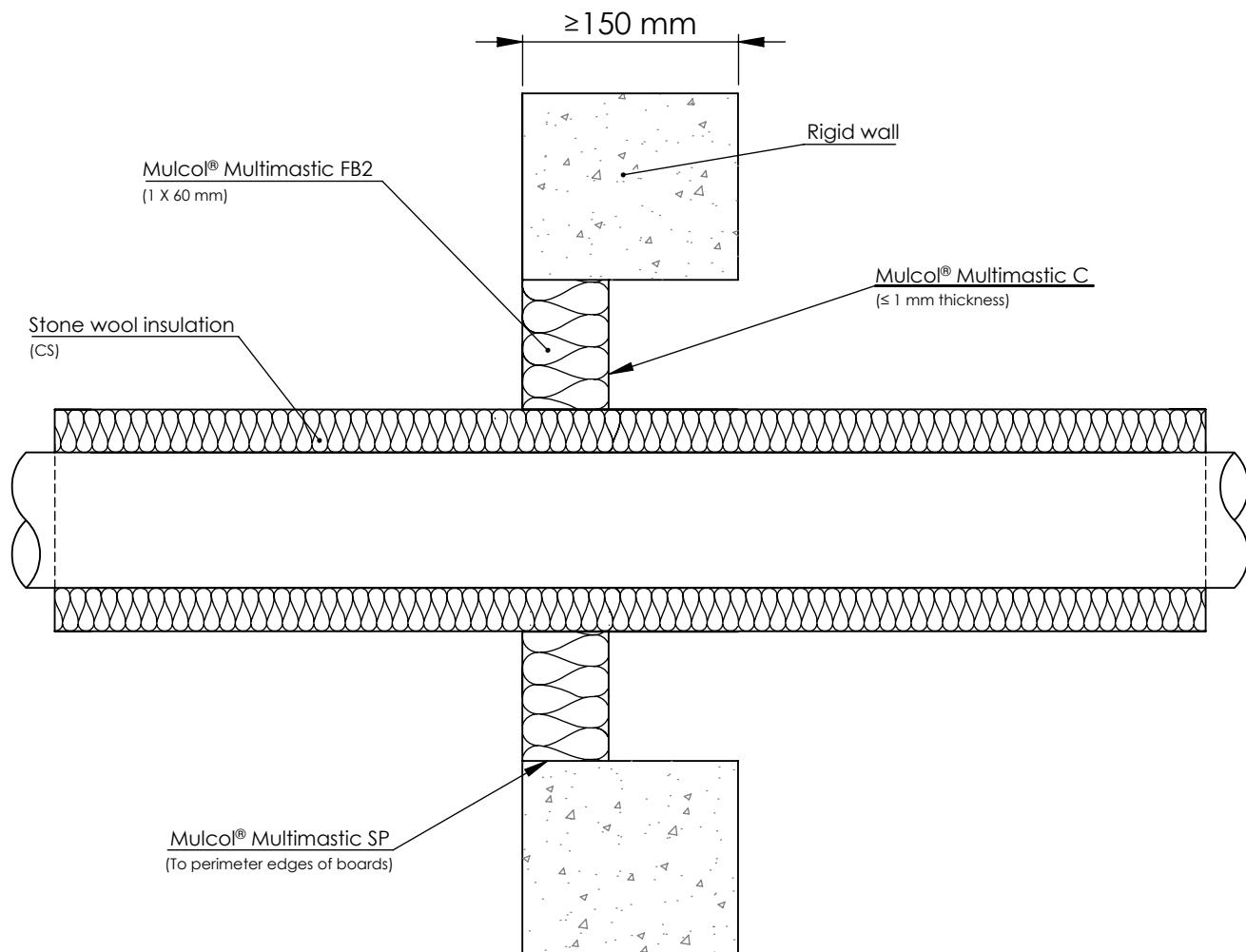
Company : Mulcol International B.V.

RW-ST-MC2.1.20

Department : Research & Development

A4

Draftsman : R.M.



A 3.7.1 Multimastic FB2 - 1x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge
Steel pipe Ø 219 mm / 5-14.2 mm wall th.	E 240 U/C, EI 60 U/C	Either side of the wall	30 mm Stone wool insulation, 80 kg/m³	Unlimited width x 1200 mm height (See section 2. 5)	25 mm

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

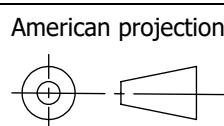
Fire test cable penetration seal

Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 8-2-2017

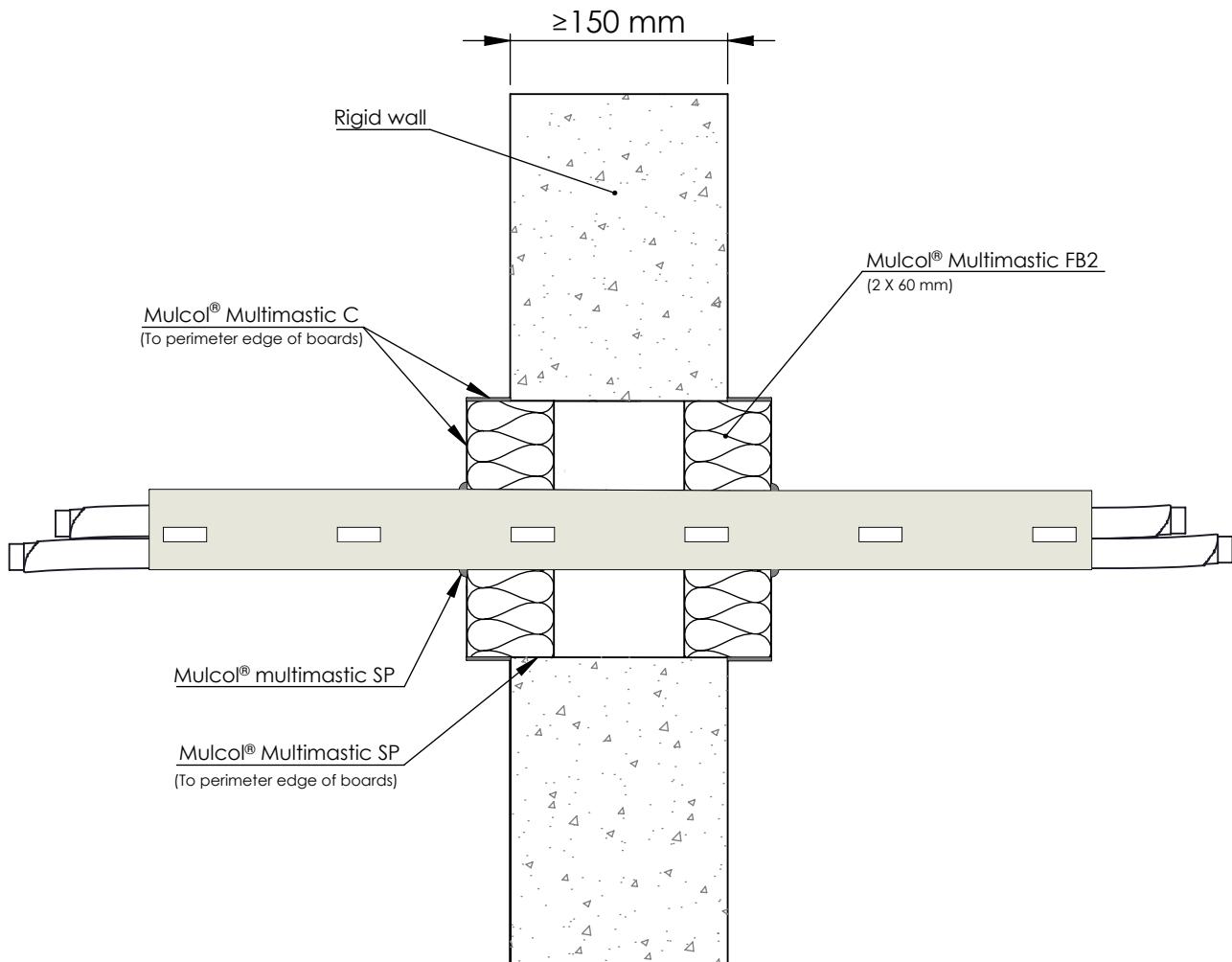
Company : Mulcol International B.V.

RW-CT-MC2.2.10

Department : Research & Development

A4

Draftsman : R.M.



A 3.8 Multimastic FB2 - 2x60 mm - with cables and trays

Services	Classification	Position Mulcol® Multimastic FB2	Maximum seal	Minimum between seals	Minimum from seal edge
Blanks seal	E 240, EI 180	Both sides of the wall (with minium seperation 90 mm)	600 x 600 mm	200 mm	25 mm
Single or bundled electrical cables up to Ø 21mm, with or without trays	E 240, EI 120				
Electrical cables up to Ø 80 mm (single, bundled and on trays)	E 240, EI 60				
Cables up to Ø 21 mm in tied bundles up to Ø 100 mm	EI 240				
Steel cable trays (perforated and non-perforated) & ladders	E 240, EI 180				
Non-Sheathed wires up to Ø 17 mm	E 240, EI 180				
Non-Sheathed wires up to Ø 24 mm	E 240, EI 90				

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

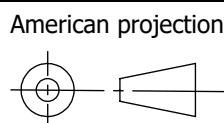
Fire test cable penetration seal

Mulcol® Multimastic C System

Rigid wall construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 8-2-2017

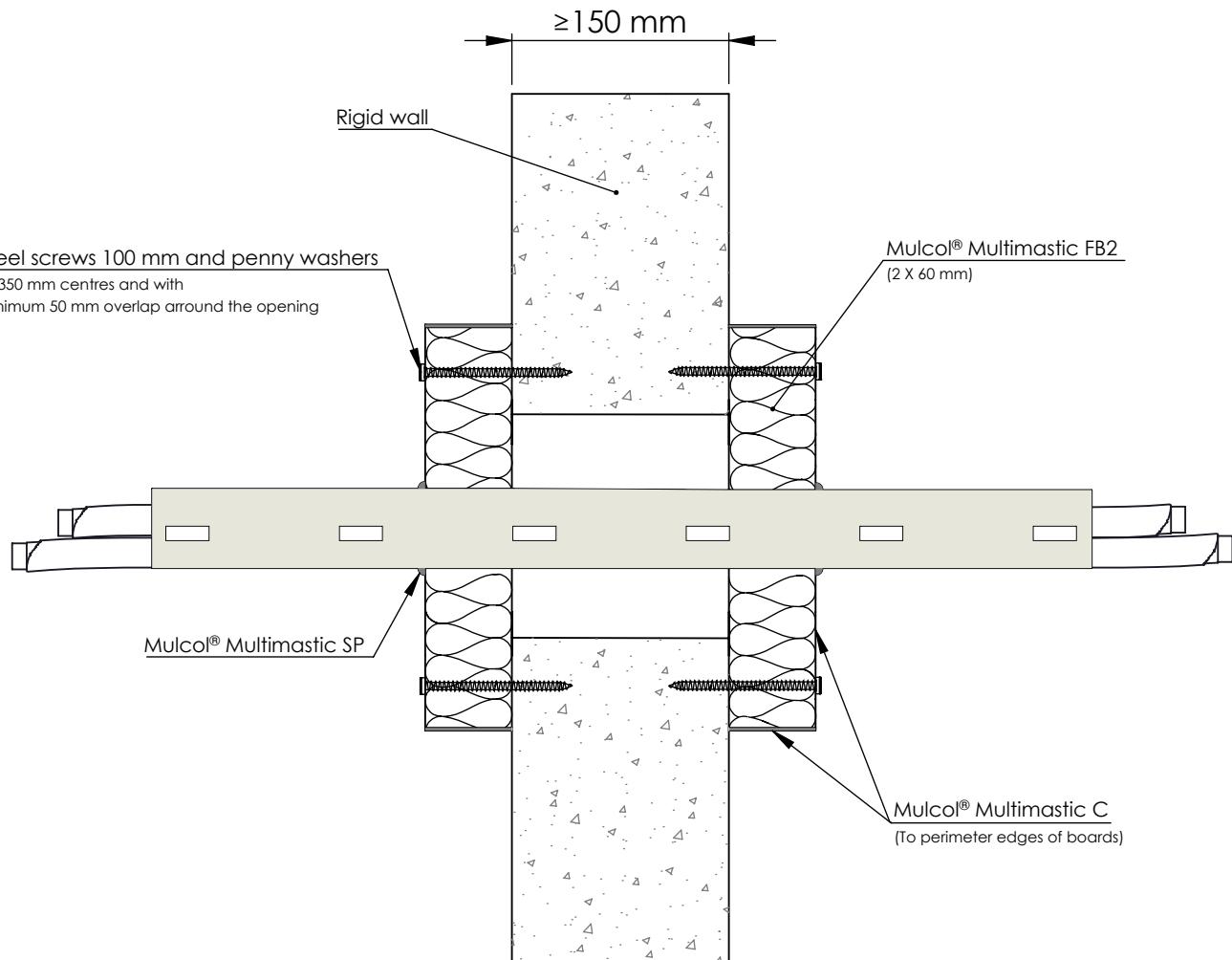
Company : Mulcol International B.V.

RW-CT-MC2.2.10

Department : Research & Development

A4

Draftsman : R.M.



A 3.9 Multimastic FB2 - 2x60 mm - with cables and trays

Services	Classification	Position Mulcol® Multimastic FB2	Maximum seal	Minimum between seals	Minimum from seal edge
Blank seals	E 240, EI 180				
Single or bundled electrical cables up to Ø50 mm, with or without trays	E 240, EI 90				
Electrical cables up to Ø80 mm (single, bundled and on trays)	E 240, EI 60				
Cables up to Ø21 mm in tied bundles up to Ø100 mm	EI 240	Both sides off the wall	600 x 600 mm	200 mm	25 mm
Steel cable trays (perforated and non-perforated) & ladders	E 240, EI 180				
Non-Sheathed wires up to Ø24 mm	E 240, EI 120				

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

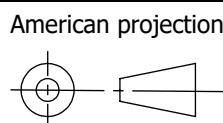
Fire test cable penetration seal

Mulcol® Multimastic C System

Rigid floor construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

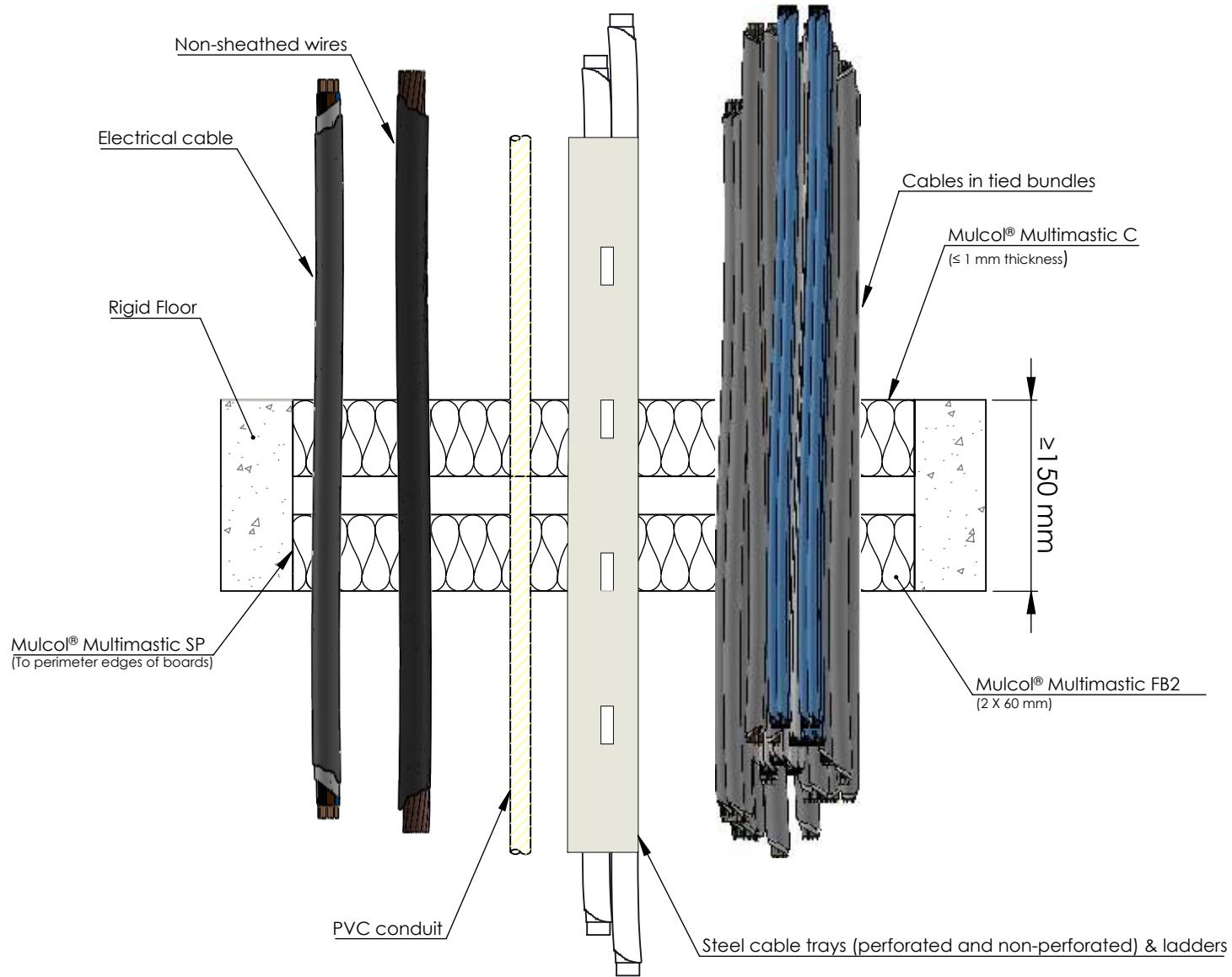
Company : Mulcol International B.V.

RF-CT-MC2.2.10

Department : Research & Development

A4

Draftsman : R.M.



Note: Services within the Multimastic C system seal do not require a minimum separation

A 4.1 Multimastic FB2 - 2x60 mm - with cables and trays

Services	Classification	Position Mulcol® Multimastic FB2	Maximum seal	Minimum from seal edge
Blank seals	EI 180		1200 x 600 mm	
	E 180, EI 120			
Electrical cables up to Ø 21 mm (single, bundled and on trays)	EI 120			
Electrical cables up to Ø 80 mm (single, bundled and on trays)	E 120, EI 60			
Cables up to Ø 21 mm in tied bundles up to Ø 100 mm	EI 120	Both sides of the floor	2400 x 1200 mm	25 mm
Steel cable trays (perforated and non-perforated) & ladders	E 120, EI 60			
Non-sheathed wires up to Ø 24 mm	E 180, EI 45			
PVC conduit up to Ø 16 mm	E 120 C/U, EI 90 C/U			

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

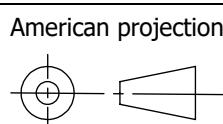
Fire test cable penetration seal

Mulcol® Multimastic C System

Rigid floor construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

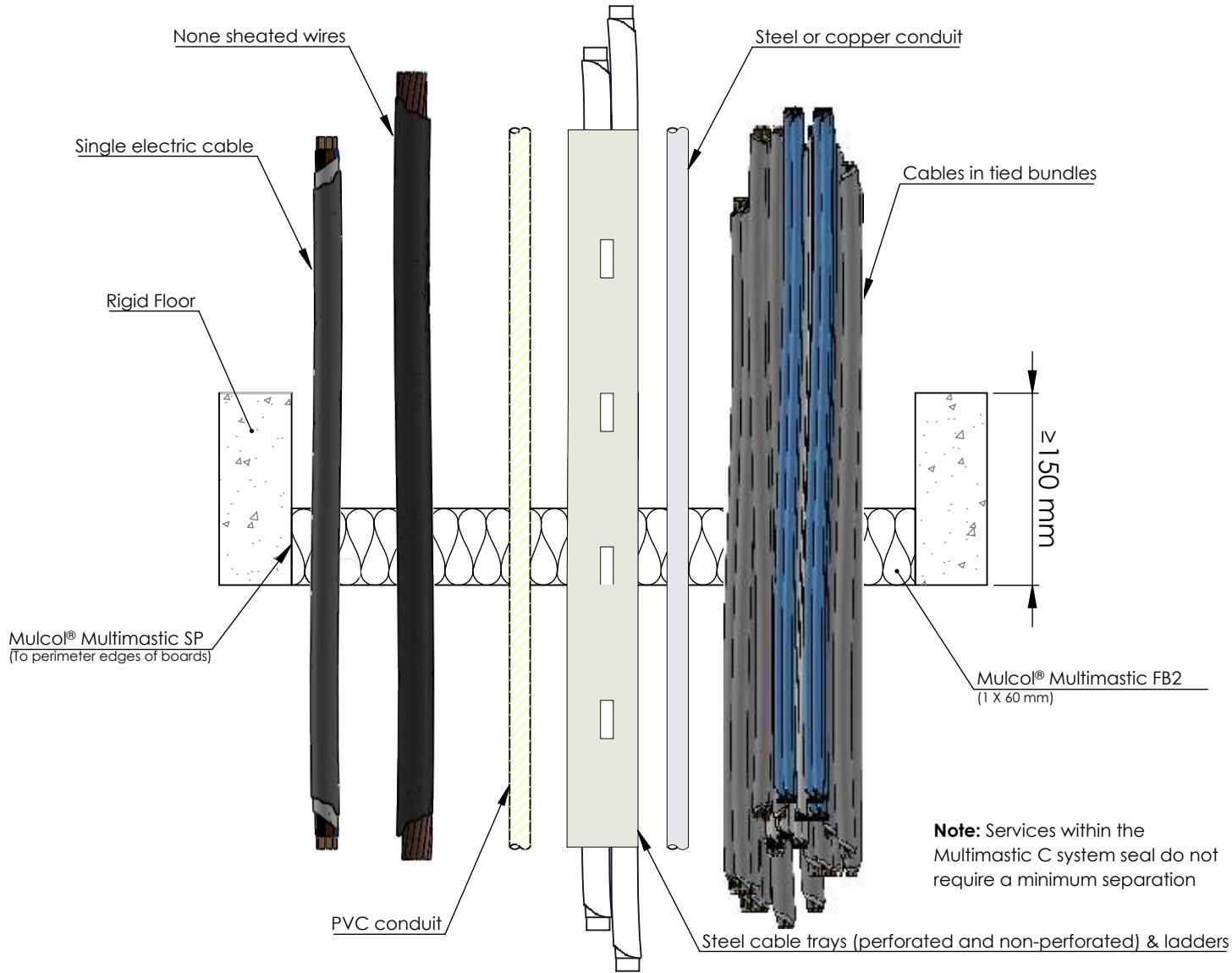
Company : Mulcol International B.V.

RF-CT-MC2.1.10

Department : Research & Development

A4

Draftsman : R.M.



A 4.2 Multimastic FB2 - 1x60 mm - with cables and trays

Services	Classification	Position Mulcol® Multimastic FB2	Maximum seal	Minimum from seal edge
Blank seals	E 240, EI 120		1200 x 600	
	E 120, EI 90		2400 x 1200 mm	
Single electrical cables up to Ø 21 mm	E 120, EI 30		600 x 1200 mm	
Single electrical cables up to Ø 21 mm	E 240, EI 30			
Electrical cables up to Ø 21 mm (single, bundled and on trays)	E 90, EI 45	Either side of the floor (or anywhere in between)		25 mm
Electrical cables up to Ø 80 mm (single, bundled and on trays)	E 90, EI 30			
Cables up to Ø 21 mm in tied bundles up to Ø 100 mm	EI 45			
Steel cable trays (perforated and non-perforated) & ladders	EI 45		2400 x 1200 mm	
None sheathed wires up to Ø 17 mm	E 45, EI 30			
None sheathed wires up to Ø 24 mm	E 45, EI 20			
PVC conduit up to Ø 16 mm	EI 45 C/U			

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

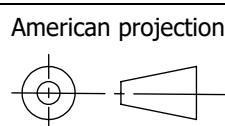
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid floor construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

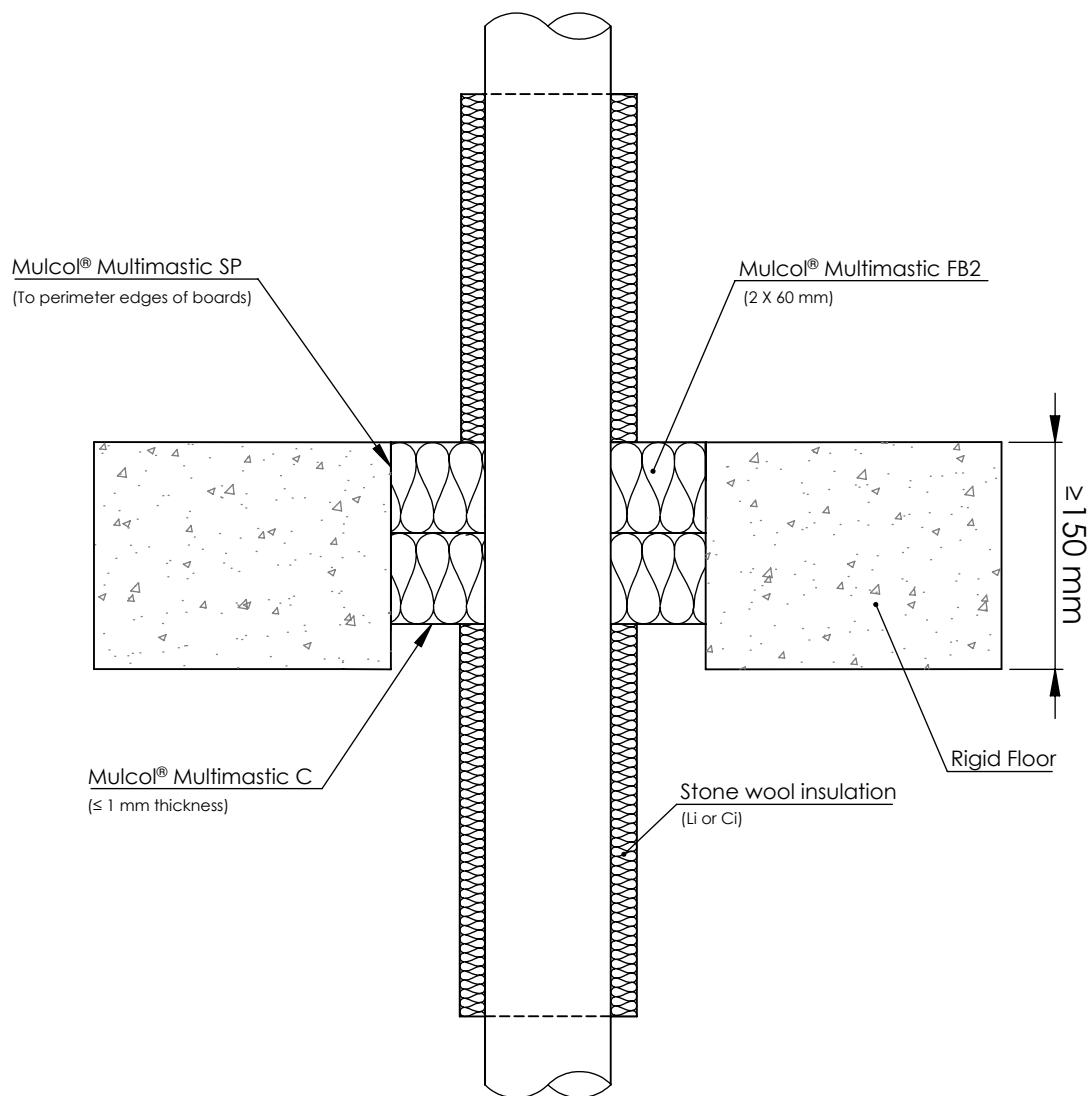
Company : Mulcol International B.V.

RF-ST-MC2.2.20

Department : Research & Development

A4

Draftsman : R.M.



A 4.3 Multimastic FB2 - 2x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge	
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.	EI 180 C/U			1200 x 600 mm		
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.	EI 240 C/U			280 x 280 mm		
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.	E 180 C/U, EI 120 C/U					
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.		2 X 60 mm together top side of the floor	1000 mm length of 20 mm Stone wool insulation, 80 kg/m³	1200 x 600 mm	25 mm	
Steel pipe Ø 50 mm / 1.7-14.2 mm wall th.				280 x 280 mm		
Steel pipe Ø 60 mm / 1.8-14.2 mm wall th.			1000 mm length of 30 mm Stone wool insulation 80 kg/m³	2400 x 1200 mm		
Steel pipe Ø 75 mm / 2.1-14.2 mm wall th.						
Steel pipe Ø 90 mm / 2.3-14.2 mm wall th.						
Steel pipe Ø 100 mm / 2.5-14.2 mm wall th.						
Steel pipe Ø 115 mm / 2.8-14.2 mm wall th.						
Steel pipe Ø 140 mm / 3.2-14.2 mm wall th.						
Steel pipe Ø 165 mm / 3.6-14.2 mm wall th.						
Steel pipe Ø 180 mm / 3.9-14.2 mm wall th.						
Steel pipe Ø 200 mm / 4.2-14.2 mm wall th.						
Steel pipe Ø 219 mm / 4.5-14.2 mm wall th.						

See graph on page 47 for intermediate sizes

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

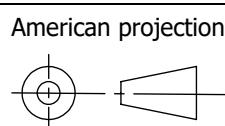
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid floor construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

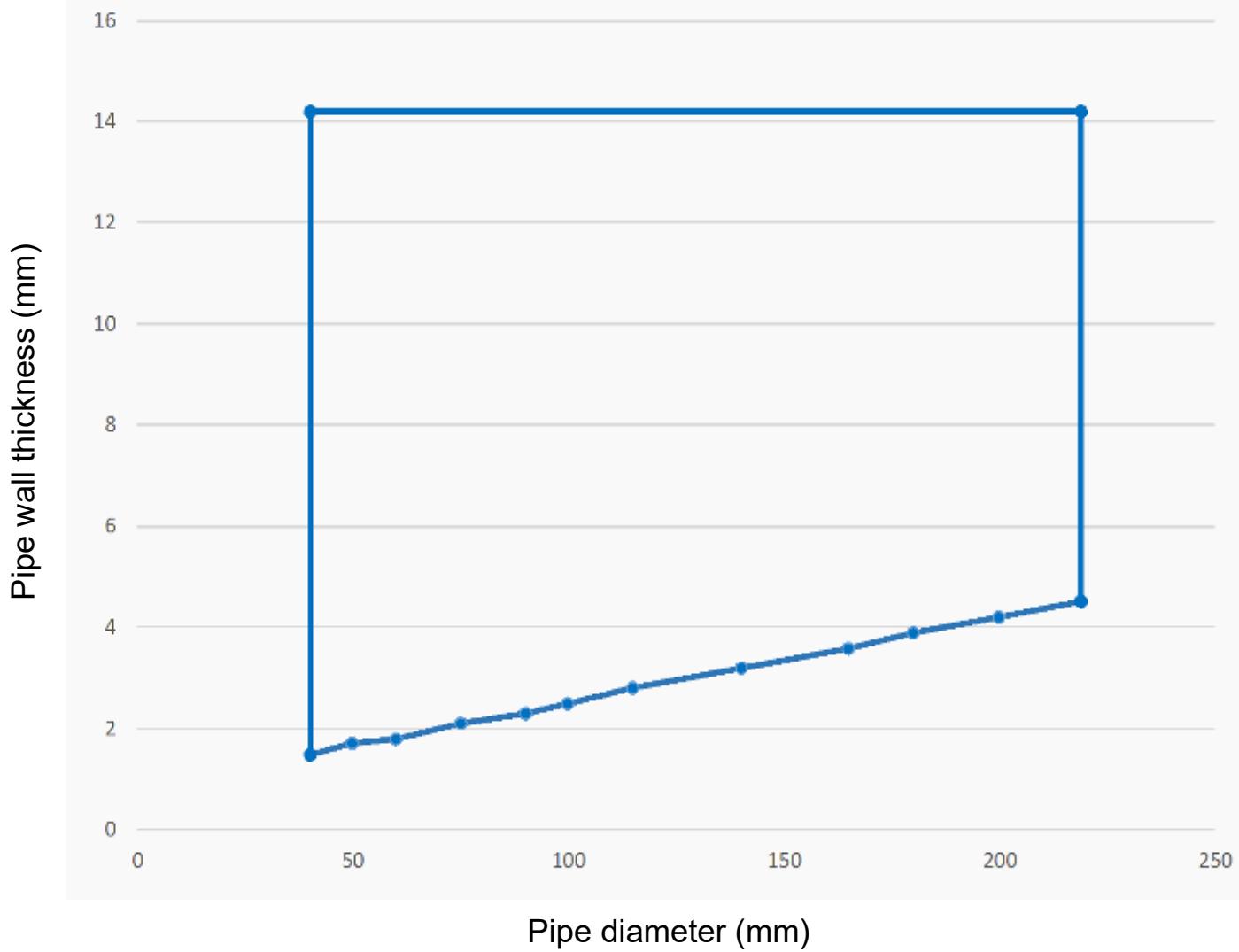
RF-ST-MC2.2.20

Department : Research & Development

Draftsman : R.M.

A4

Intermediate sizes



Annex A - Resistance to fire classification - Mulcol® Multimastic C System

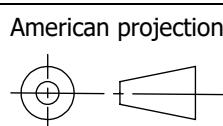
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid floor construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

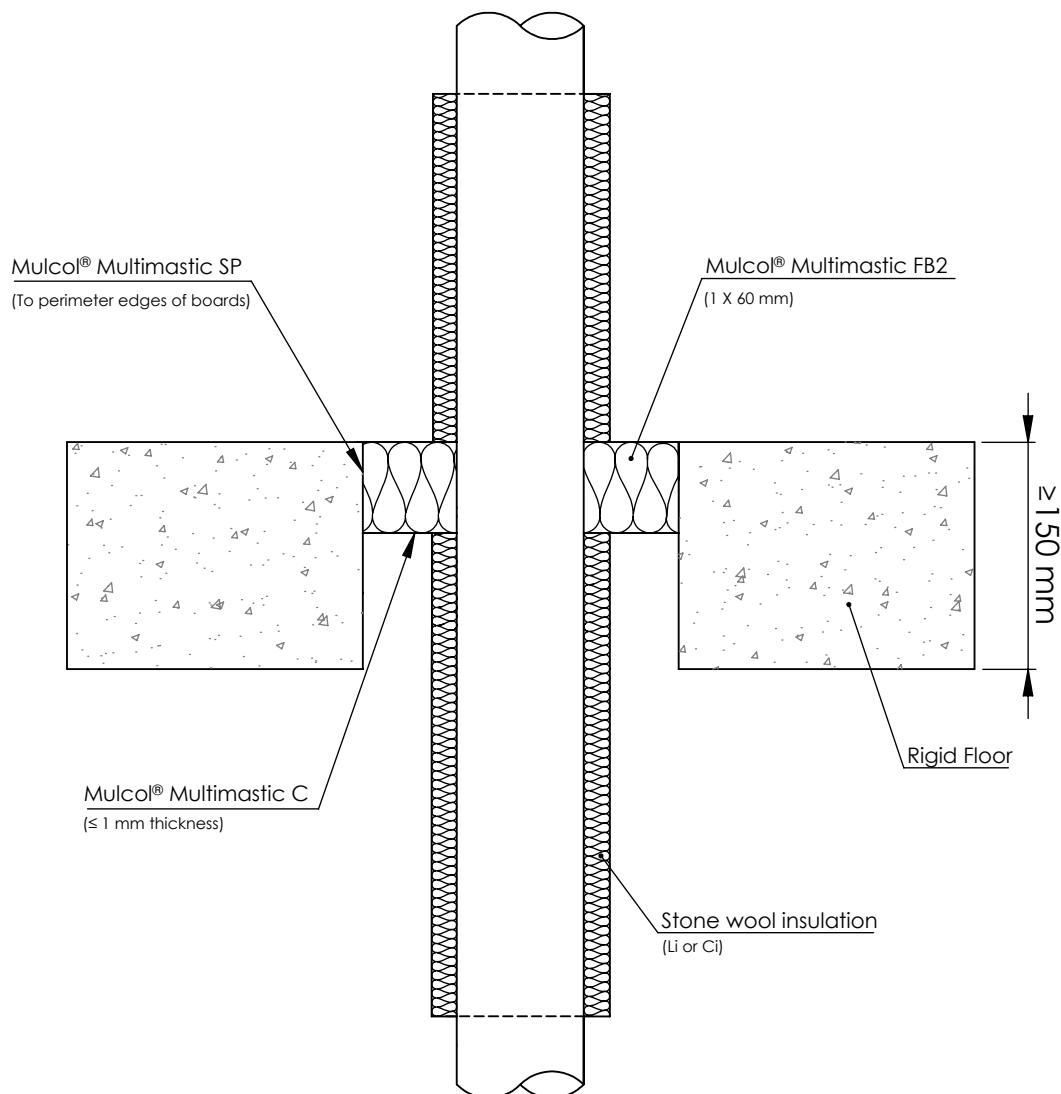
Company : Mulcol International B.V.

RF-ST-MC1.2.10

Department : Research & Development

A4

Draftsman : R.M.



A 4.4 Multimastic FB2 - 1x60 mm - with copper pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge
Copper pipe up to Ø 12 mm / 0.9-14.2 mm wall th.	E 240 C/U, EI 45 C/U	Either side of the floor (or anywhere in between)	1000 mm length of 20 mm Stone wool insulation, 80 kg/m³	1200 x 600 mm	25 mm
Copper pipe up to Ø 54 mm / 0.9-14.2 mm wall th.	E 240 C/U				
Copper pipe up to Ø 54 mm / 0.9-14.2 mm wall th.	E 120 C/U			2400 x 1200 mm	

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

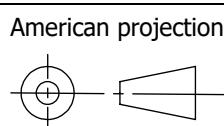
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid floor construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

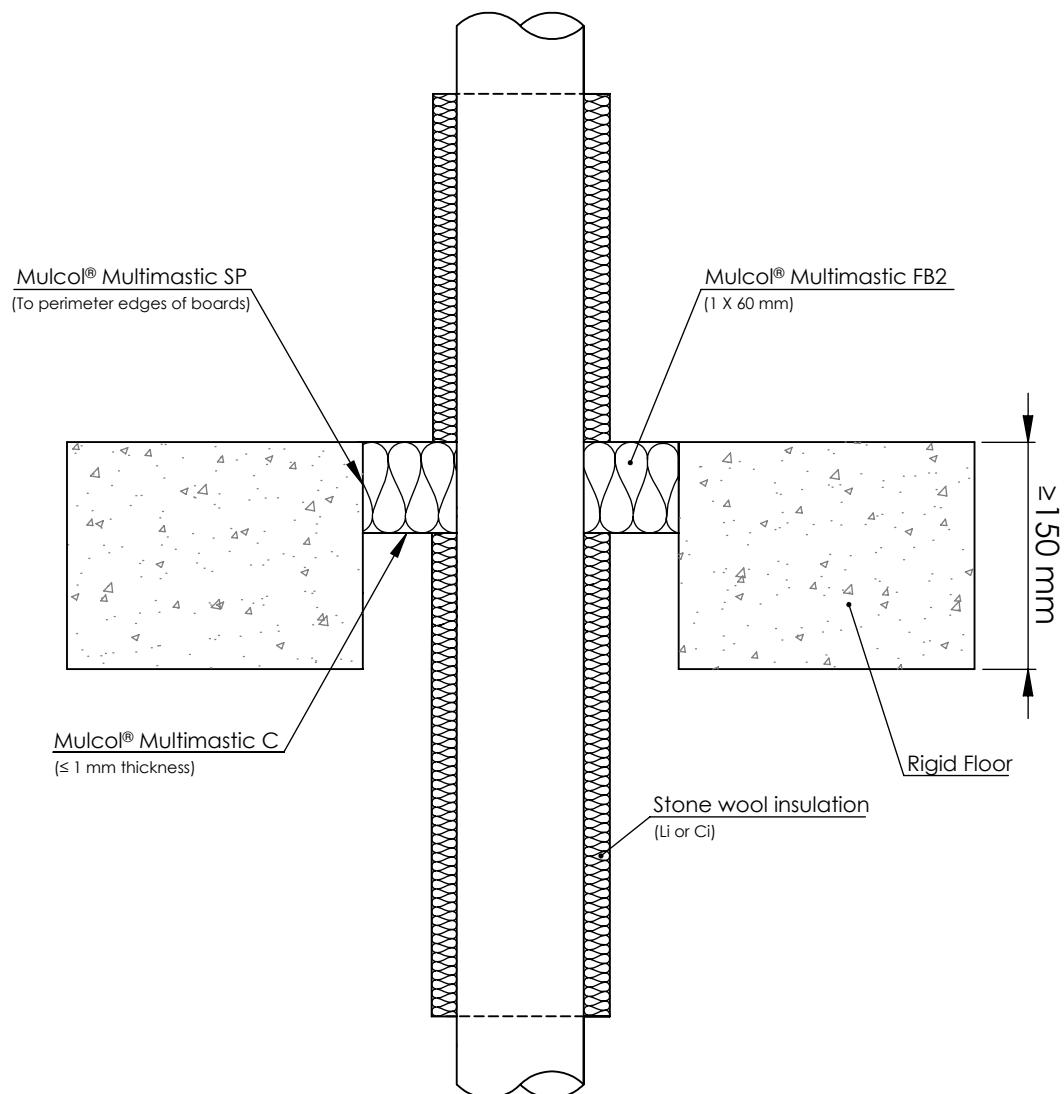
Company : Mulcol International B.V.

RF-ST-MC2.1.20

Department : Research & Development

A4

Draftsman : R.M.



A 4.4.1 Multimastic FB2 - 1x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.	E 240 C/U, EI 60 C/U		1000 mm length of 20 mm Stone wool insulation, 80 kg/m³		
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.					
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.					
Steel pipe Ø 50 mm / 1.7-14.2 mm wall th.					
Steel pipe Ø 60 mm / 1.8-14.2 mm wall th.					
Steel pipe Ø 75 mm / 2.1-14.2 mm wall th.					
Steel pipe Ø 90 mm / 2.3-14.2 mm wall th.					
Steel pipe Ø 100 mm / 2.5-14.2 mm wall th.					
Steel pipe Ø 115 mm / 2.8-14.2 mm wall th.					
Steel pipe Ø 140 mm / 3.2-14.2 mm wall th.					
Steel pipe Ø 165 mm / 3.6-14.2 mm wall th.					
Steel pipe Ø 180 mm / 3.9-14.2 mm wall th.					
Steel pipe Ø 200 mm / 4.2-14.2 mm wall th.					
Steel pipe Ø 219 mm / 4.5-14.2 mm wall th.					
See graph on page 52 for intermediate sizes					

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

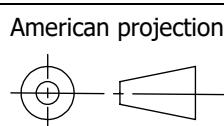
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid floor construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

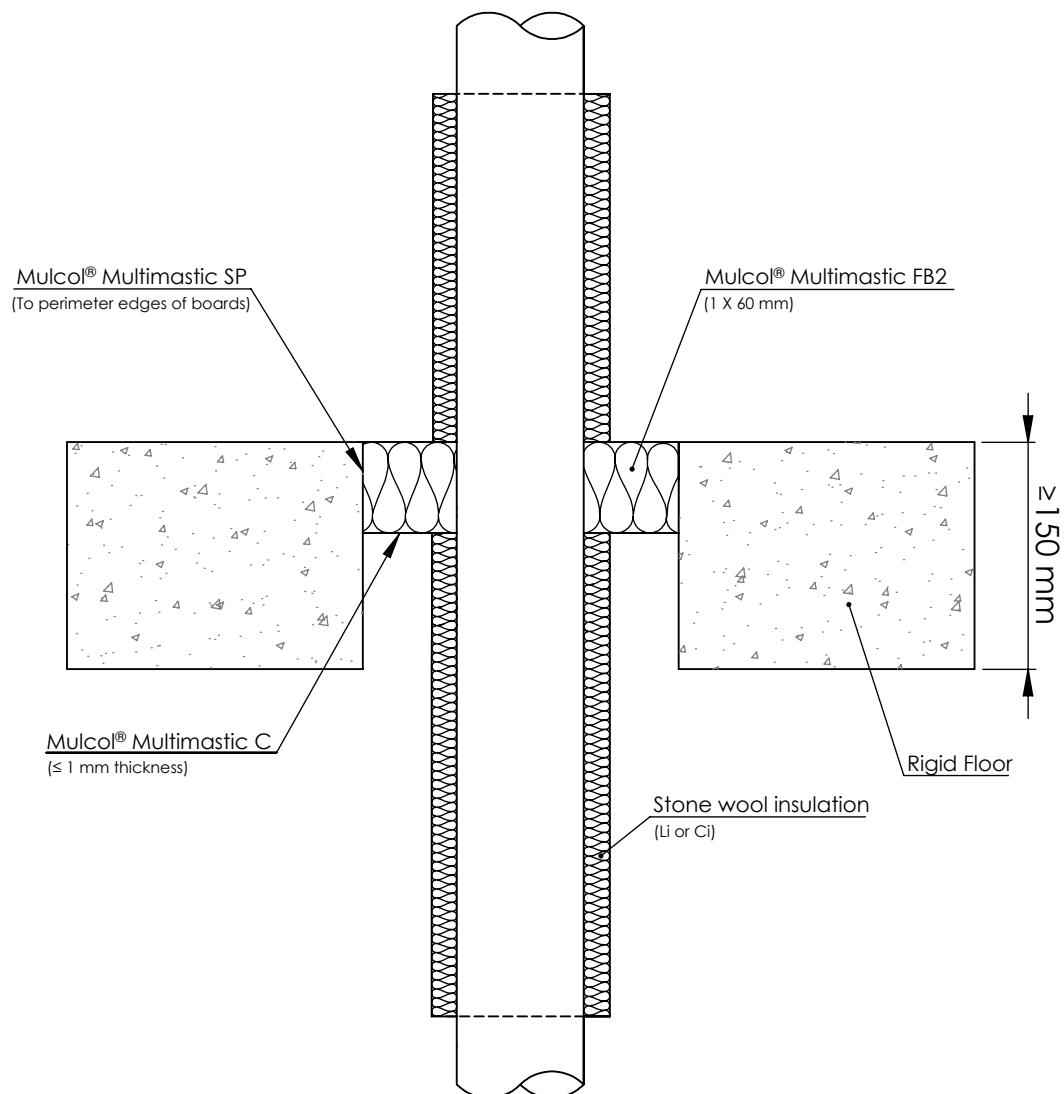
Company : Mulcol International B.V.

RF-ST-MC1.1.20

Department : Research & Development

A4

Draftsman : R.M.



A 4.4.2 Multimastic FB2 - 1x60 mm - with (stainless) steel pipes

Services	Classification	Positions Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.	E 120 C/U, EI 60 C/U		1000 mm length of 20 mm Stone wool insulation, 80 kg/m³		
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.					
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.					
Steel pipe Ø 50 mm / 1.7-14.2 mm wall th.					
Steel pipe Ø 60 mm / 1.8-14.2 mm wall th.					
Steel pipe Ø 75 mm / 2.1-14.2 mm wall th.					
Steel pipe Ø 90 mm / 2.3-14.2 mm wall th.					
Steel pipe Ø 100 mm / 2.5-14.2 mm wall th.					
Steel pipe Ø 115 mm / 2.8-14.2 mm wall th.					
Steel pipe Ø 140 mm / 3.2-14.2 mm wall th.					
Steel pipe Ø 165 mm / 3.6-14.2 mm wall th.					
Steel pipe Ø 180 mm / 3.9-14.2 mm wall th.					
Steel pipe Ø 200 mm / 4.2-14.2 mm wall th.					
Steel pipe Ø 219 mm / 4.5-14.2 mm wall th.					
See graph on page 51 for intermediate sizes					

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

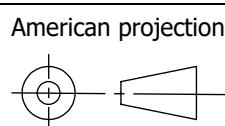
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid floor construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

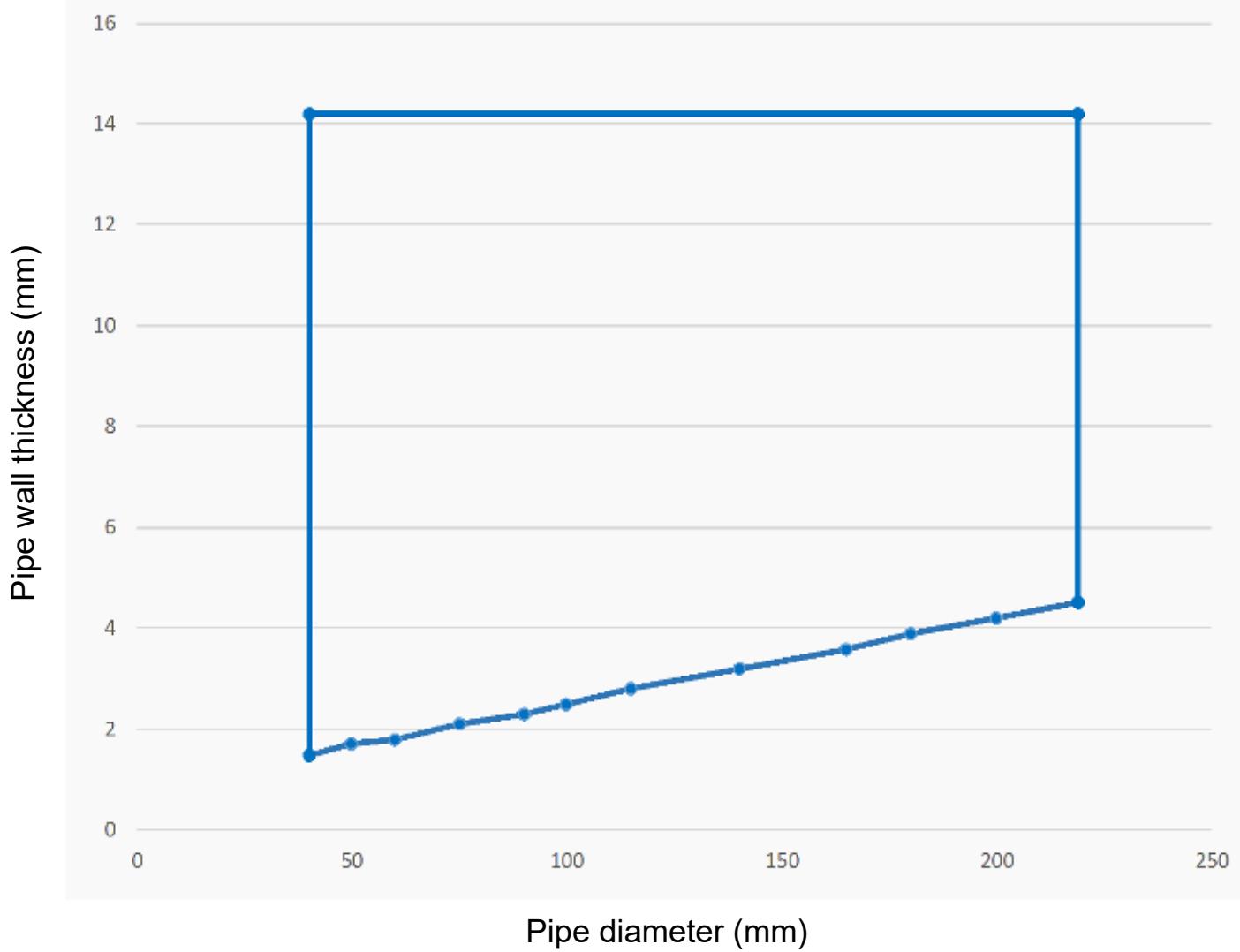
RF-ST-MC1.1.20

Department : Research & Development

Draftsman : R.M.

A4

Intermediate sizes



Annex A - Resistance to fire classification - Mulcol® Multimastic C System

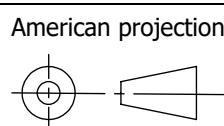
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid floor construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

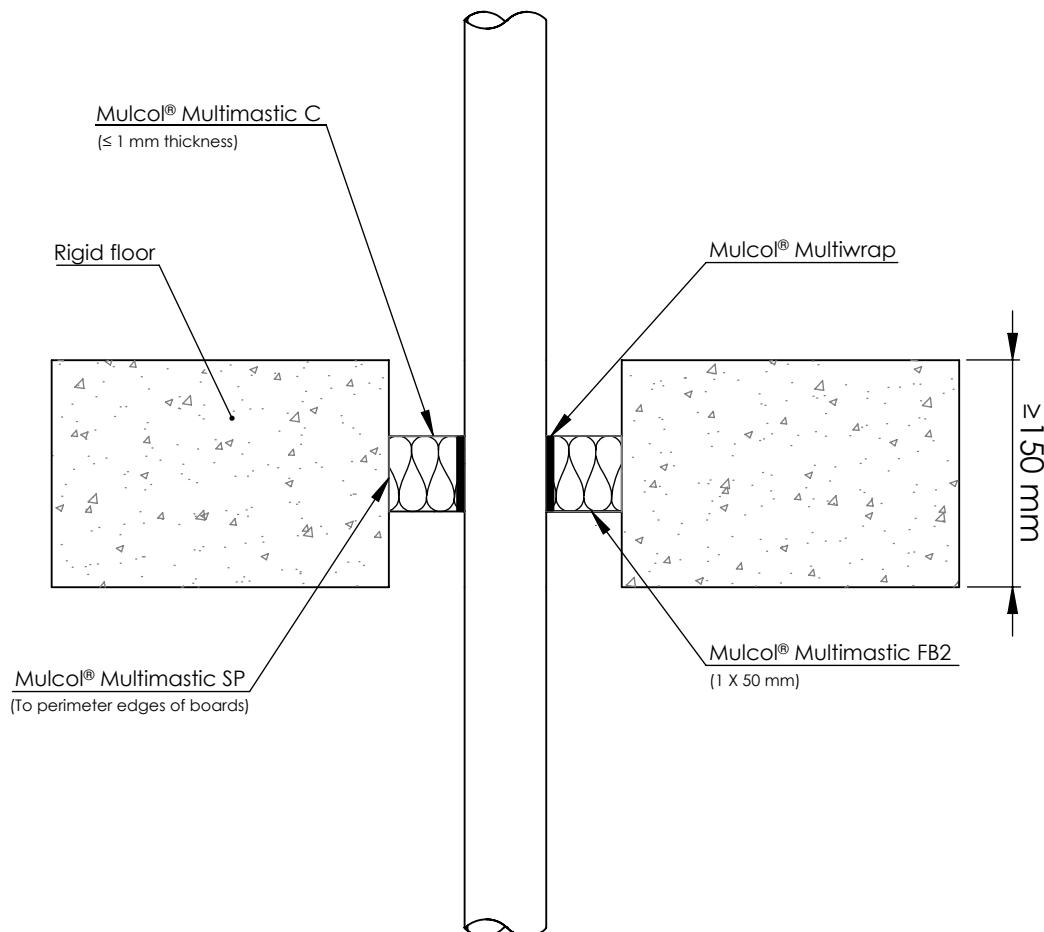
Company : Mulcol International B.V.

RF-PP-MC1.1.10

Department : Research & Development

A4

Draftsman : R.M.



A 4.5 Multimastic FB2 - 1x60 mm - with combustible pipes

Services	Classification	Position Mulcol® Multimastic FB2	Mulcol® Multiwrap	Maximum seal	Position services
PVC-U pipe according to EN 1329-1, EN 1452 and EN 1453-1**, Ø110 mm / 3.4 mm wall thickness.	EI 90 U/C	Mid-depth of the floor	50 x 3.6 mm (2 layers) Centrally fitted	2400 x 1200 mm	min. 30 mm from seal edges and 100 mm from other services

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

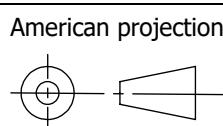
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid floor construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

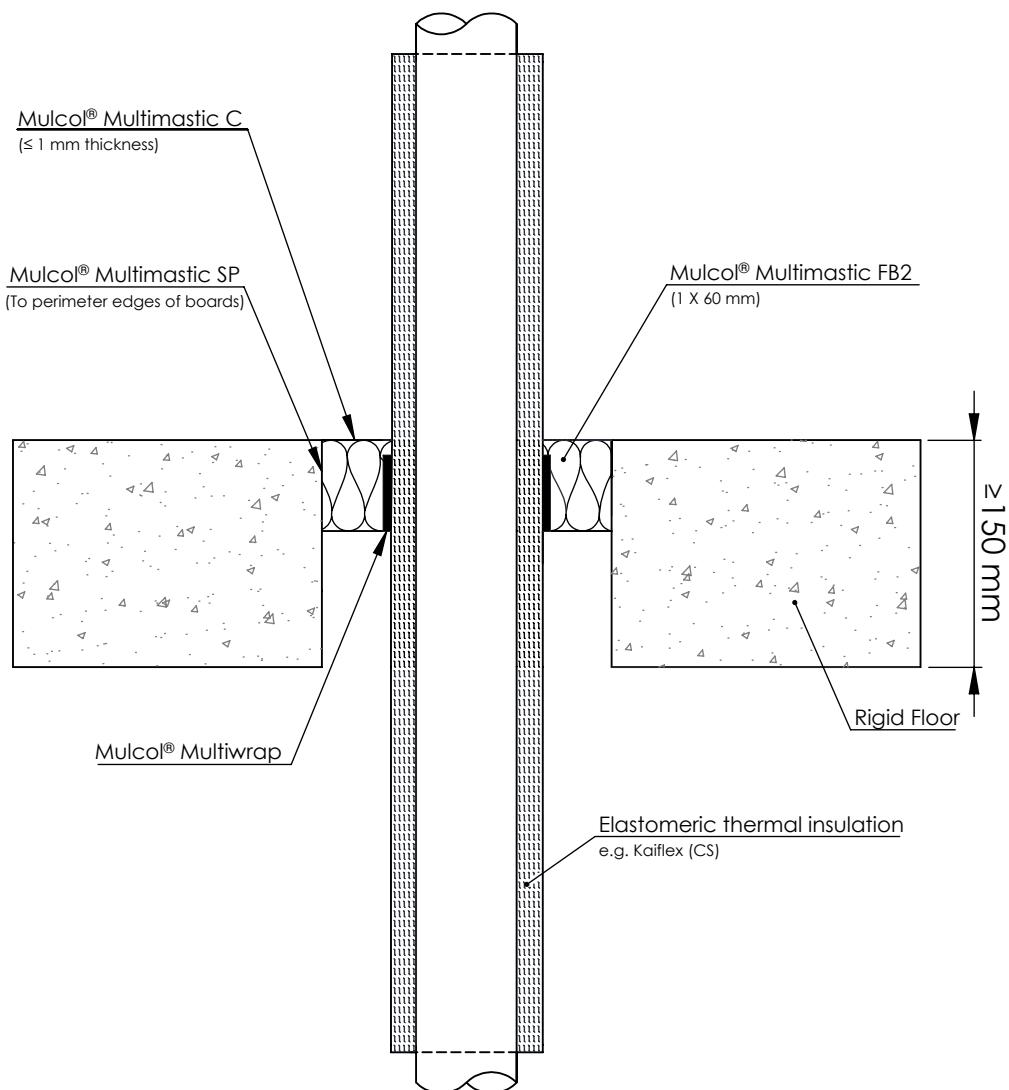
Company : Mulcol International B.V.

RF-ST-MC2.1.22

Department : Research & Development

A4

Draftsman : R.M.



A 4.6 Multimastic FB2 - 1x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Mulcol® Multiwrap	Minimum from seal edge
Steel pipe Ø 165 mm / 4.5-14.2 mm wall th.	E 90 C/U, EI 45 C/U	Either side of the floor (or anywhere in between) with a maximum seal size of 2400 x 1200 mm	13 mm Kaiflex ST insulation	50 x 3.6 mm (2 layers) fitted at bottom of seal	25 mm
Steel pipe Ø 165 mm / 4.5-14.2 mm wall th.	EI 90 C/U		19 mm Kaiflex ST insulation		

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

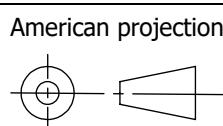
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid floor construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

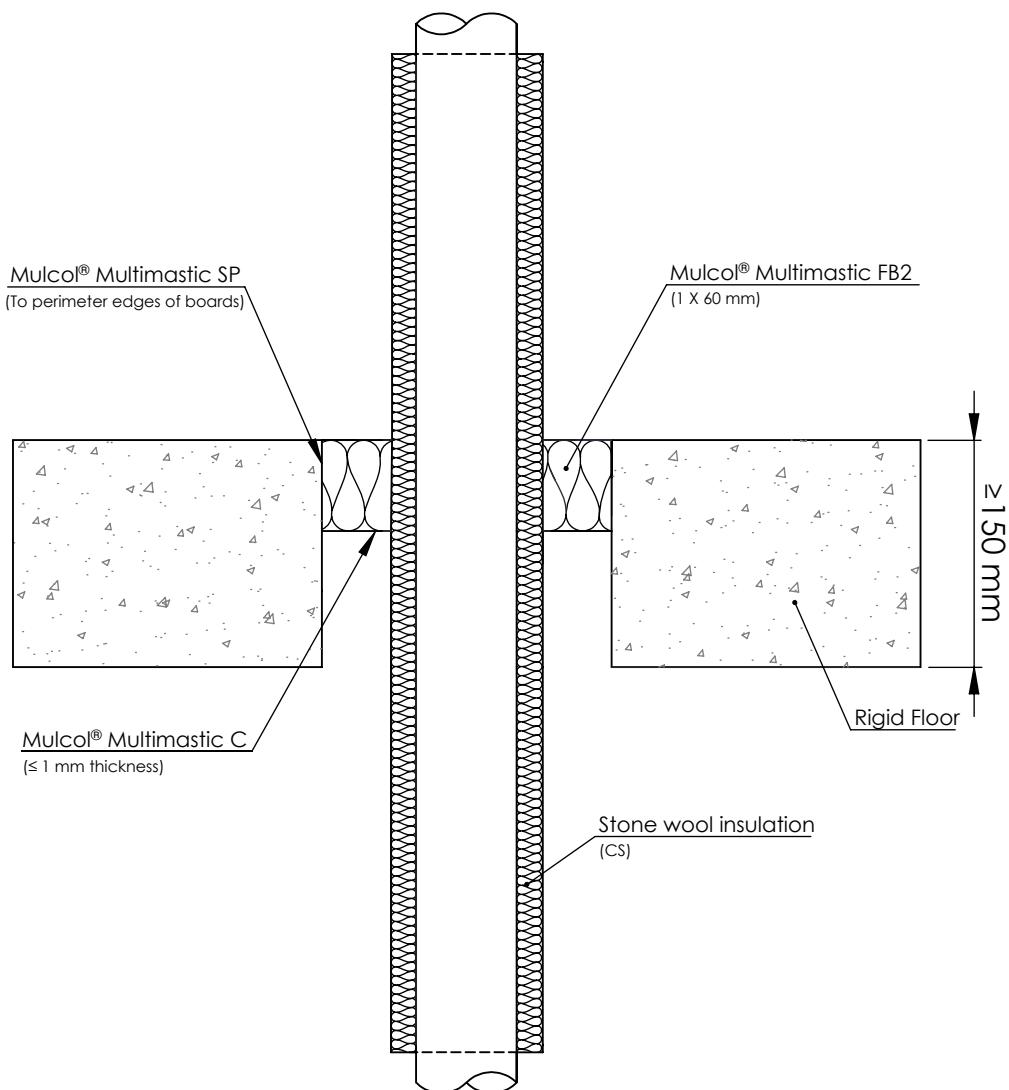
Company : Mulcol International B.V.

RF-ST-MC2.1.20

Department : Research & Development

A4

Draftsman : R.M.



A 4.6.1 Multimastic FB2 - 1x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Mulcol® Multiwrap	Minimum from seal edge
Steel pipe Ø 165 mm / 4.5-14.2 mm wall th.	E 90 C/U, EI 60 C/U	Either side of the floor (or anywhere in between) with a maximum seal size of 2400 x 1200 mm	25-40 mm Stone wool insulation, 80 kg/m³	Not required	25 mm

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

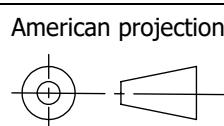
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid floor construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

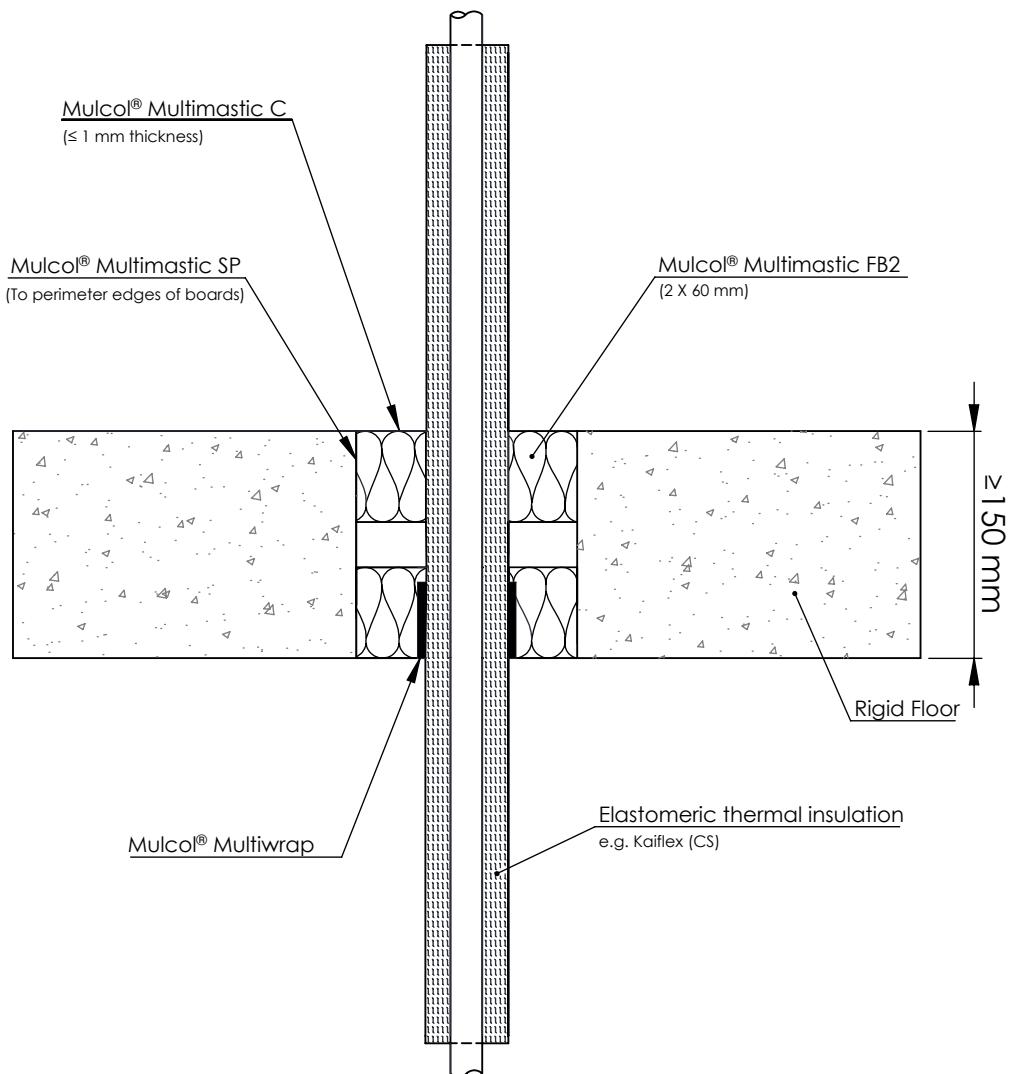
Company : Mulcol International B.V.

RF-ST-MC2.2.22

Department : Research & Development

A4

Draftsman : R.M.



A 4.7 Multimastic FB2 - 2x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Mulcol® Multiwrap	Minimum from seal edge
Steel pipe Ø 40 mm / 1-14.2 mm wall thickness	E 180 C/U, EI 120 C/U	Both sides of the floor with a maximum seal of 2400 x 1200 mm	13 mm Kaiflex ST insulation	50 x 1.8 mm (1 layer) fitted at bottom of seal	25 mm

Annex A - Resistance to fire classification - Mulcol® Multimastic C System

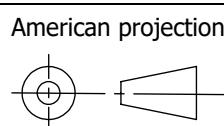
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid floor construction according to I.2.2

MULCOL

FIRE PROTECTION



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

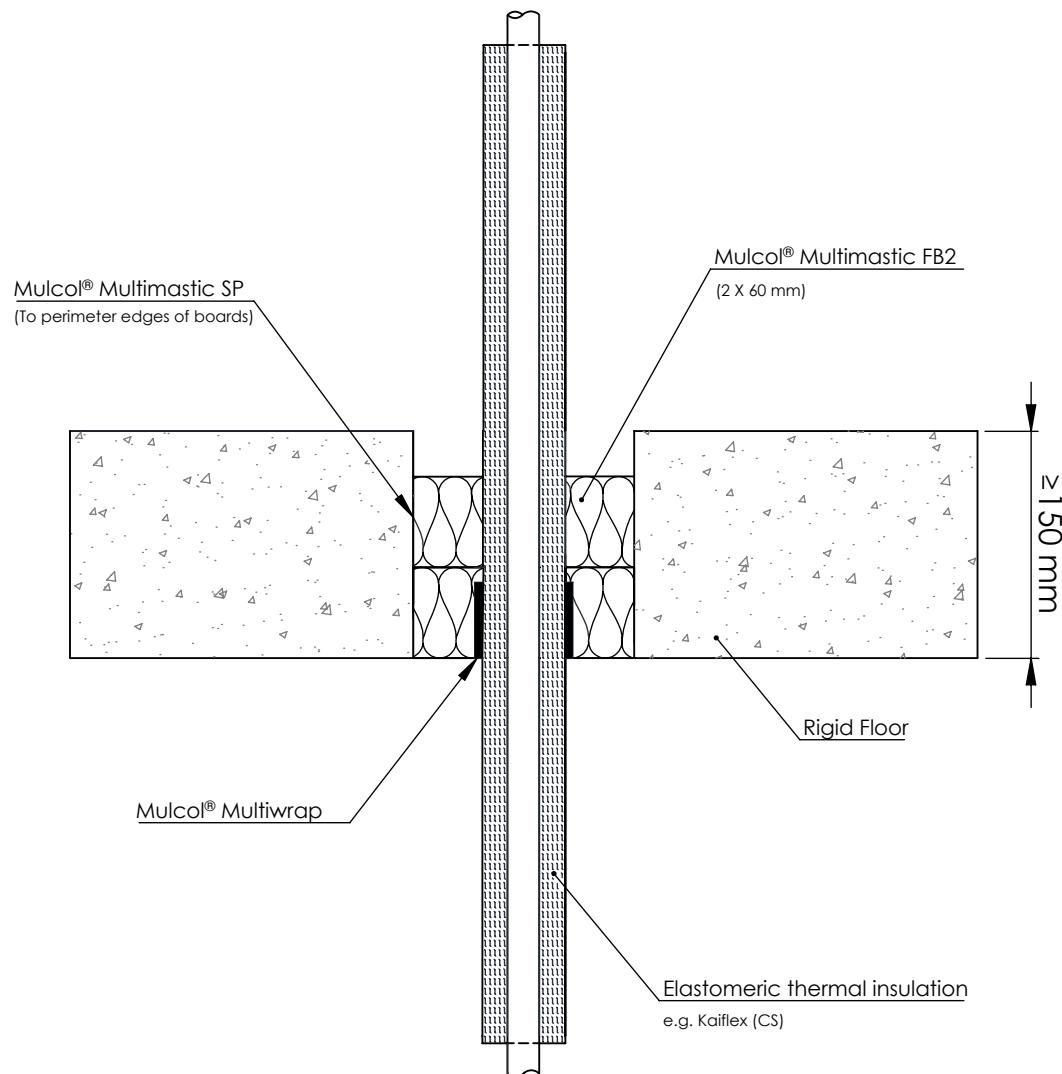
Company : Mulcol International B.V.

RF-ST-MC2.2.22

Department : Research & Development

A4

Draftsman : R.M.



A 4.8 Multimastic FB2 - 2x60 mm - with copper pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Mulcol® Multiwrap	Minimum from seal edge
Copper pipe Ø 12-54 mm / 1-1.2 mm wall th.	E 240 C/U, EI 60 C/U	To either side of the floor (or anywhere in between) with a maximum seal of 2400 x 1200 mm	9-13 mm Kaiflex ST insulation	50 x 3.6 mm (2 layers)	25 mm
	E 180 C/U, EI 45 C/U		13-25 mm Kaiflex ST insulation		