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

MEMBER OF EOTA



## European Technical Assessment ETA-21/0110 of 2021/01/01

### I General Part

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

**Trade name of the construction product:**

MULCOL® MULTIMASTIC C SYSTEM

**Product family to which the above construction product belongs:**

Fire Stopping and Sealing Product:  
• Penetration Seals

**Manufacturer:**

Mulcol International BV  
Arnesteinweg 18  
4338 PD Middelburg  
The Netherlands

**Manufacturing plant:**

A/003

**This European Technical Assessment contains:**

56 pages including 1 annex which form an integral part of the document

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

EAD 350454-00-1104

**This version replaces:**

-

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

**1 Technical description of the product**

- 1) Mulcol® Multimastic FB is a coated mineral wool board 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.
- 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 which is not declared in the document for confidentiality reasons.
- 4) The applicant has submitted a written declaration that Mulcol® Multimastic FB does not contain substances which have to be classified as dangerous according to Directive 67/548/EEC and Regulation (EC) No 1272/2008 and listed in the "Indicative list on dangerous substances" of the EGDS - taking into account the installation conditions of the construction product and the release scenarios resulting from there.

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 FB 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 system Mulcol® Multimastic FB may be used to provide a penetration seal in, are as follows:
  - a. Flexible walls: The wall must have a minimum thickness of 100 mm and comprise steel studs lined on both faces with minimum 2 layers of 12.5 mm thick boards. Apertures are not required to be lined.
  - b. Rigid walls: The wall must have a minimum thickness of 150 mm and comprise concrete, aerated concrete or masonry, with a minimum density of 650 kg/m<sup>3</sup>.
  - c. Rigid floors: The floor must have a minimum thickness of 150 mm and comprise aerated concrete or concrete with a minimum density of 650 kg/m<sup>3</sup>.

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

- 3) The System Mulcol® Multimastic FB 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 total amount of cross sections of services (including insulation) should not exceed 60% of the penetration area.
- 5) The system Mulcol® Multimastic FB may be used to seal apertures in the separating element of unlimited width by 1200mm high in a wall (uninterrupted separating studs will be required at 2400 mm centres or less in flexible walls), and 2400mm by 1200 mm in a floor. The minimum permitted separation between adjacent seals/apertures is 200mm. Services should be a minimum of 25mm from seal edges. Services within the system Mulcol® Multimastic FB 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 100 mm from other services in the aperture.
- 6) Services in floors shall be supported at 250mm and 400mm from the top face. Services in walls shall be supported at 270mm and 470mm from both faces of the wall.
- 7) The provisions made in this European Technical Assessment are based on an assumed working life of the Mulcol® Multimastic FB of 10 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 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.
- 8) 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		Intended use: Penetration Seal
	Essential characteristic	Performance
	Mechanical resistance and stability	
	None	Not relevant
Safety in case of fire		
	Reaction to fire	No performance assessed
	Resistance to fire	Annex A
Hygiene, health and environment		
	Air permeability (material property)	No performance assessed
	Water permeability (material property)	No performance assessed
	Release of dangerous substances	Declaration of manufacturer
Safety in use		
	Mechanical resistance and stability	No performance assessed
	Resistance to impact/movement	No performance assessed
	Adhesion	No performance assessed
Protection against noise		
	Airborne sound insulation	No performance assessed
Energy economy and heat retention		
	Thermal properties	No performance assessed
	Water vapour permeability	No performance assessed
General aspects relating to fitness for use		
	Durability and serviceability	Y <sub>1</sub>

**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/JOIndex.do> of the European Commission<sup>1</sup>, 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**

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

Issued in Copenhagen on 2021-01-01 by


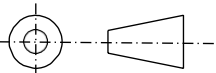


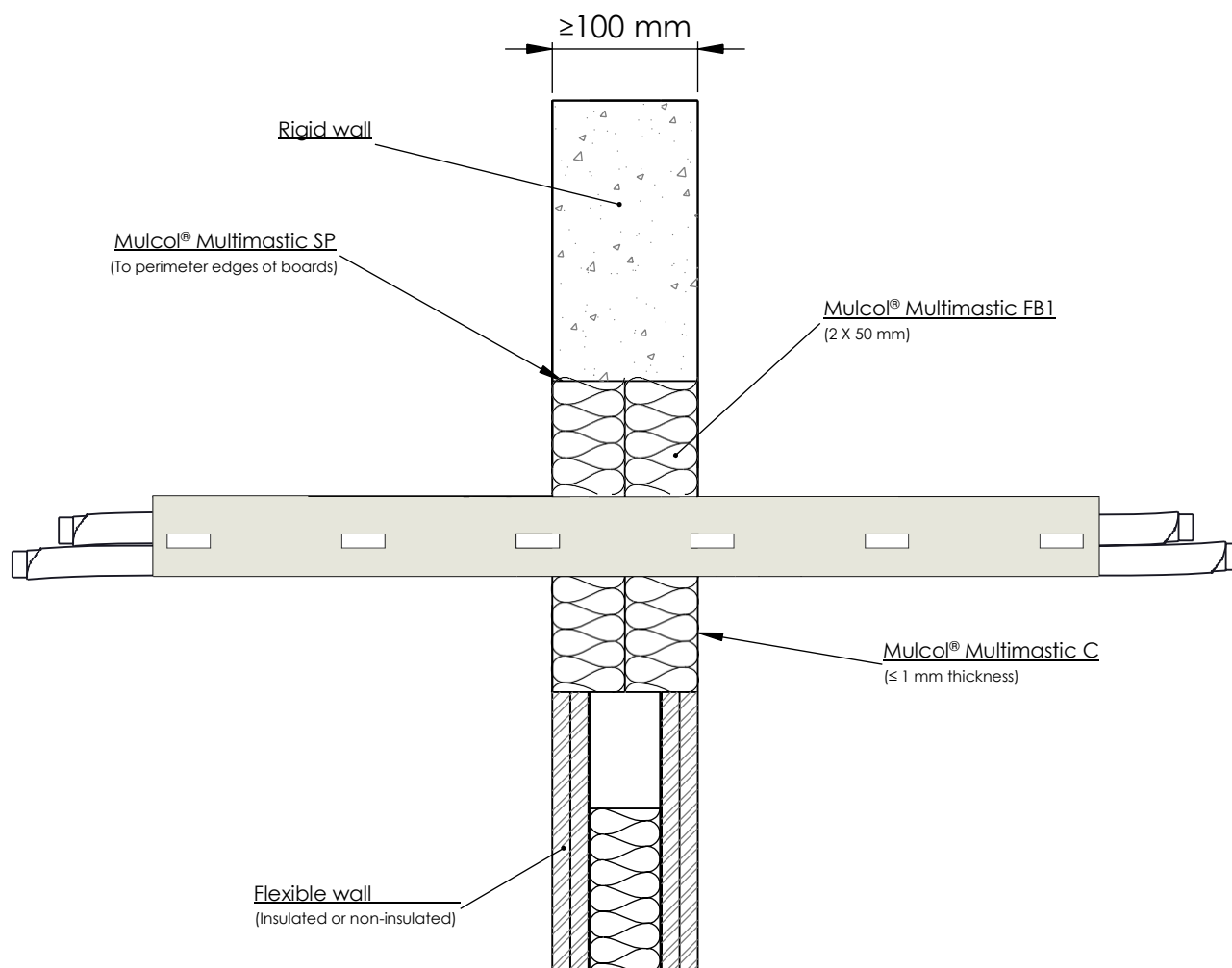
Thomas Bruun

Managing Director, ETA-Danmark

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

# 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 : 1:5	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




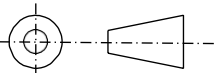
**Note:** Multi-penetration including insulated metal pipes within the same seal - Separation between seals 100 mm

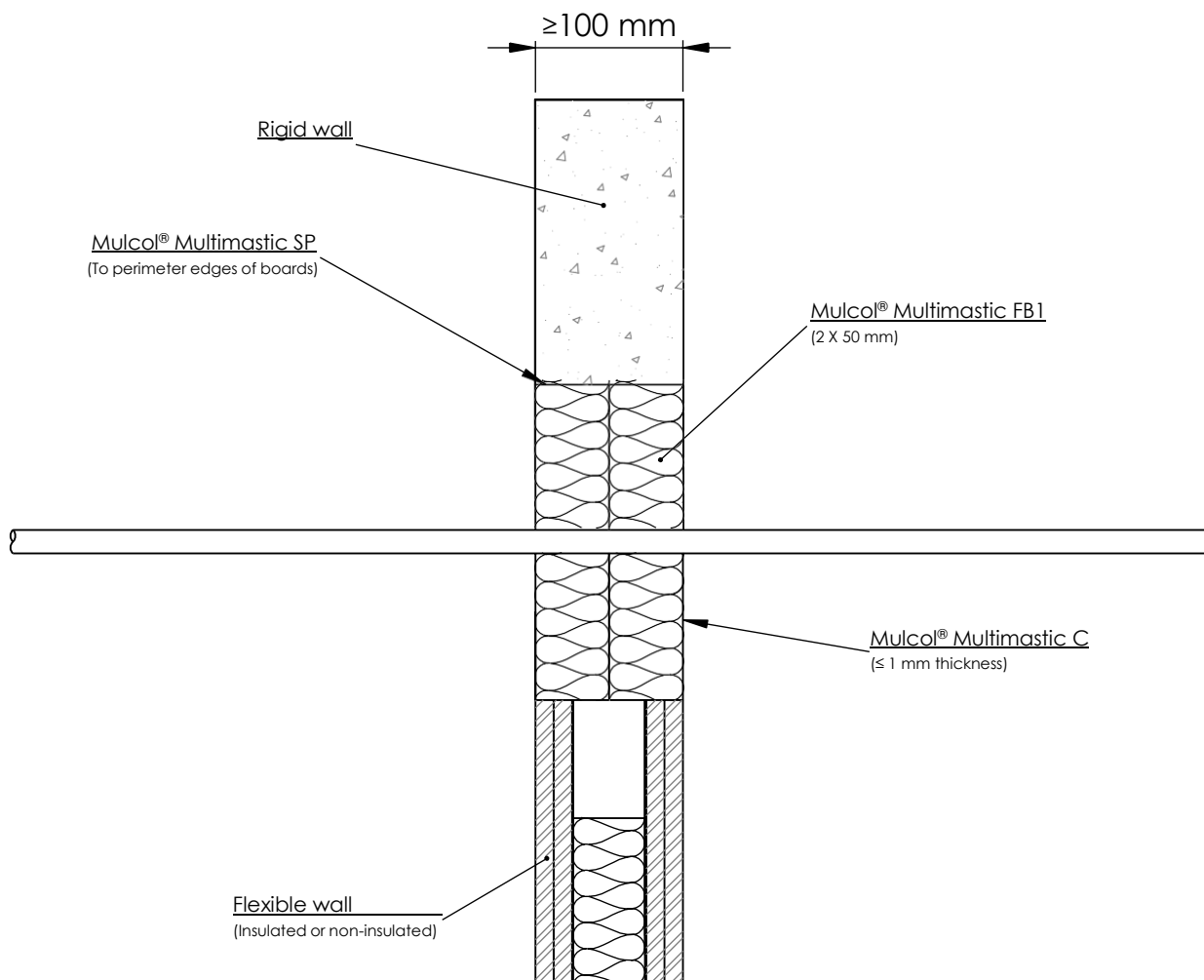
## A 1.1 Multimastic FB1 - 2x50 mm - with cables, trays and conduits

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



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


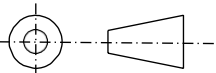
Fire test pipe penetration seal Mulcol® Multimastic C System Rigid/Flexible wall construction according to I.2.2			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	FW-CT-MC1.2.10
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4

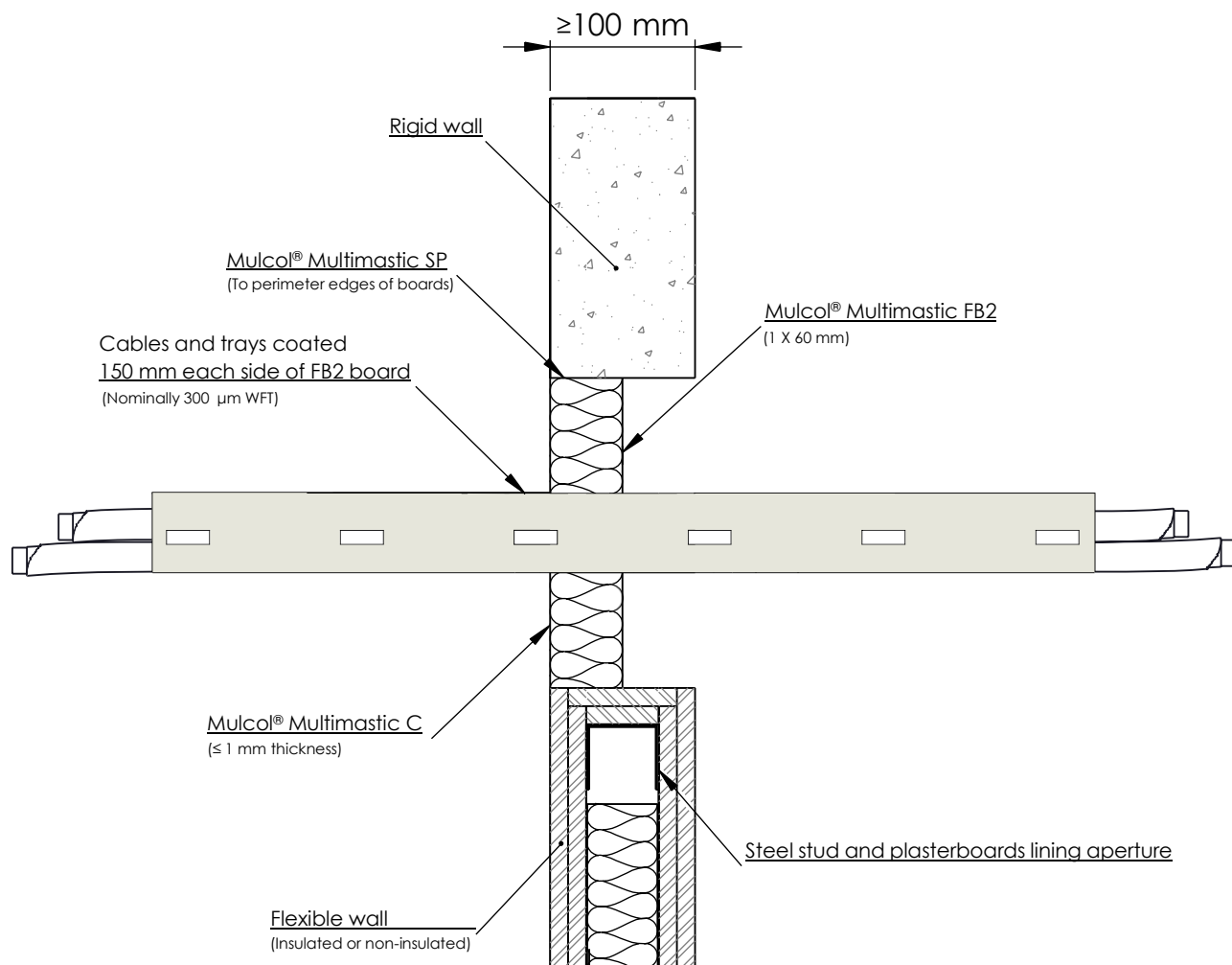


## A 1.1.1 Multimastic FB1 - 2x50 mm - with steel and copper conduits

Services	Classification	Position Mulcol® Multimastic FB1	Maximum seal	Minimum between seals	Minimum from seal edge
Steel conduit up to $\varnothing$ 16 mm	EI 60 C/U	Both sides of the wall	2400 x 1200 mm	200 mm	25 mm
Copper conduit up to $\varnothing$ 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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	FW-CT-MC2.2.10
	Unit of measure : mm	Department : Research & Development	
	Date : 13-6-2017	Draftsman : R.M.	A4



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

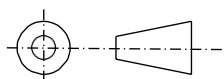
Services	Classification	Position Mulcol® Multimastic FB2	Maximum seal	Minimum between seals	Minimum from seal edge
Electrical cables up to $\varnothing$ 80 mm (single, bundled and on trays)	EI 60	Either side of the wall (or anywhere in between)	1200 x 600 mm	200 mm	25 mm
Cables up to $\varnothing$ 21 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



American projection



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

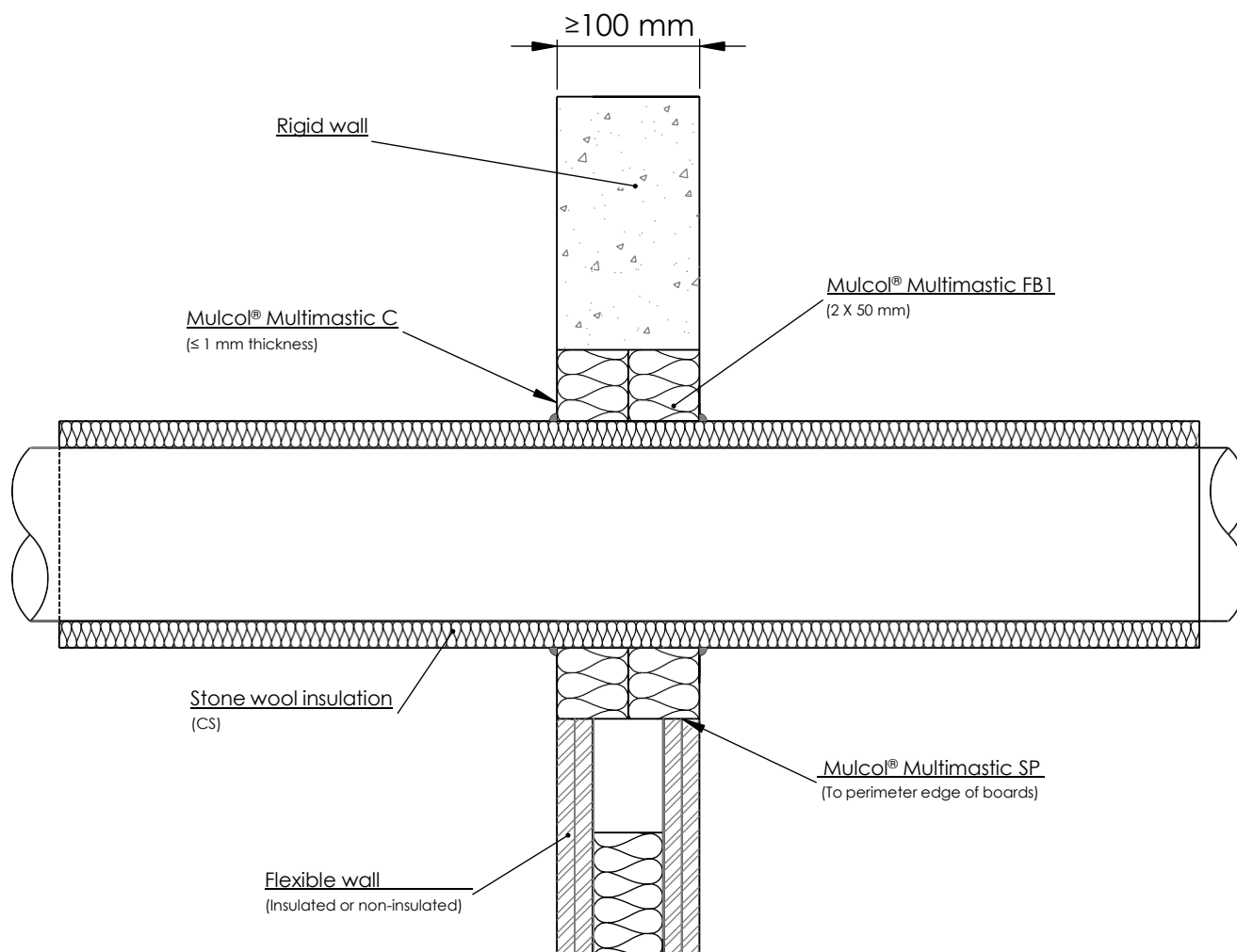
Company : Mulcol International B.V.

Department : Research & Development

Draftsman : R.M.

FW-ST-MC1.2.20

A4



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

Services	Classification	Position Mulcol® Multimastic FB1	Insulation	Maxium seal	Minimum from seal edge
Steel pipe 40 mm / 1-14.2 mm wall th.	EI 120 C/U	Both sides of the wall	20 mm Stone wool insulation, 80 kg/m³	Unlimited width x 1200 mm height (See section 2. 5)	30 mm
Steel pipe Ø40 mm / 1-14.2 mm wall th.					
Steel pipe Ø50 mm / 1.2-14.2 mm wall th.					
Steel pipe Ø60 mm / 1.4-14.2 mm wall th.					
Steel pipe Ø75 mm / 1.6-14.2 mm wall th.					
Steel pipe Ø90 mm / 1.9-14.2 mm wall th.					
Steel pipe Ø100 mm / 2.1-14.2 mm wall th.					
Steel pipe Ø115 mm / 2.4-14.2 mm wall th.					
Steel pipe Ø140 mm / 2.9-14.2 mm wall th.					
Steel pipe Ø165 mm / 3.4-14.2 mm wall th.					
Steel pipe Ø180 mm / 3.6-14.2 mm wall th.					
Steel pipe Ø200 mm / 4.0-14.2 mm wall th.					
Steel pipe Ø219 mm / 4.3-14.2 mm wall th.					
Steel pipe Ø250 mm / 5.0-14.2 mm wall th.					
Steel pipe Ø300 mm / 5.9-14.2 mm wall th.					
Steel pipe Ø324 mm / 6.35-14.2 mm wall th.					

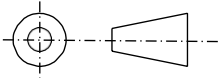
See graph on page 12 for intermediate sizes

# 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

American projection



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

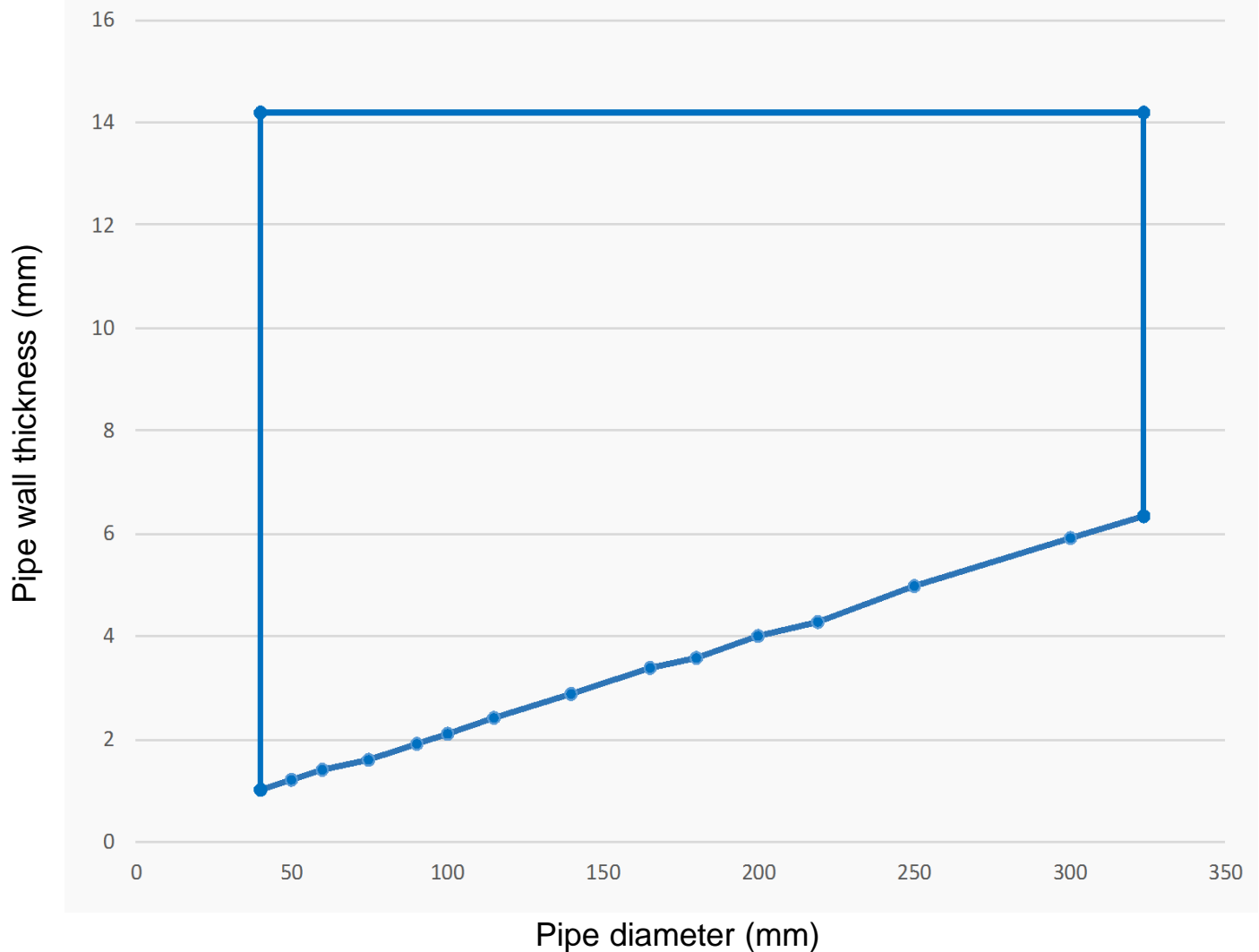
Department : Research & Development

Draftsman : R.M.


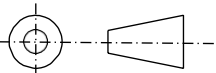
FW-ST-MC1.2.20

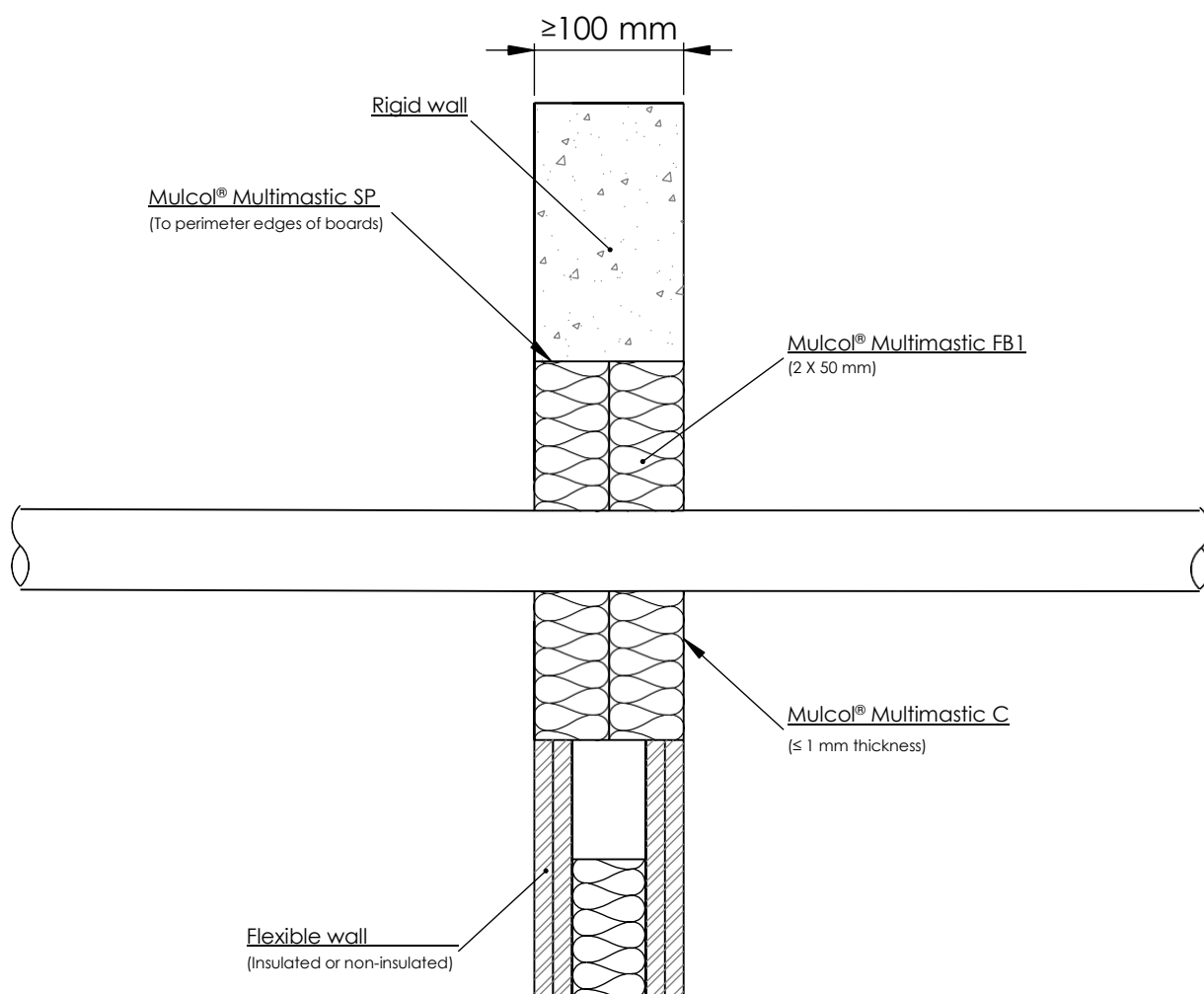
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Intermediate sizes



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


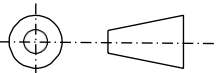
Fire test pipe penetration seal Mulcol® Multimastic C System Flexible wall construction according to I.2.2			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	FW-ST-MC1.2.20
	Unit of measure : mm	Department : Research & Development	
	Date : 13-6-2017	Draftsman : R.M.	A4

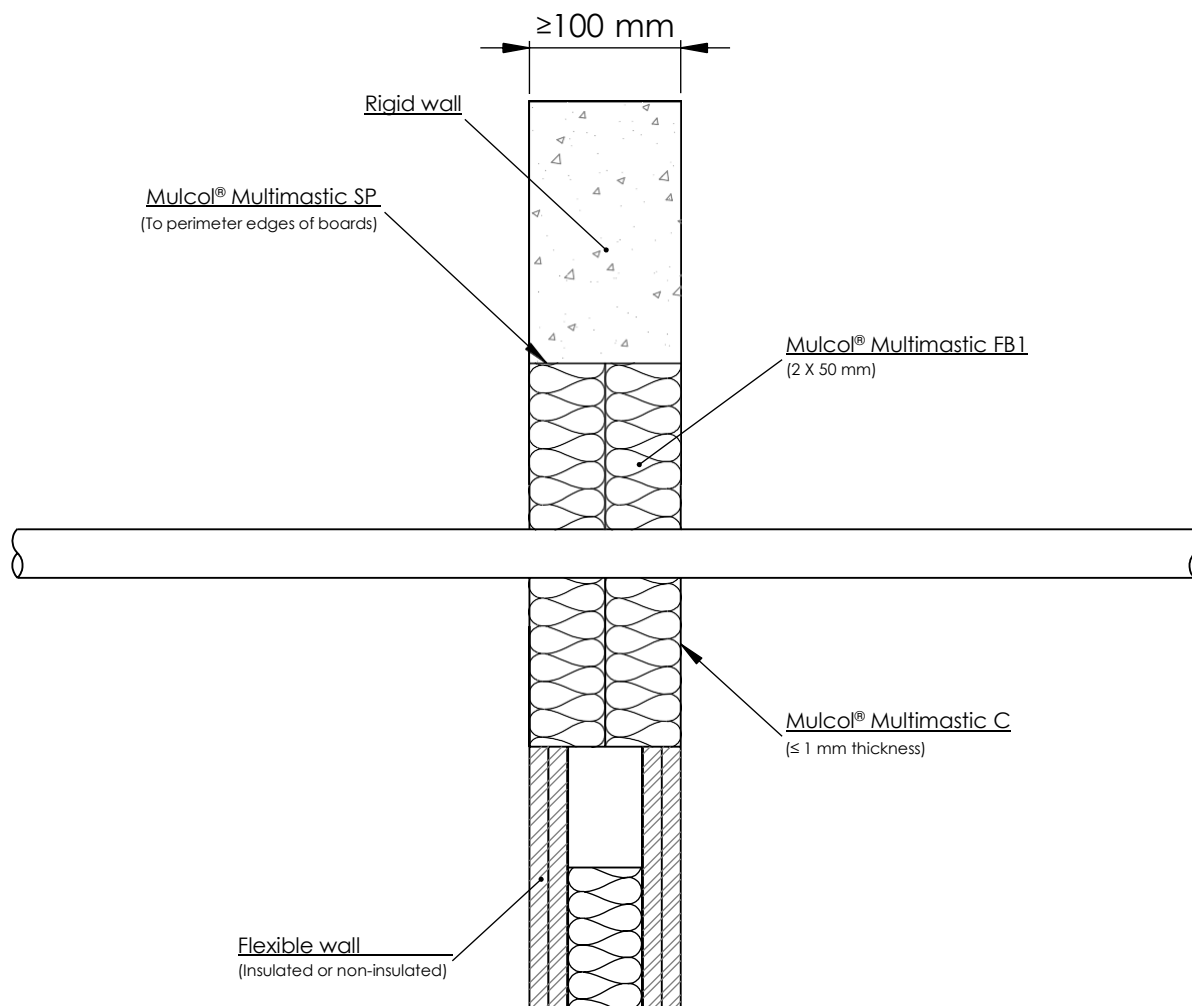


## A 1.3.1 Multimastic FB1 - 2x50 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB1	Insulation	Maximum seal	Minimum from seal edge
Steel pipe $\varnothing$ 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 $\varnothing$ 22 mm / 2-14.2 mm wall thickness	E 120 C/U, EI 60 C/U				25 mm
Steel pipe $\varnothing$ 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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	FW-PVC-MC1.2.20
	Unit of measure : mm	Department : Research & Development	
	Date : 13-6-2017	Draftsman : R.M.	A4



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

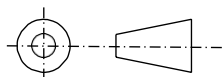
Services	Classification	Position Mulcol® Multimastic FB1	Insulation	Maximum seal	Minimum from seal edge
PVC-U pipe Ø 6 mm / 1.0 mm wall thickness	EI 120 U/C	Both sides of the wall	None	Unlimited width x 1200 mm height (See section 2. 5)	30
PVC-U pipe Ø 6-32 mm / 1.8-2.4 mm wall thickness	E 90 U/C, EI 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

American projection



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

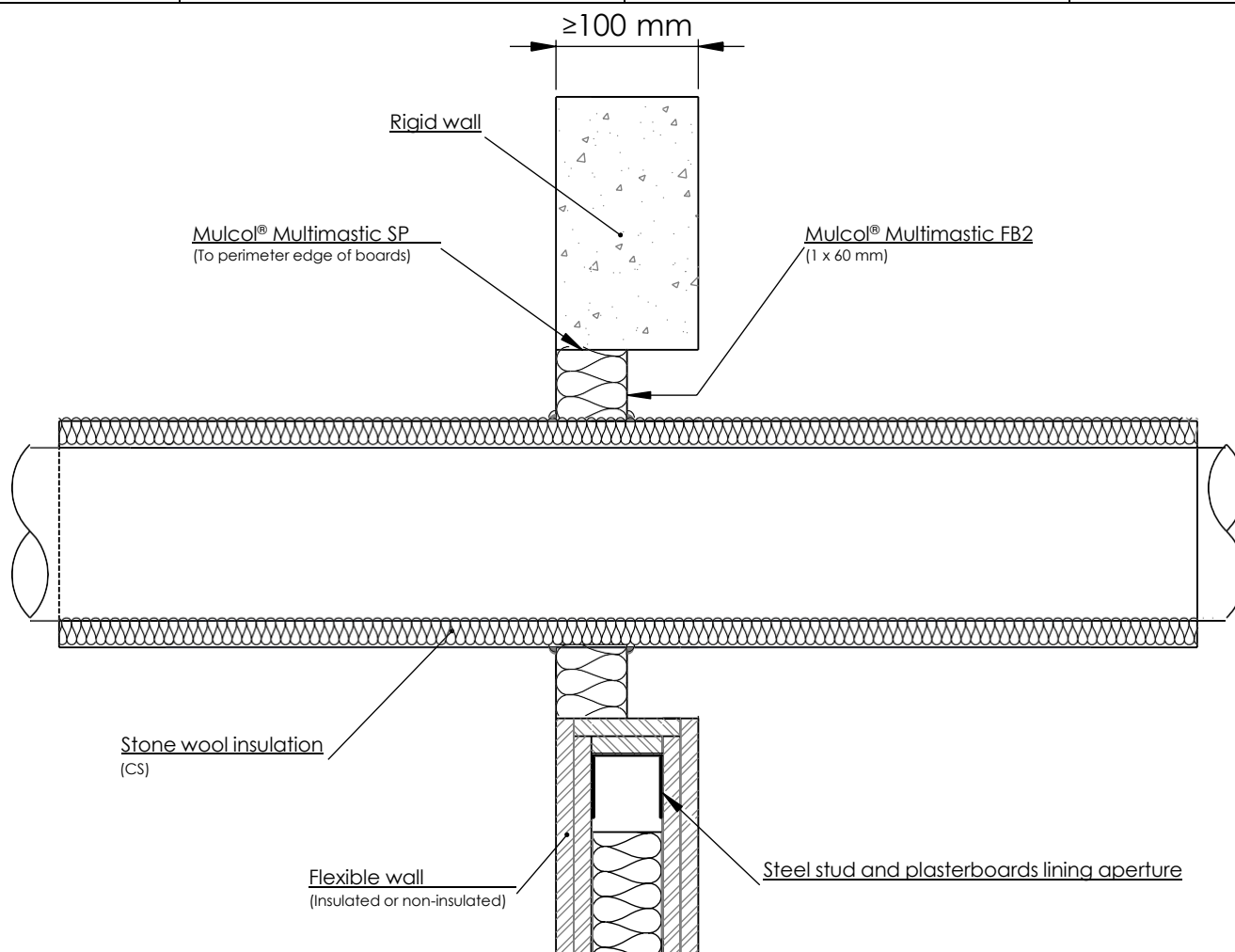
Company : Mulcol International B.V.

Department : Research & Development

Draftsman : R.M.

FW-ST-MC2.2.20

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

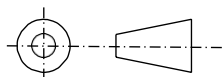
Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maxium seal	Minimum from seal edge
Steel pipe Ø 40 mm / 1-14.2 mm wall th.	E 90 C/U, EI 60 C/U	Either side of the wall (or anywhere in between)	20 mm Stone wool insulation, 80 kg/m³	1200 x 600 mm	30 mm
Steel pipe Ø 40 mm / 1-14.2 mm 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



American projection



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

Company : Mulcol International B.V.

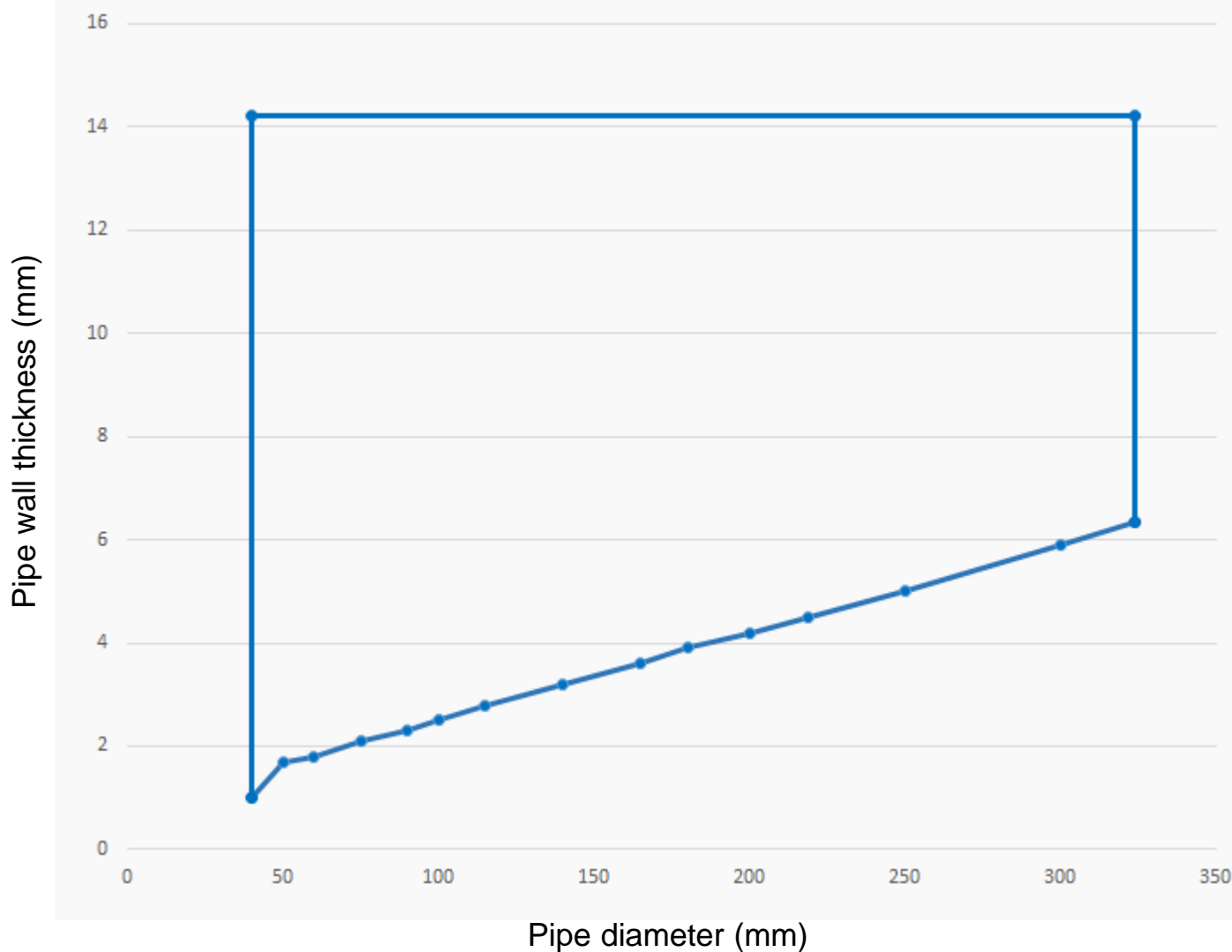
Department : Research & Development

Draftsman : R.M.

FW-ST-MC1.2.20


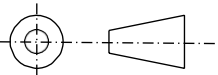
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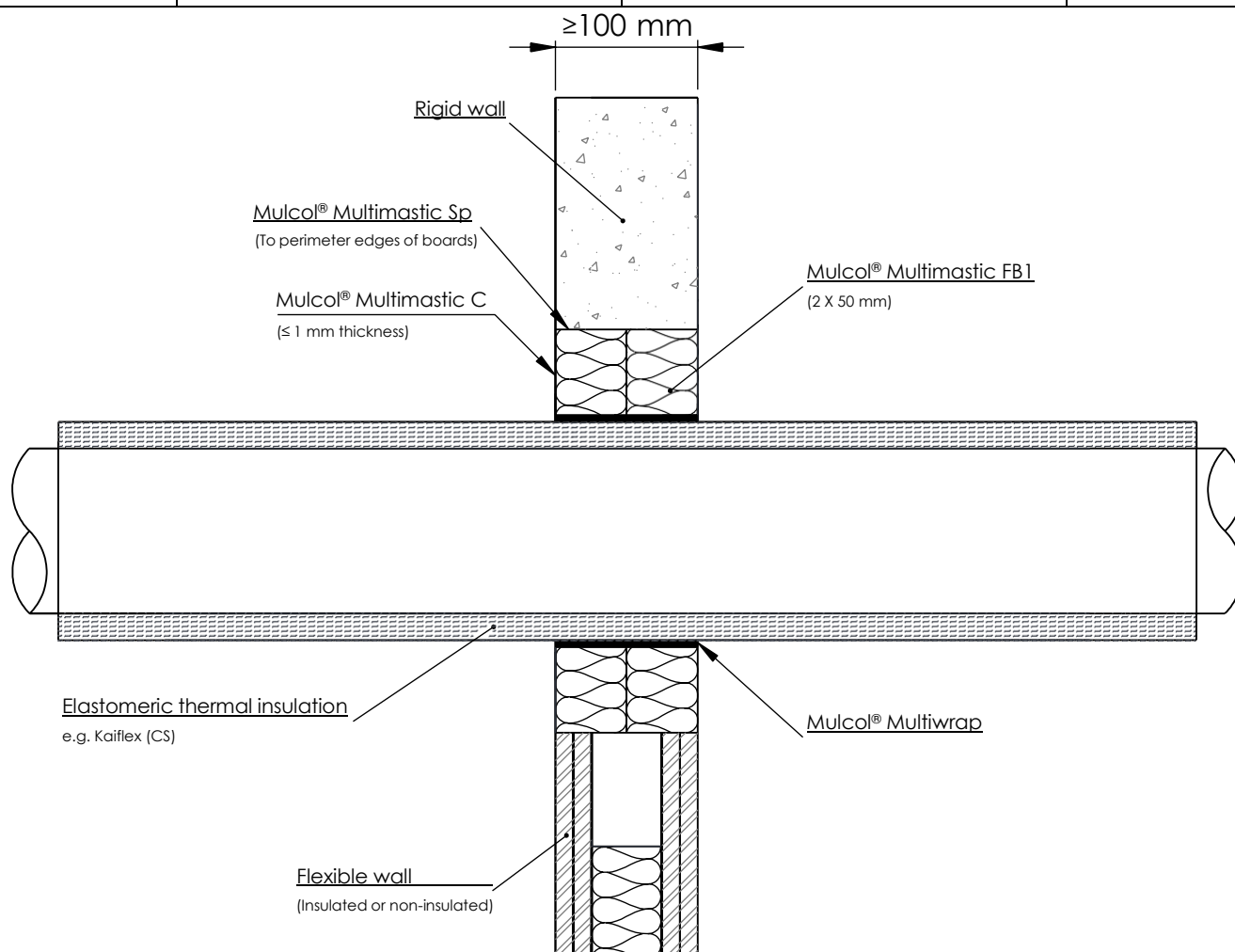
Intermediate sizes





# 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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	FW-ST-MC1.2.22
	Unit of measure : mm	Department : Research & Development	
	Date : 10-2-2017	Draftsman : R.M.	A4



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

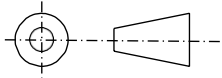
Services	Classification	Position Mulcol® Multimastic FB1	Insulation	Mulcol® MultiWrap	Minimum from seal edge
Steel pipe Ø 40 mm / 1-14.2 mm wall th.	EI 90 C/U	Both sides of the wall Unlimited width x 1200 mm high (See section 2. 5)	32 mm elastomeric insulation min. class B-s3, d0 or PE Foam insulation	50 x 5.4 mm (3 layers) one fitted flush to each face of seal	30 mm
Steel pipe Ø 40 mm / 1-14.2 mm wall th.			32-50 mm elastomeric insulation min. class B-s3, d0 or PE Foam insulation		
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.					
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

**MULCOL**  
FIRE PROTECTION

American projection



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

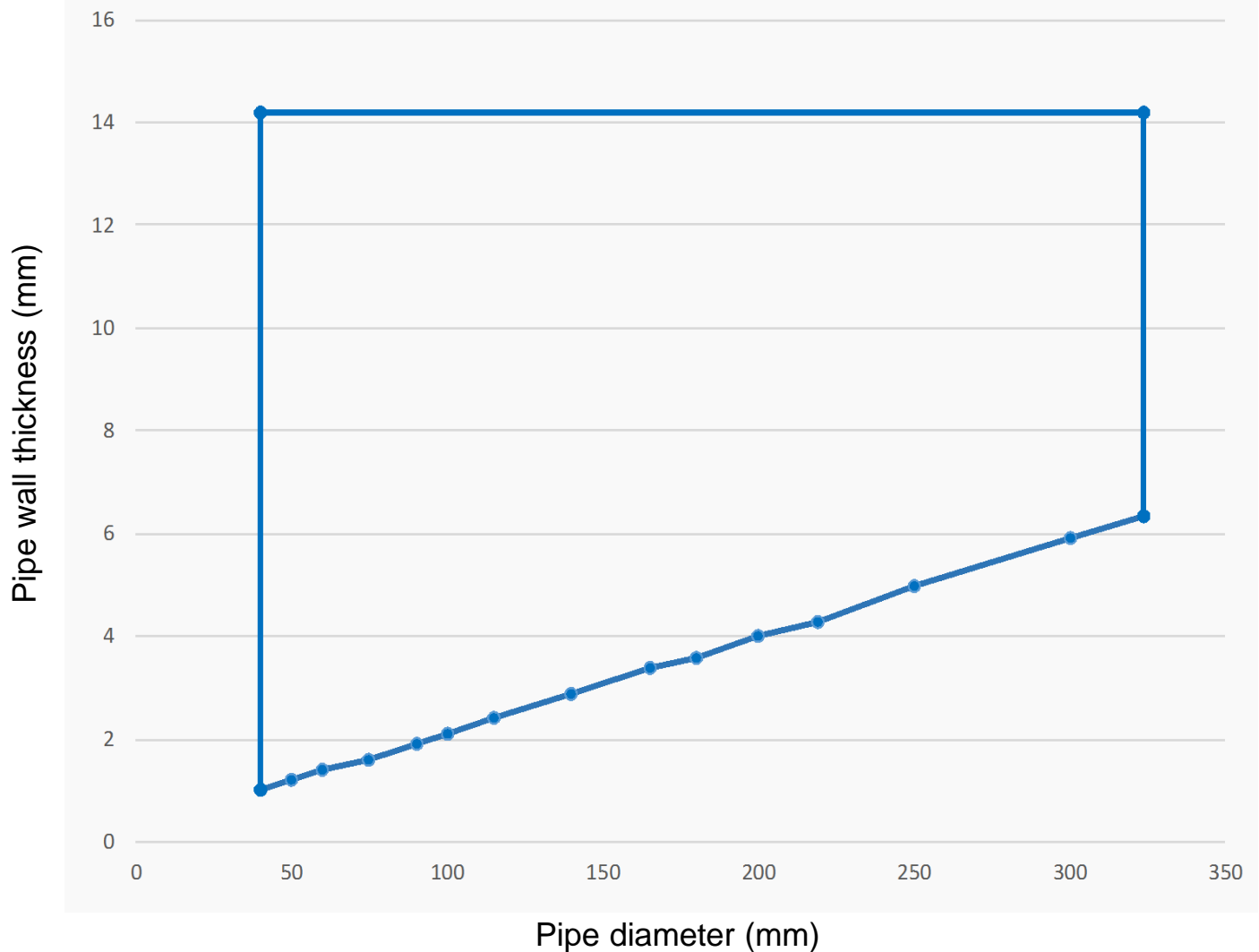
Department : Research & Development

Draftsman : R.M.

FW-ST-MC1.2.22

A4

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



American projection
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Scale	: 1:5
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Company	: Mulcol International B.V.
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FW-ST-MC1.2.22

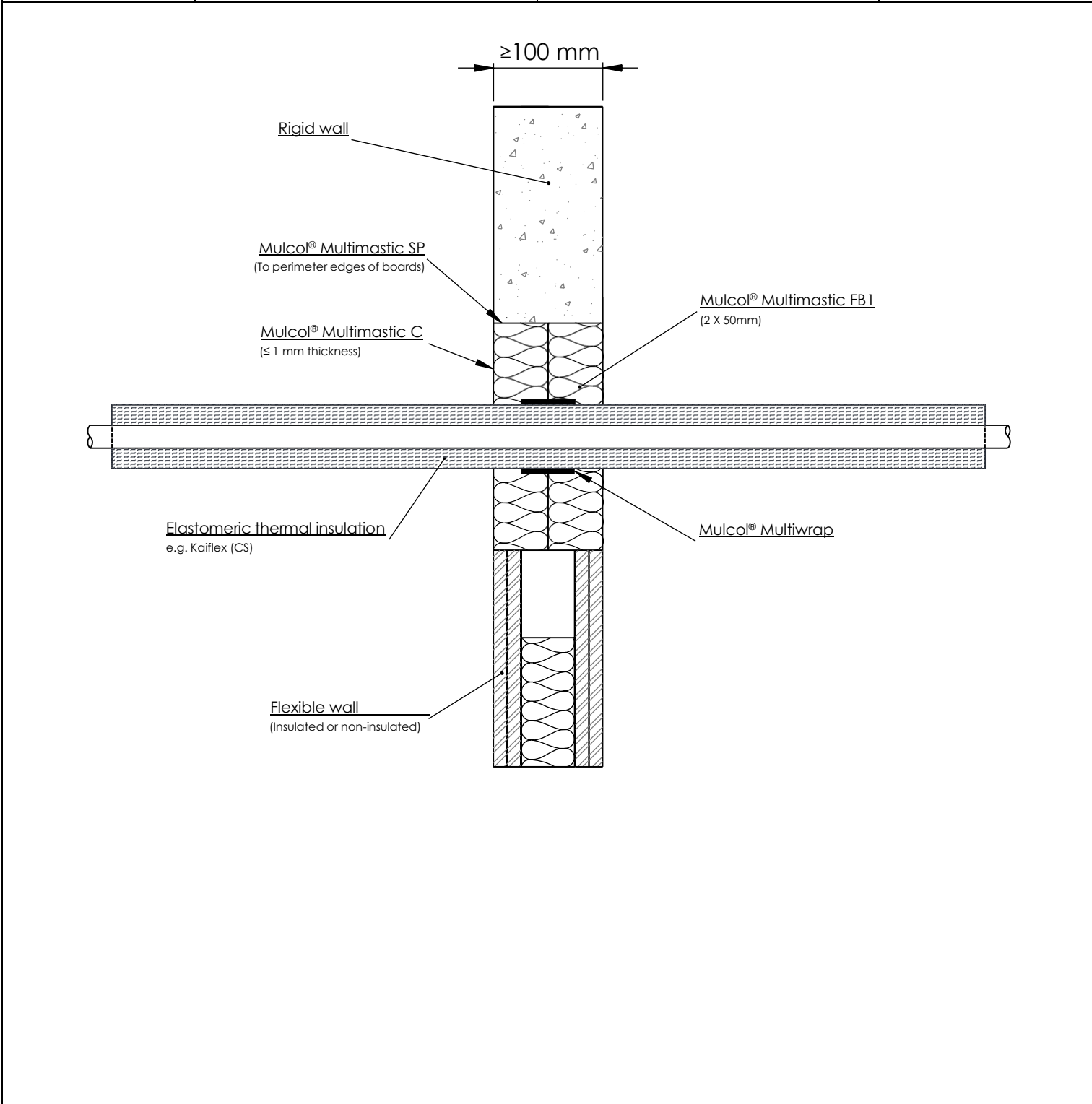
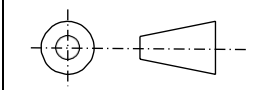
Unit of measure : mm

Department : Research &amp; Development

Date	: 10-2-2017
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Draftsman : R.M.


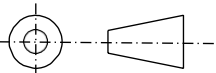
A4
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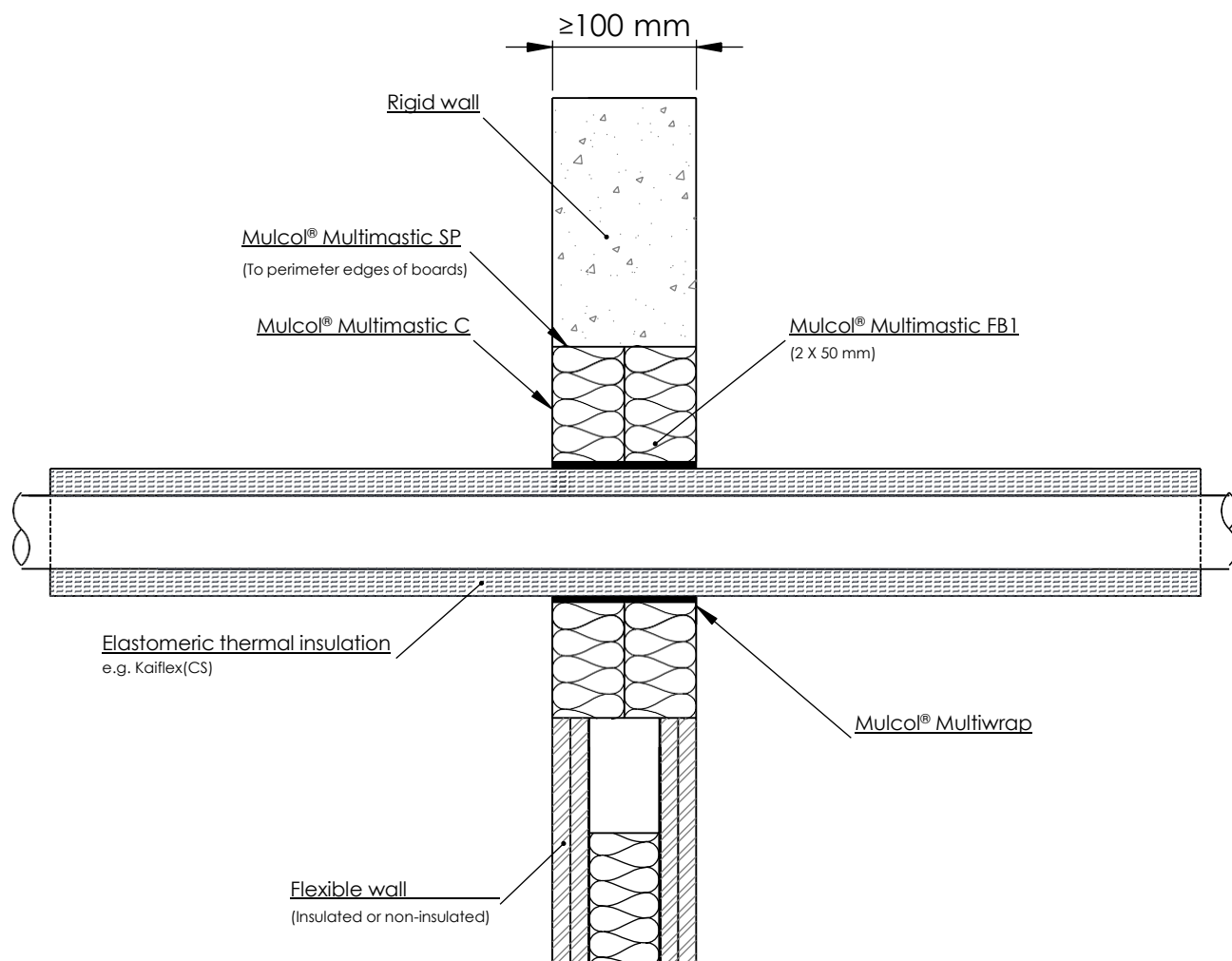


**A 1.6.1 Multimastic FB1 - 2x50 mm - with (stainless) steel pipes**

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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	FW-ST-MC1.2.22
	Unit of measure : mm	Department : Research & Development	
	Date : 10-2-2017	Draftsman : R.M.	A4



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

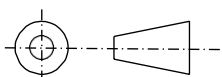
Services	Classification	Position Mulcol® Multimastic FB1	Insulation	Mulcol® Multiwrap	Minimum from seal edge
Copper pipe Ø 12 mm / 1 mm wall th.	EI 120 C/U	Both sides of the wall Unlimited width x 1200 mm high (See section 2. 5)	9 mm Kaiflex ST insulation	50 x 3.6 mm (2 layers) one fitted flush to each face of seal	25 mm
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 40 mm / 1-14.2 mm wall th.	E 120 U/C, EI 60 U/C		13-32 mm Kaiflex ST insulation		
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 75 mm / 2.-14.2 mm wall th.					
Steel pipe Ø 90 mm / 2.4-14.2 mm wall th.					
Steel pipe 100 mm / 2.7-14.2 mm wall th.					
Steel pipe 115 mm / 3.1-14.2 mm wall th.					
Steel pipe 140 mm / 3.8-14.2 mm wall th.					
Steel pipe 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



American projection



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

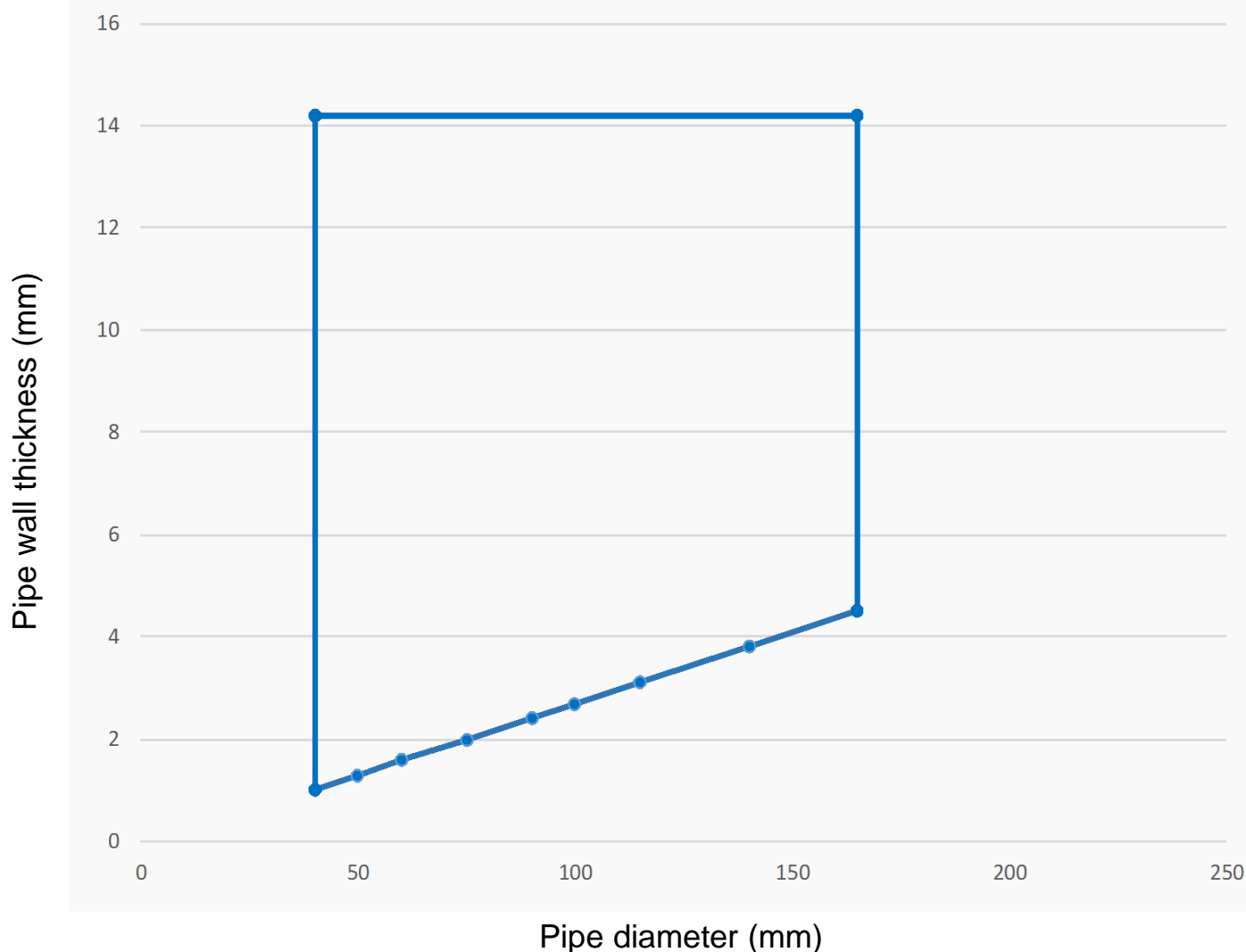
Department : Research & Development

Draftsman : R.M.


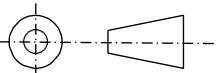
FW-ST-MC1.2.22

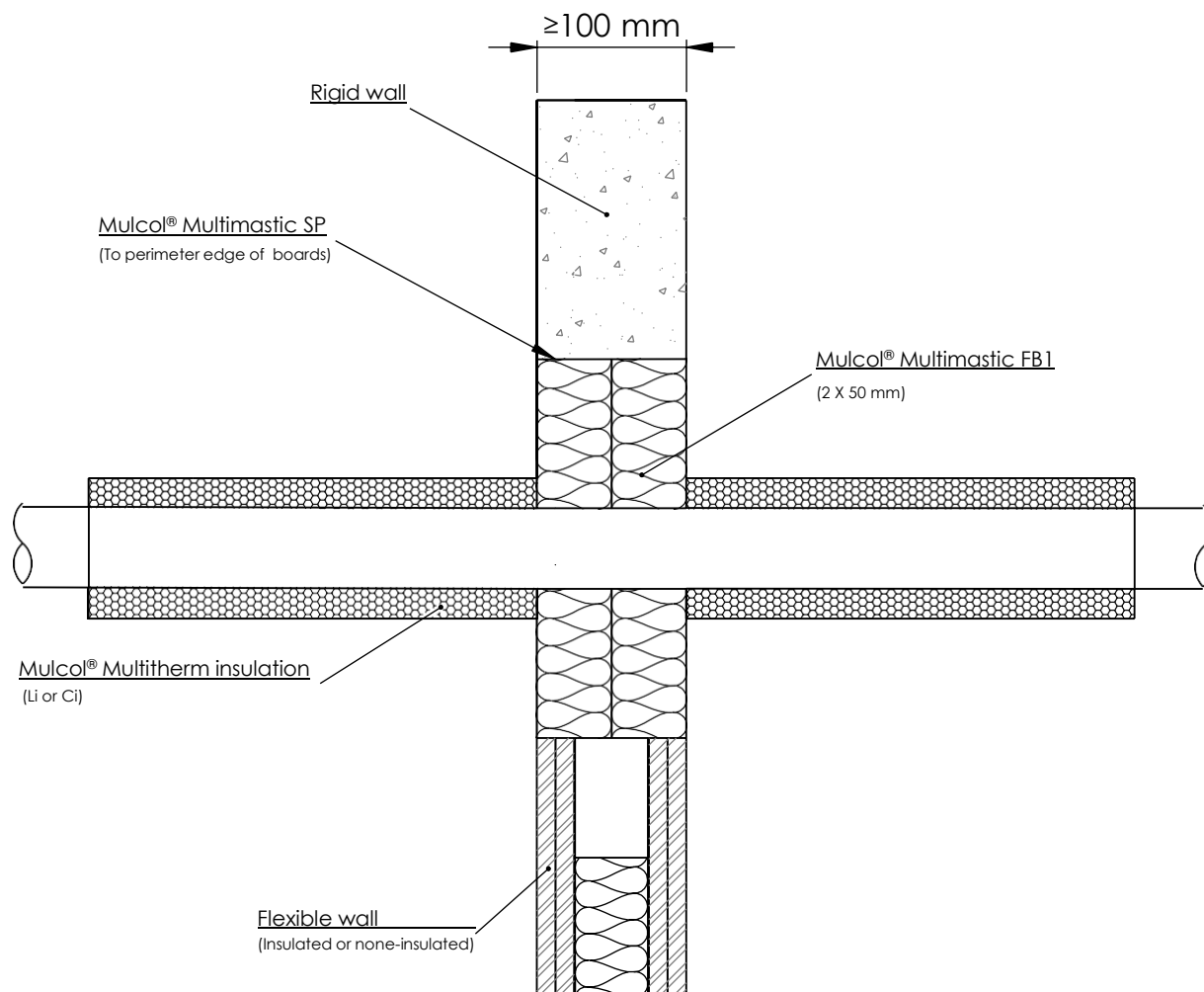
A4

Intermediate sizes



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


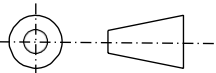
Fire test pipe penetration seal Mulcol® Multimastic C System Rigid/Flexible wall construction according to I.2.2			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	FW-MLA-MC1.2.20
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4

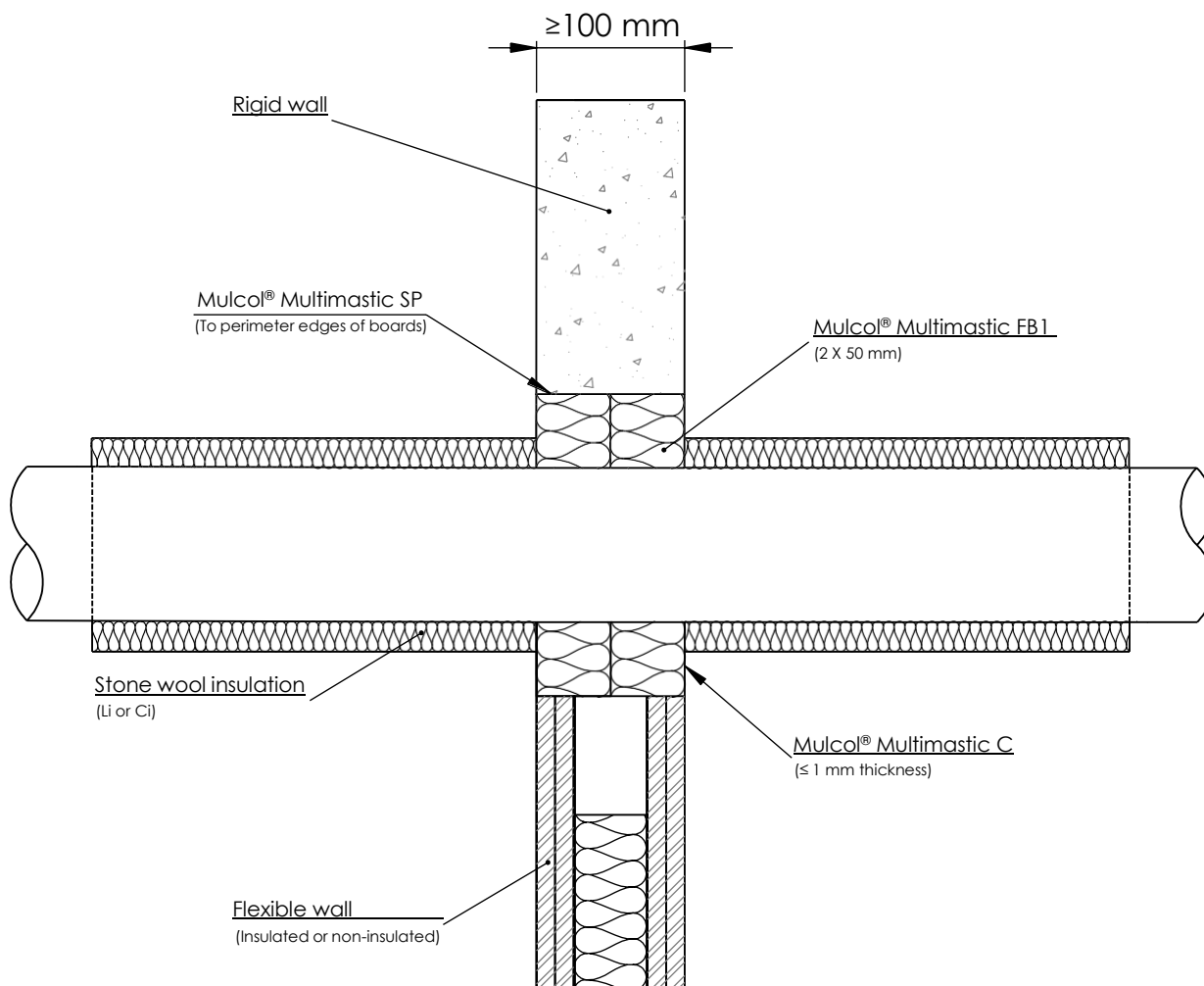


## A 1.7 Multimastic FB1 - 2x50 mm - with copper and alupex composite pipes

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 high (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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	FW-ST-MC1.2.20
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4



## 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 40 mm / 1-14.2 mm wall th.	EI 120 C/U	Both sides of the wall	500 mm length of 20 mm Stone wool insulation, 80 kg/m³	Unlimited width x 1200 mm height (See section 2. 5)	25 mm
Steel pipe Ø 40 mm / 1-14.2 mm wall th.	E 120 C/U, EI 90 C/U		500 mm length of 30 mm Stone wool insulation, 80 kg/m³		
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.					

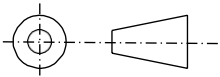
See graph on page 24 for intermediate sizes

# 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



American projection



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

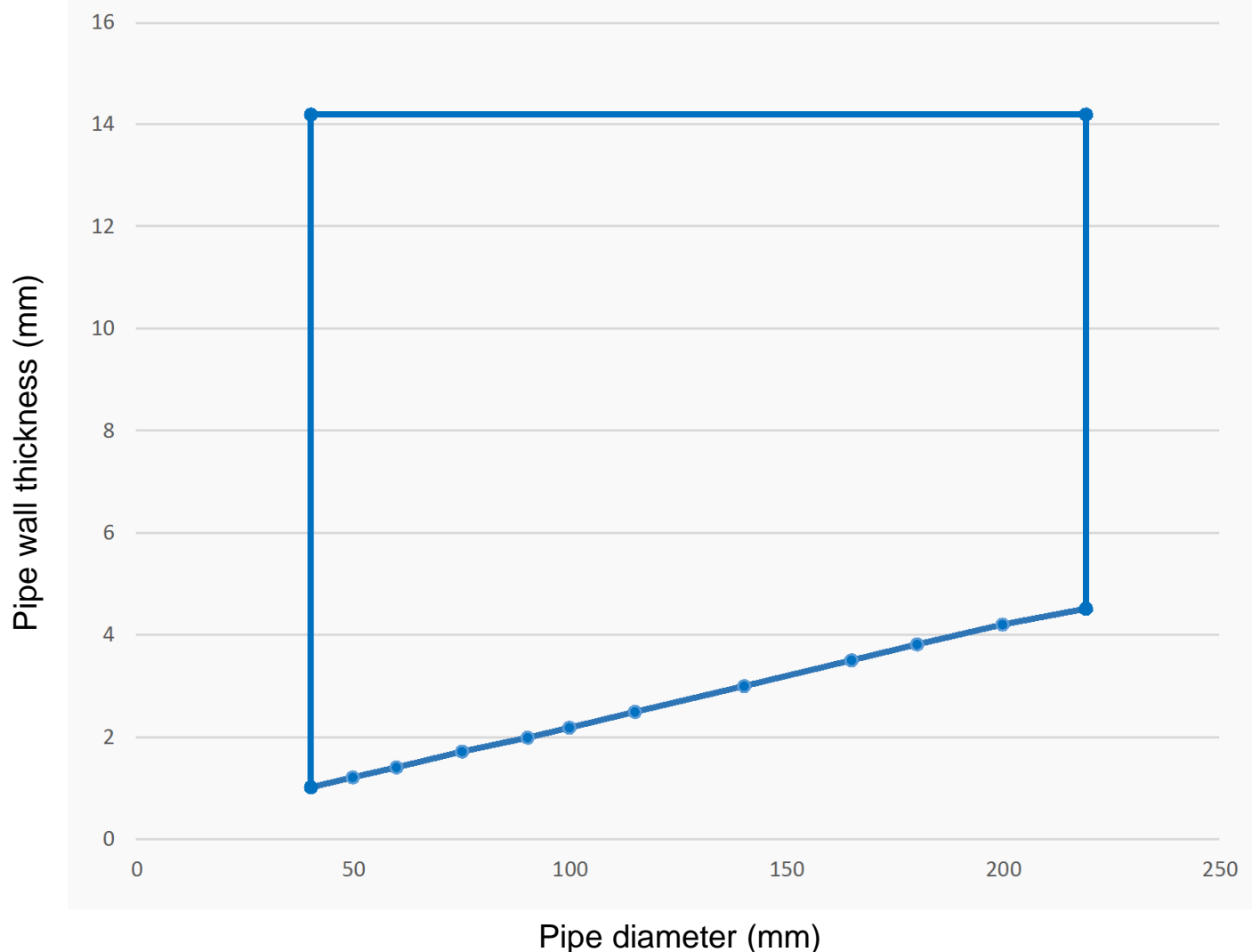
Department : Research & Development

Draftsman : R.M.

FW-ST-MC1.2.20

A4

Intermediate sizes



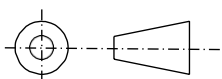


# Annex A - Resistance to fire classification - Mulcol® Multimastic C System

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

**MULCOL**  
FIRE PROTECTION

American projection



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

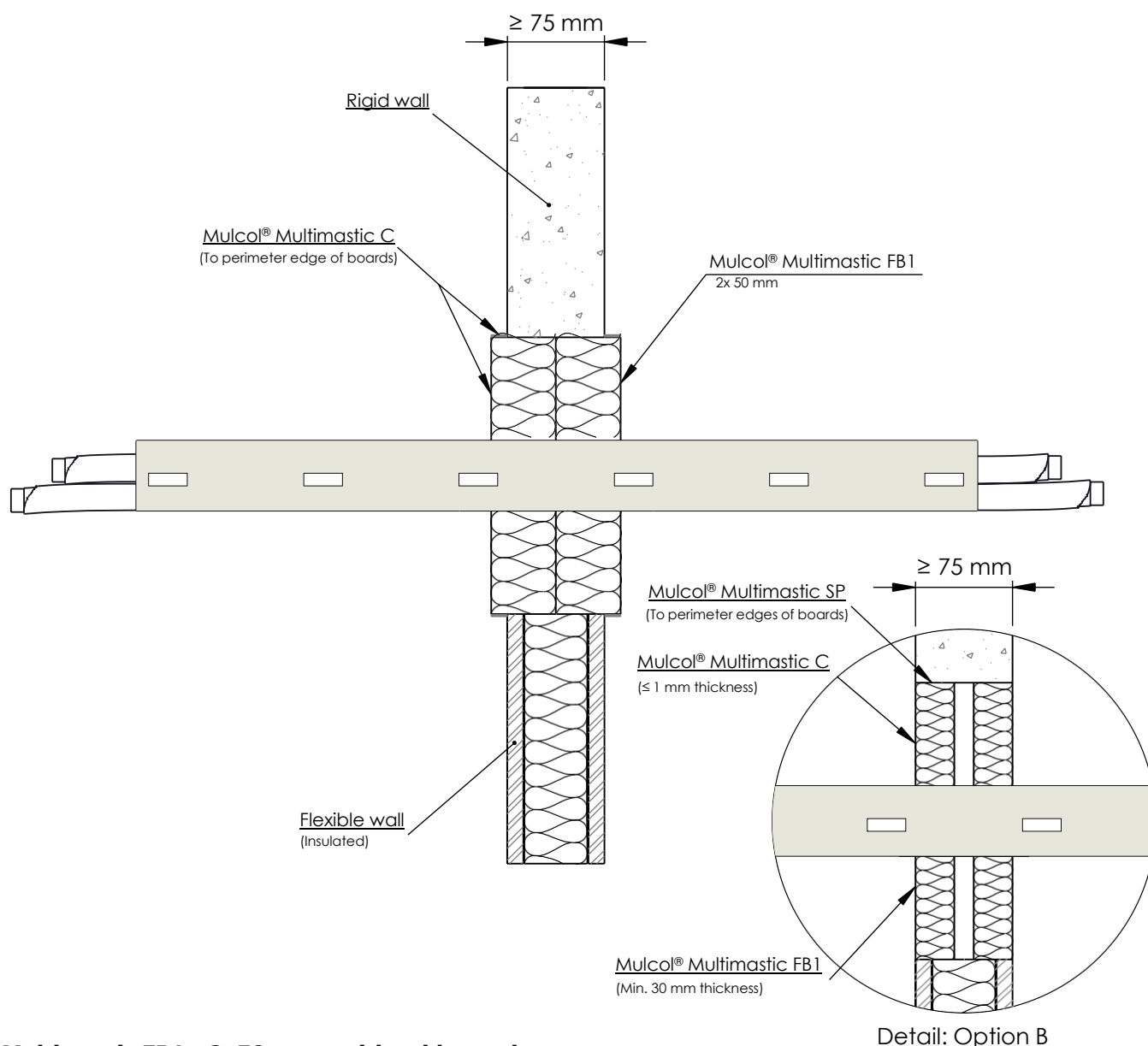
Company : Mulcol International B.V.

Department : Research & Development

Draftsman : R.M.

FW-CT-MC1.2.10

A4



## 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 $\varnothing$ 21 mm (single, bundled and on trays)	EI 45	Both sides of the wall	1200 x 600 mm	200 mm	30 mm
Electrical cables up to $\varnothing$ 80 mm (single, bundled and on trays)	E 45, EI 30				
Cables up to $\varnothing$ 21 mm in tied bundles up to $\varnothing$ 100 mm					
Steel cable trays (perforated and non-perforated) & ladders					
Unsheathed wires up to $\varnothing$ 24 mm	E 45, EI 20				
uPVC pipe $\varnothing$ 6 mm / 1.0 mm wall th.	EI 45 U/C				
uPVC pipe $\varnothing$ 32 mm / 1.8 mm wall th.					

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

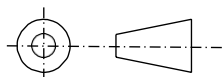
Fire test pipe penetration seal

Mulcol® Multimastic C System

Rigid/Flexible wall construction according to I.2.2

**MULCOL**  
FIRE PROTECTION

American projection



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

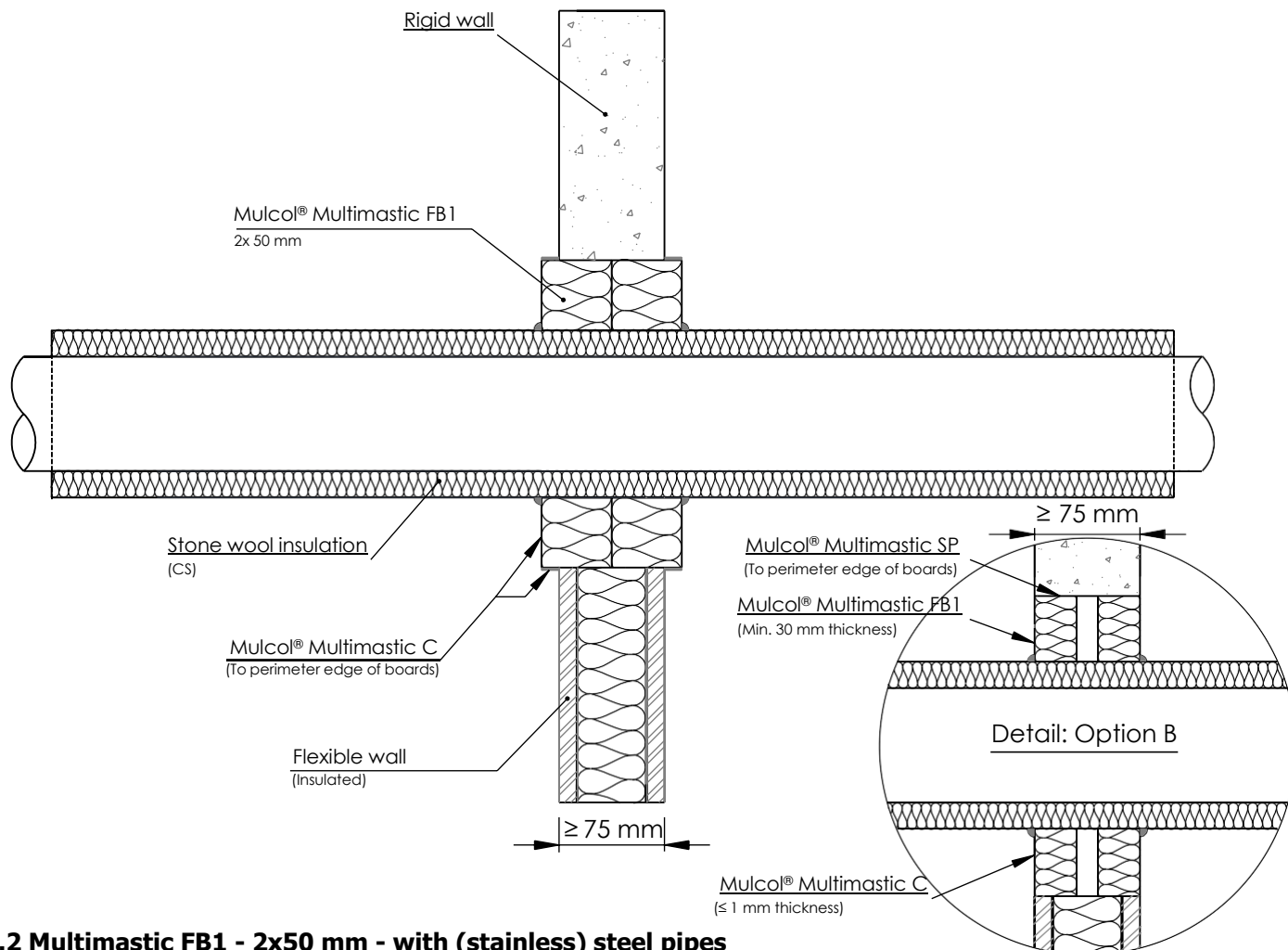
Company : Mulcol International B.V.

Department : Research & Development

Draftsman : R.M.

FW-ST-MC1.2.20

A4



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

Services	Classification	Position Mulcol® Multimastic FB1	Insulation	Maxium seal	Minimum from seal edge
Steel pipe Ø 4 mm / 0.7-14.2 mm wall th.	EI 45 C/U	Both sides of the wall	None	1200 x 600 mm	30 mm
Steel pipe Ø 22 mm / 2.0-14.2 mm wall th.	E 45 C/U, EI 30 C/U				
Steel pipe Ø 40 mm / 1-14.2 mm wall th.	EI 120 C/U		20 mm Stone wool insulation, 80 kg/m³		
Steel pipe Ø 40 mm / 1-14.2 mm wall th.			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 / 1.8-14.2 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.					

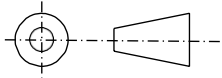
See graph on page 27 for intermediate sizes

# 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



American projection



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

Company : Mulcol International B.V.

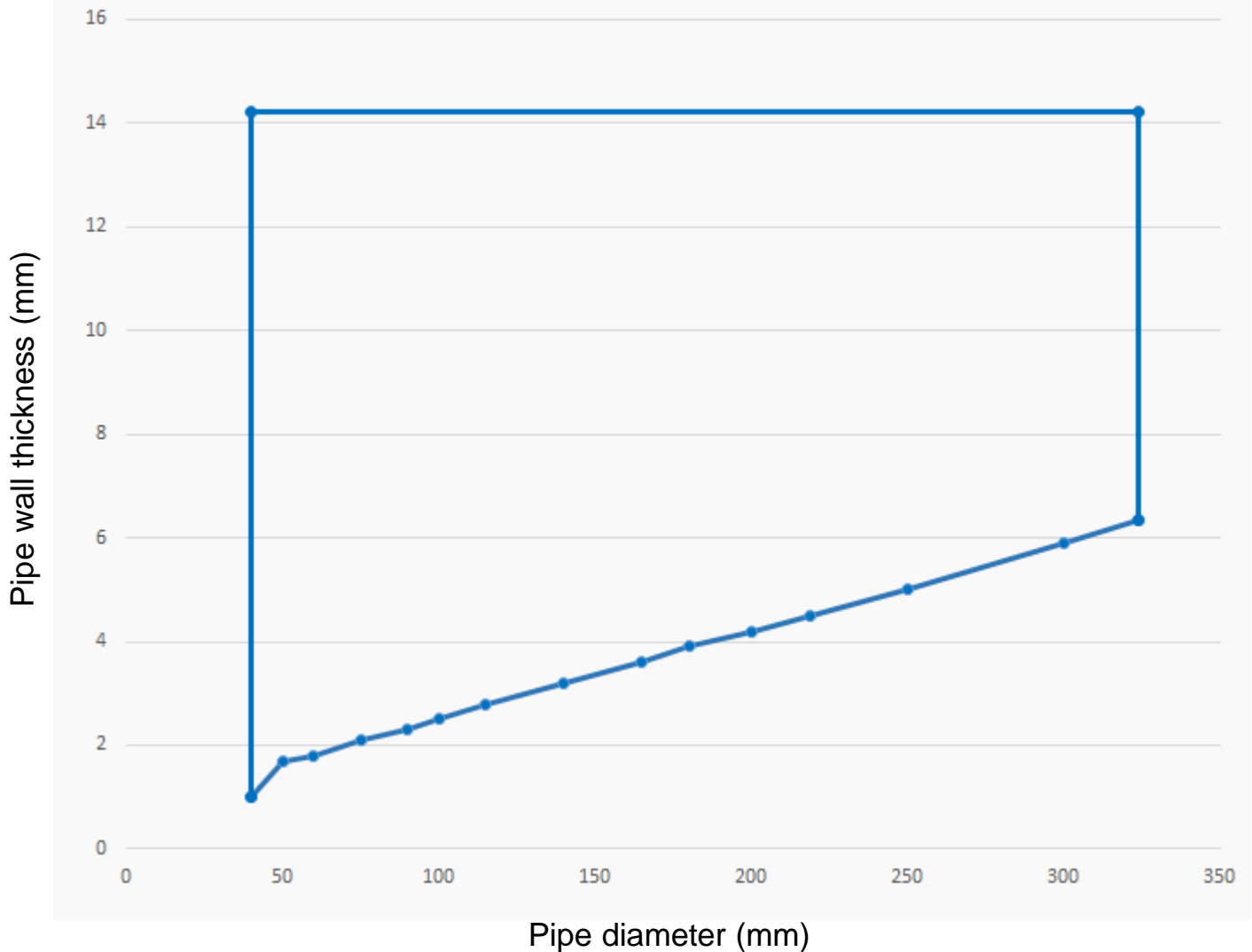
Department : Research & Development

Draftsman : R.M.

FW-ST-MC1.2.20

A4

Intermediate sizes




## 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



American projection



Scale	: 1:5
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Unit of measure : mm
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Date : 13-6-2017

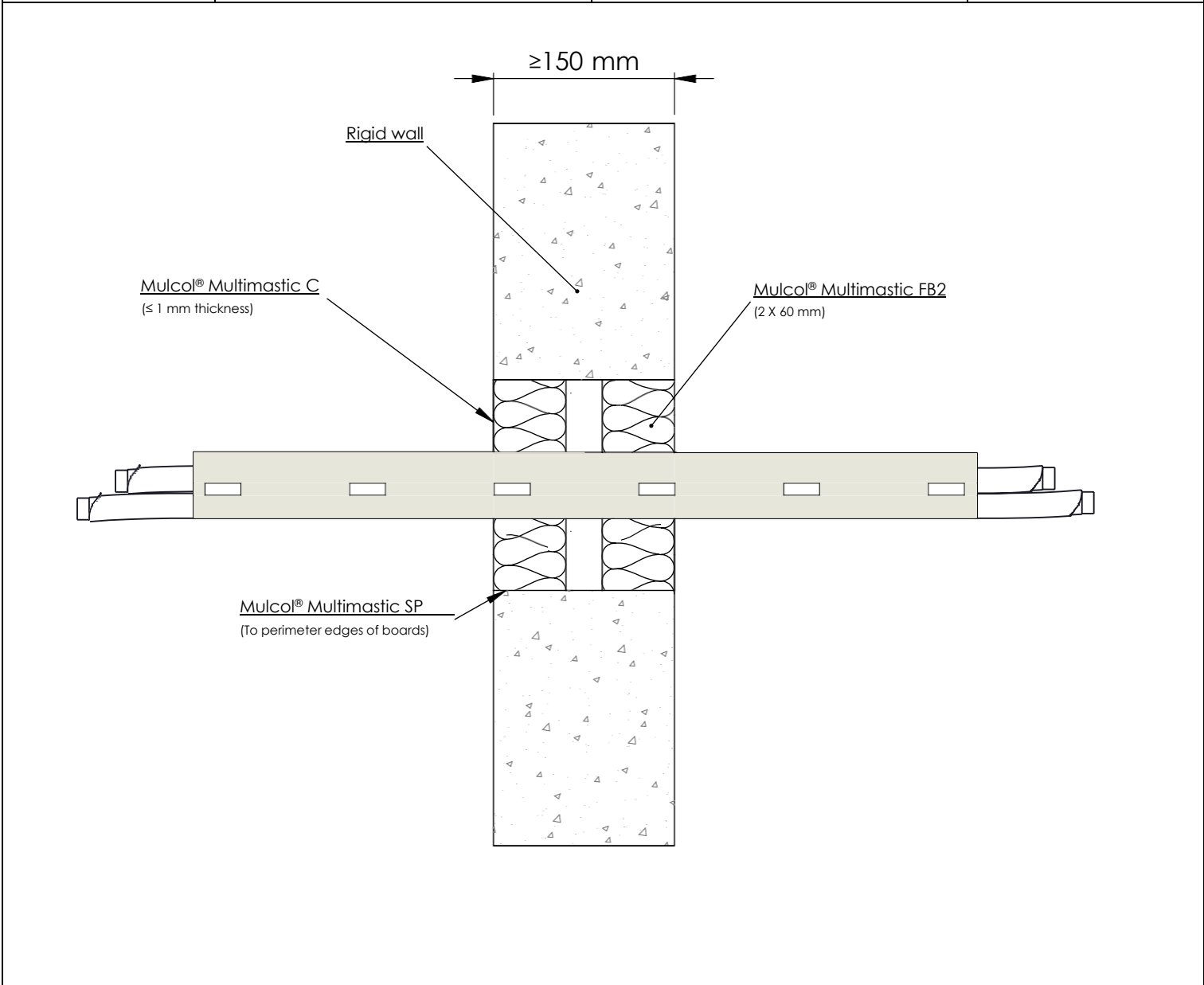
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Department : Research &amp; Development

Draftsman : R.M.

RW-CT-MC2.2.10


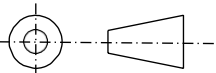
A4

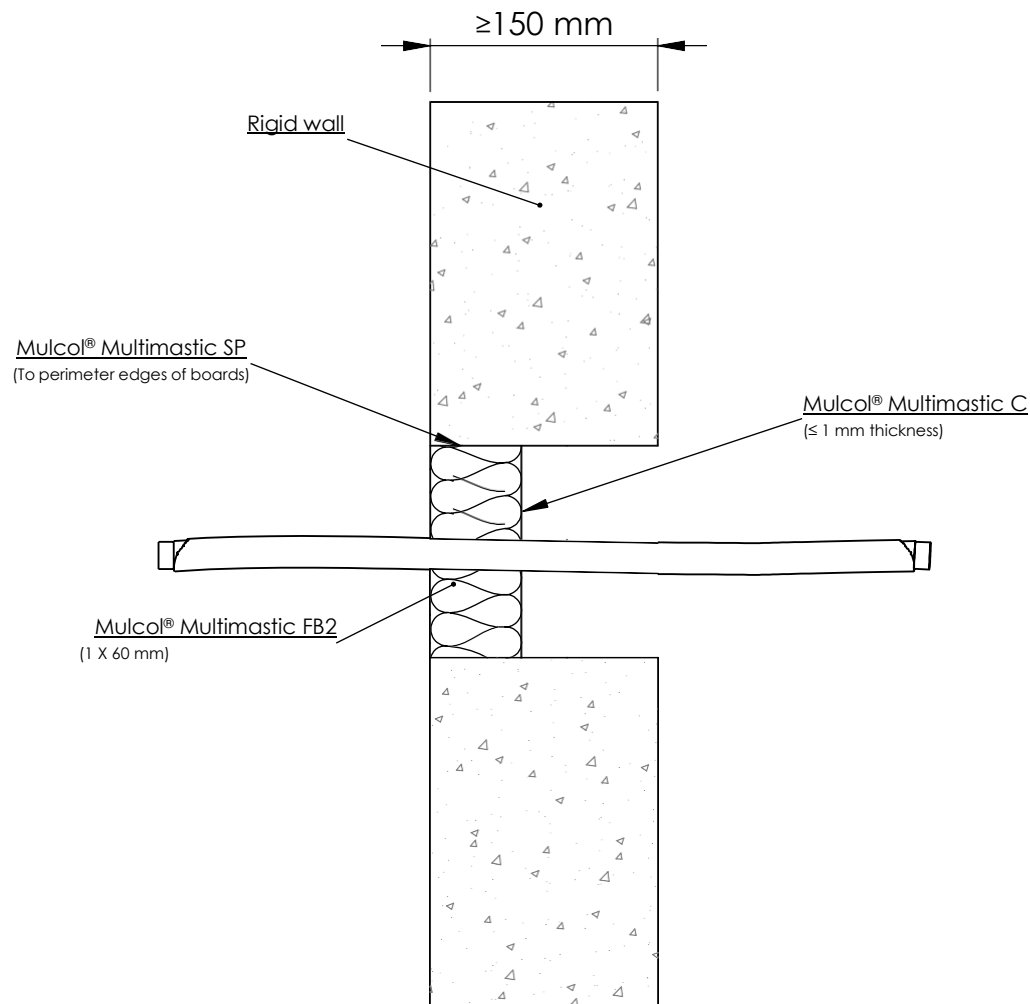


### A 3.1 Multimastic FB2 - 2x60 mm - with cables and trays

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		Unlimited width x 1200 mm height (See section 2. 5)	
Single electrical cables up to Ø 21 mm				
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 21 mm in tied bundles up to 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


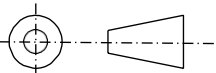
Fire test cable penetration seal Mulcol® Multimastic C System Rigid wall construction according to I.2.2			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RW-EC-MC2.1.10
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4

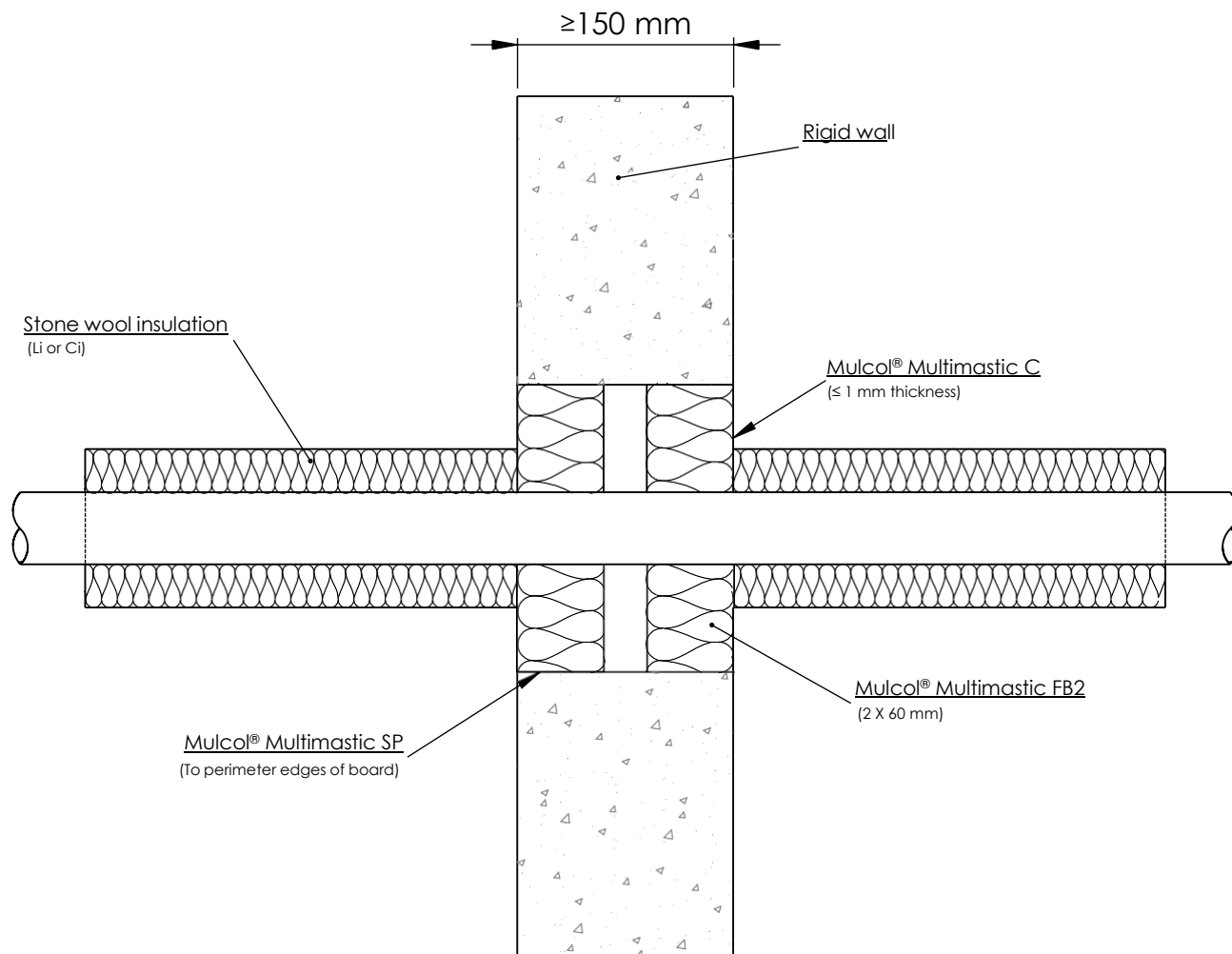


## A 3.2 Multimastic FB2 - 1x60 mm - with cables

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 Ø 21 mm	E 240, EI 90			
Single A1 cable = 5 X 1.5 mm² core HD603.3 electrical cable with PVC insulation, PVC sheath and Ø 14 mm	EI 240		70 x 70 mm	
Single A2 cable = 5 X 1.5 mm² core HD22.4 electrical cable with EPR insulation, PO sheath and Ø 11.2-14.2 mm	EI 240			
Single A3 cable = 5 X 1.5 mm² core HD604.5 electrical cable with XLPE insulation, EVA sheath and Ø 13 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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RW-ST-MC2.2.20
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	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	Both sides of the wall	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		1000 mm length of 30 mm Stone wool insulation, 80 kg/m³	Unlimited width x 1200 mm height (See section 2. 5)	25 mm	
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.	E 240 C/U, EI 90 C/U					
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						

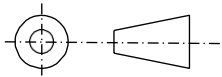
See graph on page 31 for intermediate sizes

# 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



American projection



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

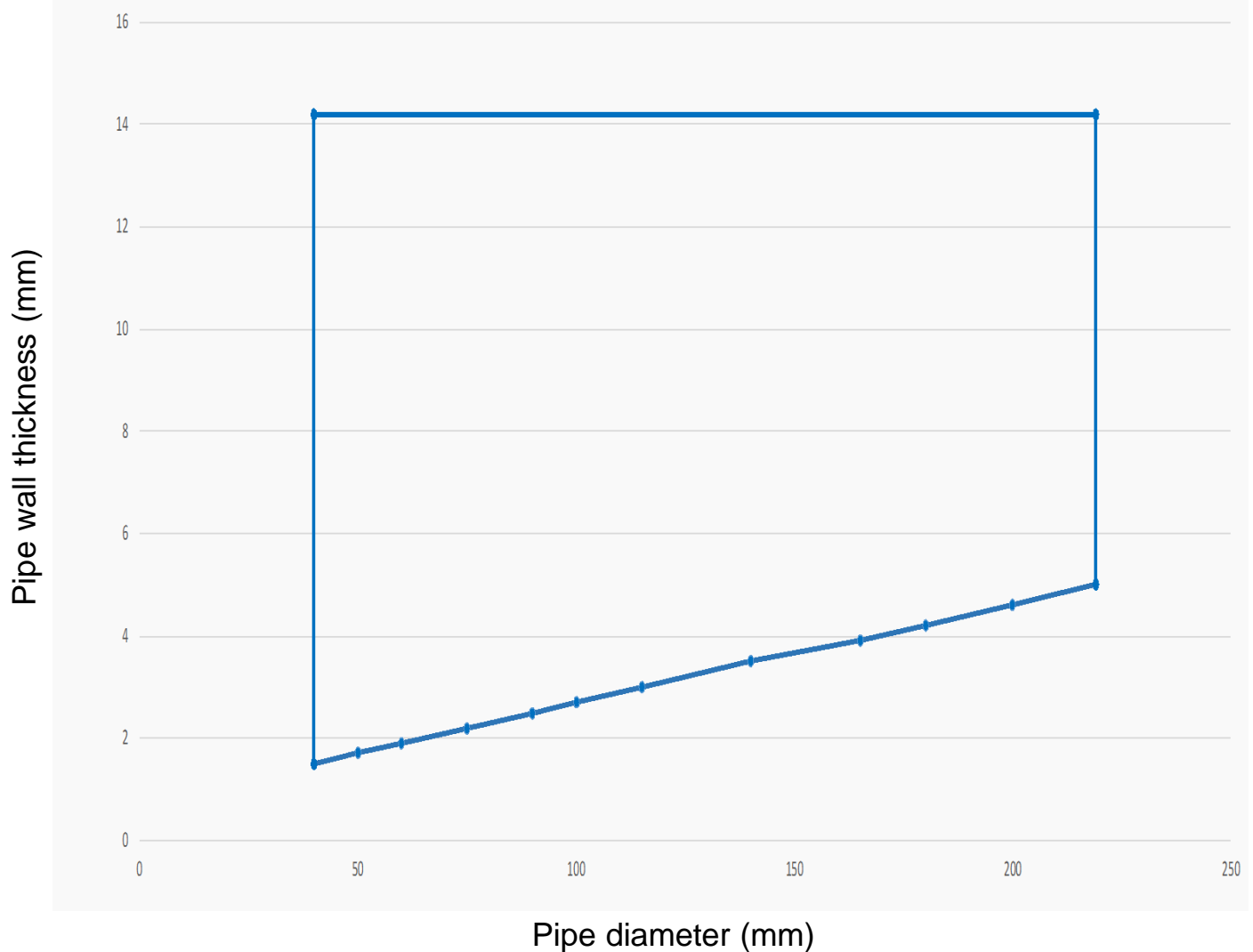
Department : Research & Development

Draftsman : R.M.


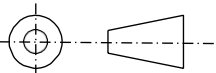
RW-ST-MC2.2.20

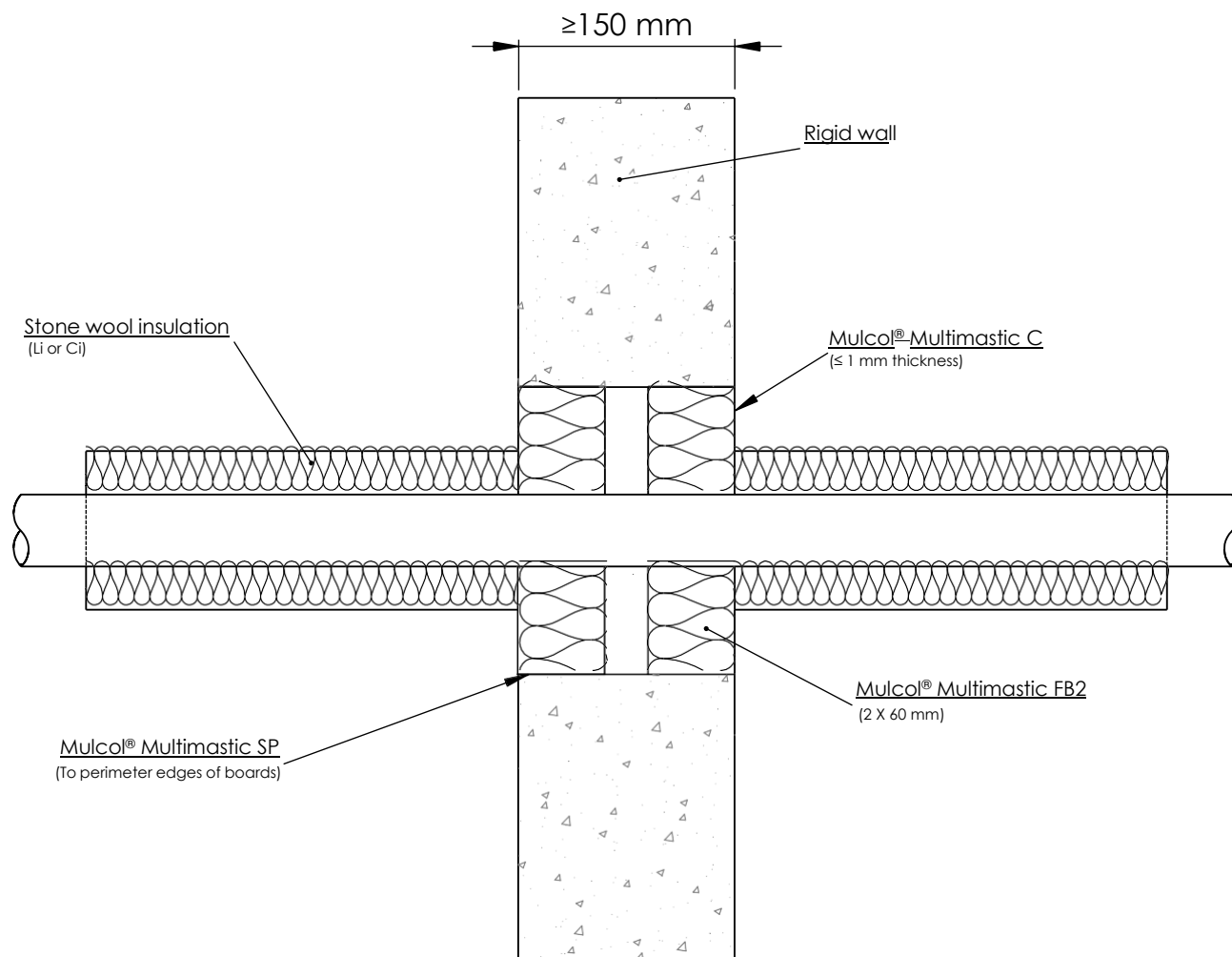
A4

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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RW-ST-MC2.2.20
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4


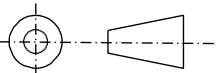


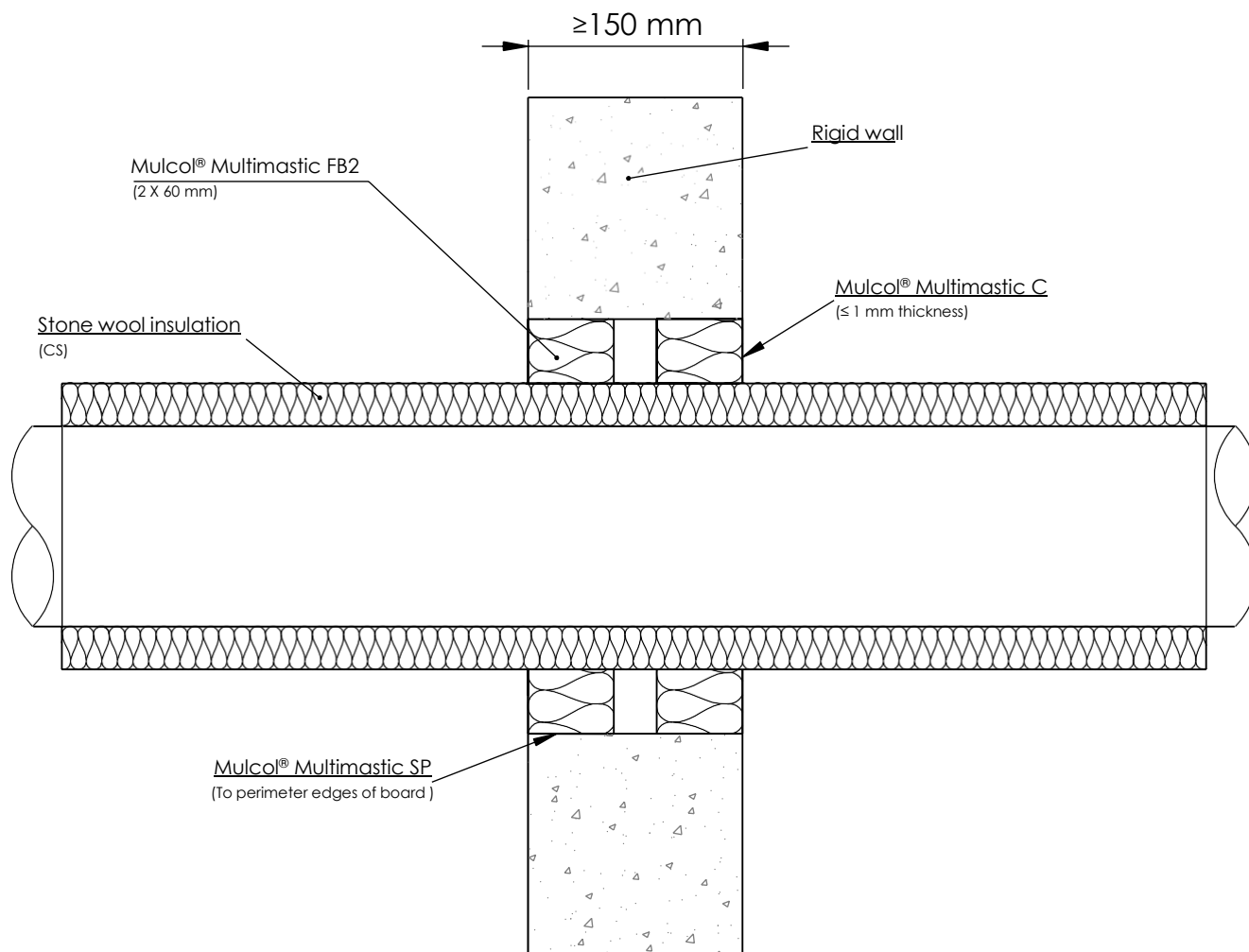
### A 3.3.1 Multimastic FB2 - 2x60 mm - with alupex composite pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge
Alupex composite pipe $\phi$ 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/m <sup>3</sup>	1200 x 1200 mm	25 mm
Alupex composite pipe $\phi$ 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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RW-ST-MC2.2.20
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4



## 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 40 mm / 1.0-14.2 mm wall th.	E 240 C/U, EI 180 C/U	Both sides of the wall	1000 mm length of 20 mm Stone wool insulation, 80 kg/m³	Unlimited width x 1200 mm height (See section 2. 5)	30 mm
Steel pipe Ø40 mm / 1.0-14.2 mm wall th.			1000 mm length of 30-80 mm Stone wool insulation, 80 kg/m³		
Steel pipe Ø50 mm / 1.2-14.2 mm wall th.					
Steel pipe Ø60 mm / 1.4-14.2 mm wall th.					
Steel pipe Ø75 mm / 1.6-14.2 mm wall th.					
Steel pipe Ø90 mm / 1.9-14.2 mm wall th.					
Steel pipe Ø100 mm / 2.1-14.2 mm wall th.					
Steel pipe Ø115 mm / 2.4-14.2 mm wall th.					
Steel pipe Ø140 mm / 2.9-14.2 mm wall th.					
Steel pipe Ø165 mm / 3.4-14.2 mm wall th.					
Steel pipe Ø180 mm / 3.6-14.2 mm wall th.					
Steel pipe Ø200 mm / 4.0-14.2 mm wall th.					
Steel pipe Ø219 mm / 4.3-14.2 mm wall th.					
Steel pipe Ø250 mm / 5.0-14.2 mm wall th.					
Steel pipe Ø300 mm / 5.9-14.2 mm wall th.					
Steel pipe Ø324 mm / 6.35-14.2 mm wall th.					

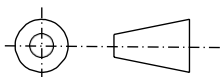
See graph on page 34 for intermediate sizes

# 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



American projection



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

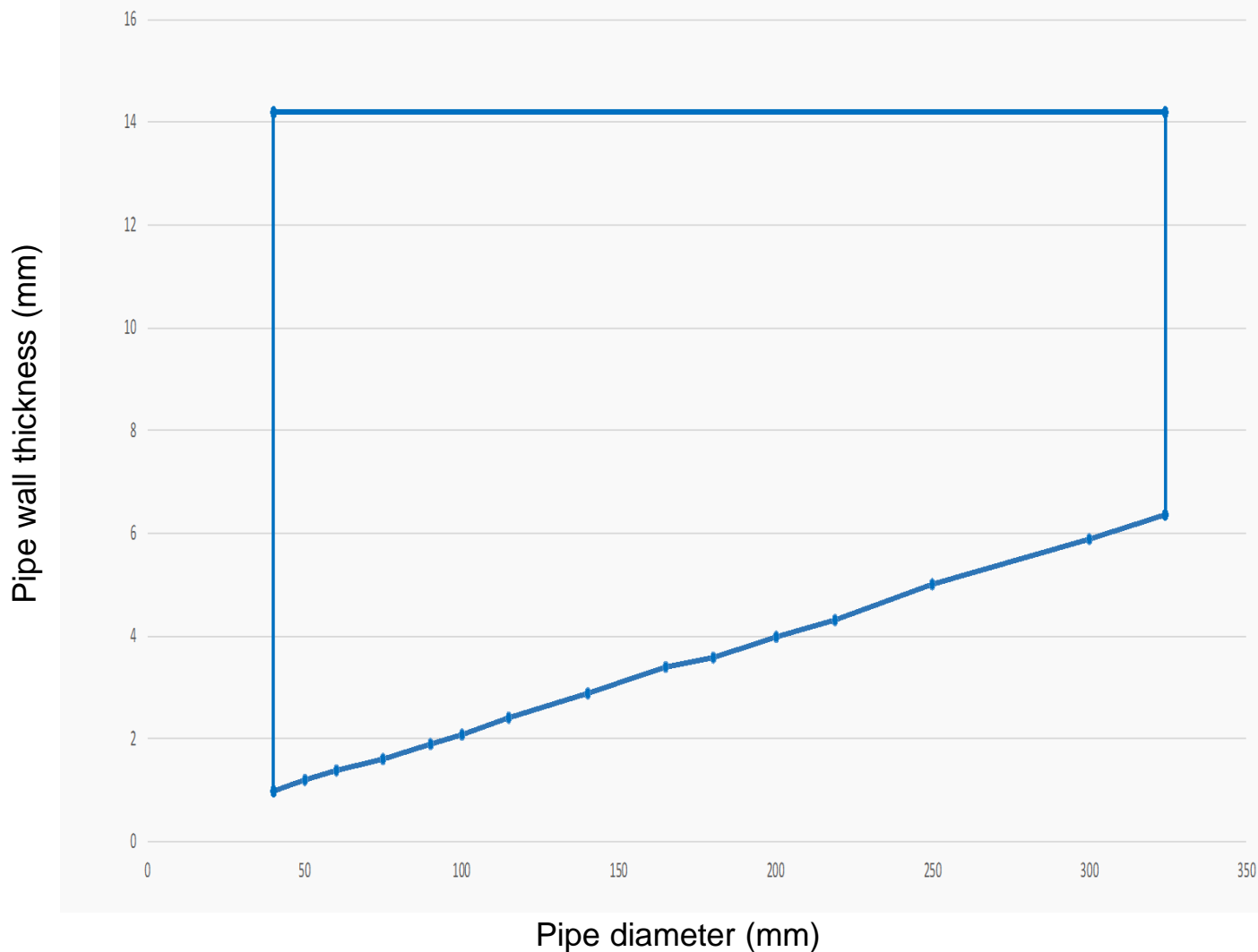
Department : Research & Development

Draftsman : R.M.

RW-ST-MC2.2.20

A4

Intermediate sizes

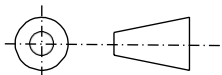


# Annex A - Resistance to fire classification - Mulcol® Multimastic C System

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

**MULCOL**  
FIRE PROTECTION

American projection



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

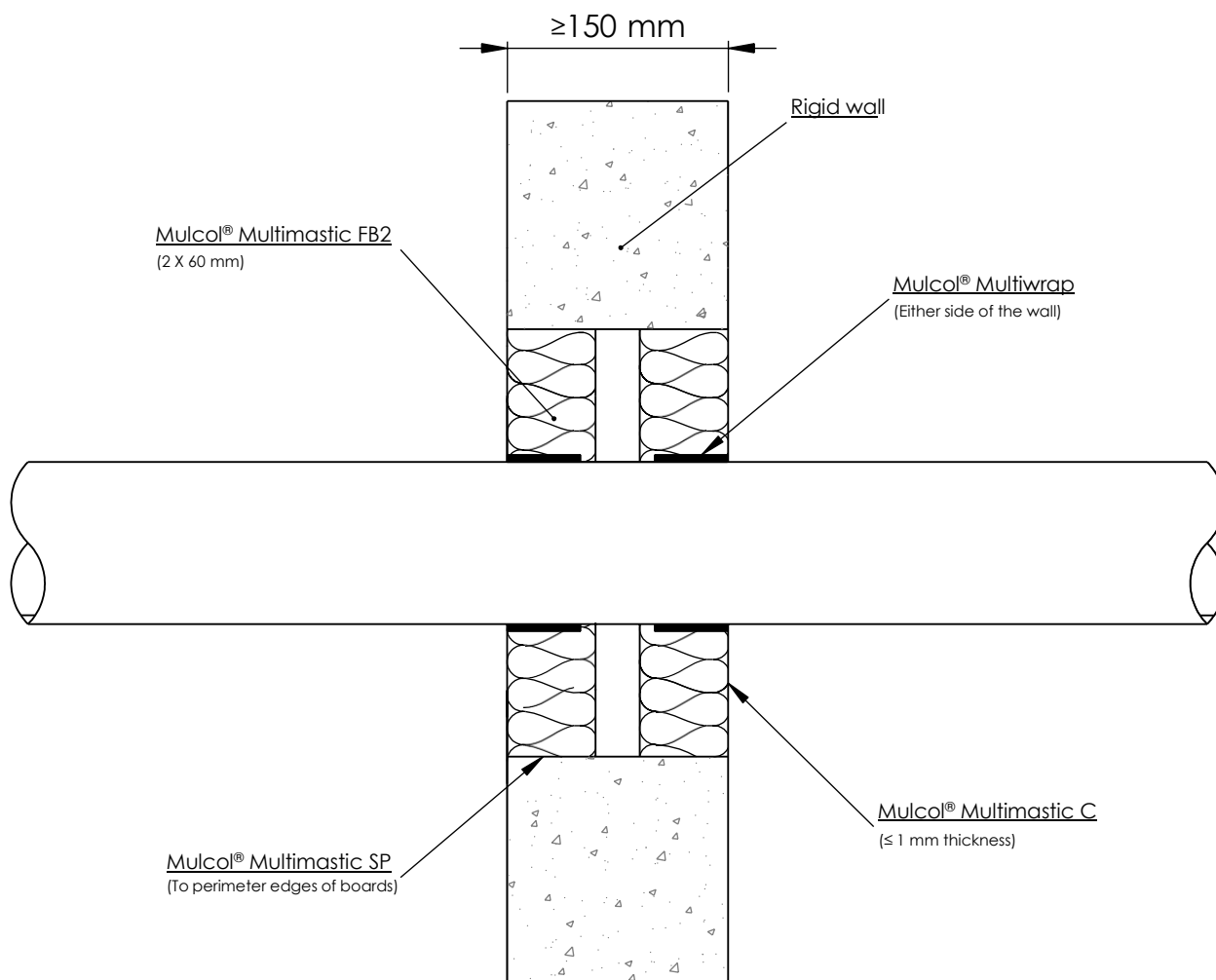
Company : Mulcol International B.V.

Department : Research & Development

Draftsman : R.M.

RW-PP-MC2.2.10


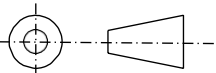
A4

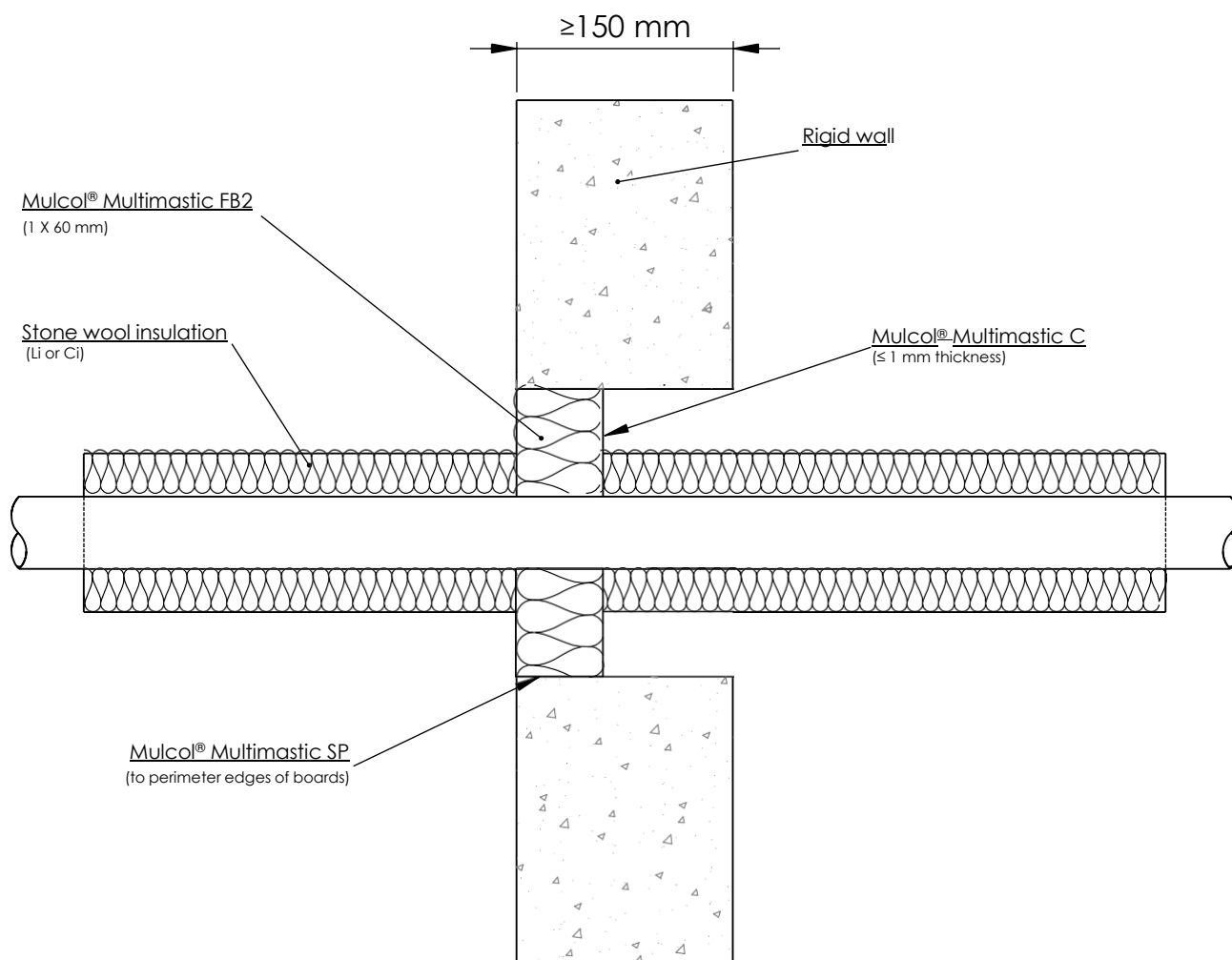


## A 3.5 Multimastic FB2 - 2x60 mm - with combustible pipes

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

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


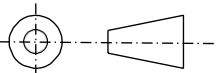
Fire test pipe penetration seal Mulcol® Multimastic C System Rigid wall construction according to I.2.2			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RW-ST-MC2.1.20
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4

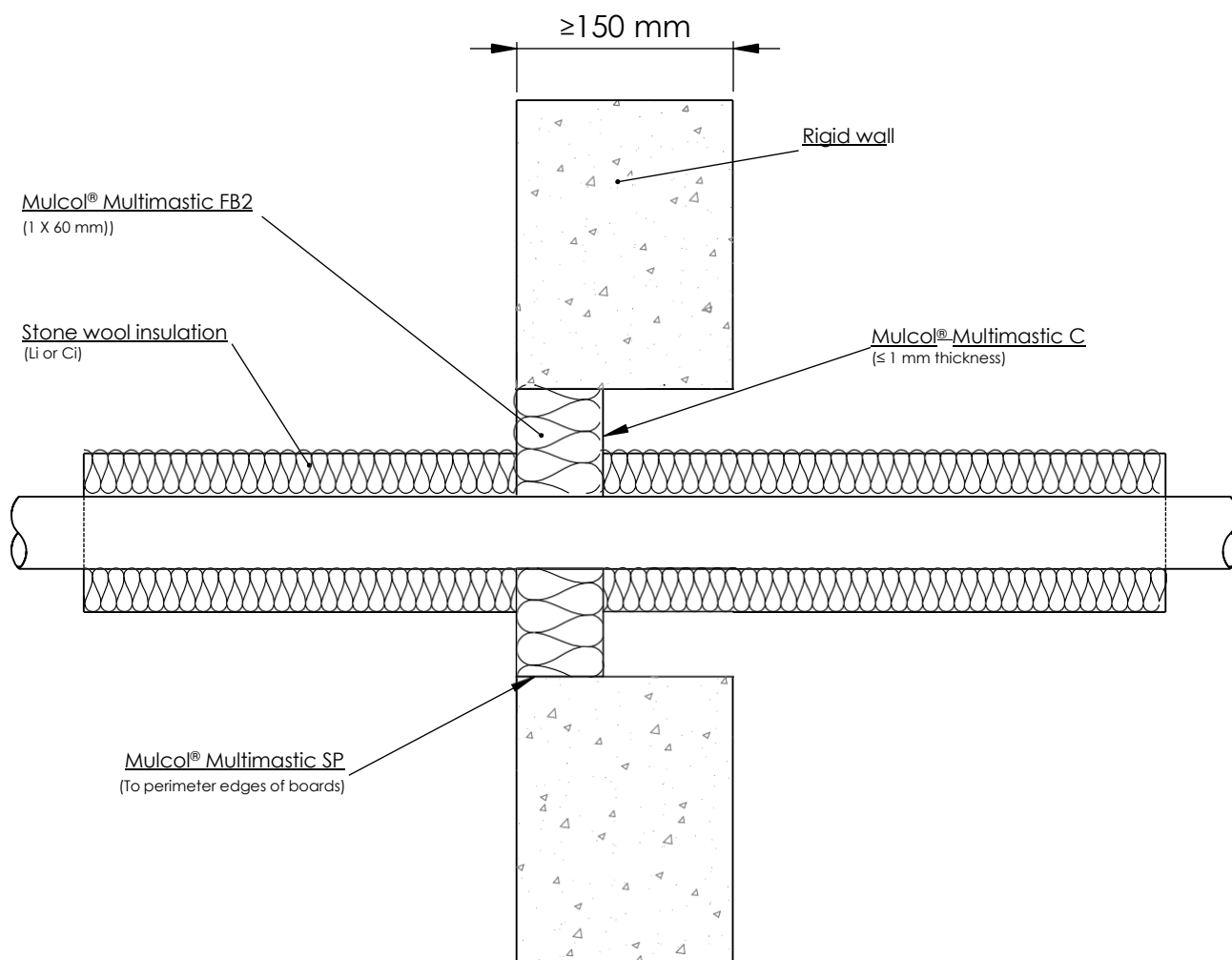


## A 3.6 Multimastic FB2 - 1x60 mm - with copper pipes

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 <sup>3</sup>	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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RW-ST-MC2.1.20
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4



## 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

American projection

Scale : 1:5

Company : Mulcol International B.V.

RW-ST-MC2.1.20

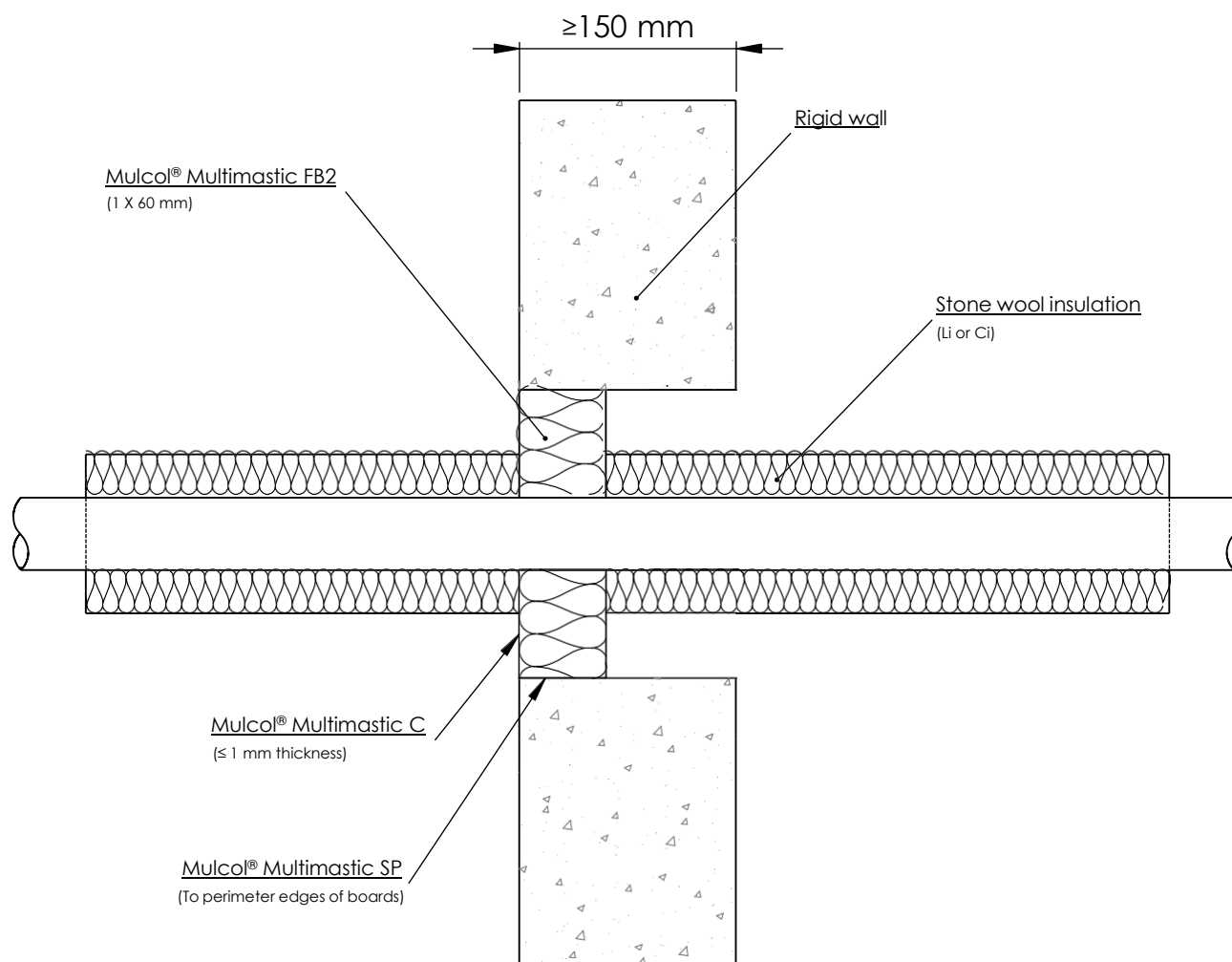
Unit of measure : mm

Department : Research & Development

Date : 13-6-2017

Draftsman : R.M.

A4



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

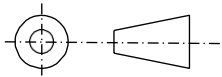
Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge
Steel pipe Ø 40 mm / 1.5-14.2 mm wall th.	E 240 C/U, EI 90 C/U	Either side of the wall	1000 mm length of 20 mm Stone wool insulation, 80 kg/m³	Unlimited width x 1200 mm height (See section 2. 5)	25 mm
Steel pipe Ø 50 mm / 1.7-14.2 mm wall th.			1000 mm length of 30 mm Stone wool insulation, 80 kg/m³		
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				
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



American projection



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

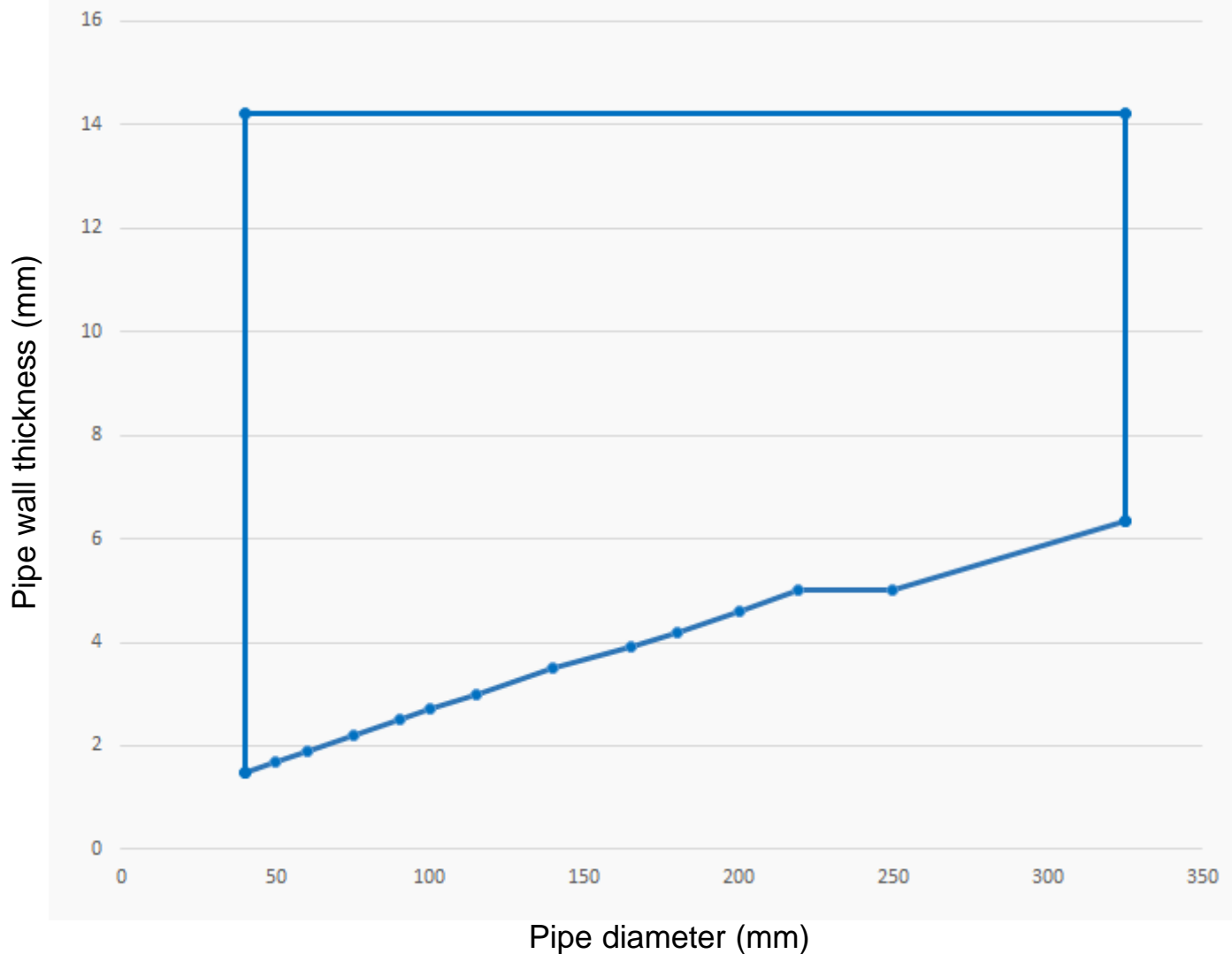
Department : Research & Development

Draftsman : R.M.


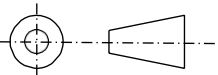
RW-ST-MC2.1.20

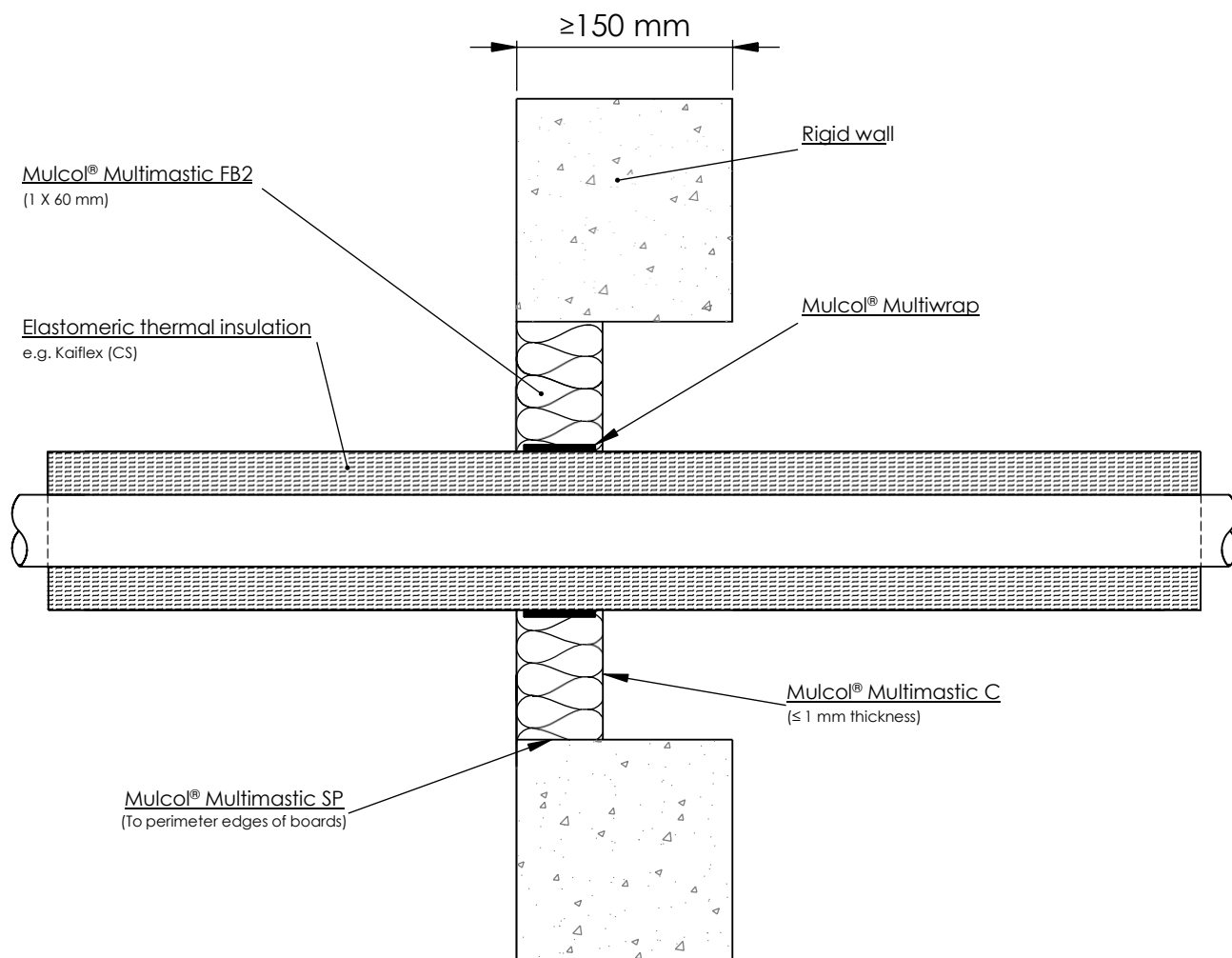
A4

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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RW-ST-MC2.1.22
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4



## 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 $\varnothing$ 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

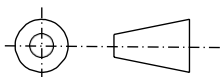


# Annex A - Resistance to fire classification - Mulcol® Multimastic C System

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

**MULCOL**  
FIRE PROTECTION

American projection



Scale : 1:5

Unit of measure : mm

Date : 16-6-2016

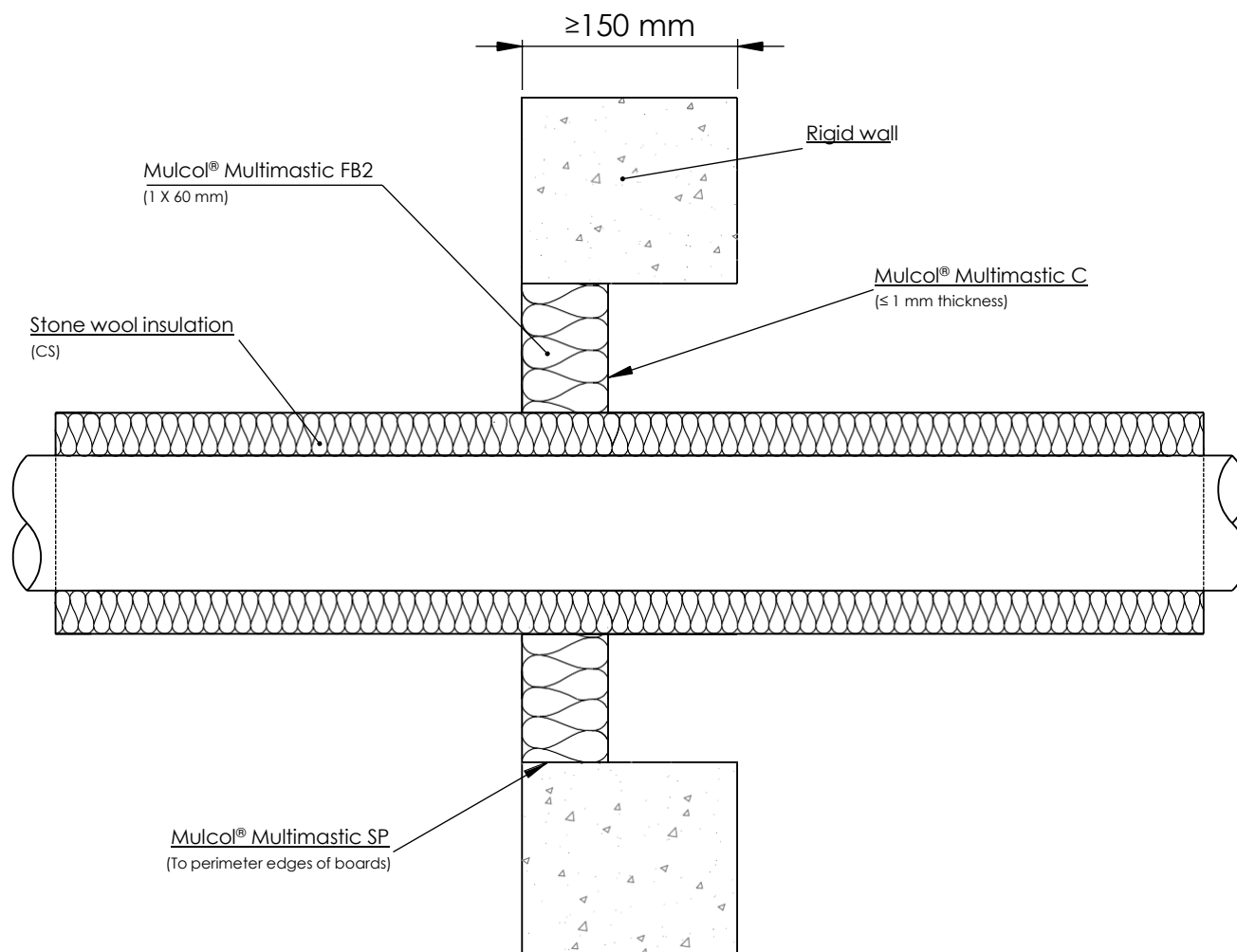
Company : Mulcol International B.V.

Department : Research & Development

Draftsman : R.M.

RW-ST-MC2.1.20


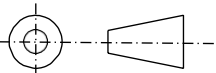
A4

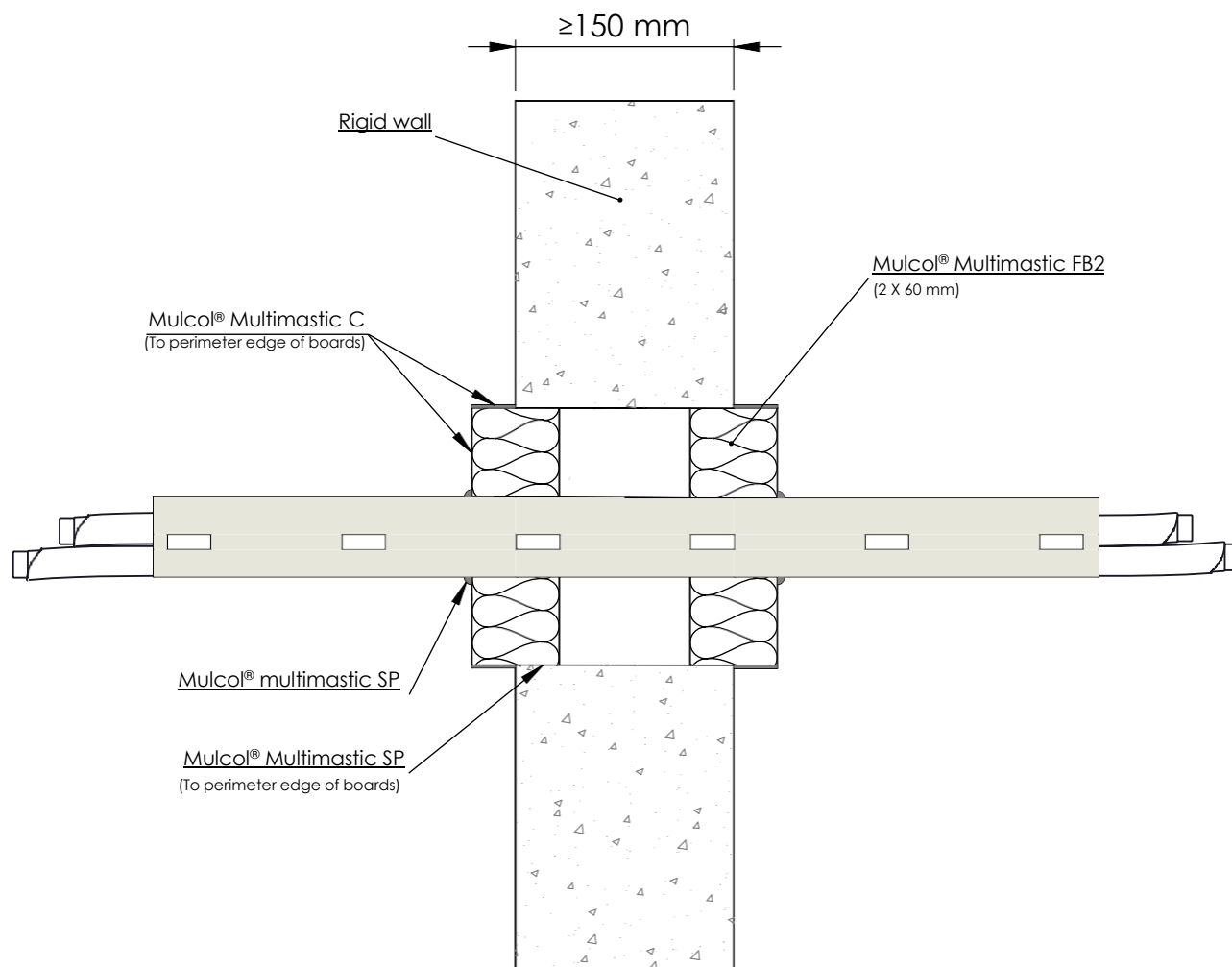


## A 3.7.1 Multimastic FB2 - 1x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge
Steel pipe $\varnothing$ 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/m <sup>3</sup>	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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RW-CT-MC2.2.10
	Unit of measure : mm	Department : Research & Development	
	Date : 8-2-2017	Draftsman : R.M.	A4



## 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 $\varnothing$ 21mm, with or without trays	E 240, EI 120				
Electrical cables up to $\varnothing$ 80 mm (single, bundled and on trays)	E 240, EI 60				
Cables up to $\varnothing$ 21 mm in tied bundles up to $\varnothing$ 100 mm	EI 240				
Steel cable trays (perforated and non-perforated) & ladders	E 240, EI 180				
Non-Sheathed wires up to $\varnothing$ 17 mm	E 240, EI 180				
Non-Sheathed wires up to $\varnothing$ 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

American projection

Scale : 1:5

Company : Mulcol International B.V.

RW-CT-MC2.2.10

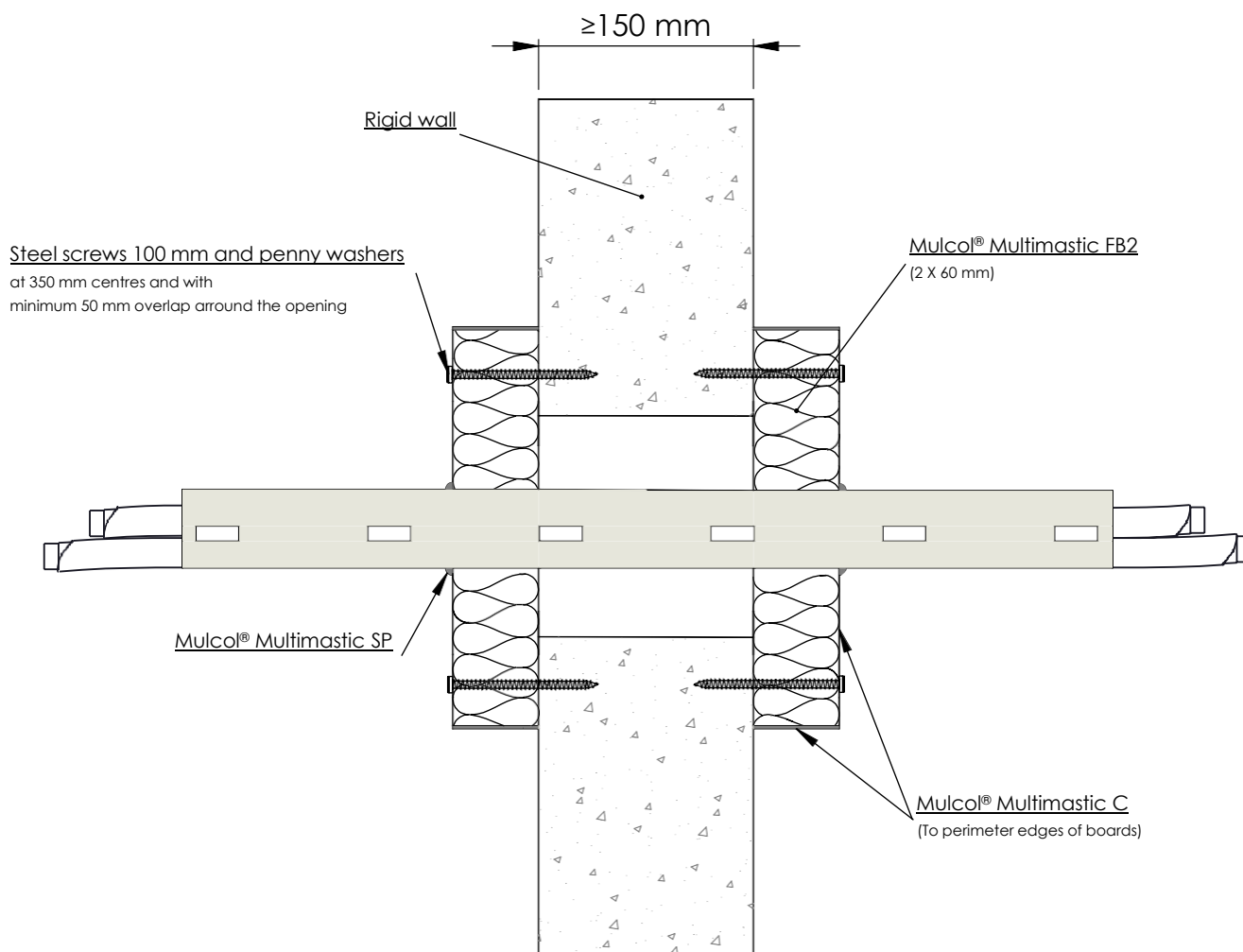
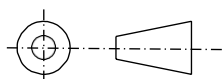
Unit of measure : mm

Department : Research & Development

Date : 8-2-2017

Draftsman : R.M.

A4



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

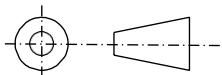
Services	Classification	Position Mulcol® Multimastic FB2	Maximum seal	Minimum between seals	Minimum from seal edge
Blank seals	E 240, EI 180	Both sides off the wall	600 x 600 mm	200 mm	25 mm
Single or bundled electrical cables up to $\varnothing$ 50 mm, with or without trays	E 240, EI 90				
Electrical cables up to $\varnothing$ 80 mm (single, bundled and on trays)	E 240, EI 60				
Cables up to $\varnothing$ 21 mm in tied bundles up to $\varnothing$ 100 mm	EI 240				
Steel cable trays (perforated and non-perforated) & ladders	E 240, EI 180				
Non-Sheathed wires up to $\varnothing$ 24 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

American projection



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

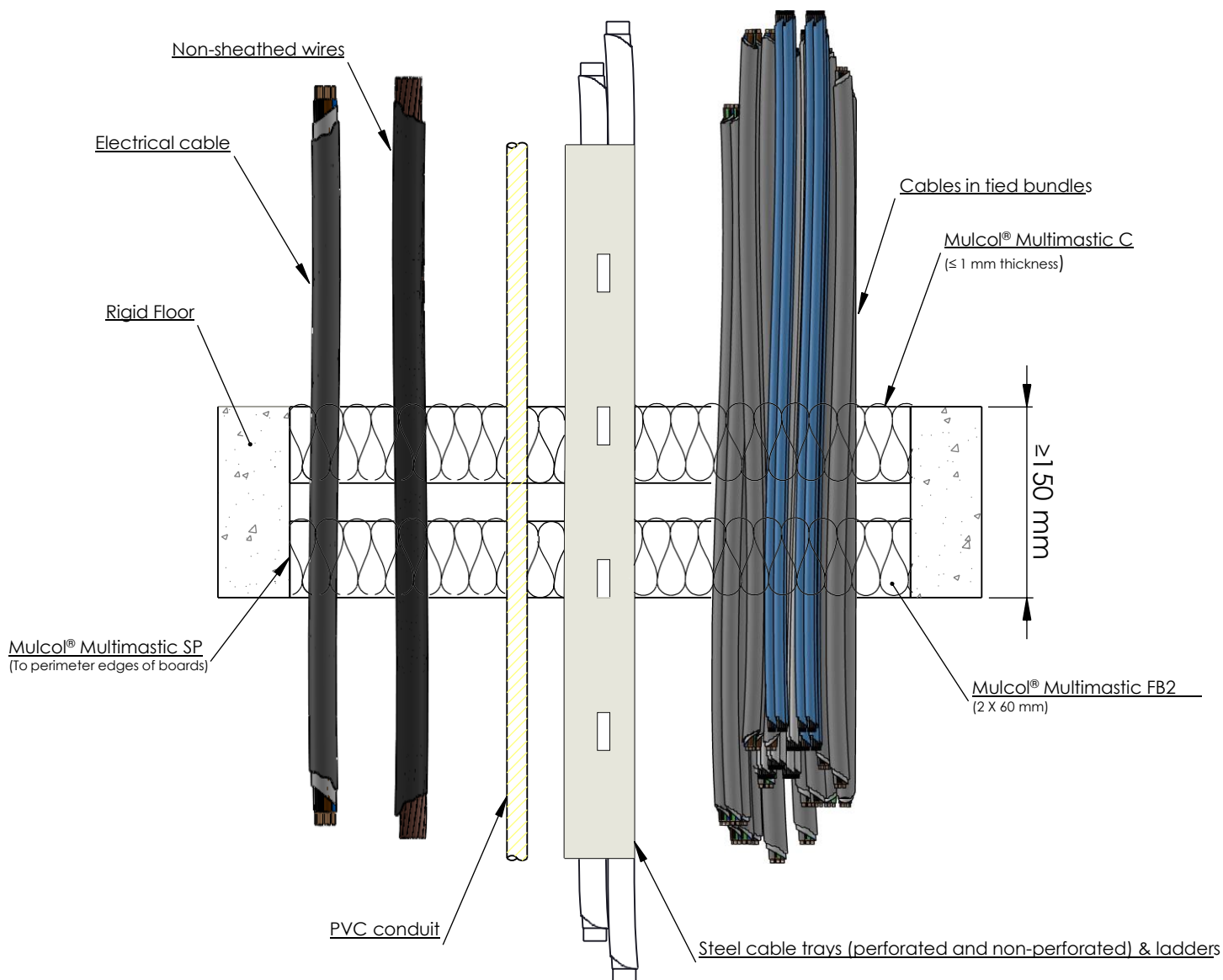
Company : Mulcol International B.V.

Department : Research & Development

Draftsman : R.M.

RF-CT-MC2.2.10

A4


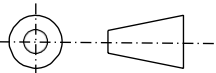


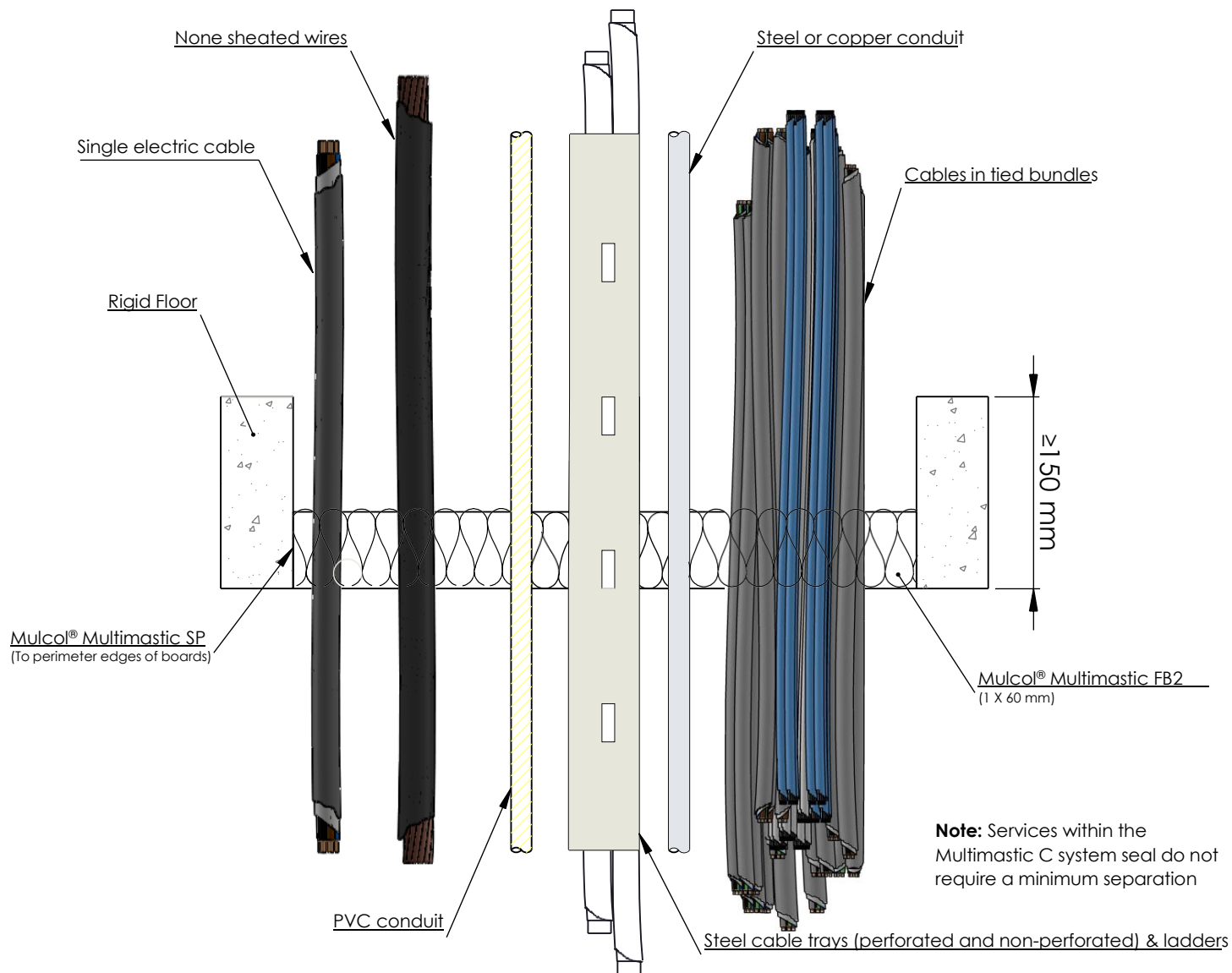
**Note:** Services within the Multimastic C system seal do not require a minimum separation

## 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	Both sides of the floor	1200 x 600 mm	25 mm
	E 180, EI 120		2400 x 1200 mm	
Electrical cables up to Ø21 mm (single, bundled and on trays)	EI 120			
Electrical cables up to Ø80 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			
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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RF-CT-MC2.1.10
	Unit of measure : mm	Department : Research & Development	
	Date : 13-6-2017	Draftsman : R.M.	A4



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

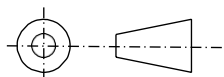
Services	Classification	Position Mulcol® Multimastic FB2	Maximum seal	Minimum from seal edge
Blank seals	E 240, EI 120	Either side of the floor (or anywhere in between)	1200 x 600	25 mm
	E 120, EI 90		2400 x 1200 mm	
Single electrical cables up to Ø 21 mm	E 120, EI 30		600 x 1200 mm	
Single electrical cables up to Ø 21 mm	E 240, EI 30		2400 x 1200 mm	
Electrical cables up to Ø 21 mm (single, bundled and on trays)	E 90, EI 45			
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			
None sheated wires up to Ø 17 mm	E 45, EI 30			
None sheated 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

American projection



Scale : 1:5

Unit of measure : mm

Date : 13-6-2017

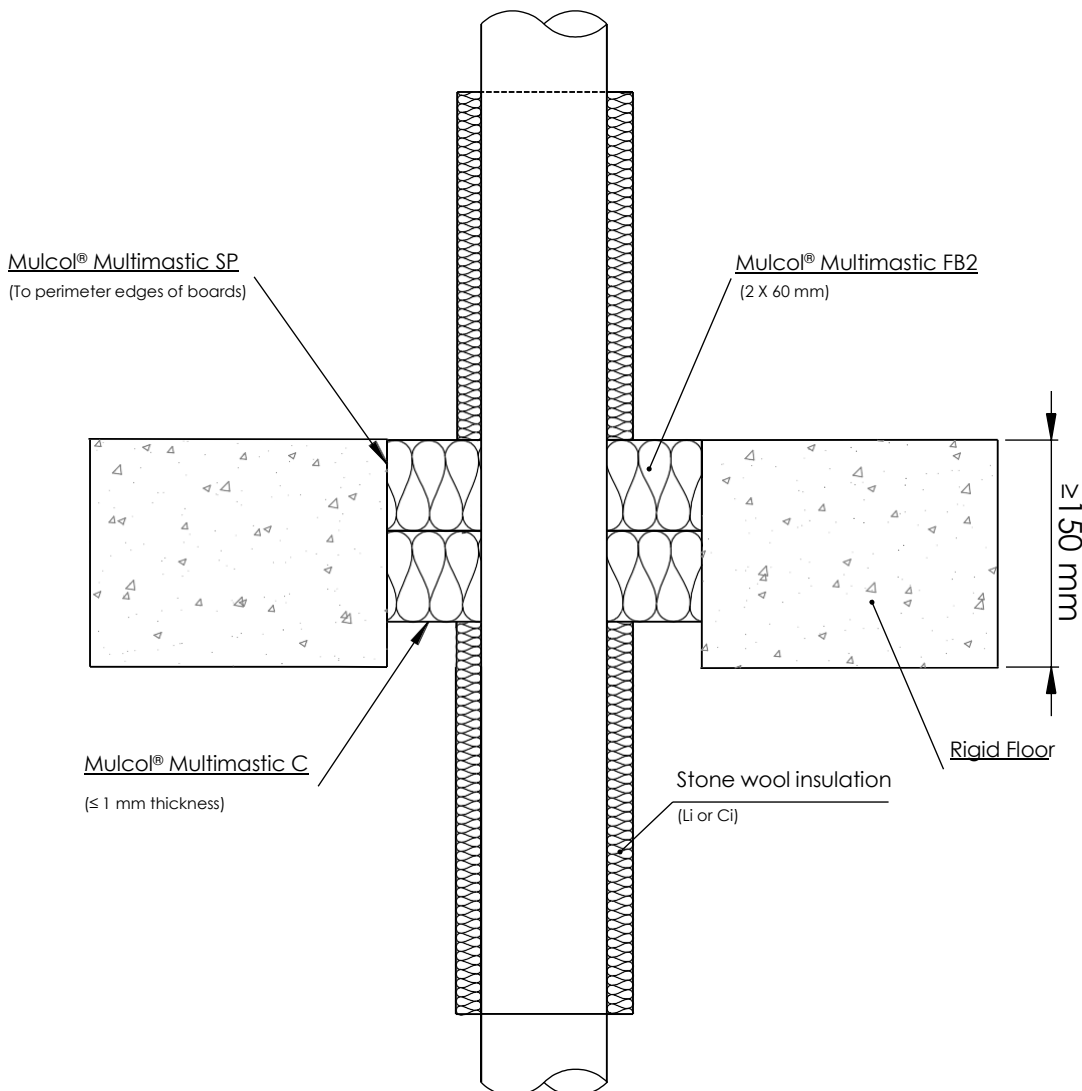
Company : Mulcol International B.V.

Department : Research & Development

Draftsman : R.M.

RF-ST-MC2.2.20

A4



## 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 40 mm / 1.5-14.2 mm wall th.	EI 180 C/U	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 40 mm / 1.5-14.2 mm wall th.	EI 240 C/U			280 x 280 mm	
Steel pipe Ø40 mm / 1.5-14.2 mm wall th.	E 180 C/U, EI 120 C/U				
Steel pipe Ø40 mm / 1.5-14.2 mm wall th.	E 180 C/U, EI 60 C/U		1000 mm length of 30 mm Stone wool insulation 80 kg/m3	2400 x 1200 mm	
Steel pipe Ø50 mm / 1.7-14.2 mm wall th.					
Steel pipe Ø60 mm / 1.8-14.2 mm wall th.					
Steel pipe Ø75 mm / 2.1-14.2 mm wall th.					
Steel pipe Ø90 mm / 2.3-14.2 mm wall th.					
Steel pipe Ø100 mm / 2.5-14.2 mm wall th.					
Steel pipe Ø115 mm / 2.8-14.2 mm wall th.					
Steel pipe Ø140 mm / 3.2-14.2 mm wall th.					
Steel pipe Ø165 mm / 3.6-14.2 mm wall th.					
Steel pipe Ø180 mm / 3.9-14.2 mm wall th.					
Steel pipe Ø200 mm / 4.2-14.2 mm wall th.					
Steel pipe Ø219 mm / 4.5-14.2 mm wall th.					

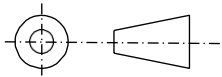
See graph on page 47 for intermediate sizes

# 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

American projection



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

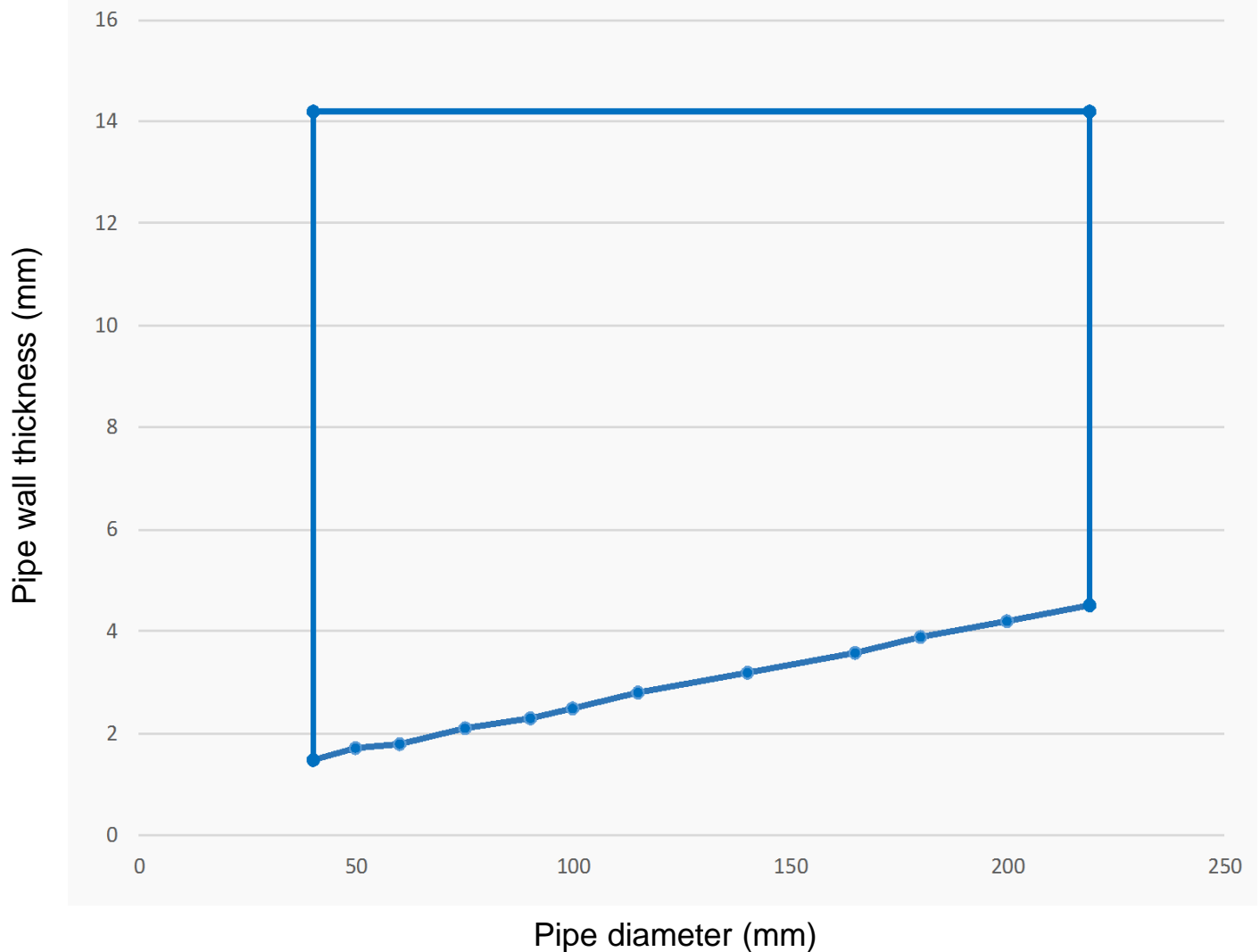
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Draftsman : R.M.


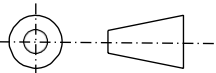
RF-ST-MC2.2.20

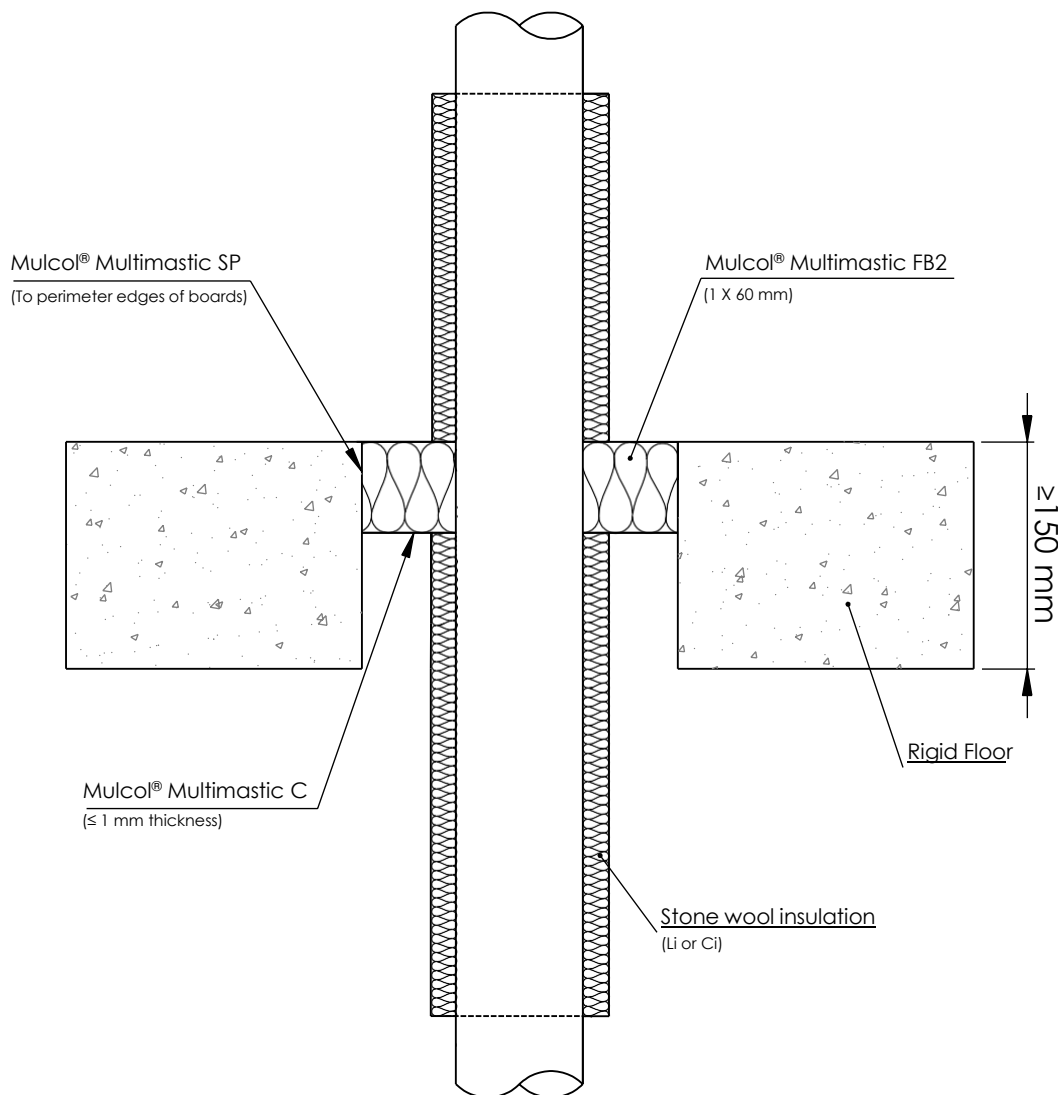
A4

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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RF-ST-MC1.2.10
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4


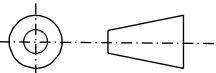


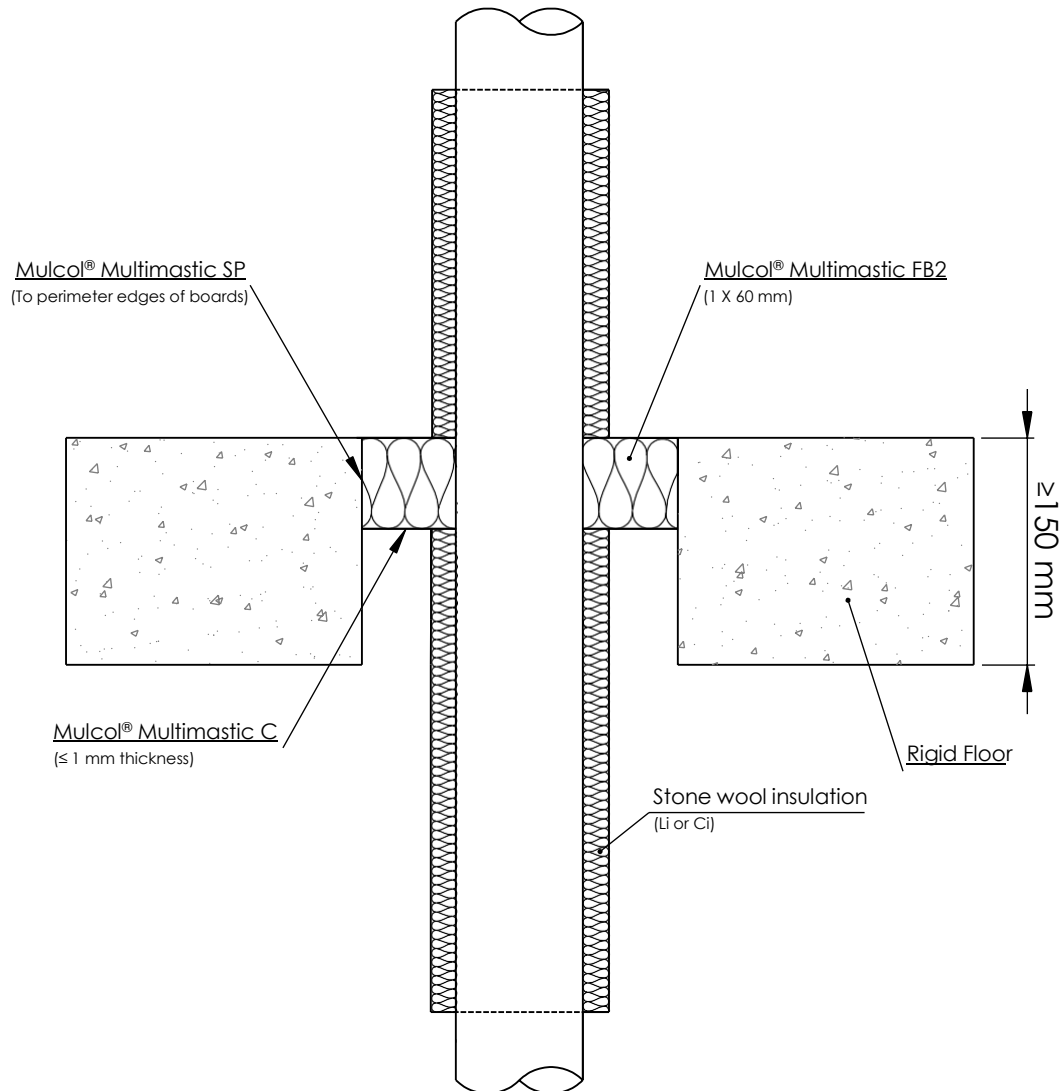
## A 4.4 Multimastic FB2 - 1x60 mm - with copper pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge
Copper pipe up to 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 $\varnothing$ 54 mm / 0.9-14.2 mm wall th.	E 240 C/U			2400 x 1200 mm	
Copper pipe up to 54 mm / 0.9-14.2 mm wall th.	E 120 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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RF-ST-MC2.1.20
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4


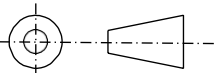


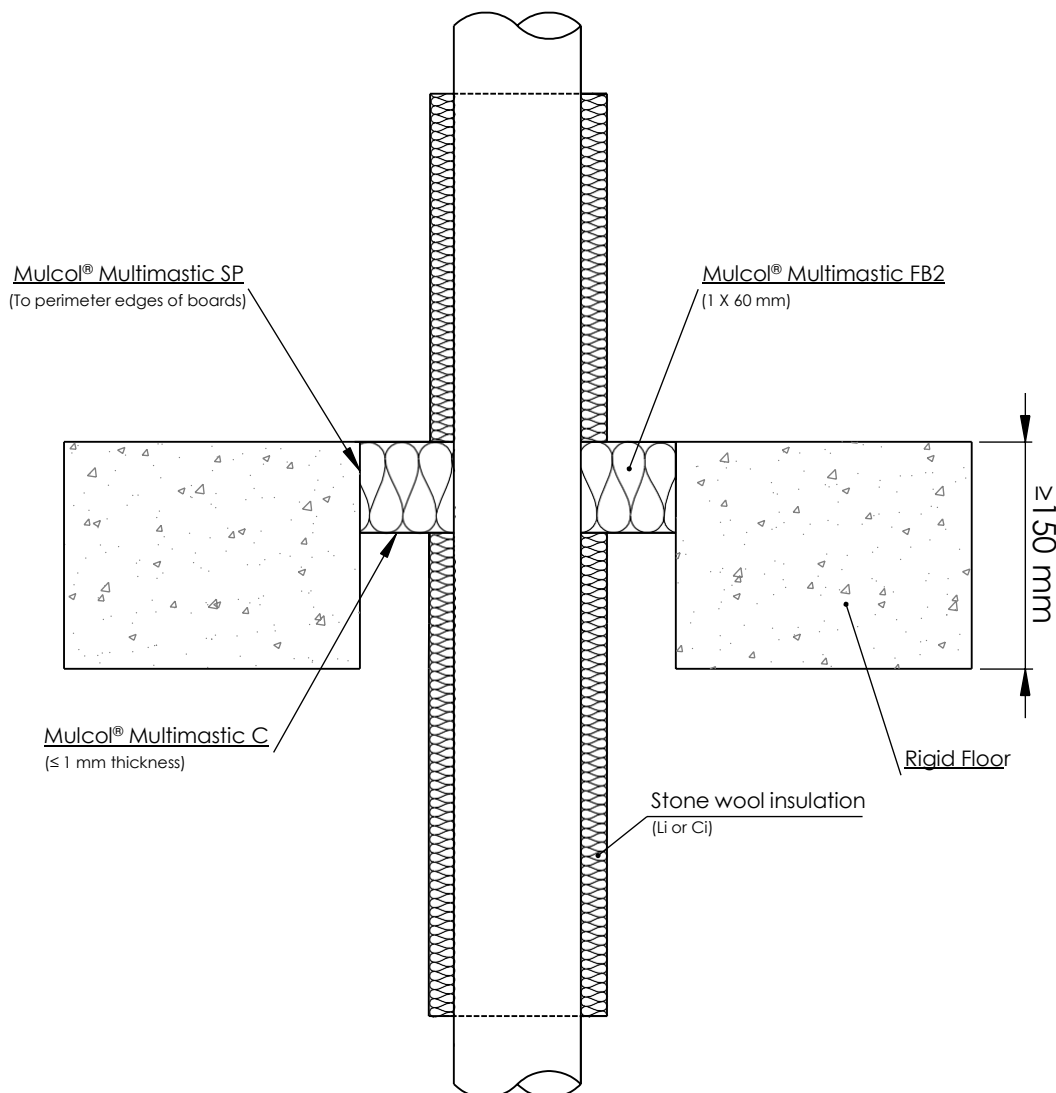
## A 4.4.1 Multimastic FB2 - 1x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Maximum seal	Minimum from seal edge
Steel pipe 40 mm / 1.5-14.2 mm wall th.	E 240 C/U, EI 60 C/U	Either side of the floor (or anywhere in between)	1000 mm length of 20 mm Stone wool insulation, 80 kg/m³	600 x 1200 mm	25 mm
Steel pipe Ø40 mm / 1.5-14.2 mm wall th.	E 240 C/U, EI 90 C/U		1000 mm length of 30 mm Stone wool insulation, 80 kg/m³		
Steel pipe Ø40 mm / 1.5-14.2 mm wall th.					
Steel pipe Ø50 mm / 1.7-14.2 mm wall th.					
Steel pipe Ø60 mm / 1.8-14.2 mm wall th.					
Steel pipe Ø75 mm / 2.1-14.2 mm wall th.					
Steel pipe Ø90 mm / 2.3-14.2 mm wall th.					
Steel pipe Ø100 mm / 2.5-14.2 mm wall th.					
Steel pipe Ø115 mm / 2.8-14.2 mm wall th.					
Steel pipe Ø140 mm / 3.2-14.2 mm wall th.					
Steel pipe Ø165 mm / 3.6-14.2 mm wall th.					
Steel pipe Ø180 mm / 3.9-14.2 mm wall th.					
Steel pipe Ø200 mm / 4.2-14.2 mm wall th.					
Steel pipe Ø219 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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RF-ST-MC1.1.20
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4



## 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 40 mm / 1.5-14.2 mm wall th.	E 120 C/U, EI 60 C/U	Either side of the floor (or anywhere in between)	1000 mm length of 20 mm Stone wool insulation, 80 kg/m³	2400 x 1200 mm	25 mm
Steel pipe Ø40 mm / 1.5-14.2 mm wall th.	E 120 C/U, EI 90 C/U		1000 mm length of 30 mm Stone wool insulation, 80 kg/m³		
Steel pipe Ø40 mm / 1.5-14.2 mm wall th.					
Steel pipe Ø50 mm / 1.7-14.2 mm wall th.					
Steel pipe Ø60 mm / 1.8-14.2 mm wall th.					
Steel pipe Ø75 mm / 2.1-14.2 mm wall th.					
Steel pipe Ø90 mm / 2.3-14.2 mm wall th.					
Steel pipe Ø100 mm / 2.5-14.2 mm wall th.					
Steel pipe Ø115 mm / 2.8-14.2 mm wall th.					
Steel pipe Ø140 mm / 3.2-14.2 mm wall th.					
Steel pipe Ø165 mm / 3.6-14.2 mm wall th.					
Steel pipe Ø180 mm / 3.9-14.2 mm wall th.					
Steel pipe Ø200 mm / 4.2-14.2 mm wall th.					
Steel pipe Ø219 mm / 4.5-14.2 mm wall th.					

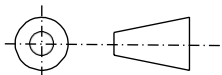
See graph on page 51 for intermediate sizes

# 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



American projection



Scale : 1:5

Unit of measure : mm

Date : 18-12-2016

Company : Mulcol International B.V.

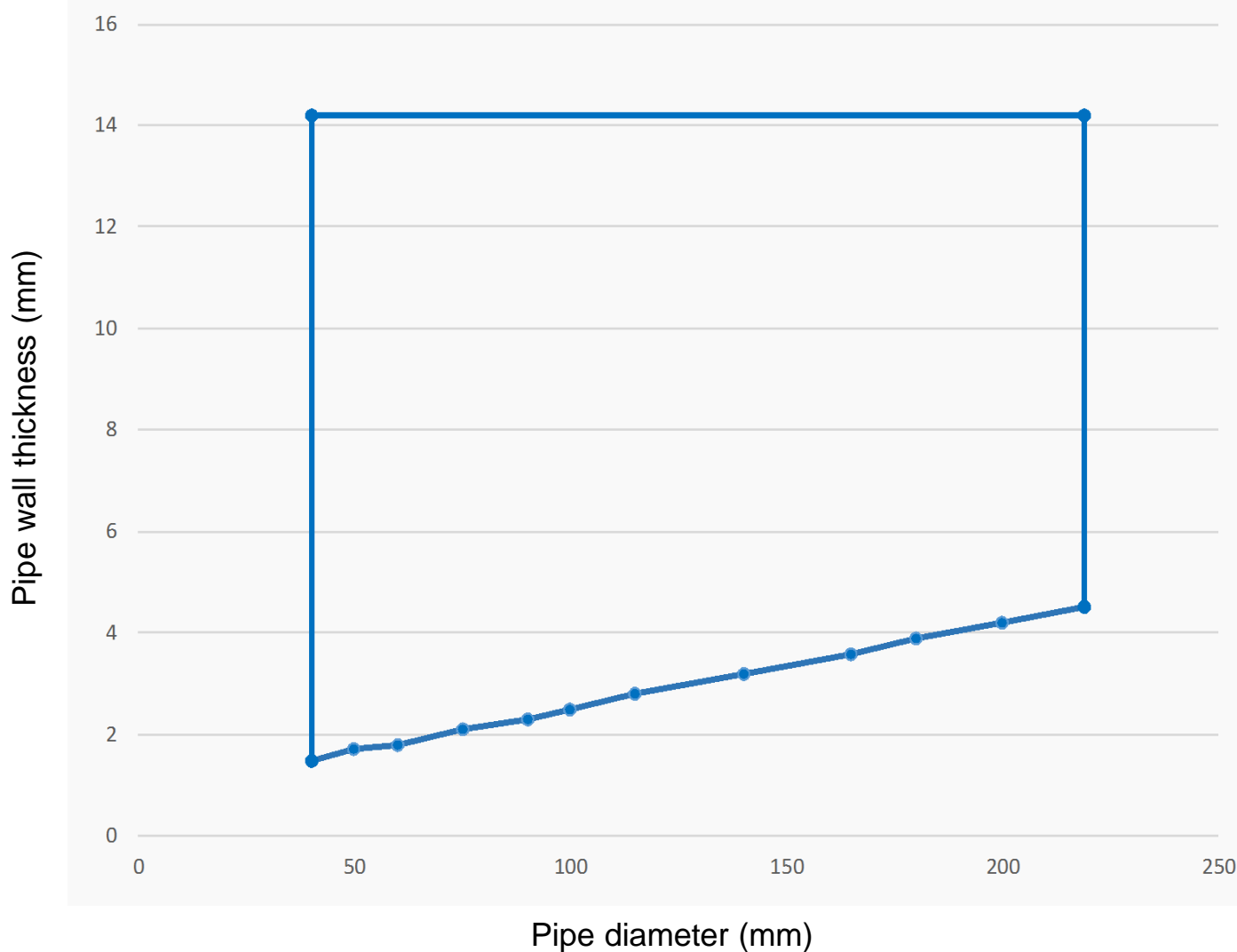
Department : Research & Development

Draftsman : R.M.


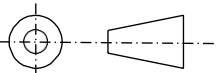
RF-ST-MC1.1.20

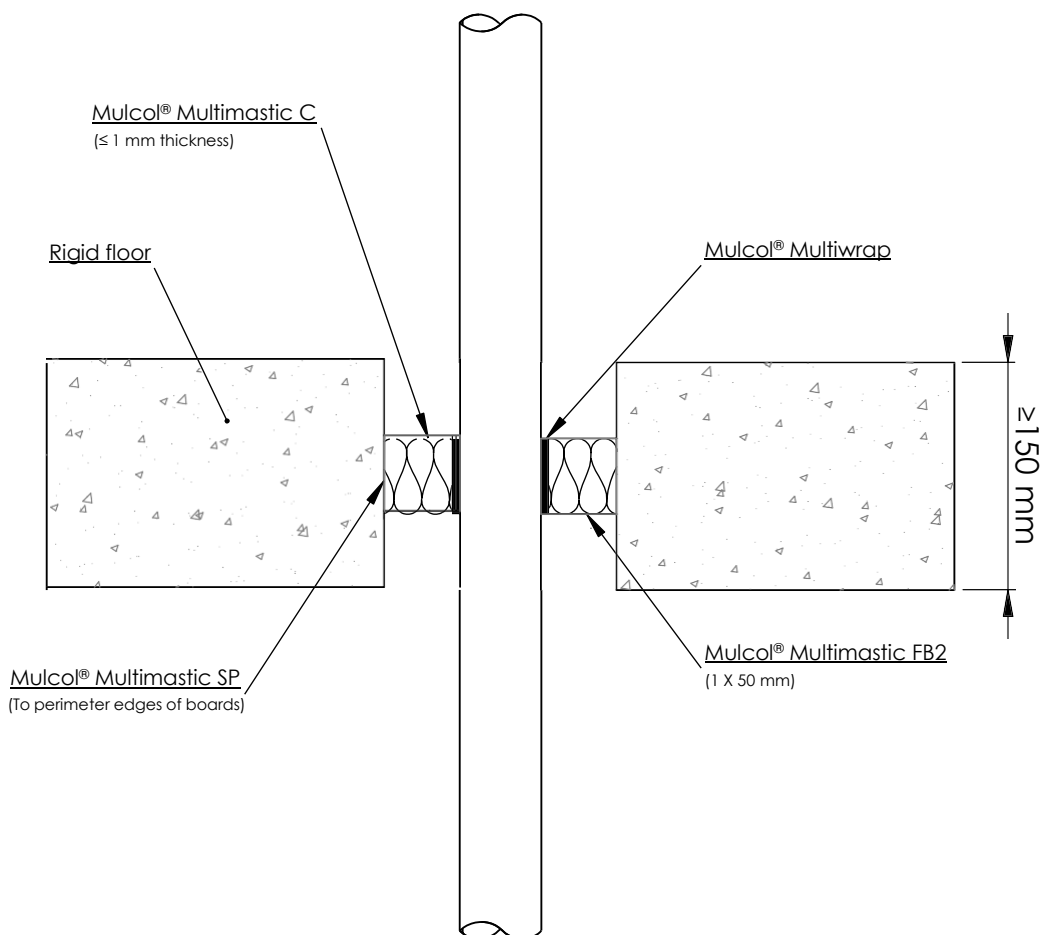
A4

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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RF-PP-MC1.1.10
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4



## 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** Ø 110 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



American projection

Scale	: 1:5
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Company	: Mulcol International B.V.
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RF-ST-MC2.1.22

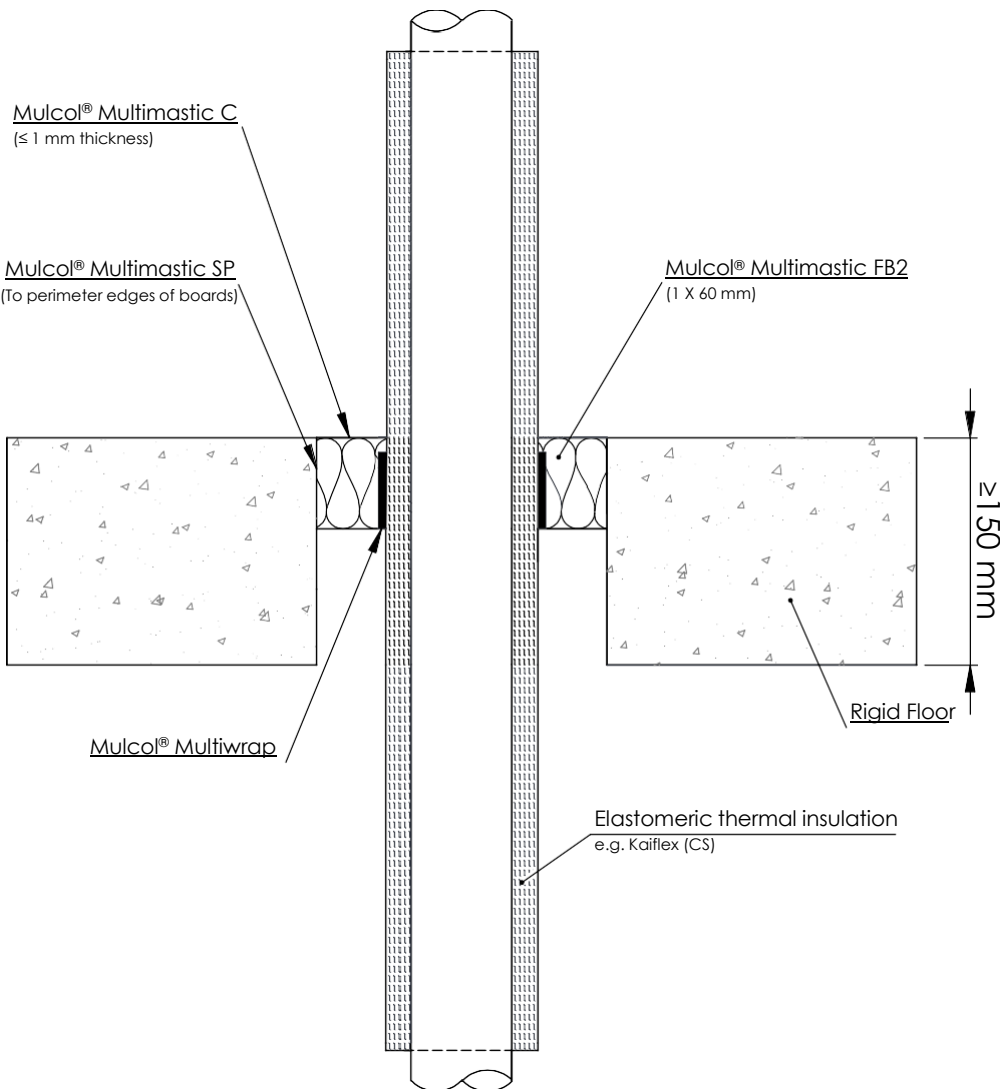
Unit of measure : mm
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Department : Research &amp; Development

Date	: 16-6-2016
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Draftsman	: R.M.
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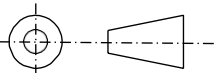
A4

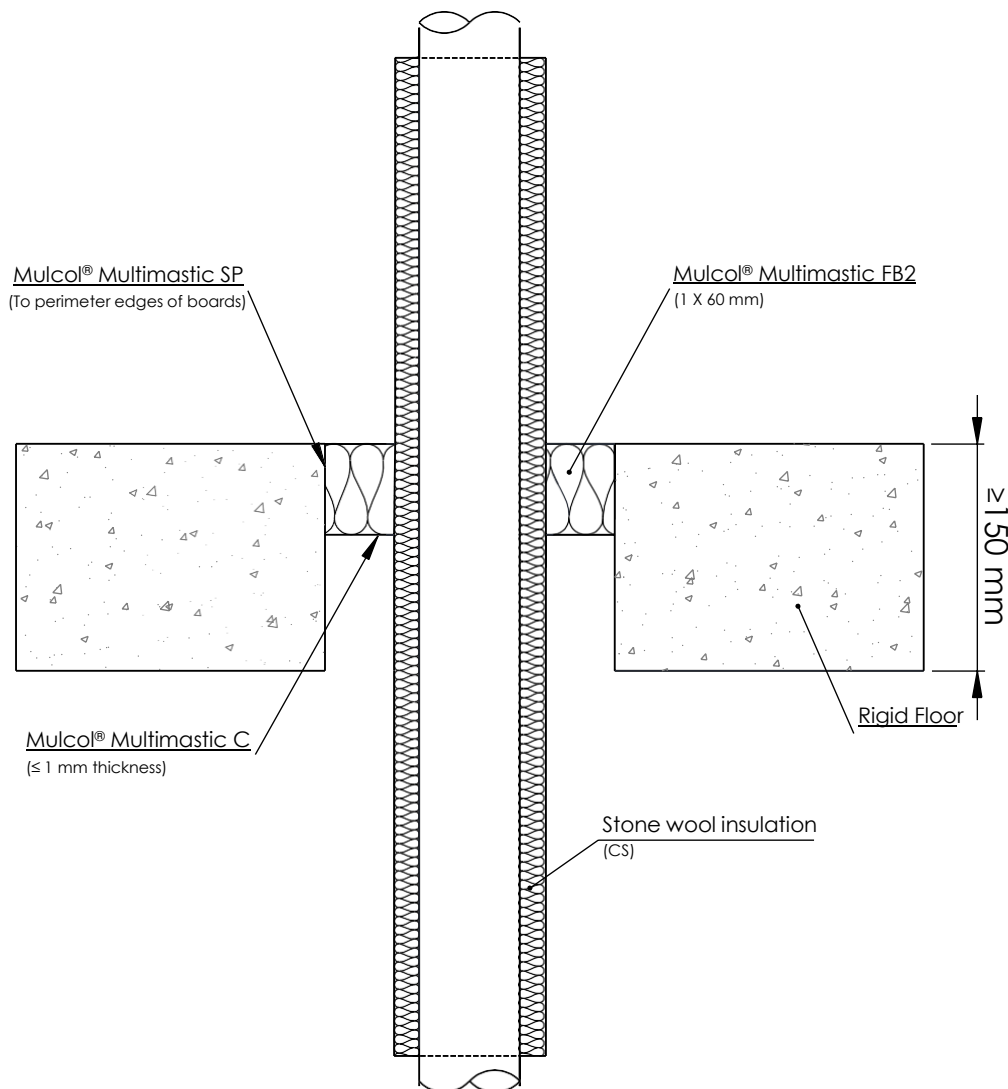


#### A 4.6 Multimastic FB2 - 1x60 mm - with (stainless) steel pipes

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


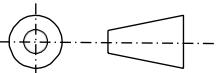
Fire test pipe penetration seal Mulcol® Multimastic C System Rigid floor construction according to I.2.2			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RF-ST-MC2.1.20
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4

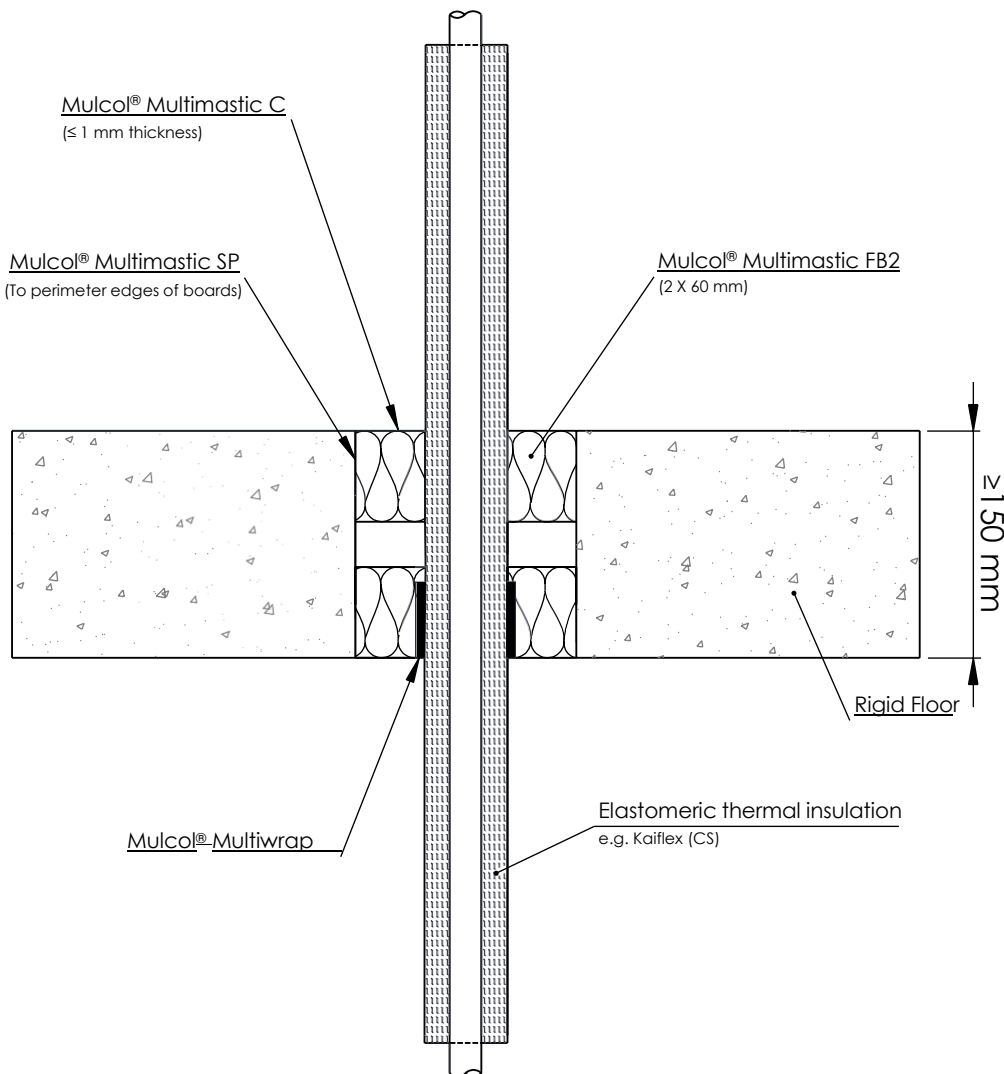


## A 4.6.1 Multimastic FB2 - 1x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Mulcol® Multiwrap	Minimum from seal edge
Steel pipe $\varnothing$ 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/m <sup>3</sup>	Not required	25 mm

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


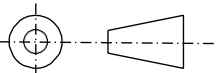
Fire test pipe penetration seal Mulcol® Multimastic C System Rigid floor construction according to I.2.2			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RF-ST-MC2.2.22
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4

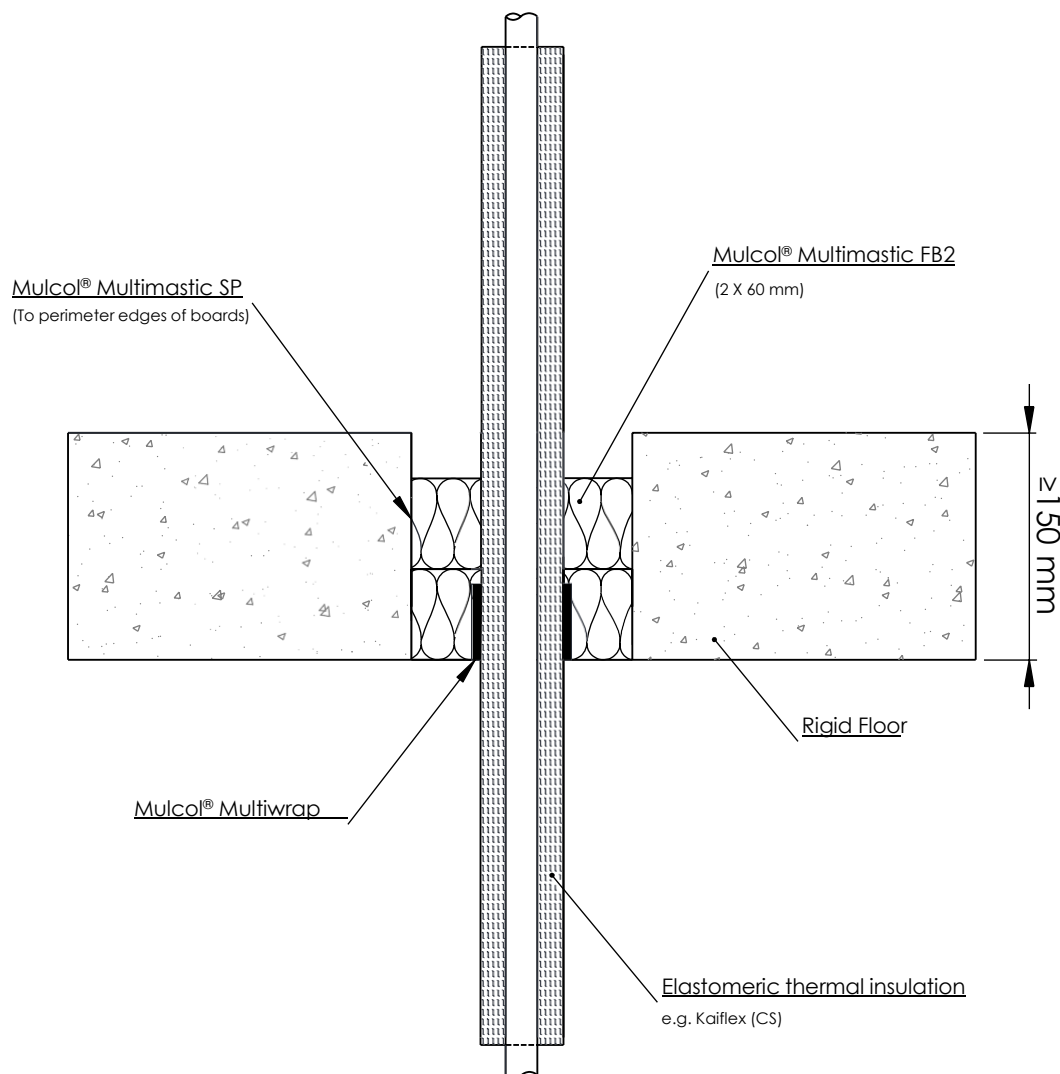


## A 4.7 Multimastic FB2 - 2x60 mm - with (stainless) steel pipes

Services	Classification	Position Mulcol® Multimastic FB2	Insulation	Mulcol® Multiwrap	Minimum from seal edge
Steel pipe $\varnothing 40$ 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			
American projection 	Scale : 1:5	Company : Mulcol International B.V.	RF-ST-MC2.2.22
	Unit of measure : mm	Department : Research & Development	
	Date : 16-6-2016	Draftsman : R.M.	A4



## 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		