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European Technical Assessment

ETA 16/0771
of 17.06.2024



General part

Technical Assessment Body issuing the ETA: ITeC

ITeC has been designated according to Article 29 of Regulation (EU) No 305/2011 and is member of EOTA (European Organisation for Technical Assessment).

**Trade name of the construction
product**

AF MULTICOLLAR

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

Fire stopping and fire sealing products.
Penetration seals.

Manufacturer

AF SYSTEMS SPA
Via Edward Jenner 41-43
IT-26837 Mulazzano
Italy

Manufacturing plant(s)

According to Annex N kept by ITeC.

**This European Technical
Assessment contains**

149 pages including 2 annexes which form an integral part of
this assessment

and

Annex N, which contains confidential information and is not
included in the European Technical Assessment when that
assessment is publicly available.

**This European Technical
Assessment is issued in
accordance with Regulation
(EU) 305/2011, on the basis of**

European Assessment Document EAD 350454-00-1104.

This version replaces

ETA 16/0771, issued on 04.09.2023.

**This ETA is a corrigendum (1)
of**

ETA 16/0771, issued on 17.06.2024.

General comments

Translations of this European Technical Assessment in other languages shall fully correspond to the original issued document.

Communication of this European Technical Assessment, including transmission by electronic means, shall be in full (excepted the confidential Annex(es)).

2 Specification of the intended use(s) in accordance with the applicable EAD

AF MULTICOLLAR is used to reinstate the resistance to fire performance of a constructive element where it is penetrated by the following services (detailed specification in Annex A):

- Plastic pipes.
- Insulated steel pipes,
- Multilayer composite pipes,
- Cable bundles.

The constructive elements where AF MULTICOLLAR may be installed to provide a penetration seal are as follows (detailed specification in Annex B):

- Flexible walls (B.2.1).
- Lining walls (B.2.2).
- Sandwich panels walls (B.2.3).
- Timber (CLT) walls (B.2.4).
- Rigid walls (B.2.5).
- Rigid floors (B.3.1).
- Timber (CLT) floors (B.3.2).
- False ceilings (B.3.3).

The constructive element where the penetration seal is installed must be classified in accordance with EN 13501-2¹ for the required fire resistance period.

AF MULTICOLLAR is intended for environmental conditions as defined for use category Type Y₁ according to EAD 350454-00-1104: intended for semi-exposed use at temperatures below 0°C, with exposure to UV but not to rain. Type Y₁ includes lower use categories (i.e., Type Y₂, Type Z₁ and Type Z₂).

The provisions made in this ETA are based on a working life of AF MULTICOLLAR of at least 25 years, provided that the conditions laid down in the manufacturer's instructions for the installation, use and maintenance are met. These provisions are based upon the current state of the art and the available knowledge and experience.

The indications given as to the working life of the product cannot be interpreted as a guarantee but are regarded only as a means for choosing the appropriate products in relation to the expected economically reasonable working life of the works.

¹ EN 13501-2 Fire classification of construction products and building elements. Part 2: Classification using data from fire resistance tests, excluding ventilation services.

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

3.1 Performance of the product

The assessment of AF MULTICOLLAR has been performed in accordance with EAD 350454-00-1104 *Fire stopping and fire sealing products - Penetration seals* (September 2017).

Table 2: Performance of the product.

Product: AF MULTICOLLAR		Intended use: Fire penetration seal	
Basic requirement	Essential characteristic	Performance	
BWR 2 Safety in case of fire	Reaction to fire	Inlay material	E
		Steel housing	A1
	Resistance to fire	See Annex A	
BWR 4 Safety and accessibility in use	Durability	Type Y ₁	

The rest of characteristics included in EAD 350454-00-1104 have not been assessed in this ETA.

3.2 Methods used for the assessment

3.2.1 Reaction to fire

The performance of the inlay material of AF MULTICOLLAR has been tested according to EN ISO 11925-2² and determined according to EN 13501-1³ and Regulation (EU) 2016/364. The collar housing made of stainless steel has a class A1 according to Decision 96/603/EC and Decision 2000/605/EC.

3.2.2 Resistance to fire

Tested and assessed according to EN 1366-3⁴, the fire resistance classification has been determined according to EN 13501-2 and is given in Annex A.

3.2.3 Durability

AF MULTICOLLAR has been tested and assessed for the environmental use category Type Y₁ in accordance with section 2.2.9 of EAD 350454-00-1104 and the EOTA Technical Report 024⁵, section 4.2.4 (for a 25-year working life). Stainless steel in accordance with EN 10088-1⁶ is intended for use category Type Y₁.

² EN ISO 11925-2 Reaction to fire tests. Ignitability of products subjected to direct impingement of flame. Part 2: Single-flame source test.

³ EN 13501-1 Fire classification of construction products and building elements. Part 1: Classification using data from reaction to fire tests.

⁴ EN 1366-3 Fire resistance tests for service installations. Part 3: Penetration seals.

⁵ EOTA TR 024 Characterisation, Aspects of Durability and Factory Production Control for Reactive Materials, Components and Products, Edition July 2009.

⁶ EN 10088-1 Stainless steels. Part 1: List of stainless steels.

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

According to the Decision 1999/454/EC of the European Commission, the system of AVCP (see EC delegated Regulation (EU) No 568/2014 amending Annex V to Regulation (EU) 305/2011) given in the following table applies.

Table 3: AVCP System.

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 foreseen in the applicable EAD

All the necessary technical details for the implementation of the AVCP system are laid down in the *Control Plan* deposited with the ITeC and agreed in accordance with EAD 350454-00-1104, section 3.

The *Control Plan* is a confidential part of the ETA and only handed over to the notified product certification body involved in the assessment and verification of constancy of performance.

The factory production control operated by the manufacturer shall be in accordance with the above mentioned *Control Plan*.

Issued in Barcelona on 17 June 2024

by the Catalonia Institute of Construction Technology.



Ferran Bermejo Nualart
Technical Director, ITeC

ANNEX A. Resistance to fire performance

In this Annex, the resistance to fire performance of AF MULTICOLLAR is given (see the following Index). The classification is expressed in terms of classification of the supporting construction with fire-separating function being penetrated.

The supporting constructive elements and AF MULTICOLLAR installation criteria shall meet the specification given in Annex B.

The rules for the field of direct application of the test results given in EN 1366-3 can be applied.

INDEX

A.1	Plastic pipes	13
A.1.1	Standard plastic pipes through the constructive element	13
A.1.1.1	Flexible wall	13
A.1.1.1.1	80 mm thick flexible wall	13
A.1.1.1.2	100 mm thick flexible wall	14
A.1.1.1.3	120 mm thick flexible wall	15
A.1.1.1.4	125 mm thick flexible wall	16
A.1.1.2	Lining wall	17
A.1.1.2.1	30 mm thick lining wall	17
A.1.1.2.2	50 mm thick lining wall	18
A.1.1.3	Cross laminated timber (CLT) wall	19
A.1.1.3.1	137 mm thick CLT wall	19
A.1.1.4	Rigid wall	20
A.1.1.4.1	150 mm thick rigid wall	20
A.1.1.4.2	200 mm thick rigid wall	21
A.1.1.5	Rigid floor	22
A.1.1.5.1	150 mm thick rigid floor	22
A.1.1.5.2	200 mm thick rigid floor	23
A.1.1.6	Cross laminated timber (CLT) floor	24
A.1.1.6.1	158 mm thick CLT floor	24
A.1.1.7	False ceiling	25
A.1.1.7.1	50 mm thick false ceiling	25
A.1.2	Standard plastic pipes through AF PANEL	26
A.1.2.1	Flexible wall	26
A.1.2.1.1	80 mm thick flexible wall	26
A.1.2.1.2	100 mm thick flexible wall	27
A.1.2.1.3	120 mm thick flexible wall	28
A.1.2.1.4	125 mm thick flexible wall	29

A.1.2.2	Lining wall	30
A.1.2.2.1	30 mm thick lining wall	30
A.1.2.2.2	50 mm thick lining wall	31
A.1.2.3	Sandwich panel wall	32
A.1.2.3.1	100 mm thick sandwich panel wall	32
A.1.2.4	Cross laminated timber (CLT) wall	33
A.1.2.4.1	137 mm thick CLT wall	33
A.1.2.5	Rigid wall	34
A.1.2.5.1	150 mm thick rigid wall	34
A.1.2.5.2	200 mm thick rigid wall	35
A.1.2.6	Rigid floor	36
A.1.2.6.1	150 mm thick rigid floor	36
A.1.2.6.2	200 mm thick rigid floor	37
A.1.2.7	Cross laminated timber (CLT) floor	38
A.1.2.7.1	158 mm thick CLT floor	38
A.1.2.8	False ceiling	39
A.1.2.8.1	50 mm thick false ceiling	39
A.1.3	Standard plastic pipes through AF BRICK	40
A.1.3.1	Flexible wall	40
A.1.3.1.1	120 mm thick flexible wall	40
A.1.3.2	Rigid floor	41
A.1.3.2.1	150 mm thick rigid floor	41
A.1.4	Standard plastic pipes in series through the constructive element	42
A.1.4.1	Flexible wall	42
A.1.4.1.1	100 mm thick flexible wall	42
A.1.4.1.2	120 mm thick flexible wall	43
A.1.4.2	Rigid floor	44
A.1.4.2.1	150 mm thick rigid floor	44
A.1.4.2.2	200 mm thick rigid floor	45
A.1.5	Standard plastic pipes in series through AF PANEL	46
A.1.5.1	Flexible wall	46
A.1.5.1.1	100 mm thick flexible wall	46
A.1.5.1.2	120 mm thick flexible wall	47
A.1.5.2	Rigid floor	48
A.1.5.2.1	150 mm thick rigid floor	48
A.1.5.2.2	200 mm thick rigid floor	49
A.1.6	Standard plastic pipes in corners	50
A.1.6.1	Flexible wall	50
A.1.6.1.1	120 mm thick flexible wall	50
A.1.6.2	Rigid floor	51
A.1.6.2.1	150 mm thick rigid floor	51

A.1.7	Standard plastic curved pipes	52
A.1.7.1	Flexible wall	52
A.1.7.1.1	120 mm thick flexible wall	52
A.1.7.2	Rigid floor	53
A.1.7.2.1	150 mm thick rigid floor	53
A.1.8	Standard plastic pipes with an intermediate box	54
A.1.8.1	Flexible wall	54
A.1.8.1.1	120 mm thick flexible wall	54
A.1.8.2	Rigid floor	55
A.1.8.2.1	150 mm thick rigid floor	55
A.1.9	Acoustic plastic pipes	56
A.1.9.1	Flexible wall	56
A.1.9.1.1	120 mm thick flexible wall	56
A.1.9.2	Rigid floor	57
A.1.9.2.1	150 mm thick rigid floor	57
A.1.10	Insulated standard plastic pipes	58
A.1.10.1	Flexible wall	58
A.1.10.1.1	100 mm thick flexible wall	58
A.1.10.1.2	120 mm thick flexible wall	59
A.1.10.2	Cross laminated timber (CLT) wall	60
A.1.10.2.1	137 mm thick CLT wall	60
A.1.10.3	Rigid floor	61
A.1.10.3.1	150 mm thick rigid floor	61
A.1.10.3.2	200 mm thick rigid floor	62
A.1.10.4	Cross laminated timber (CLT) floor	63
A.1.10.4.1	158 mm thick CLT floor	63
A.2	Insulated steel pipes	64
A.2.1	Insulated steel pipes through the constructive element	64
A.2.1.1	Flexible wall	64
A.2.1.1.1	100 mm thick flexible wall	64
A.2.1.1.2	120 mm thick flexible wall	65
A.2.1.1.3	125 mm thick flexible wall	66
A.2.1.1.4	135 mm thick flexible wall	67
A.2.1.2	Lining wall	68
A.2.1.2.1	30 mm thick lining wall	68
A.2.1.2.2	50 mm thick lining wall	69
A.2.1.3	Cross laminated timber (CLT) wall	70
A.2.1.3.1	137 mm thick CLT wall	70
A.2.1.4	Rigid wall	71
A.2.1.4.1	150 mm thick rigid wall	71

A.2.1.5	Rigid floor	72
A.2.1.5.1	150 mm thick rigid floor	72
A.2.1.5.2	200 mm thick rigid floor	73
A.2.1.6	Cross laminated timber (CLT) floor	74
A.2.1.6.1	150 mm thick CLT floor	74
A.2.1.7	False ceiling	75
A.2.1.7.1	50 mm thick false ceiling	75
A.2.2	Insulated steel pipes through AF PANEL	76
A.2.2.1	Flexible wall	76
A.2.2.1.1	100 mm thick flexible wall	76
A.2.2.1.2	120 mm thick flexible wall	77
A.2.2.1.3	125 mm thick flexible wall	78
A.2.2.1.4	135 mm thick flexible wall	79
A.2.2.2	Lining wall	80
A.2.2.2.1	30 mm thick lining wall	80
A.2.2.2.2	50 mm thick lining wall	81
A.2.2.3	Sandwich panel wall	82
A.2.2.3.1	100 mm thick sandwich panel wall	82
A.2.2.4	Cross laminated timber (CLT) wall	83
A.2.2.4.1	137 mm thick CLT wall	83
A.2.2.5	Rigid wall	84
A.2.2.5.1	150 mm thick rigid wall	84
A.2.3	Insulated steel pipes in series through the constructive element	85
A.2.3.1	Flexible wall	85
A.2.3.1.1	120 mm thick flexible wall	85
A.2.3.2	Rigid floor	86
A.2.3.2.1	150 mm thick rigid floor	86
A.3	Multilayer composite pipes	87
A.3.1	Multilayer composite pipes through the constructive element	87
A.3.1.1	Flexible wall	87
A.3.1.1.1	80 mm thick flexible wall	87
A.3.1.1.2	100 mm thick flexible wall	88
A.3.1.2	Cross laminated timber (CLT) wall	89
A.3.1.2.1	137 mm thick CLT wall	89
A.3.1.3	Rigid wall	90
A.3.1.3.1	150 mm thick rigid wall	90
A.3.1.4	Rigid floor	91
A.3.1.4.1	150 mm thick rigid floor	91
A.3.1.4.2	200 mm thick rigid floor	92

A.3.1.5	Cross laminated timber (CLT) floor	93
A.3.1.5.1	158 mm thick CLT floor	93
A.3.1.6	False ceiling	94
A.3.1.6.1	50 mm thick false ceiling	94
A.3.2	Multilayer composite pipes in bundles through the constructive element	95
A.3.2.1	Flexible wall	95
A.3.2.1.1	80 mm thick flexible wall	95
A.3.2.1.2	100 mm thick flexible wall	96
A.3.2.2	Cross laminated timber (CLT) wall	98
A.3.2.2.1	137 mm thick CLT wall	98
A.3.2.3	Rigid wall	99
A.3.2.3.1	150 mm thick rigid wall	99
A.3.2.4	Rigid floor	101
A.3.2.4.1	150 mm thick rigid floor	101
A.3.2.5	False ceiling	102
A.3.2.5.1	50 mm thick false ceiling	102
A.3.3	Multilayer composite pipes through AF PANEL	103
A.3.3.1	Flexible wall	103
A.3.3.1.1	80 mm thick flexible wall	103
A.3.3.1.2	100 mm thick flexible wall	104
A.3.3.2	Lining wall	105
A.3.3.2.1	30 mm thick lining wall	105
A.3.3.2.2	50 mm thick lining wall	106
A.3.3.3	Rigid wall	107
A.3.3.3.1	150 mm thick rigid wall	107
A.3.3.4	Rigid floor	108
A.3.3.4.1	150 mm thick rigid floor	108
A.3.4	Multilayer composite pipes in bundles through AF PANEL	109
A.3.4.1	Flexible wall	109
A.3.4.1.1	80 mm thick flexible wall	109
A.3.4.1.2	100 mm thick flexible wall	110
A.3.4.2	Lining wall	112
A.3.4.2.1	30 mm thick lining wall	112
A.3.4.2.2	50 mm thick lining wall	113
A.3.4.3	Rigid wall	114
A.3.4.3.1	150 mm thick rigid wall	114
A.3.4.4	Rigid floor	115
A.3.4.4.1	150 mm thick rigid floor	115

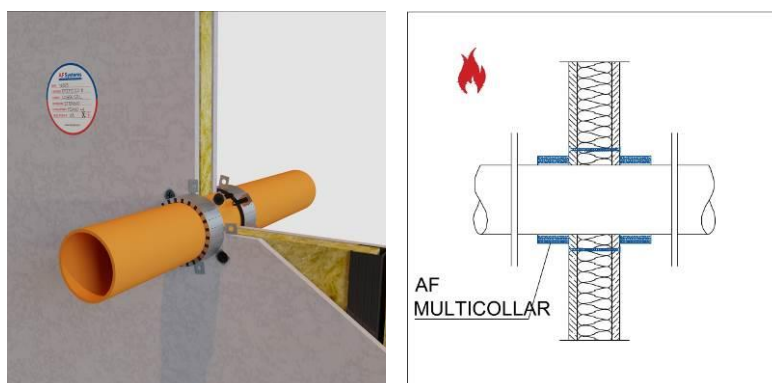
A.4	Cables	116
A.4.1	Cable bundles through the constructive element	116
A.4.1.1	Flexible wall	116
A.4.1.1.1	80 mm thick flexible wall	116
A.4.1.1.2	100 mm thick flexible wall	117
A.4.1.1.3	125 mm thick flexible wall	119
A.4.1.2	Cross laminated timber (CLT) wall	121
A.4.1.2.1	137 mm thick CLT wall	121
A.4.1.3	Rigid wall	122
A.4.1.3.1	150 mm thick rigid wall	122
A.4.1.4	Rigid floor	124
A.4.1.4.1	150 mm thick rigid floor	124
A.4.1.5	Cross laminated timber (CLT) floor	125
A.4.1.5.1	158 mm thick CLT floor	125
A.4.1.6	False ceiling	126
A.4.1.6.1	50 mm thick false ceiling	126
A.4.2	Cable bundles through AF PANEL	127
A.4.2.1	Flexible wall	127
A.4.2.1.1	80 mm thick flexible wall	127
A.4.2.1.2	100 mm thick flexible wall	128
A.4.2.1.3	120 mm thick flexible wall	129
A.4.2.1.4	125 mm thick flexible wall	131
A.4.2.2	Lining wall	133
A.4.2.2.1	30 mm thick lining wall	133
A.4.2.2.2	50 mm thick lining wall	134
A.4.2.3	Cross laminated timber (CLT) wall	135
A.4.2.3.1	137 mm thick CLT wall	135
A.4.2.4	Rigid wall	136
A.4.2.4.1	150 mm thick rigid wall	136
A.4.2.5	Rigid floor	138
A.4.2.5.1	150 mm thick rigid floor	138
A.4.2.6	Cross laminated timber (CLT) floor	139
A.4.2.6.1	158 mm thick CLT floor	139

A.1 Plastic pipes

A.1.1 Standard plastic pipes through the constructive element

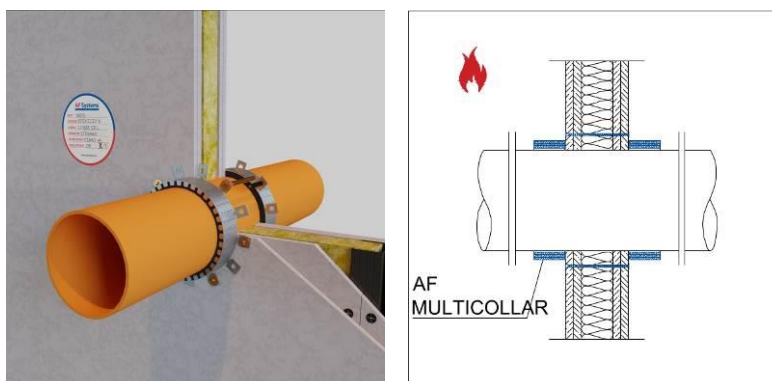
A.1.1.1 Flexible wall

A.1.1.1.1 80 mm thick flexible wall



Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	4,2 – 15,1	EI 60 U/C
	$110 < \varnothing \leq 160$	4,2 – 6,2	EI 60 U/C
PP	≤ 110	2,7 – 18,3	EI 60 U/C
	$110 < \varnothing \leq 160$	2,7 – 3,9	EI 60 U/C
PVC	≤ 110	2,7 – 8,1	EI 60 U/C
	$110 < \varnothing \leq 160$	2,7 – 3,2	EI 60 U/C
PPR	≤ 110	15,1	EI 60 U/C

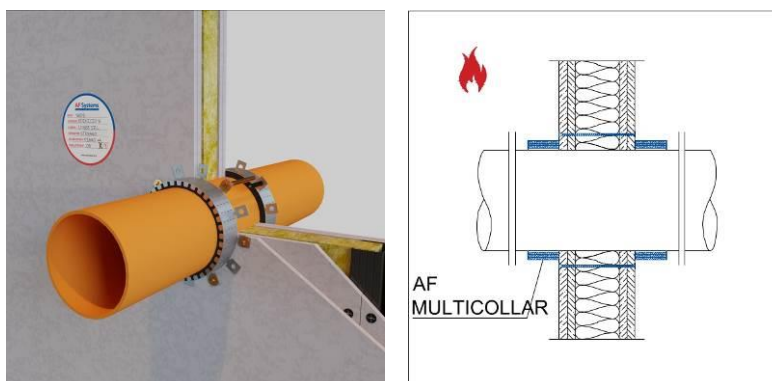
A.1.1.1.2 100 mm thick flexible wall

Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	4,2 – 12,3	EI 120 U/C
	$110 < \varnothing \leq 160$	6,2 – 16,0	EI 120 U/C
	$160 < \varnothing \leq 250$	7,7 – 22,7	EI 120 U/C
PP	≤ 110	2,7 – 15,1	EI 120 U/C
		4,2	EI 120 U/U
	$110 < \varnothing \leq 160$	3,9 – 14,6	EI 120 U/C
	$160 < \varnothing \leq 250$	7,7 – 16	EI 120 U/C
PVC	≤ 110	3,2 – 8,1	EI 120 U/C
		6,6	EI 120 U/U
	$110 < \varnothing \leq 160$	3,2 – 9,5	EI 120 U/C
	$160 < \varnothing \leq 250$	6,2 – 18,4	EI 120 U/C
	$250 < \varnothing \leq 315$	23,2	EI 120 U/C
PPR	≤ 110	15,1	EI 120 U/C

Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	9,3	EI 120 U/C
	$110 < \varnothing \leq 160$	6,2	EI 120 U/C
PP	≤ 110	2,7	EI 120 U/C
	$110 < \varnothing \leq 160$	3,9	EI 120 U/C
PVC	≤ 110	3,2 – 8,1	EI 120 U/C

A.1.1.1.3 120 mm thick flexible wall

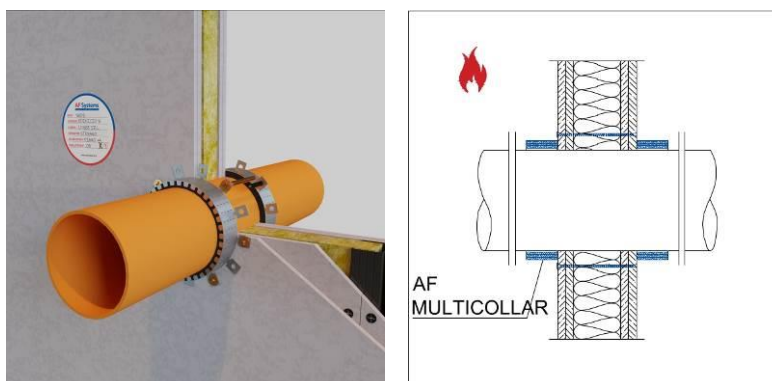
Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	3,0 – 12,3	EI 120 U/U
	$110 < \varnothing \leq 160$	6,2 – 16,0	EI 120 U/C
	$160 < \varnothing \leq 250$	7,7 – 22,7	EI 120 U/C
PP	≤ 110	2,7 – 15,1	EI 120 U/U
	$110 < \varnothing \leq 160$	3,9 – 14,6	EI 120 U/C
	$160 < \varnothing \leq 250$	7,7 – 16,0	EI 120 U/C
PVC	≤ 110	3,2 – 8,1	EI 120 U/U
	$110 < \varnothing \leq 160$	3,2 – 9,5	EI 120 U/U
	$160 < \varnothing \leq 250$	6,2 – 18,4	EI 120 U/C
	$250 < \varnothing \leq 315$	23,2	EI 120 U/C
PPR	≤ 110	15,1	EI 120 U/C

Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 50	3,0	EI 120 U/C
	≤ 110	9,3	EI 120 U/C
	$110 < \varnothing \leq 160$	6,2	EI 120 U/U ⁷
PP	≤ 110	2,7	EI 120 U/U
	$110 < \varnothing \leq 160$	3,9	EI 120 U/C
PVC	≤ 110	3,2 – 8,1	EI 120 U/C
		3,2	EI 120 U/U

⁷ Two adjacent AF MULTICOLLAR are installed (see figure B.1) for a total length (H) of the intumescent inlay of 100 mm, with 6 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 24 mm.

A.1.1.1.4 125 mm thick flexible wall

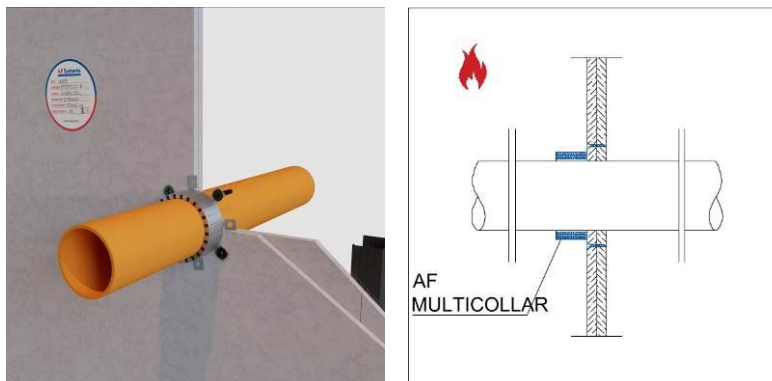
Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	3,0 – 12,3	EI 120 U/U
	$110 < \varnothing \leq 160$	6,2 – 16,0	EI 120 U/C
	$160 < \varnothing \leq 250$	7,7 – 22,7	EI 120 U/C
PP	≤ 110	2,7 – 15,1	EI 120 U/U
	$110 < \varnothing \leq 160$	3,9 – 14,6	EI 120 U/C
	$160 < \varnothing \leq 250$	7,7 – 16,0	EI 120 U/C
PVC	≤ 110	3,2 – 8,1	EI 120 U/U
	$110 < \varnothing \leq 160$	3,2 – 9,5	EI 120 U/U
	$160 < \varnothing \leq 250$	6,2 – 18,4	EI 120 U/C
	$250 < \varnothing \leq 315$	23,2	EI 120 U/C
PPR	≤ 110	15,1	EI 120 U/C

Collar at the fire exposed side only

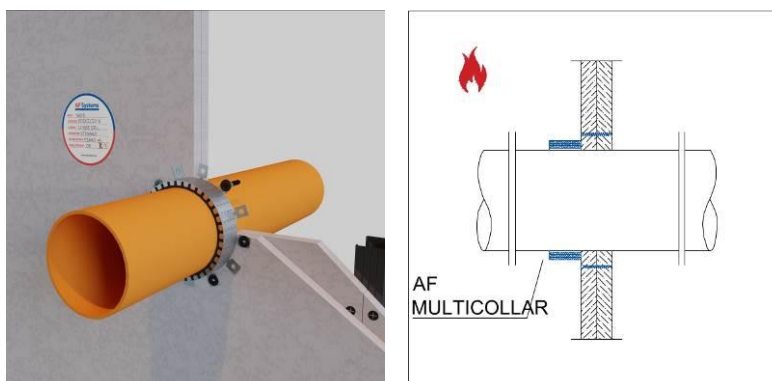
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 50	3,0	EI 120 U/C
	≤ 110	9,3 – 10,5	EI 120 U/C
	$110 < \varnothing \leq 160$	6,2	EI 120 U/U ⁸
		6,2 – 16,0	EI 120 U/C
PP	≤ 110	2,7	EI 120 U/C
	$110 < \varnothing \leq 160$	4,0	EI 120 U/C
PVC	≤ 63	3,0 – 8,1	EI 120 U/C
	≤ 110	8,1	EI 120 U/C

⁸ Two adjacent AF MULTICOLLAR are installed (see figure B.1) for a total length (H) of the intumescent inlay of 100 mm, with 6 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 24 mm.

A.1.1.2 Lining wall**A.1.1.2.1 30 mm thick lining wall**

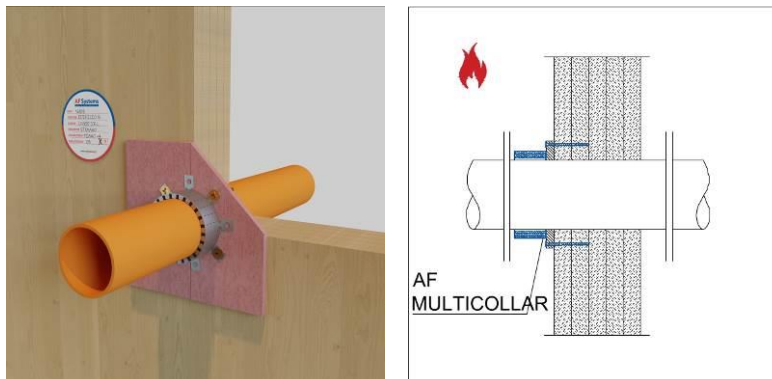
Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	12,3	EI 60 U/C
PP	≤ 110	12,3	EI 60 U/C
PVC	≤ 110	8,1	EI 60 U/C
	$110 < \varnothing \leq 160$	9,5	EI 60 U/C
PPR	≤ 110	15,1	EI 60 U/C

A.1.1.2.2 50 mm thick lining wall

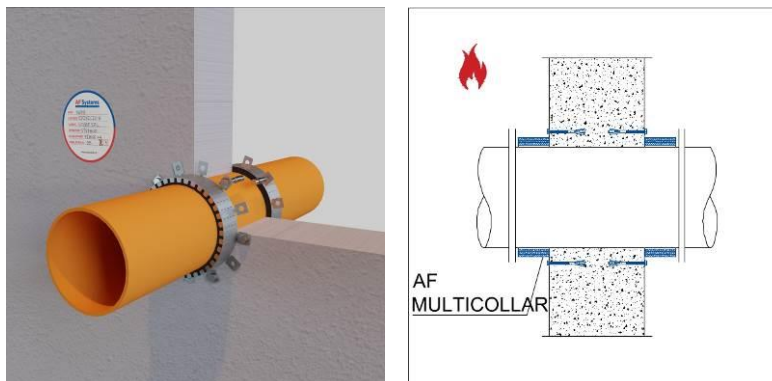
Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	12,3	EI 60 U/C
PP	≤ 110	12,3	EI 60 U/C
PVC	≤ 110	8,1	EI 120 U/C
	$110 < \varnothing \leq 160$	11,8	EI 120 U/C
PPR	≤ 110	15,1	EI 60 U/C

A.1.1.3 Cross laminated timber (CLT) wall**A.1.1.3.1 137 mm thick CLT wall**

Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	3,0 – 4,2	EI 120 U/C
PP	≤ 110	2,7 – 3,4	EI 120 U/C
PVC	≤ 110	3,2 – 8,1	EI 120 U/C

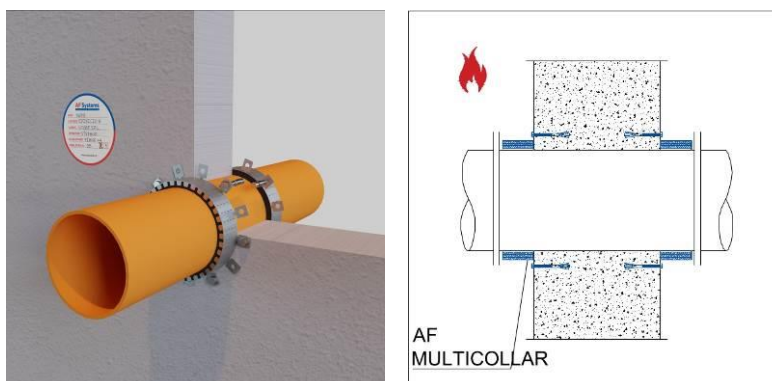
A.1.1.4 Rigid wall**A.1.1.4.1 150 mm thick rigid wall**

Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	4,2 – 12,3	EI 180 U/C
	$110 < \varnothing \leq 160$	6,2 – 16,0	EI 180 U/C
PP	≤ 110	2,7 – 16,1	EI 180 U/C
	$110 < \varnothing \leq 160$	3,9 – 14,6	EI 180 U/C
PVC	≤ 110	3,2 – 8,1	EI 180 U/C
	$110 < \varnothing \leq 160$	3,2 – 11,0	EI 180 U/C

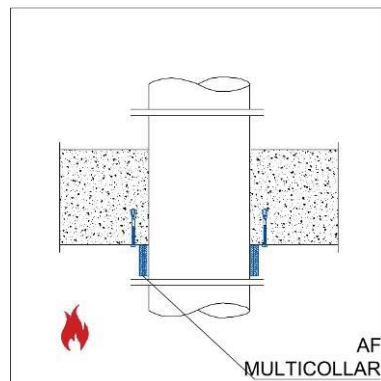
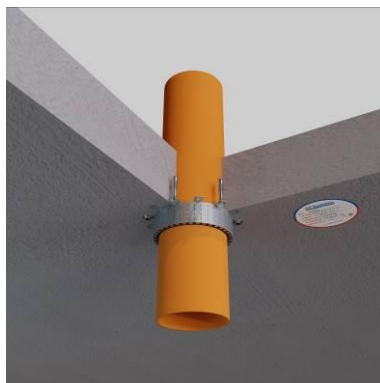
Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
PP	≤ 110	3,0	EI 120 U/U

A.1.1.4.2 200 mm thick rigid wall

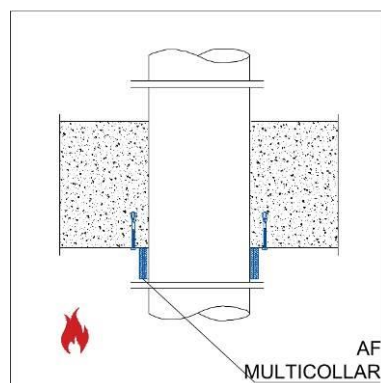
Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	2,7 – 4,2	EI 240 U/C
	$110 < \varnothing \leq 160$	14,6	EI 240 U/C
PP	≤ 110	2,7 – 15,1	EI 240 U/C
	$110 < \varnothing \leq 160$	14,6	EI 240 U/C
PVC	≤ 110	2,7 – 8,1	EI 240 U/C
	$110 < \varnothing \leq 160$	2,7 – 11,8	EI 240 U/C
PPR	≤ 110	14,9	EI 240 U/C

A.1.1.5 Rigid floor**A.1.1.5.1 150 mm thick rigid floor**

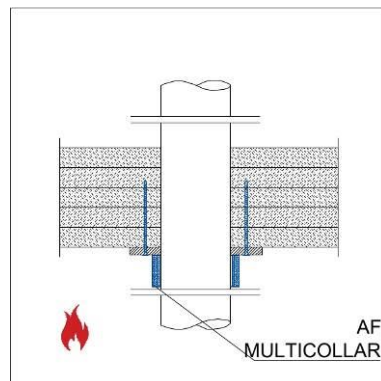
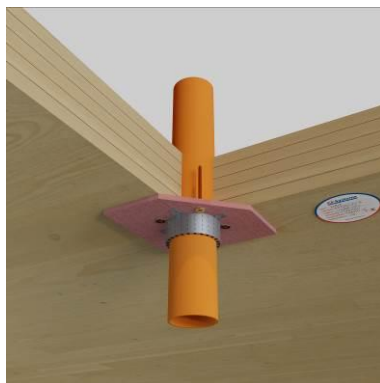
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	4,2 – 15,1	EI 180 U/U
	$110 < \varnothing \leq 160$	6,2 – 21,9	EI 180 U/C
	$160 < \varnothing \leq 250$	7,7 – 22,7	EI 180 U/C
PP	≤ 110	2,7	EI 180 U/U
		2,7 – 7,2	EI 180 U/C
		2,7 – 15,1	EI 120 U/U
	$110 < \varnothing \leq 160$	3,9 – 14,6	EI 180 U/C
	$160 < \varnothing \leq 250$	8,8 – 22,7	EI 180 U/C
PVC	≤ 110	3,2 – 8,1	EI 180 U/U
	$110 < \varnothing \leq 160$	3,2	EI 180 U/U ⁹
		3,2 – 11,8	EI 180 U/C
	$160 < \varnothing \leq 250$	6,2 – 18,4	EI 180 U/C
	$250 < \varnothing \leq 315$	23,2	EI 180 U/C

⁹ Two adjacent AF MULTICOLLAR are installed (see figure B.1) for a total length (H) of the intumescent inlay of 100 mm, with 5 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 20 mm.

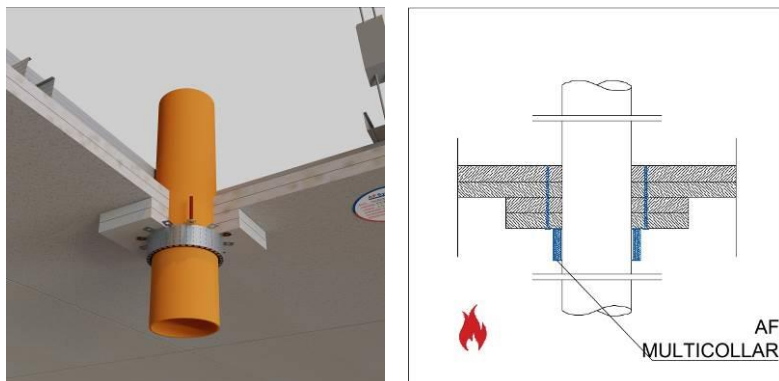
A.1.1.5.2 200 mm thick rigid floor

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	2,7 – 15,1	EI 240 U/C
		4,2 – 15,1	EI 180 U/U
	$110 < \varnothing \leq 160$	6,2 – 21,9	EI 180 U/C
	$160 < \varnothing \leq 250$	7,7 – 22,7	EI 180 U/C
PP	≤ 110	2,7 – 15,1	EI 240 U/C
		2,7	EI 180 U/U
	$110 < \varnothing \leq 160$	3,9 – 14,6	EI 180 U/C
	$160 < \varnothing \leq 250$	8,8 – 22,7	EI 180 U/C
PVC	≤ 110	2,7 – 8,1	EI 240 U/C
		3,2 – 8,1	EI 180 U/U
	$110 < \varnothing \leq 160$	2,7 – 11,8	EI 240 U/C
		3,2	EI 180 U/U ¹⁰
	$160 < \varnothing \leq 250$	6,2 – 18,4	EI 180 U/C
	$250 < \varnothing \leq 315$	23,2	EI 180 U/C

¹⁰ Two adjacent AF MULTICOLLAR are installed (see figure B.1) for a total length (H) of the intumescent inlay of 100 mm, with 5 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 20 mm.

A.1.1.6 Cross laminated timber (CLT) floor**A.1.1.6.1 158 mm thick CLT floor**

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	3,0 – 4,2	EI 120 U/C
PP	≤ 110	2,7 – 3,4	EI 120 U/C
PVC	≤ 110	3,2 – 6,6	EI 120 U/C

A.1.1.7 False ceiling**A.1.1.7.1 50 mm thick false ceiling**

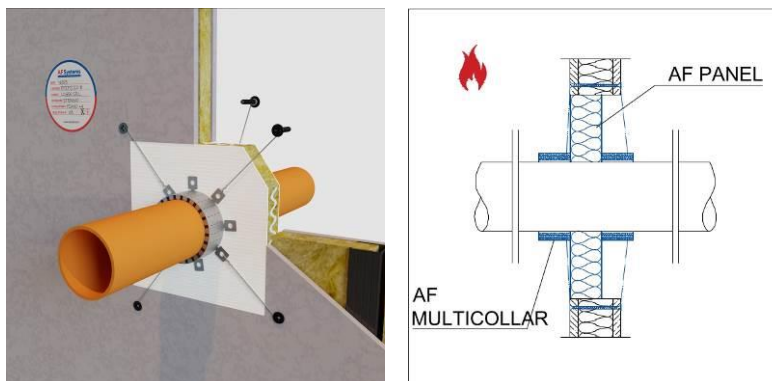
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	4,2 – 12,3	EI 120 U/C
	$110 < \varnothing \leq 250$	18,4	EI 120 U/C ¹¹
PP	≤ 110	2,7 – 18,2	EI 120 U/C
PVC	≤ 110	3,2 – 8,1	EI 120 U/C

¹¹ In the whole range of pipe diameter from 110 mm to 250 mm, two adjacent AF MULTICOLLAR are installed (see figure B.1) for a total length (H) of the intumescent inlay of 100 mm, with 5 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 20 mm.

A.1.2 Standard plastic pipes through AF PANEL

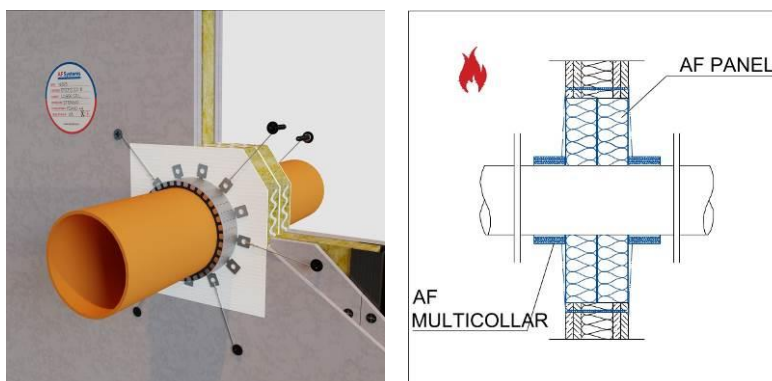
A.1.2.1 Flexible wall

A.1.2.1.1 80 mm thick flexible wall



Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	4,2 – 15,1	EI 60 U/C
	$110 < \varnothing \leq 160$	4,2 – 6,2	EI 60 U/C
PP	≤ 110	2,7 – 18,3	EI 60 U/C
	$110 < \varnothing \leq 160$	2,7 – 3,9	EI 60 U/C
PVC	≤ 110	2,7 – 8,1	EI 60 U/C
	$110 < \varnothing \leq 160$	2,7 – 3,2	EI 60 U/C
PPR	≤ 110	15,1	EI 60 U/C

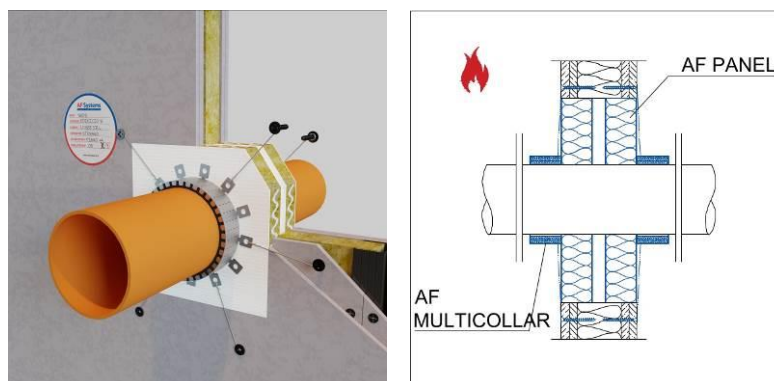
A.1.2.1.2 100 mm thick flexible wall

Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	4,2 – 12,3	EI 120 U/C
	$110 < \varnothing \leq 160$	6,2 – 16,0	EI 120 U/C
	$160 < \varnothing \leq 250$	7,7 – 22,7	EI 120 U/C
PP	≤ 110	2,7 – 15,1	EI 120 U/C
		4,2	EI 120 U/U
	$110 < \varnothing \leq 160$	3,9 – 14,6	EI 120 U/C
	$160 < \varnothing \leq 250$	7,7 – 16	EI 120 U/C
PVC	≤ 110	3,2 – 8,1	EI 120 U/C
		6,6	EI 120 U/U
	$110 < \varnothing \leq 160$	3,2 – 9,5	EI 120 U/C
	$160 < \varnothing \leq 250$	6,2 – 18,4	EI 120 U/C
	$250 < \varnothing \leq 315$	23,2	EI 120 U/C
PPR	≤ 110	15,1	EI 120 U/C

Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	9,3	EI 120 U/C
	$110 < \varnothing \leq 160$	6,2	EI 120 U/C
PP	≤ 110	2,7	EI 120 U/C
	$110 < \varnothing \leq 160$	3,9	EI 120 U/C
PVC	≤ 110	3,2 – 8,1	EI 120 U/C

A.1.2.1.3 120 mm thick flexible wall

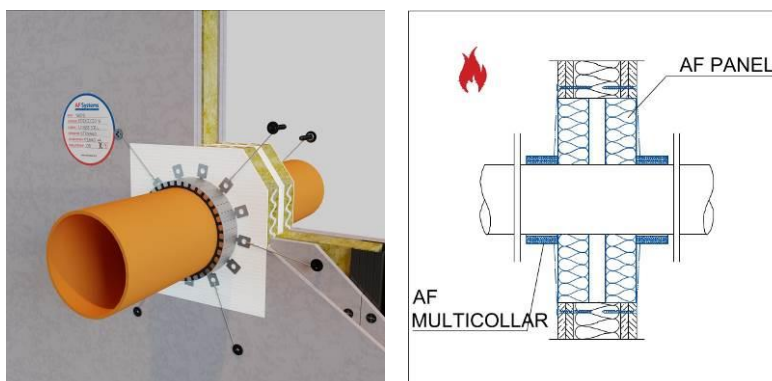
Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	3,0 – 12,3	EI 120 U/U
	$110 < \varnothing \leq 160$	6,2 – 16,0	EI 120 U/C
	$160 < \varnothing \leq 250$	7,7 – 22,7	EI 120 U/C
PP	≤ 110	2,7 – 15,1	EI 120 U/U
	$110 < \varnothing \leq 160$	3,9 – 14,6	EI 120 U/C
	$160 < \varnothing \leq 250$	7,7 – 16,0	EI 120 U/C
PVC	≤ 110	3,2 – 8,1	EI 120 U/U
	$110 < \varnothing \leq 160$	3,2 – 9,5	EI 120 U/U
	$160 < \varnothing \leq 250$	6,2 – 18,4	EI 120 U/C
	$250 < \varnothing \leq 315$	23,2	EI 120 U/C
PPR	≤ 110	15,1	EI 120 U/C

Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 50	3,0	EI 120 U/C
	≤ 110	9,3	EI 120 U/C
	$110 < \varnothing \leq 160$	6,2	EI 120 U/U ¹²
PP	≤ 110	2,7	EI 120 U/U
	$110 < \varnothing \leq 160$	3,9	EI 120 U/C
PVC	≤ 110	3,2 – 8,1	EI 120 U/C
		3,2	EI 120 U/U

¹² Two adjacent AF MULTICOLLAR are installed (see figure B.1) for a total length (H) of the intumescent inlay of 100 mm, with 6 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 24 mm.

A.1.2.1.4 125 mm thick flexible wall

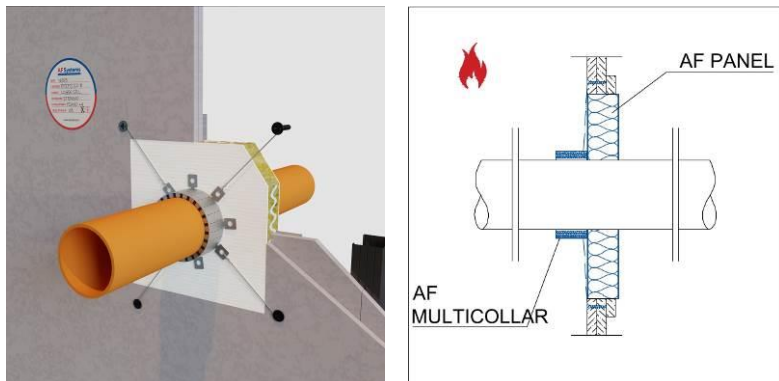
Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	3,0 – 12,3	EI 120 U/U
	$110 < \varnothing \leq 160$	6,2 – 16,0	EI 120 U/C
	$160 < \varnothing \leq 250$	7,7 – 22,7	EI 120 U/C
PP	≤ 110	2,7 – 15,1	EI 120 U/U
	$110 < \varnothing \leq 160$	3,9 – 14,6	EI 120 U/C
	$160 < \varnothing \leq 250$	7,7 – 16,0	EI 120 U/C
PVC	≤ 110	3,2 – 8,1	EI 120 U/U
	$110 < \varnothing \leq 160$	3,2 – 9,5	EI 120 U/U
	$160 < \varnothing \leq 250$	6,2 – 18,4	EI 120 U/C
	$250 < \varnothing \leq 315$	23,2	EI 120 U/C
PPR	≤ 110	15,1	EI 120 U/C

Collar at the fire exposed side only

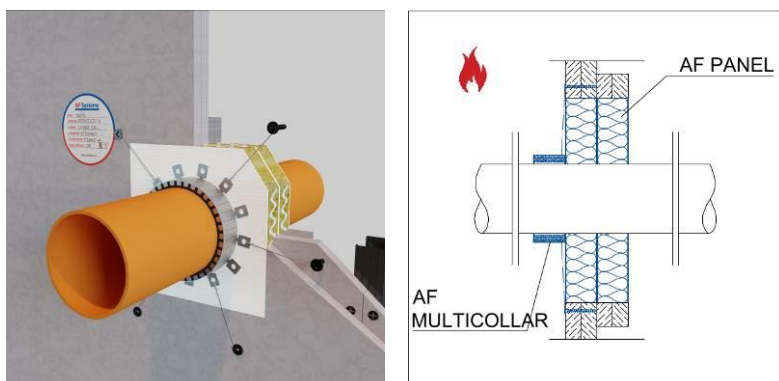
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 50	3,0	EI 120 U/C
	≤ 110	9,3 – 10,5	EI 120 U/C
	$110 < \varnothing \leq 160$	6,2	EI 120 U/U ¹³
		6,2 – 16,0	EI 120 U/C
PP	≤ 110	2,7	EI 120 U/C
	$110 < \varnothing \leq 160$	4,0	EI 120 U/C
PVC	≤ 63	3,0 – 8,1	EI 120 U/C
	≤ 110	8,1	EI 120 U/C

¹³ Two adjacent AF MULTICOLLAR are installed (see figure B.1) for a total length (H) of the intumescent inlay of 100 mm, with 6 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 24 mm.

A.1.2.2 Lining wall**A.1.2.2.1 30 mm thick lining wall**

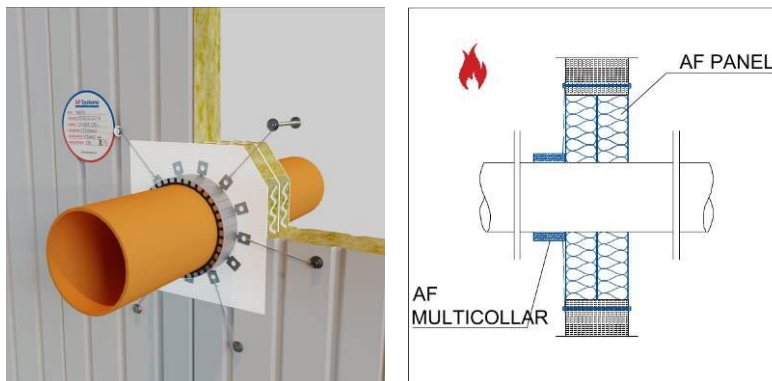
Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	12,3	EI 60 U/C
PP	≤ 110	12,3	EI 60 U/C
PVC	≤ 110	8,1	EI 60 U/C
	$110 < \varnothing \leq 160$	9,5	EI 60 U/C
PPR	≤ 110	15,1	EI 60 U/C

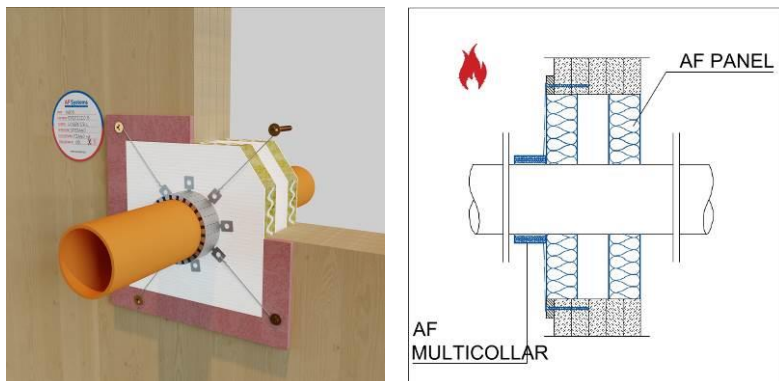
A.1.2.2.2 50 mm thick lining wall

Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	12,3	EI 60 U/C
PP	≤ 110	12,3	EI 60 U/C
PVC	≤ 110	8,1	EI 120 U/C
	$110 < \varnothing \leq 160$	11,8	EI 120 U/C
PPR	≤ 110	15,1	EI 60 U/C

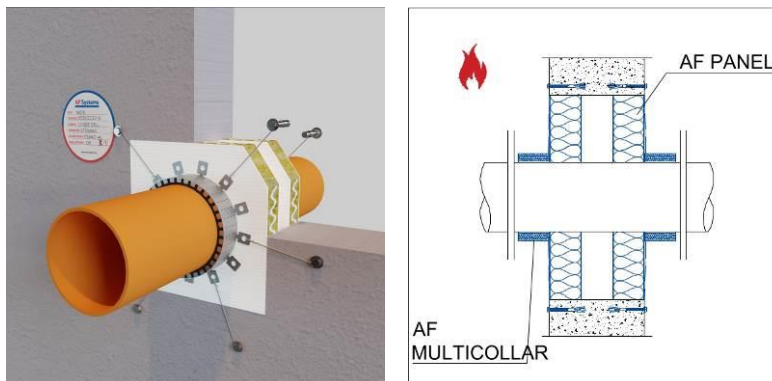
A.1.2.3 Sandwich panel wall**A.1.2.3.1 100 mm thick sandwich panel wall**

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
PVC	≤ 110	8,1	EI 120 U/C

A.1.2.4 Cross laminated timber (CLT) wall**A.1.2.4.1 137 mm thick CLT wall**

Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	3,0 – 4,2	EI 120 U/C
PP	≤ 110	2,7 – 3,4	EI 120 U/C
PVC	≤ 110	3,2 – 8,1	EI 120 U/C

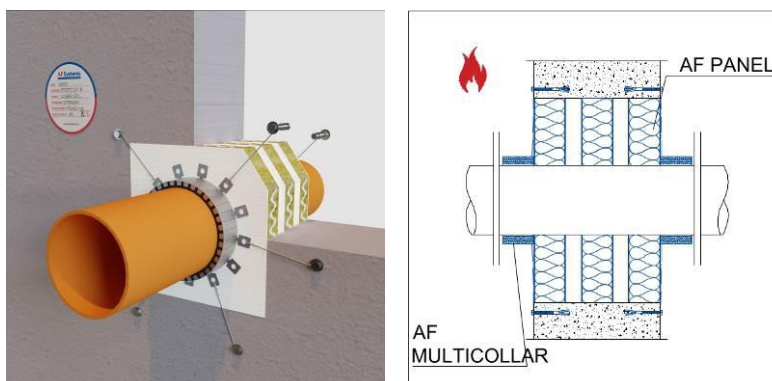
A.1.2.5 Rigid wall**A.1.2.5.1 150 mm thick rigid wall**

Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	4,2 – 12,3	EI 180 U/C
	$110 < \varnothing \leq 160$	6,2 – 16,0	EI 180 U/C
PP	≤ 110	2,7 – 16,1	EI 180 U/C
	$110 < \varnothing \leq 160$	3,9 – 14,6	EI 180 U/C
PVC	≤ 110	3,2 – 8,1	EI 180 U/C
	$110 < \varnothing \leq 160$	3,2 – 11,0	EI 180 U/C

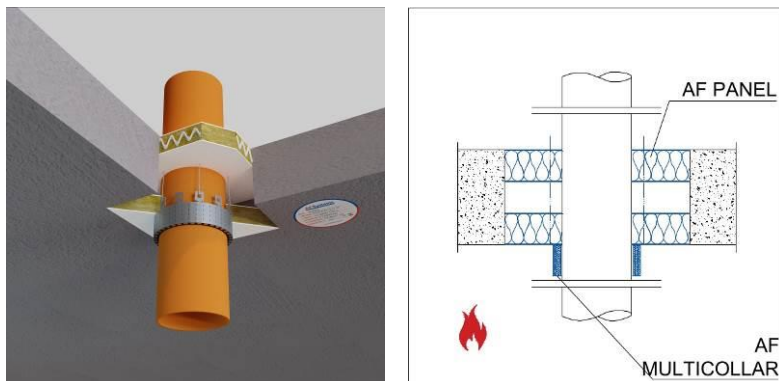
Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
PP	≤ 110	3,0	EI 120 U/U

A.1.2.5.2 200 mm thick rigid wall

Collar at both sides of the wall

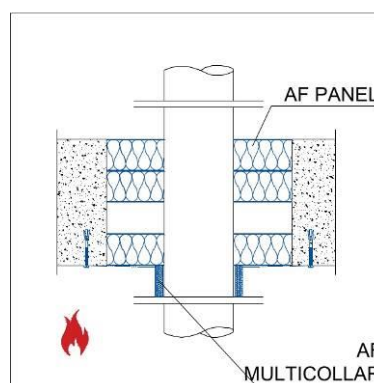
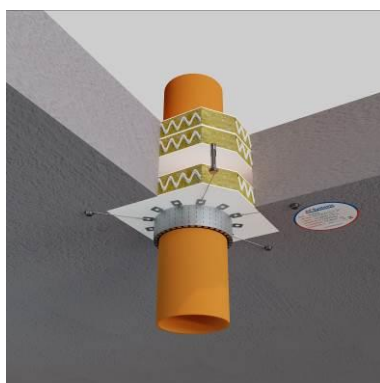
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	2,7 – 4,2	EI 240 U/C
	$110 < \varnothing \leq 160$	14,6	EI 240 U/C
PP	≤ 110	2,7 – 15,1	EI 240 U/C
	$110 < \varnothing \leq 160$	14,6	EI 240 U/C
PVC	≤ 110	2,7 – 8,1	EI 240 U/C
	$110 < \varnothing \leq 160$	2,7 – 11,8	EI 240 U/C
PPR	≤ 110	14,9	EI 240 U/C

A.1.2.6 Rigid floor**A.1.2.6.1 150 mm thick rigid floor**

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	4,2 – 15,1	EI 180 U/U
	$110 < \varnothing \leq 160$	6,2 – 21,9	EI 180 U/C
	$160 < \varnothing \leq 250$	7,7 – 22,7	EI 180 U/C
PP	≤ 110	2,7	EI 180 U/U
		2,7 – 7,2	EI 180 U/C
		2,7 – 15,1	EI 120 U/U
	$110 < \varnothing \leq 160$	3,9 – 14,6	EI 180 U/C
	$160 < \varnothing \leq 250$	8,8 – 22,7	EI 180 U/C
PVC	≤ 110	3,2 – 8,1	EI 180 U/U
	≤ 110	4,2	EI 90 U/C ¹⁴
	$110 < \varnothing \leq 160$	3,2	EI 180 U/U ¹⁵
		3,2 – 11,8	EI 180 U/C
	$160 < \varnothing \leq 250$	6,2 – 18,4	EI 180 U/C
	$250 < \varnothing \leq 315$	23,2	EI 180 U/C

¹⁴ AF MULTICOLLAR can be fixed to AF PANEL with 4 steel spiral pigtail screws in accordance with section B.4.2. AF PANEL closing solution according to section B.3.1 with opening maximum dimensions of 900 mm x 450 mm.

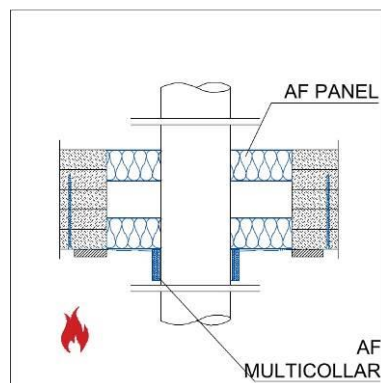
¹⁵ Two adjacent AF MULTICOLLAR are installed (see figure B.1) for a total length (H) of the intumescent inlay of 100 mm, with 5 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 20 mm.

A.1.2.6.2 200 mm thick rigid floor

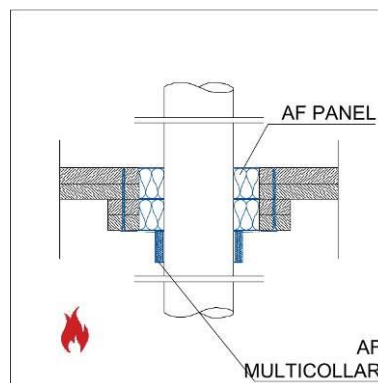
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	2,7 – 15,1	EI 240 U/C
		4,2 – 15,1	EI 180 U/U
	≤ 110	7,5	EI 60 U/C ¹⁶
	$110 < \varnothing \leq 160$	6,2 – 21,9	EI 180 U/C
	$160 < \varnothing \leq 250$	7,7 – 22,7	EI 180 U/C
PP	≤ 110	2,7 – 15,1	EI 240 U/C
		2,7	EI 180 U/U
	≤ 110	13,0	EI 60 U/C ¹⁶
	$110 < \varnothing \leq 160$	3,9 – 14,6	EI 180 U/C
	$160 < \varnothing \leq 250$	8,8 – 22,7	EI 180 U/C
PVC	≤ 110	2,7 – 8,1	EI 240 U/C
		3,2 – 8,1	EI 180 U/U
	≤ 110	6,6	EI 60 U/C ¹⁶
	$110 < \varnothing \leq 160$	2,7 – 11,8	EI 240 U/C
		3,2	EI 180 U/U ¹⁷
	$160 < \varnothing \leq 250$	6,2 – 18,4	EI 180 U/C
	$250 < \varnothing \leq 315$	23,2	EI 180 U/C

¹⁶ AF MULTICOLLAR can be fixed to AF PANEL with 4 steel spiral pigtail screws in accordance with section B.4.2. AF PANEL closing solution according to section B.3.1 with opening maximum dimensions of 450 mm x 300 mm and only one layer of AF PANEL levelled to the surface at the bottom sides of the floor.

¹⁷ Two adjacent AF MULTICOLLAR are installed (see figure B.1) for a total length (H) of the intumescent inlay of 100 mm, with 5 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 20 mm.

A.1.2.7 Cross laminated timber (CLT) floor**A.1.2.7.1 158 mm thick CLT floor**

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	3,0 – 4,2	EI 120 U/C
PP	≤ 110	2,7 – 3,4	EI 120 U/C
PVC	≤ 110	3,2 – 6,6	EI 120 U/C

A.1.2.8 False ceiling**A.1.2.8.1 50 mm thick false ceiling**

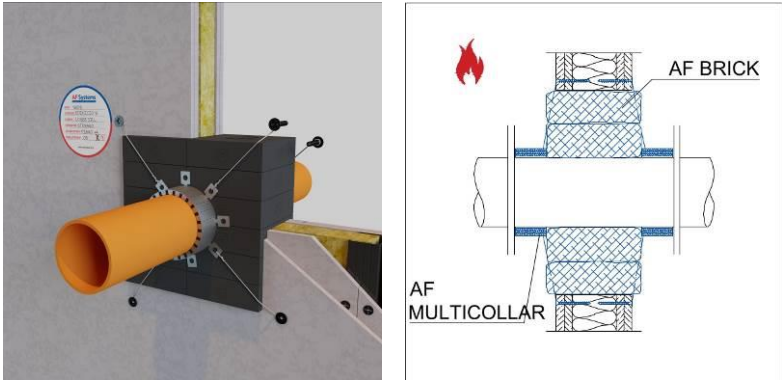
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	4,2 – 12,3	EI 120 U/C
	$110 < \varnothing \leq 250$	18,4	EI 120 U/C ¹⁸
PP	≤ 110	2,7 – 18,2	EI 120 U/C
PVC	≤ 110	3,2 – 8,1	EI 120 U/C

¹⁸ In the whole range of pipe diameter from 110 mm to 250 mm, two adjacent AF MULTICOLLAR are installed (see figure B.1) for a total length (H) of the intumescent inlay of 100 mm, with 5 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 20 mm.

A.1.3 Standard plastic pipes through AF BRICK

A.1.3.1 Flexible wall

A.1.3.1.1 120 mm thick flexible wall

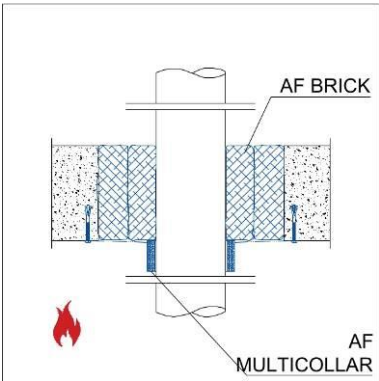
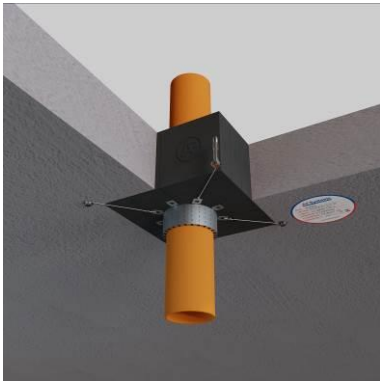


Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
PVC	≤ 110	3,2 – 8,1	EI 120 U/C

A.1.3.2 Rigid floor

A.1.3.2.1 150 mm thick rigid floor

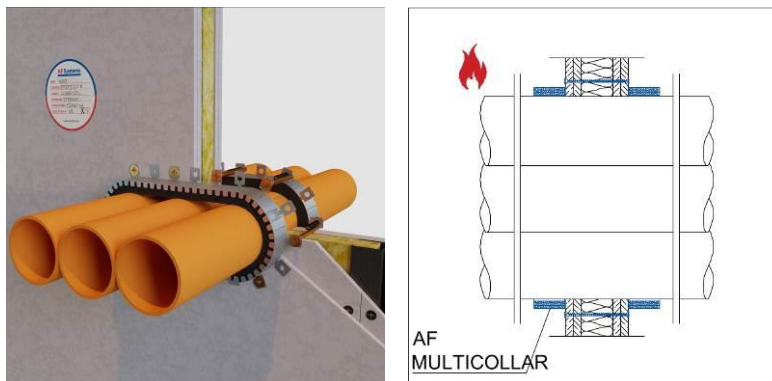


Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
PVC	≤ 110	3,2 – 8,1	EI 180 U/C

A.1.4 Standard plastic pipes in series through the constructive element

A.1.4.1 Flexible wall

A.1.4.1.1 100 mm thick flexible wall



Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	9,3	EI 120 U/C
PP	≤ 110	2,7	EI 120 U/C
PVC	≤ 110	3,2	EI 120 U/C

Installation notes:

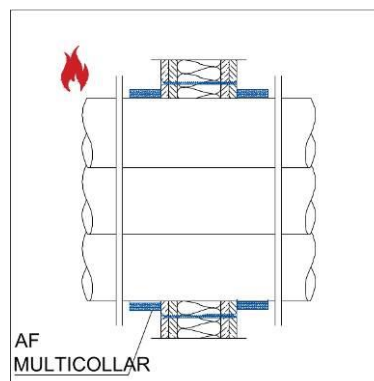
AF MULTICOLLAR is installed with a length (H) of the intumescent inlay of 50 mm and with 5 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 20 mm. AF MULTICOLLAR is installed closely fitted around the pipes.

The pipes shall be aligned adjacent to each other (no gap between services), and the pipe material can be any of the above table.

The maximum number of pipes is 3 for the maximum dimensions as given in the table above.

The number of pipes according to the table above can be reduced provided that the collar is closely fitted around the pipes.

When pipes of smaller diameter according to the table above are installed, the number of pipes can be increased provided that the collar is closely fitted around the pipes, which shall be aligned adjacent to each other (no gap between services), the overall dimensions of the opening are maximum 330 mm x 110 mm, and the total amount of the pipes wall cross-section is maximum 2500 mm².

A.1.4.1.2 120 mm thick flexible wall

Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	9,3	EI 120 U/U
PP	≤ 110	2,7	EI 120 U/U
PVC	≤ 110	3,2	EI 120 U/U

Collar at the fire exposed side only

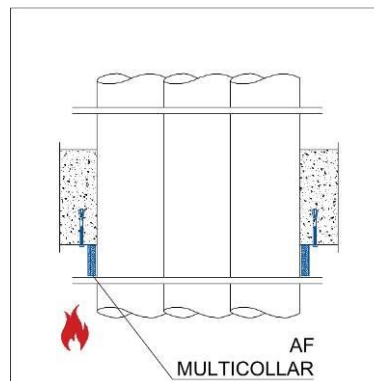
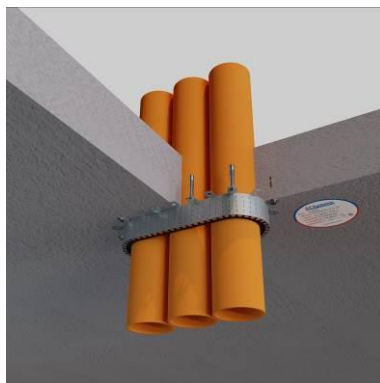
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	9,3	EI 120 U/C
PP	≤ 110	2,7	EI 120 U/C
PVC	≤ 110	3,2	EI 120 U/C

Installation notes:

AF MULTICOLLAR is installed with a length (H) of the intumescent inlay of 50 mm and with 5 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 20 mm. AF MULTICOLLAR is installed closely fitted around the pipes.

The pipes shall be aligned adjacent to each other (no gap between services), and the pipe material can be any of the above table. The maximum number of pipes is 3 for the maximum dimensions as given in the table above. The number of pipes according to the table above can be reduced provided that the collar is closely fitted around the pipes.

When pipes of smaller diameter according to the table above are installed, the number of pipes can be increased provided that the collar is closely fitted around the pipes, which shall be aligned adjacent to each other (no gap between services), the overall dimensions of the opening are maximum 330 mm x 110 mm, and the total amount of the pipes wall cross-section is maximum 2500 mm².

A.1.4.2 Rigid floor**A.1.4.2.1 150 mm thick rigid floor**

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	10,0	EI 180 U/C
PP	≤ 110	7,2	EI 180 U/C
PVC	≤ 110	3,2	EI 180 U/C

Installation notes:

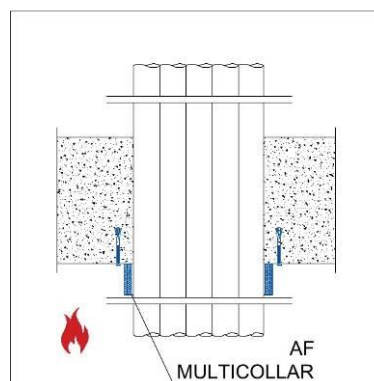
AF MULTICOLLAR is installed with a length (H) of the intumescent inlay of 50 mm and with 5 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 20 mm. AF MULTICOLLAR is installed closely fitted around the pipes.

The pipes shall be aligned adjacent to each other (no gap between services), and the pipe material can be any of the above table.

The maximum number of pipes is 3 for the maximum dimensions as given in the table above.

The number of pipes according to the table above can be reduced provided that the collar is closely fitted around the pipes.

When pipes of smaller diameter according to the table above are installed, the number of pipes can be increased provided that the collar is closely fitted around the pipes, which shall be aligned adjacent to each other (no gap between services), the overall dimensions of the opening are maximum 330 mm x 110 mm, and the total amount of the pipes wall cross-section is maximum 3300 mm².

A.1.4.2.2 200 mm thick rigid floor

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 63	2,7 – 5,8	EI 240 U/C
PP	≤ 63	5,8	EI 240 U/C
PVC	≤ 63	2,7 – 5,8	EI 240 U/C

Installation notes:

AF MULTICOLLAR is installed with a length (H) of the intumescent inlay of 50 mm and with 3 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 12 mm. AF MULTICOLLAR is installed closely fitted around the pipes.

The pipes shall be aligned adjacent to each other (no gap between services), and the pipe material can be any of the above table.

The maximum number of pipes is 5 for the maximum dimensions as given in the table above.

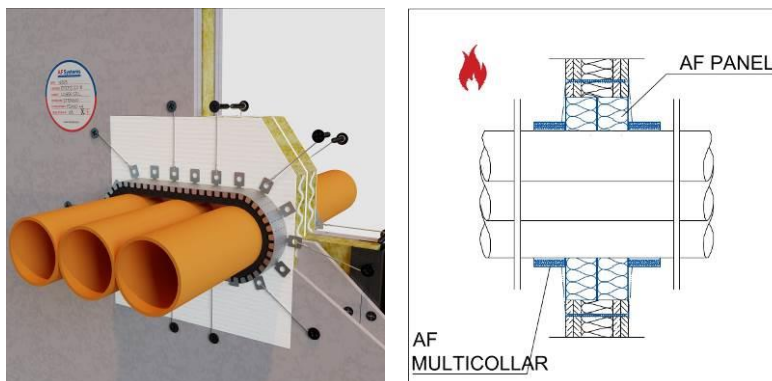
The number of pipes according to the table above can be reduced provided that the collar is closely fitted around the pipes.

When pipes of smaller diameter according to the table above are installed, the number of pipes can be increased provided that the collar is closely fitted around the pipes, which shall be aligned adjacent to each other (no gap between services), the overall dimensions of the opening are maximum 315 mm x 63 mm, and the total amount of the pipes wall cross-section is maximum 2000 mm².

A.1.5 Standard plastic pipes in series through AF PANEL

A.1.5.1 Flexible wall

A.1.5.1.1 100 mm thick flexible wall



Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	9,3	EI 120 U/C
PP	≤ 110	2,7	EI 120 U/C
PVC	≤ 110	3,2	EI 120 U/C

Installation notes:

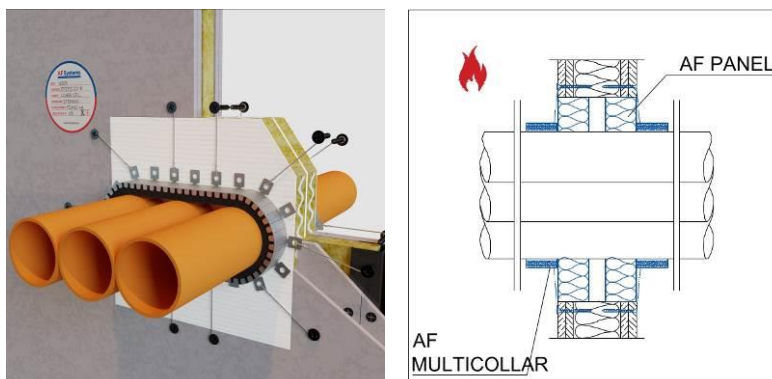
AF MULTICOLLAR is installed with a length (H) of the intumescent inlay of 50 mm and with 5 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 20 mm. AF MULTICOLLAR is installed closely fitted around the pipes.

The pipes shall be aligned adjacent to each other (no gap between services), and the pipe material can be any of the above table.

The maximum number of pipes is 3 for the maximum dimensions as given in the table above.

The number of pipes according to the table above can be reduced provided that the collar is closely fitted around the pipes.

When pipes of smaller diameter according to the table above are installed, the number of pipes can be increased provided that the collar is closely fitted around the pipes, which shall be aligned adjacent to each other (no gap between services), the overall dimensions of the opening are maximum 330 mm x 110 mm, and the total amount of the pipes wall cross-section is maximum 2500 mm².

A.1.5.1.2 120 mm thick flexible wall

Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	9,3	EI 120 U/U
PP	≤ 110	2,7	EI 120 U/U
PVC	≤ 110	3,2	EI 120 U/U

Collar at the fire exposed side only

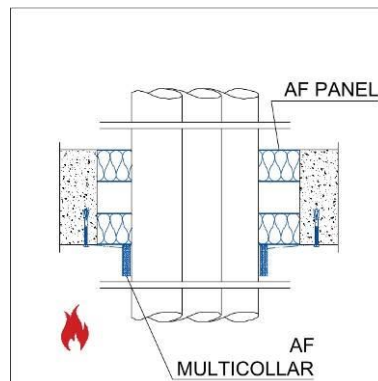
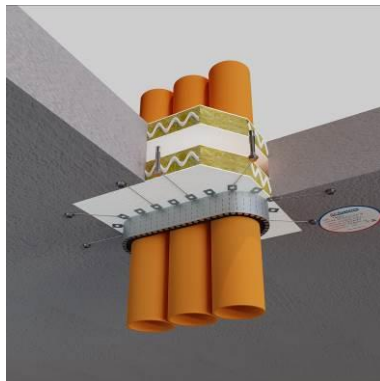
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	9,3	EI 120 U/C
PP	≤ 110	2,7	EI 120 U/C
PVC	≤ 110	3,2	EI 120 U/C

Installation notes:

AF MULTICOLLAR is installed with a length (H) of the intumescent inlay of 50 mm and with 5 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 20 mm. AF MULTICOLLAR is installed closely fitted around the pipes.

The pipes shall be aligned adjacent to each other (no gap between services), and the pipe material can be any of the above table. The maximum number of pipes is 3 for the maximum dimensions as given in the table above. The number of pipes according to the table above can be reduced provided that the collar is closely fitted around the pipes.

When pipes of smaller diameter according to the table above are installed, the number of pipes can be increased provided that the collar is closely fitted around the pipes, which shall be aligned adjacent to each other (no gap between services), the overall dimensions of the opening are maximum 330 mm x 110 mm, and the total amount of the pipes wall cross-section is maximum 2500 mm².

A.1.5.2 Rigid floor**A.1.5.2.1 150 mm thick rigid floor**

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	10,0	EI 180 U/C
PP	≤ 110	7,2	EI 180 U/C
PVC	≤ 110	3,2	EI 180 U/C

Installation notes:

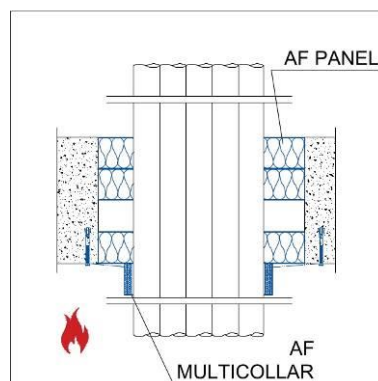
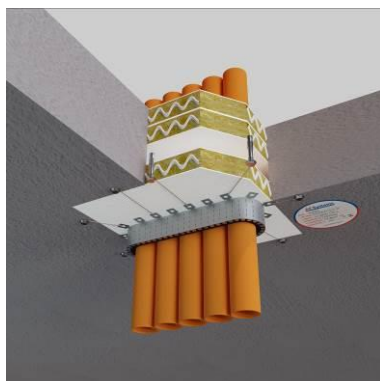
AF MULTICOLLAR is installed with a length (H) of the intumescent inlay of 50 mm and with 5 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 20 mm. AF MULTICOLLAR is installed closely fitted around the pipes.

The pipes shall be aligned adjacent to each other (no gap between services), and the pipe material can be any of the above table.

The maximum number of pipes is 3 for the maximum dimensions as given in the table above.

The number of pipes according to the table above can be reduced provided that the collar is closely fitted around the pipes.

When pipes of smaller diameter according to the table above are installed, the number of pipes can be increased provided that the collar is closely fitted around the pipes, which shall be aligned adjacent to each other (no gap between services), the overall dimensions of the opening are maximum 330 mm x 110 mm, and the total amount of the pipes wall cross-section is maximum 3300 mm².

A.1.5.2.2 200 mm thick rigid floor

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 63	2,7 – 5,8	EI 240 U/C
PP	≤ 63	5,8	EI 240 U/C
PVC	≤ 63	2,7 – 5,8	EI 240 U/C

Installation notes:

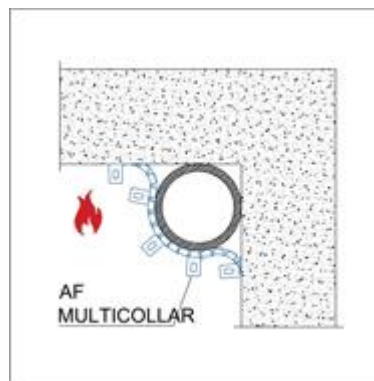
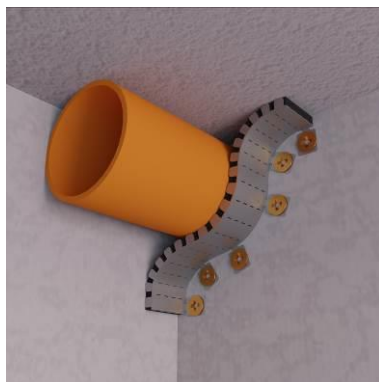
AF MULTICOLLAR is installed with a length (H) of the intumescent inlay of 50 mm and with 3 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 12 mm. AF MULTICOLLAR is installed closely fitted around the pipes.

The pipes shall be aligned adjacent to each other (no gap between services), and the pipe material can be any of the above table.

The maximum number of pipes is 5 for the maximum dimensions as given in the table above.

The number of pipes according to the table above can be reduced provided that the collar is closely fitted around the pipes.

When pipes of smaller diameter according to the table above are installed, the number of pipes can be increased provided that the collar is closely fitted around the pipes, which shall be aligned adjacent to each other (no gap between services), the overall dimensions of the opening are maximum 315 mm x 63 mm, and the total amount of the pipes wall cross-section is maximum 2000 mm².

A.1.6 Standard plastic pipes in corners**A.1.6.1 Flexible wall****A.1.6.1.1 120 mm thick flexible wall**

Collar at the fire exposed side only

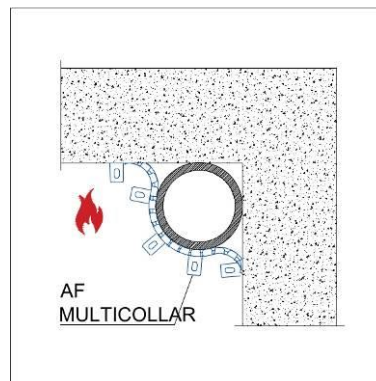
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	9,3	EI 120 U/C

Installation notes:

The pipe shall be in contact with the constructive elements forming the corner (floor and wall), which shall have a minimum density of 550 kg/m³ and a resistance to fire at least as given in the table above.

AF MULTICOLLAR is fixed to the wall in such a position that the inlay strip is in direct contact with the pipe along a minimum angle arch of 120°.

AF MULTICOLLAR is installed to fully close the space with the constructive elements forming the corner (floor and wall). The inlay strip length and the collar housing sheet length are those specified for the standard AF MULTICOLLAR 110.

A.1.6.2 Rigid floor**A.1.6.2.1 150 mm thick rigid floor**

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	8,1	EI 180 U/C

Installation notes:

The pipe shall be in contact with the walls forming the corner, which shall have a minimum density of 550 kg/m³ and a resistance to fire at least as given in the table above.

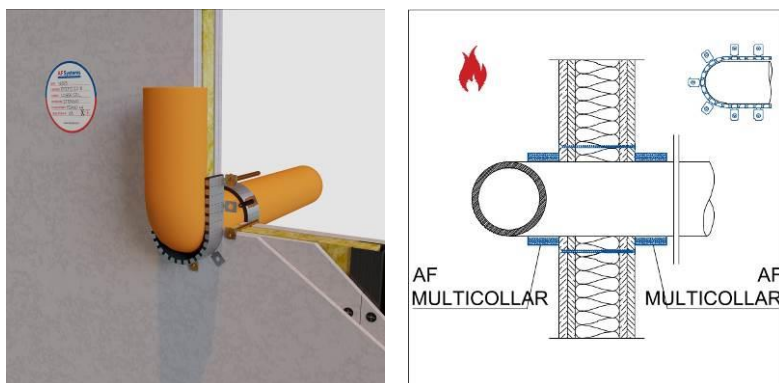
AF MULTICOLLAR is fixed to the floor in such a position that the inlay strip is in direct contact with the pipe along a minimum angle arch of 120°.

AF MULTICOLLAR is installed to fully close the space with the walls forming the corner. The inlay strip length and the collar housing sheet length are those specified for the standard AF MULTICOLLAR 110.

A.1.7 Standard plastic curved pipes

A.1.7.1 Flexible wall

A.1.7.1.1 120 mm thick flexible wall



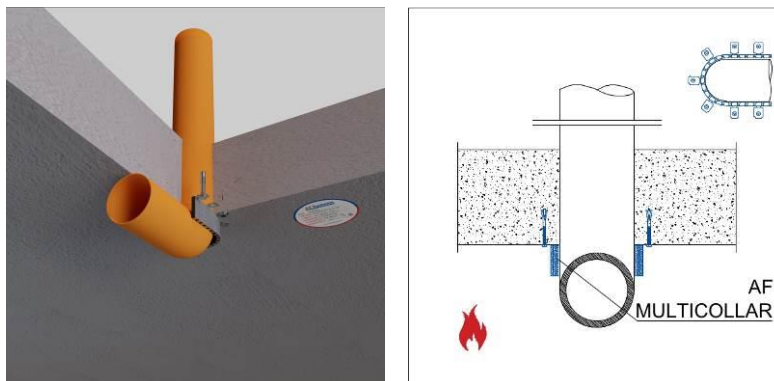
Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
HDPE, PE, ABS, SAN+PVC	≤ 110	4,2 – 15,1	EI 120 U/C
PP	≤ 110	2,7 – 15,1	EI 120 U/C
PVC	≤ 110	3,2 – 8,1	EI 120 U/C
PPR	≤ 110	8,0	EI 120 U/C

Installation notes:

The pipe curves at the fire exposed side, where AF MULTICOLLAR is installed with U shape (open side at the direction of the pipe curve), with a length (H) of the intumescent inlay of 50 mm and with two layers of intumescent strip for a total thickness (b) of the intumescent inlay of 8 mm, fixed to the wall in such a position that the inlay strip is in direct contact with the pipe except at the open side. The inlay strip length and the collar housing sheet length are those specified for the standard AF MULTICOLLAR 110.

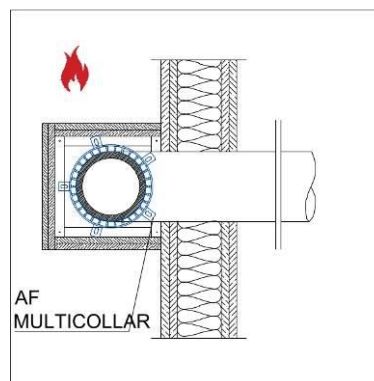
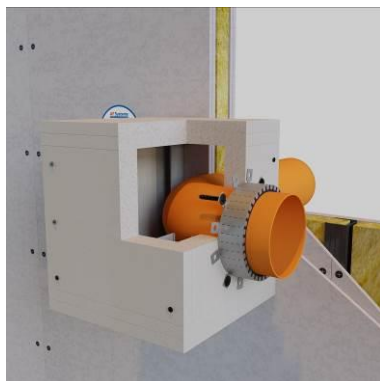
At the cold side, AF MULTICOLLAR is installed following the standard procedure described in section B.4.1.

A.1.7.2 Rigid floor**A.1.7.2.1 150 mm thick rigid floor**

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
PVC	≤ 110	3,2 – 8,1	EI 180 U/C

Installation notes:

The pipe curves at the bottom side of floor, where AF MULTICOLLAR is installed with U shape (open side at the direction of the pipe curve), with a length (H) of the intumescent inlay of 50 mm and with two layers of intumescent strip for a total thickness (b) of the intumescent inlay of 8 mm, fixed to the floor in such a position that the inlay strip is in direct contact with the pipe except at the open side. The inlay strip length and the collar housing sheet length are those specified for the standard AF MULTICOLLAR 110.

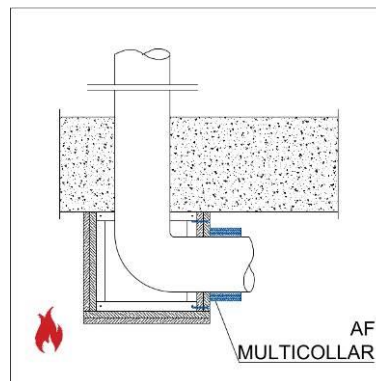
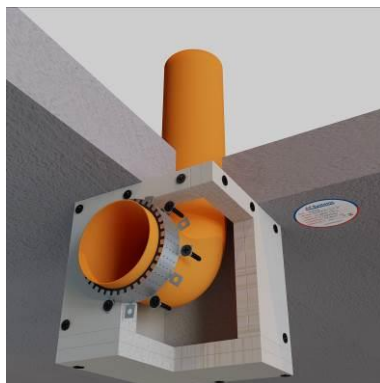
A.1.8 Standard plastic pipes with an intermediate box**A.1.8.1 Flexible wall****A.1.8.1.1 120 mm thick flexible wall**

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
PVC	≤ 110	4,3	EI 120 U/C
	$110 < \varnothing \leq 160$	3,2	EI 120 U/C

Installation notes:

The box shall be installed according to the manufacturer's instructions. The box is made of a double layer of 25 mm thick 'Type F' gypsum plasterboards coated with fiberglass, according to EN 15283-1, which are fixed with steel screws of $\varnothing 3,5$ mm x 55 mm to an internal steel structure made of L-profiles of 30 mm x 30 mm x 1 mm, fixed to the wall with steel screws of $\varnothing 8$ x 120 mm. The gypsum plasterboards fixed to each other with steel screws of $\varnothing 3,5$ mm x 55 mm. The external dimensions of the box are 700 mm (horizontal) x 350 mm (vertical) x 300 mm (depth), and the internal dimensions are 600 mm x 250 mm x 250 mm. The installation of the box shall not cause any adverse effect on the resistance to fire of the wall.

AF MULTICOLLAR is installed at the fire exposed side following the standard procedure described in section B.4.1, at the lateral sides of the box, fixed to the gypsum plasterboards with self-tapping steel screws $\varnothing 6$ mm x 50 mm. No collar is required at the cold side of the wall.

A.1.8.2 Rigid floor**A.1.8.2.1 150 mm thick rigid floor**

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
PVC	≤ 110	3,2	EI 180 U/C
	$110 < \varnothing \leq 160$	4,0	EI 180 U/C

Installation notes:

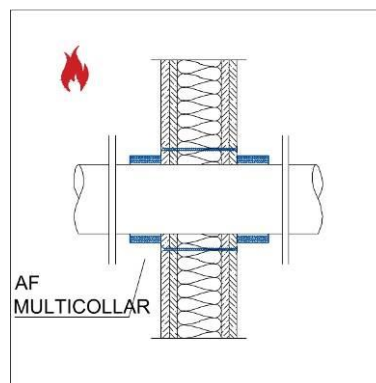
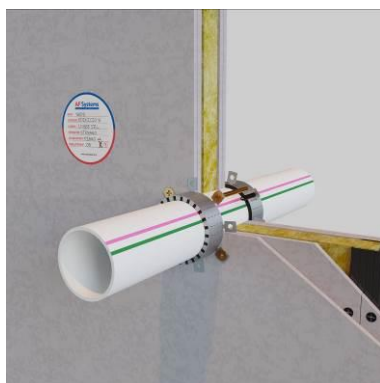
The box shall be installed according to the manufacturer's instructions. The box is made of a double layer of 25 mm thick 'Type F' gypsum plasterboards coated with fiberglass, according to EN 15283-1, which are fixed with steel screws of $\varnothing 3,5$ mm x 55 mm to an internal steel structure made of L-profiles of 30 mm x 30 mm x 1 mm, fixed to the floor with steel anchors of $\varnothing 8$ x 60 mm. The gypsum plasterboards fixed to each other with steel screws of $\varnothing 3,5$ mm x 55 mm. The external dimensions of the box are 600 mm x 350 mm x 350 mm (height), and the internal dimensions are 500 mm x 250 mm x 300 mm. The installation of the box shall not cause any adverse effect on the resistance to fire of the floor.

AF MULTICOLLAR is installed at the fire exposed side following the standard procedure described in section B.4.1, at the lateral sides of the box, fixed to the gypsum plasterboards with self-tapping steel screws $\varnothing 6$ mm x 50 mm.

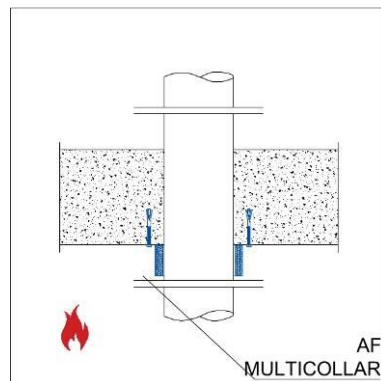
A.1.9 Acoustic plastic pipes

A.1.9.1 Flexible wall

A.1.9.1.1 120 mm thick flexible wall



Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
PEX-a pipe type AQUA of Uponor	≤ 63	8,7	EI 120 U/C
PVC-U pipe type FRIAPHON of Girpi	≤ 110	6,0	EI 120 U/C
Mineral reinforced PP-MD pipe type SiTech+ of Wavin	≤ 110	3,4	EI 120 U/C
Mineral reinforced PP-MD pipe type RAUPIANO PLUS of Rehau	≤ 110	2,5	EI 120 U/C
Mineral reinforced PE-S2 pipe type Silent-db20 of Geberit	≤ 110	6,0	EI 120 U/C
Mineral reinforced PP pipe type ASTO of Wavin	≤ 110	6,0	EI 120 U/C
Mineral reinforced PP-MX pipe type Silent-Pro of Geberit	≤ 110	6,0	EI 120 U/C
PP-R pipe type PhoNoFire of Coes Company	≤ 110	6,0	EI 120 U/C
PP-R pipe type POLO-KAL NG of Poloplast	≤ 110	3,4	EI 120 U/C
PP-R pipe type POLO-KAL 3S of Poloplast	≤ 110	4,8	EI 120 U/C
PP-R pipe type Decibel of Uponor	≤ 110	3,8	EI 120 U/C
PP-R pipe type Silenta of GF Hakan Plastik	≤ 110	3,4	EI 120 U/C
PP-R pipe type aquatherm blue SDR 11 MF of Aquatherm	≤ 110	10,0	EI 120 U/C
PP-R pipe type aquatherm green SDR 9 MF-RP of Aquatherm	≤ 110	12,3	EI 120 U/C
PP-R pipe type aquatherm red SDR 7,4 MF of Aquatherm	≤ 110	15,1	EI 120 U/C
MDPP pipe type SEA4 Master 3 Plus of Pipelife	≤ 110	3,4	EI 120 U/C

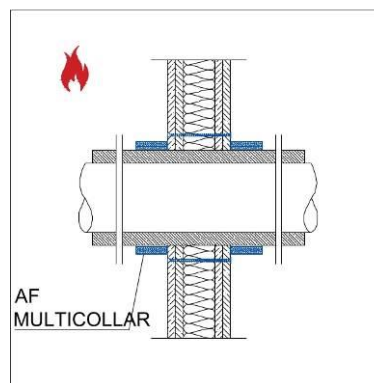
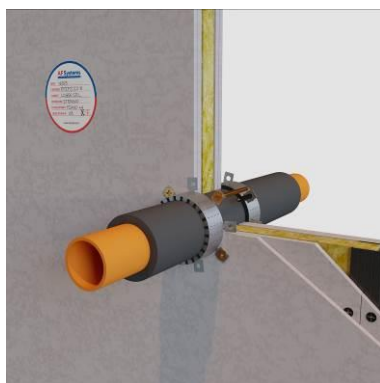
A.1.9.2 Rigid floor**A.1.9.2.1 150 mm thick rigid floor**

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Classification
PVC-U pipe type FRIAPHON of Girpi	≤ 110	6,0	EI 180 U/C
Mineral reinforced PP pipe type SiTech+ of Wavin	≤ 110	3,4	EI 180 U/C
Mineral reinforced PP-MD pipe type RAUPIANO PLUS of Rehau	≤ 110	2,4	EI 180 U/C
Mineral reinforced PE-S2 pipe type Silent-db20 of Geberit	≤ 110	6,0	EI 180 U/C
Mineral reinforced PP pipe type ASTO of Wavin	≤ 110	5,3	EI 180 U/C
Mineral reinforced PP-MX pipe type Silent-Pro of Geberit	≤ 110	4,2	EI 180 U/C
PP-R pipe type PhoNoFire of Coes Company	≤ 110	6,0	EI 180 U/C
PP-R pipe type POLO-KAL NG of Poloplast	≤ 110	3,4	EI 180 U/C
PP-R pipe type POLO-KAL 3S of Poloplast	≤ 110	4,8	EI 180 U/C
PP-R pipe type Decibel of Uponor	≤ 110	3,8	EI 180 U/C
PP-R pipe type Silenta of GF Hakan Plastik	≤ 110	3,4	EI 180 U/C
PP-R pipe type aquatherm blue SDR 11 MF of Aquatherm	≤ 110	10,0	EI 180 U/C
PP-R pipe type aquatherm green SDR 9 MF-RP of Aquatherm	≤ 110	12,3	EI 180 U/C
PP-R pipe type aquatherm red SDR 7,4 MF of Aquatherm	≤ 110	15,1	EI 180 U/C

A.1.10 Insulated standard plastic pipes

A.1.10.1 Flexible wall

A.1.10.1.1 100 mm thick flexible wall



Collar at both sides of the wall

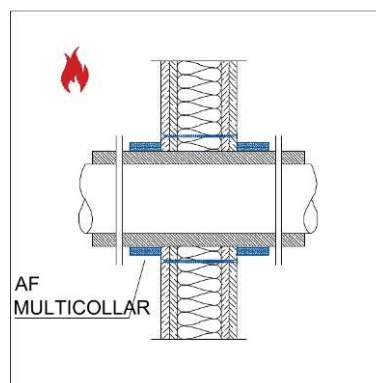
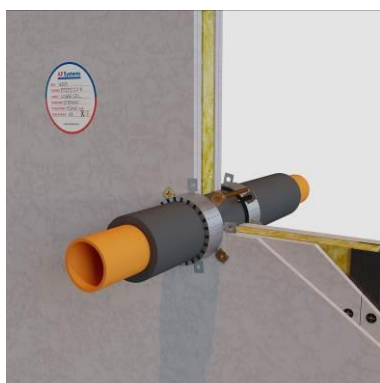
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PP	≤ 110	4,5	≤ 20	EI 120 U/U
PPR	≤ 110	6,8	≤ 19	EI 120 U/C

Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PP	≤ 110	4,5 – 6,6	≤ 20	EI 120 U/C
PVC	≤ 110	6,6	≤ 20	EI 120 U/C

Installation notes:

AF MULTICOLLAR size will be adapted to closely fit around the service external diameter (pipe and insulation), installed with a length (H) of the intumescent inlay of 50 mm and with 3 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 12 mm.

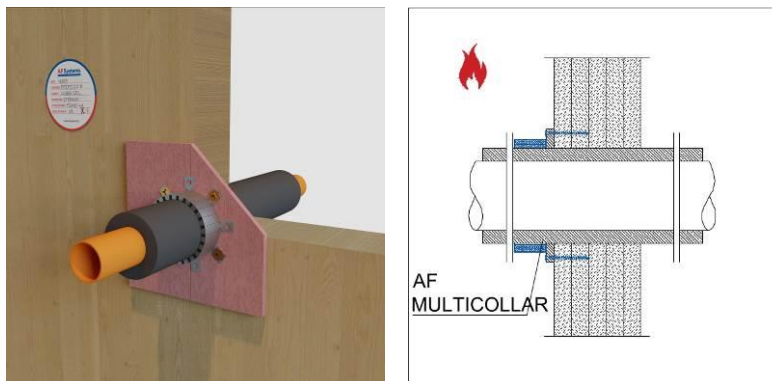
A.1.10.1.2 120 mm thick flexible wall

Collar at both sides of the wall

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PP	≤ 110	4,5	≤ 20	EI 120 U/U

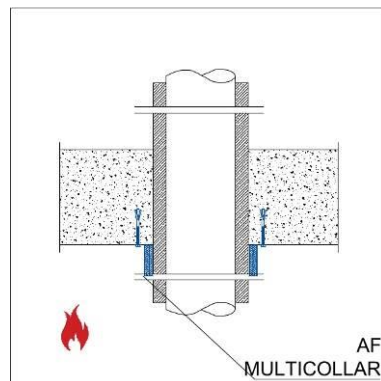
Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PP	≤ 110	4,5 – 6,6	≤ 20	EI 120 U/C
PVC	≤ 110	6,6	≤ 20	EI 120 U/C
PPR	≤ 110	6,8	≤ 19	EI 120 U/C

A.1.10.2 Cross laminated timber (CLT) wall**A.1.10.2.1 137 mm thick CLT wall**

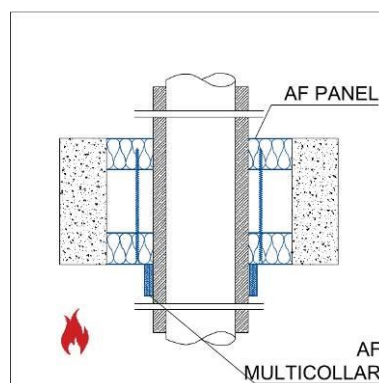
Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PPR	≤ 63	10,5	$\leq 21,5$	EI 120 U/C

A.1.10.3 Rigid floor**A.1.10.3.1 150 mm thick rigid floor**

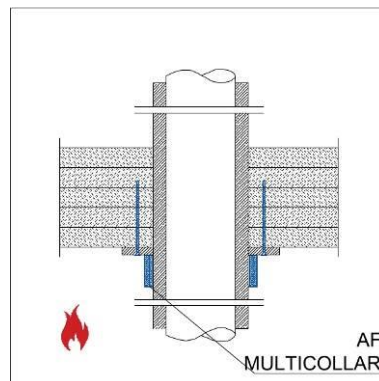
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PVC	≤ 110	4,5	≤ 20	EI 90 U/C ¹⁹
PPR	≤ 110	4,2 – 4,8	≤ 19	EI 180 U/C

¹⁹ Classification valid for the pipe passing through AF PANEL closing solution according to section B.3.1, with opening maximum dimensions of 900 mm x 450 mm. AF MULTICOLLAR can be fixed to AF PANEL with 5 steel spiral pigtail screws in accordance with section B.4.2.

A.1.10.3.2 200 mm thick rigid floor

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PPR	≤ 110	10,0	≤ 40	EI 45 U/C ²⁰

²⁰ Classification valid for the insulated pipe passing through AF PANEL closing solution according to section B.3.1, with opening maximum dimensions of 300 mm x 300 mm and two layers of AF PANEL levelled to the surface at both sides of the floor. AF MULTICOLLAR can be fixed to AF PANEL with 5 steel spiral pigtail screws in accordance with section B.4.2.

A.1.10.4 Cross laminated timber (CLT) floor**A.1.10.4.1 158 mm thick CLT floor**

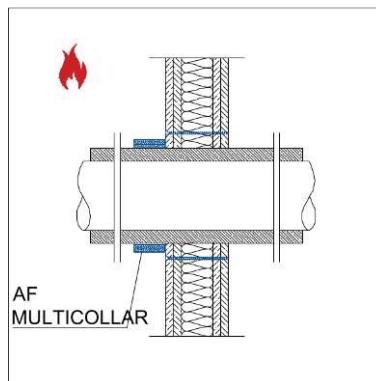
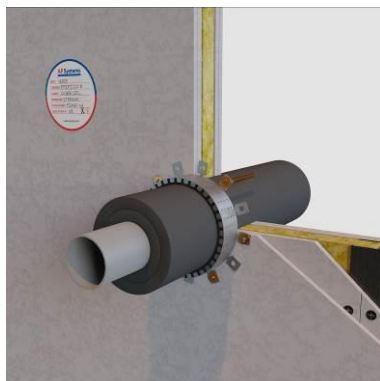
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PPR	≤ 63	10,5	≤ 17	EI 120 U/C

A.2 Insulated steel pipes

A.2.1 Insulated steel pipes through the constructive element

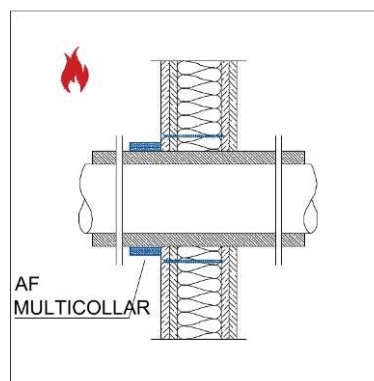
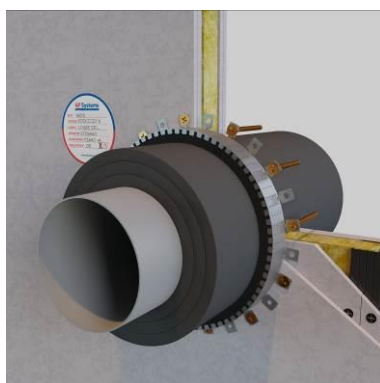
A.2.1.1 Flexible wall

A.2.1.1.1 100 mm thick flexible wall



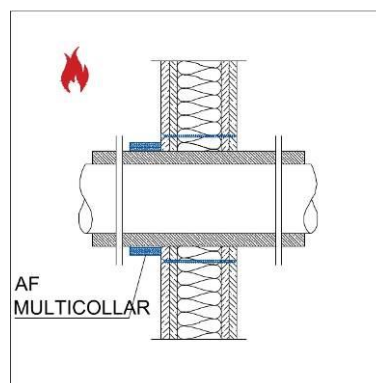
Collar at the fire exposed side only

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 160	$\geq 1,2$	19,0 – 40,0	EI 120 C/C
≤ 180	$\geq 9,0$	40,0	EI 120 C/C

A.2.1.1.2 120 mm thick flexible wall

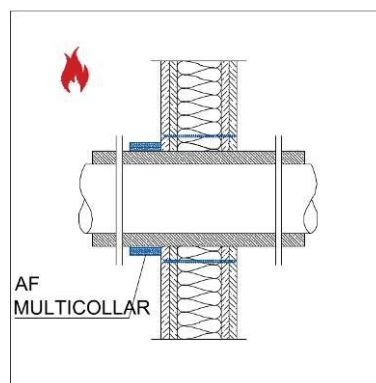
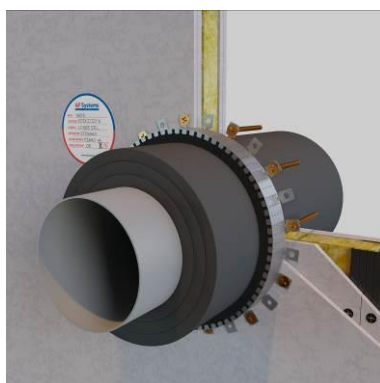
Collar at the fire exposed side only

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 20	$\geq 1,0$	9,0 – 60,0	EI 120 C/C
≤ 200	$\geq 1,2$	19,0 – 60,0	EI 120 C/C

A.2.1.1.3 125 mm thick flexible wall

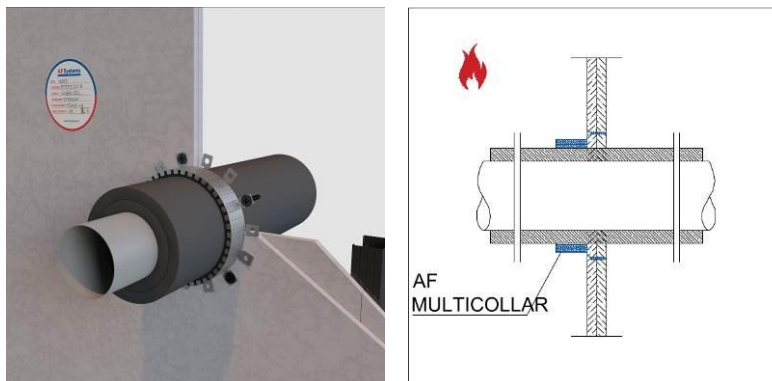
Collar at the fire exposed side only

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 20	$\geq 1,0$	9,0 – 60,0	EI 120 C/C
≤ 200	$\geq 1,2$	19,0 – 60,0	EI 120 C/C

A.2.1.1.4 135 mm thick flexible wall

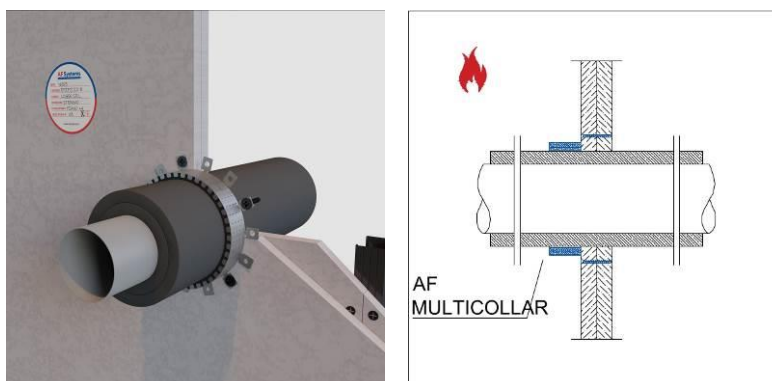
Collar at the fire exposed side only

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 20	$\geq 1,0$	9,0 – 60,0	EI 120 C/C
≤ 50	$\geq 2,5$	40,0	EI 120 U/C
≤ 160	$\geq 4,0$	40,0	EI 120 C/U
≤ 200	$\geq 1,2$	19,0 – 60,0	EI 120 C/C

A.2.1.2 Lining wall**A.2.1.2.1 30 mm thick lining wall**

Collar at the fire exposed side only

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 108	$\geq 1,0$	40,0	EI 60 U/C

A.2.1.2.2 50 mm thick lining wall

Collar at the fire exposed side only

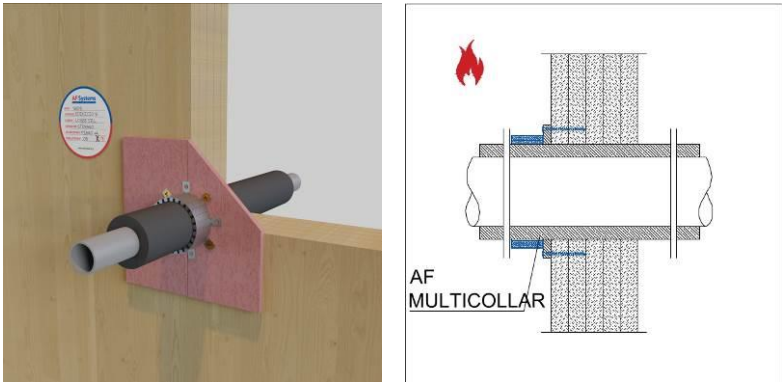
Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 108	≥ 1,0	40,0	EI 60 U/C
≤ 200	≥ 4,0	40,0	EI 120 C/C ⁽ⁱ⁾

Installation notes:

- (i) A plate of dimensions 400 mm x 400 mm, made of 'Type GM-F' gypsum and vermiculite plasterboards, coated with fiberglass according to EN 520, is installed with the service axis in the plate centre as a support for AF MULTICOLLAR fixing. The plate has a minimum thickness of 50 mm (e.g.: two boards of thickness 25 mm) and is fixed to the wall plasterboards with self-tapping steel screws Ø 4 mm every 200 mm.

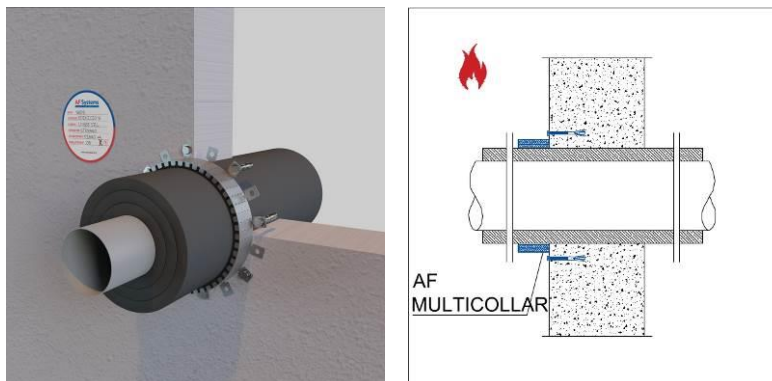
A.2.1.3 Cross laminated timber (CLT) wall

A.2.1.3.1 137 mm thick CLT wall



Collar at the fire exposed side only

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 50	≥ 1,5	21,0	EI 120 C/U

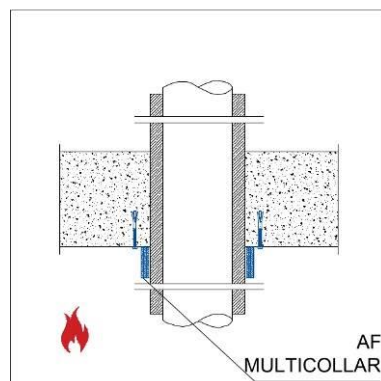
A.2.1.4 Rigid wall**A.2.1.4.1 150 mm thick rigid wall**

Collar at the fire exposed side only

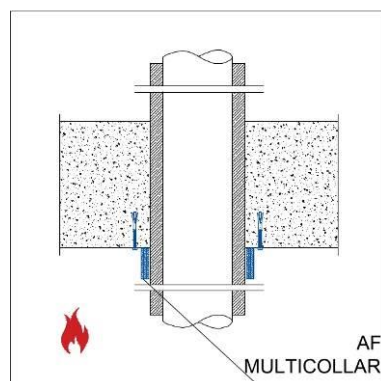
Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 50	$\geq 2,5$	40,0 ²¹	EI 120 C/U
≤ 100	$\geq 4,0$	20,0 ²² – 60,0	EI 180 C/C

²¹ The insulation can be covered with an aluminium foil 0,6 mm thick.

²² The insulation can be covered with an aluminium foil 0,4 mm thick.

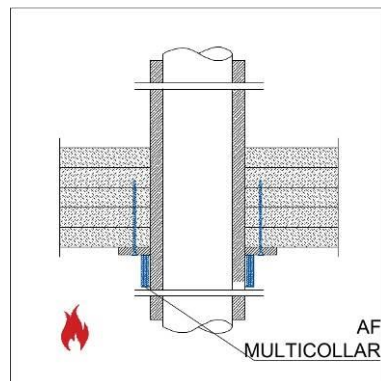
A.2.1.5 Rigid floor**A.2.1.5.1 150 mm thick rigid floor**

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 20	$\geq 1,0$	9,0 – 60,0	EI 180 C/C
≤ 20	$\geq 3,0$	9,0	EI 180 U/C
≤ 108	$\geq 1,0$	60,0	EI 180 C/U
≤ 200	$\geq 1,0$	19,0	EI 60 U/U
≤ 200	$\geq 1,0$	19,0	EI 120 U/C
≤ 200	$\geq 1,2$	19,0 – 60,0	EI 180 C/C
≤ 200	$\geq 6,0$	60,0	EI 180 U/C

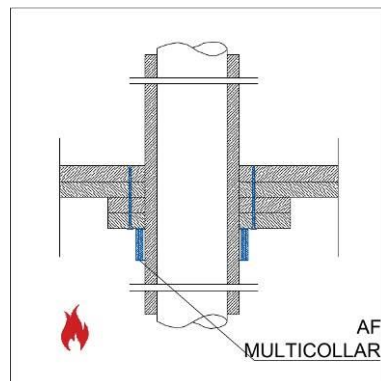
A.2.1.5.2 200 mm thick rigid floor

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 20	$\geq 1,0$	9,0 – 60,0	EI 180 C/C
≤ 20	$\geq 3,0$	9,0	EI 180 U/C
≤ 80	$\geq 3,5$	40,0 ²³	EI 180 C/C
≤ 200	$\geq 1,0$	19,0	EI 60 U/U
≤ 200	$\geq 1,0$	19,0	EI 120 U/C
≤ 200	$\geq 1,2$	19,0 – 60,0	EI 180 C/C
≤ 200	$\geq 6,0$	60,0	EI 180 U/C

²³ The insulation can be covered with an aluminium foil 0,4 mm thick.

A.2.1.6 Cross laminated timber (CLT) floor**A.2.1.6.1 150 mm thick CLT floor**

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 50	$\geq 1,25$	16,5	EI 120 U/C

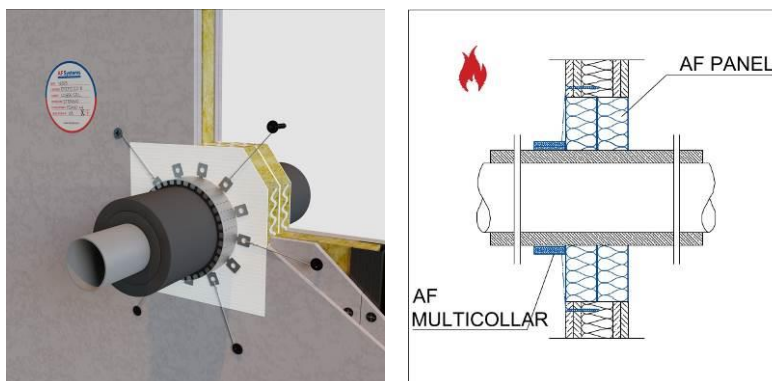
A.2.1.7 False ceiling**A.2.1.7.1 50 mm thick false ceiling**

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 108	$\geq 4,0$	20,0 – 40,0	EI 120 C/C

A.2.2 Insulated steel pipes through AF PANEL

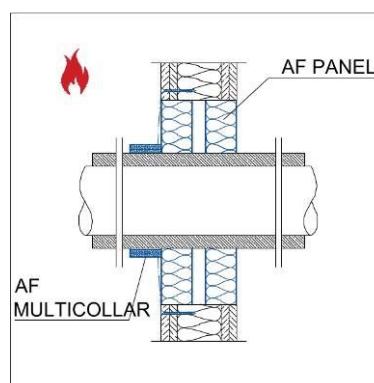
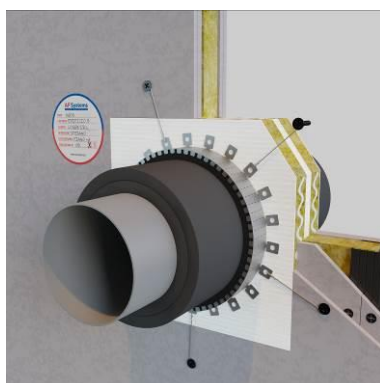
A.2.2.1 Flexible wall

A.2.2.1.1 100 mm thick flexible wall



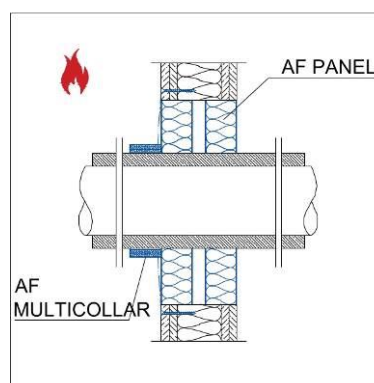
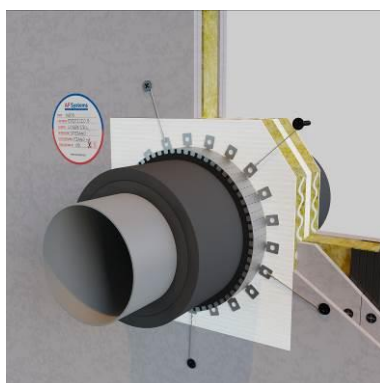
Collar at the fire exposed side only

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 160	$\geq 1,2$	19,0 – 40,0	EI 120 C/C
≤ 180	$\geq 9,0$	40,0	EI 120 C/C

A.2.2.1.2 120 mm thick flexible wall

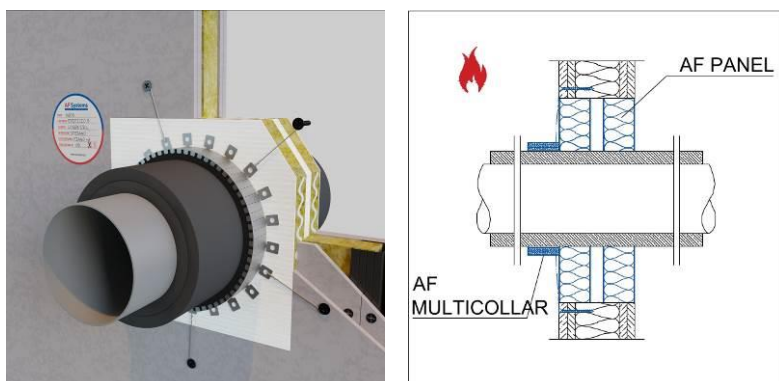
Collar at the fire exposed side only

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 20	$\geq 1,0$	9,0 – 60,0	EI 120 C/C
≤ 200	$\geq 1,2$	19,0 – 60,0	EI 120 C/C

A.2.2.1.3 125 mm thick flexible wall

Collar at the fire exposed side only

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 20	$\geq 1,0$	9,0 – 60,0	EI 120 C/C
≤ 200	$\geq 1,2$	19,0 – 60,0	EI 120 C/C

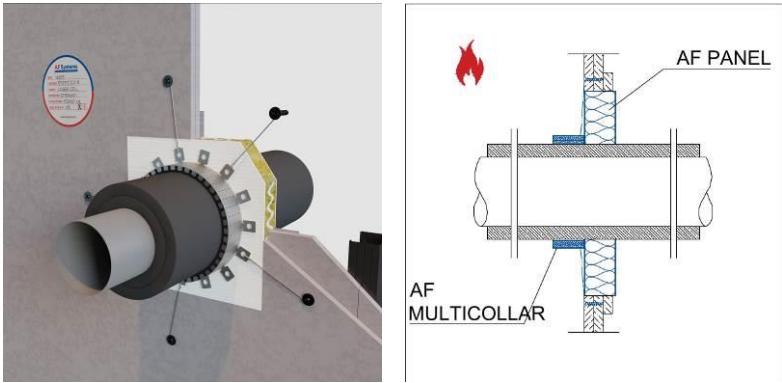
A.2.2.1.4 135 mm thick flexible wall

Collar at the fire exposed side only

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 20	$\geq 1,0$	9,0 – 60,0	EI 120 C/C
≤ 50	$\geq 2,5$	40,0	EI 120 U/C
≤ 160	$\geq 4,0$	40,0	EI 120 C/U
≤ 200	$\geq 1,2$	19,0 – 60,0	EI 120 C/C

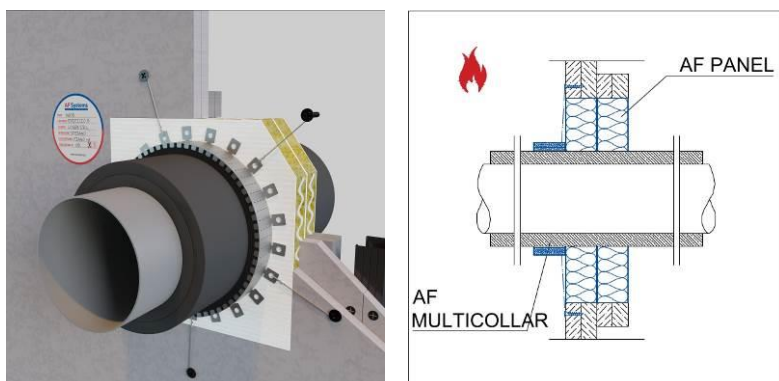
A.2.2.2 Lining wall

A.2.2.2.1 30 mm thick lining wall



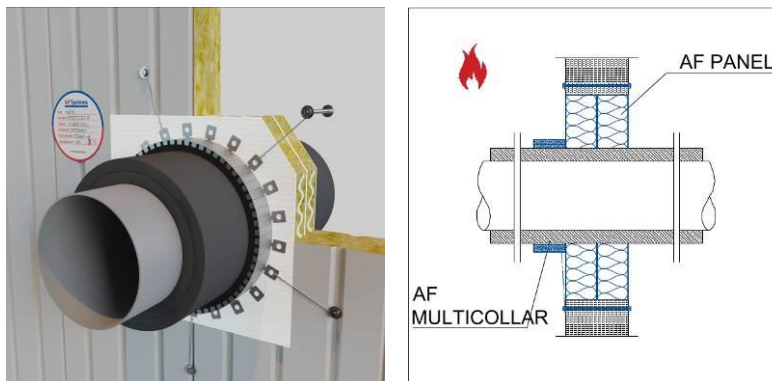
Collar at the fire exposed side only

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 108	≥ 1,0	40,0	EI 60 U/C

A.2.2.2.2 50 mm thick lining wall

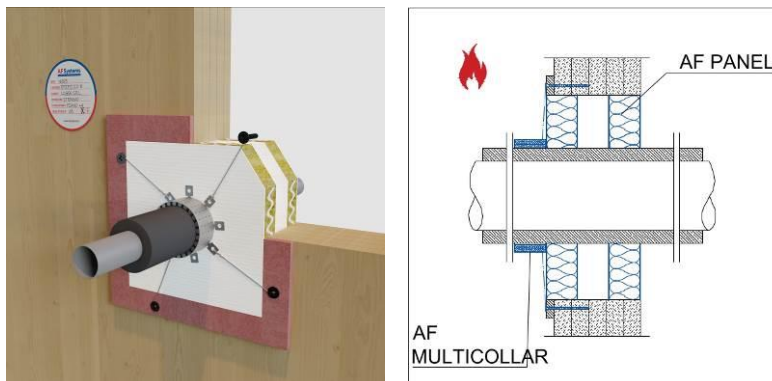
Collar at the fire exposed side only

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 108	$\geq 1,0$	40,0	EI 60 U/C
≤ 200	$\geq 4,0$	40,0	EI 120 C/C

A.2.2.3 Sandwich panel wall**A.2.2.3.1 100 mm thick sandwich panel wall**

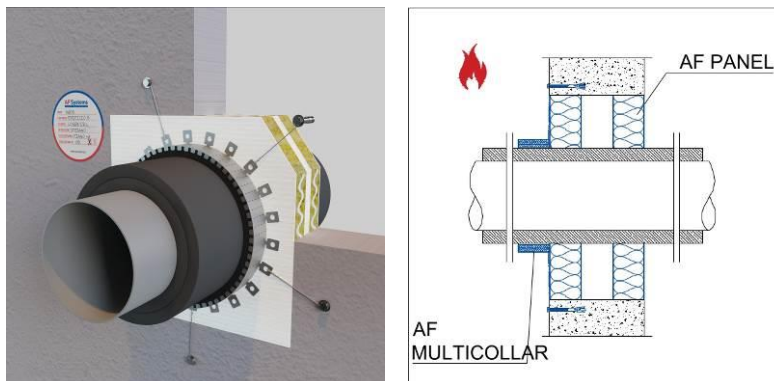
Collar at the fire exposed side only

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 200	$\geq 4,0$	40,0	EI 120 C/C

A.2.2.4 Cross laminated timber (CLT) wall**A.2.2.4.1 137 mm thick CLT wall**

Collar at the fire exposed side only

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 50	$\geq 1,5$	21,0	EI 120 C/U

A.2.2.5 Rigid wall**A.2.2.5.1 150 mm thick rigid wall**

Collar at the fire exposed side only

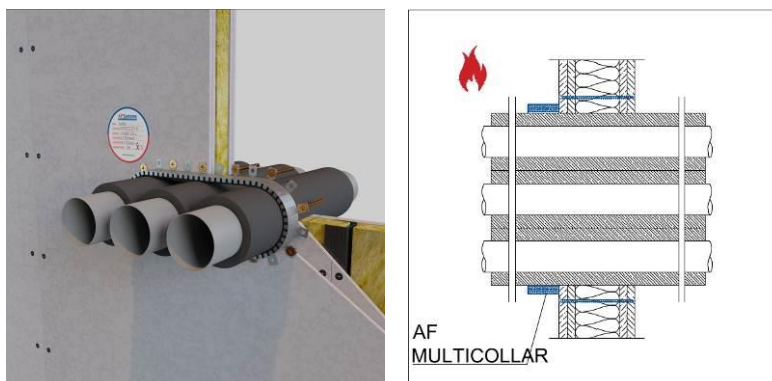
Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 50	$\geq 2,5$	40,0 ²⁴	EI 120 C/U

²⁴ The insulation can be covered with an aluminium foil 0,6 mm thick.

A.2.3 Insulated steel pipes in series through the constructive element

A.2.3.1 Flexible wall

A.2.3.1.1 120 mm thick flexible wall



Collar at the fire exposed side only

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 108	$\geq 4,0$	20,0	EI 120 C/C

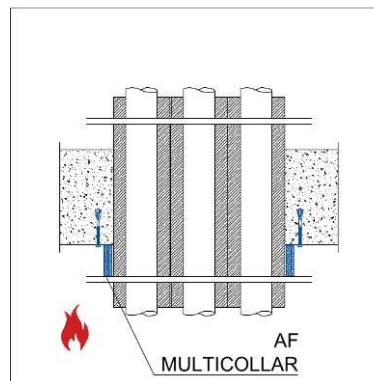
Installation notes:

AF MULTICOLLAR is installed with a length (H) of the intumescent inlay of 50 mm and with 3 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 12 mm. AF MULTICOLLAR is installed closely fitted around the services.

The pipes shall be aligned adjacent to each other (no gap between services).

The maximum number of pipes is 3 for the maximum dimensions as given in the table above.

The number of pipes according to the table above can be reduced provided that the collar is closely fitted around the services.

A.2.3.2 Rigid floor**A.2.3.2.1 150 mm thick rigid floor**

Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 108	$\geq 4,0$	20,0	EI 180 C/C

Installation notes:

AF MULTICOLLAR is installed with a length (H) of the intumescent inlay of 50 mm and with 3 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 12 mm. AF MULTICOLLAR is installed closely fitted around the services.

The pipes shall be aligned adjacent to each other (no gap between services).

The maximum number of pipes is 3 for the maximum dimensions as given in the table above.

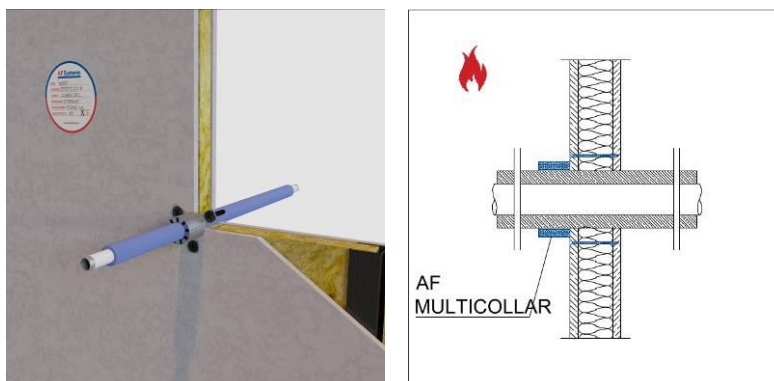
The number of pipes according to the table above can be reduced provided that the collar is closely fitted around the services.

A.3 Multilayer composite pipes

A.3.1 Multilayer composite pipes through the constructive element

A.3.1.1 Flexible wall

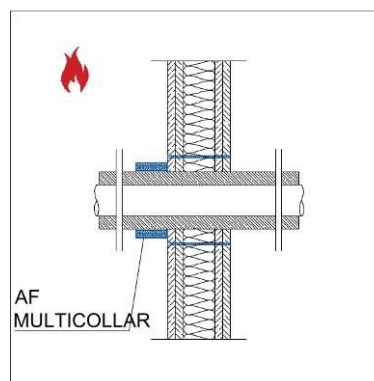
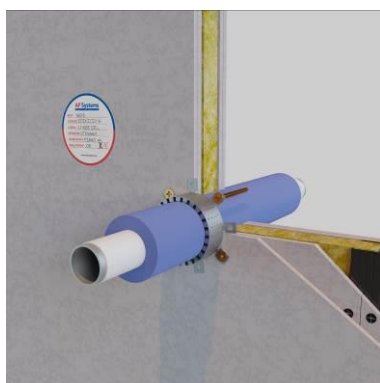
A.3.1.1.1 80 mm thick flexible wall



Collar at the fire exposed side only

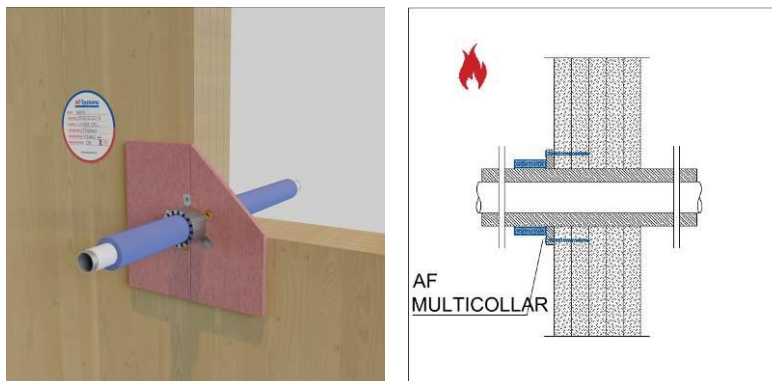
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PE-X/Al/HDPE ²⁵	≤ 16	2,0	--	EI 60 U/C
	≤ 16	2,0	≤ 9 mm	EI 60 U/C
	≤ 26	3,0	--	EI 60 U/C

²⁵ PE-X refers to PE-Xa, PE-Xb or PE-Xc.

A.3.1.1.2 100 mm thick flexible wall

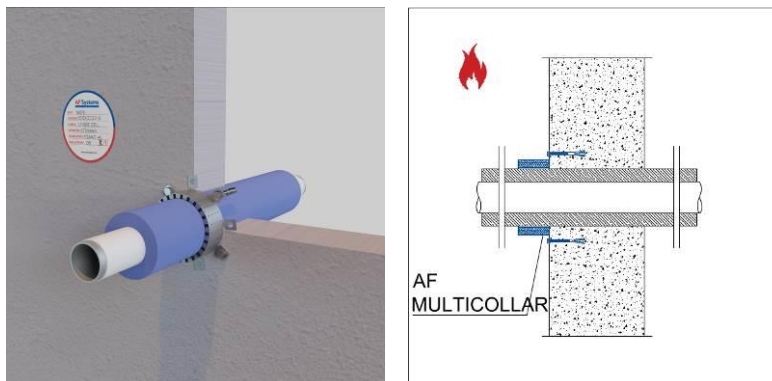
Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PE-X/Al/PE	≤ 16	2,0	--	EI 120 U/C
			≤ 6,0 (PE insulation)	EI 120 U/C
	≤ 25	2,5	--	EI 120 U/C
			≤ 9,0 (PE insulation)	EI 120 U/C
	≤ 26	3,0	--	EI 120 U/C
			≤ 9,0 (PE insulation)	EI 120 U/C
PE-X/Al/HDPE	≤ 16	2,0	--	EI 120 U/C
			≤ 9,0	EI 120 U/C
	≤ 20	3,0	≤ 6,0 (PE insulation)	EI 120 U/C
			--	EI 120 U/C
	≤ 26	3,0	--	EI 120 U/C
			≤ 9,0	EI 120 U/C
PE-X/Al/PE-RT	≤ 16	2,0	--	EI 120 U/C
	≤ 26	3,0	≤ 9,0 (PE insulation)	EI 120 U/C

A.3.1.2 Cross laminated timber (CLT) wall**A.3.1.2.1 137 mm thick CLT wall**

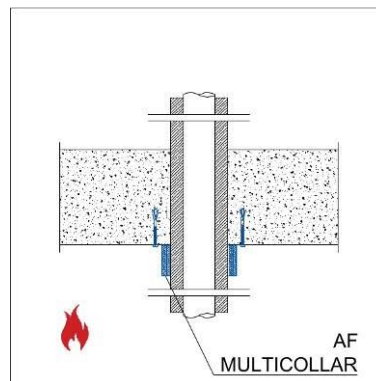
Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PE-X/Al/PE-X	≤ 26	3,0	8,5	EI 120 U/C

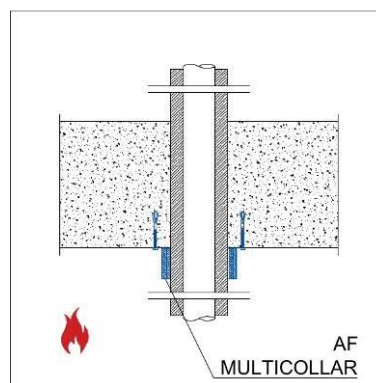
A.3.1.3 Rigid wall**A.3.1.3.1 150 mm thick rigid wall**

Collar at the fire exposed side only

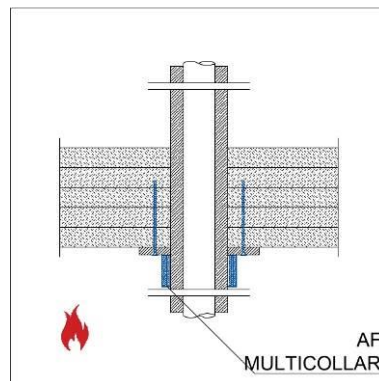
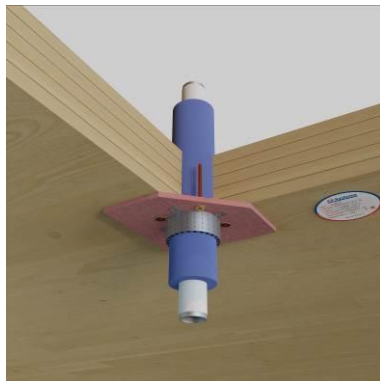
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PE-X/Al/PE	≤ 16	2,0	--	EI 120 U/C
			≤ 6,0 (PE insulation)	EI 120 U/C
	≤ 25	2,5	--	EI 120 U/C
			≤ 9,0 (PE insulation)	EI 120 U/C
	≤ 26	3,0	--	EI 120 U/C
			≤ 9,0 (PE insulation)	EI 120 U/C
PE-X/Al/HDPE	≤ 16	2,0	≤ 7,0 (PE insulation)	EI 180 U/C
	≤ 20	3,0	≤ 7,0 (PE insulation)	EI 180 U/C
	≤ 26	3,0	--	EI 120 U/C
			≤ 9,0	EI 120 U/C
PE-X/Al/PE-RT	≤ 16	2,0	--	EI 120 U/C
	≤ 26	3,0	≤ 9,0 (PE insulation)	EI 120 U/C

A.3.1.4 Rigid floor**A.3.1.4.1 150 mm thick rigid floor**

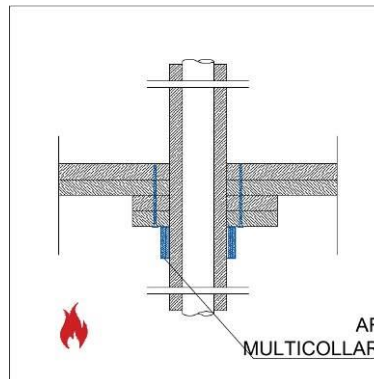
Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PE-X/Al/PE	≤ 63	8,7	19,0	EI 180 U/C
PE-X/Al/HDPE	≤ 20	3,0	$\leq 6,0$ (PE insulation)	EI 180 U/C

A.3.1.4.2 200 mm thick rigid floor

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PE-X/Al/PE	≤ 63	6,0	≤ 20,0	EI 120 U/C

A.3.1.5 Cross laminated timber (CLT) floor**A.3.1.5.1 158 mm thick CLT floor**

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PE-X/Al/HDPE	≤ 63	6,0	17,0	EI 120 U/C

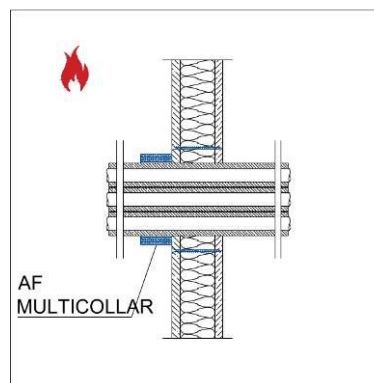
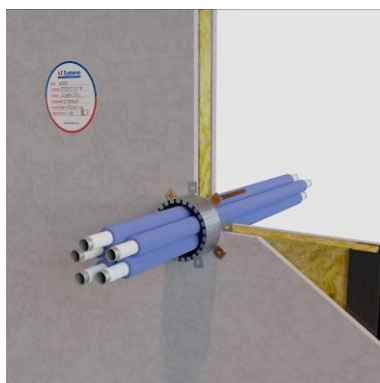
A.3.1.6 False ceiling**A.3.1.6.1 50 mm thick false ceiling**

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PE-X/Al/PE-RT	≤ 16	2,0	≤ 6,0 (PE insulation)	EI 120 U/C
	≤ 26	3,0	≤ 9,0 (PE insulation)	EI 120 U/C

A.3.2 Multilayer composite pipes in bundles through the constructive element

A.3.2.1 Flexible wall

A.3.2.1.1 80 mm thick flexible wall



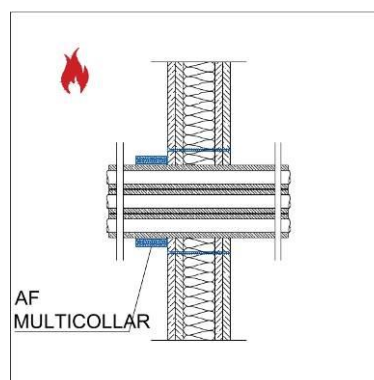
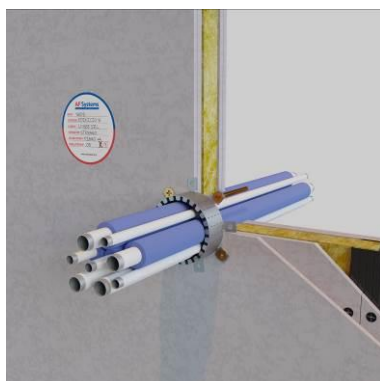
Collar at the fire exposed side only

Overall diameter (mm)	Pipe material and number	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	4 PE-X/Al/HDPE	≤ 16	2,0	--	EI 60 U/C
	3 PE-X/Al/HDPE	≤ 26	3,0	--	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	9,0	EI 60 U/C
	10 corrugated PVC pipes with cable type A1	≤ 20	2,0	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes (as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

A.3.2.1.2 100 mm thick flexible wall

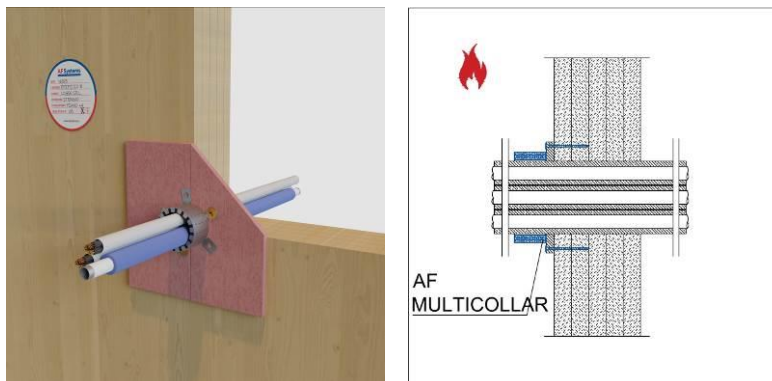
Collar at the fire exposed side only

Overall diameter (mm)	Pipe material and number	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 80	3 PE-X/Al/HDPE	≤ 20	3,0	≤ 6,0 (PE insulation)	EI 120 C/C
	3 corrugated PVC pipes with cable type A1	≤ 26	3,0	--	
≤ 110	4 PE-X/Al/HDPE	≤ 16	2,0	--	EI 60 U/C
	3 PE-X/Al/HDPE	≤ 26	3,0	--	
≤ 110	9 PE-X/Al/HDPE	≤ 20	3,0	≤ 6,0 (PE insulation)	EI 120 U/C
≤ 110	2 PE-X/Al/PE	≤ 16	2,0	--	EI 120 U/C
	2 PE-X/Al/PE			≤ 6,0 (PE insulation)	
	2 PE-X/Al/PE	≤ 25	2,5	-	
	2 PE-X/Al/PE			≤ 9,0 (PE insulation)	
≤ 110	2 PE-X/Al/PE-RT	≤ 16	2,0	--	EI 120 U/C
	2 PE-X/Al/PE			≤ 6,0 (PE insulation)	
	2 PE-X/Al/PE	≤ 25	2,5	-	
	2 PE-X/Al/PE			≤ 9,0 (PE insulation)	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	9,0	EI 60 U/C
	10 corrugated PVC pipes with cable type A1	≤ 20	2,0	--	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	≤ 9,0 (PE insulation)	EI 120 U/C
	2 PE-X/Al/PE	≤ 26	3,0	≤ 9,0 (PE insulation)	
	3 corrugated PA pipes with cable type A1	≤ 26	0,5	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

A.3.2.2 Cross laminated timber (CLT) wall**A.3.2.2.1 137 mm thick CLT wall**

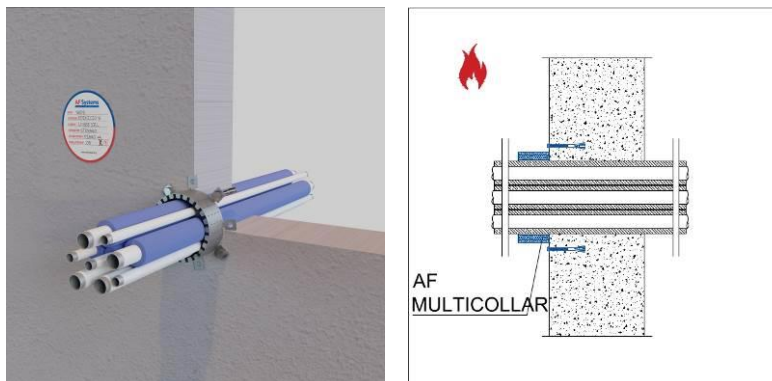
Collar at the fire exposed side only

Overall diameter (mm)	Pipe material and number	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 65	1 PE-X/Al/PE-X	≤ 26	3,0	8,5	EI 120 U/C
	2 corrugated PVC pipes with cable type A2	≤ 24	2,0	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes (maximum 3 pipes as given in the above table) can be reduced provided that the collar is closely fitted around the pipes.

A.3.2.3 Rigid wall**A.3.2.3.1 150 mm thick rigid wall**

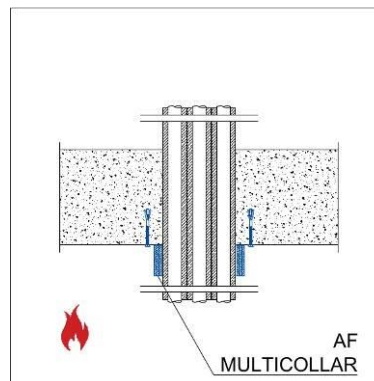
Collar at the fire exposed side only

Overall diameter (mm)	Pipe material and number	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	8 PE-X/Al/HDPE	≤ 16	2,0	≤ 7,0 (PE insulation)	EI 180 U/C
	2 PE-X/Al/HDPE	≤ 20	3,0	≤ 7,0 (PE insulation)	
≤ 110	4 PE-X/Al/HDPE	≤ 16	2,0	--	EI 60 U/C
	3 PE-X/Al/HDPE	≤ 26	3,0	--	
≤ 110	9 PE-X/Al/HDPE	≤ 20	3,0	≤ 6,0 (PE insulation)	EI 120 U/C
≤ 110	2 PE-X/Al/PE	≤ 16	2,0	--	EI 120 U/C
	2 PE-X/Al/PE			≤ 6,0 (PE insulation)	
	2 PE-X/Al/PE	≤ 25	2,5	-	
	2 PE-X/Al/PE			≤ 9,0 (PE insulation)	
≤ 110	2 PE-X/Al/PE-RT	≤ 16	2,0	--	EI 120 U/C
	2 PE-X/Al/PE			≤ 6,0 (PE insulation)	
	2 PE-X/Al/PE	≤ 25	2,5	-	
	2 PE-X/Al/PE			≤ 9,0 (PE insulation)	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	≤ 9,0 (PE insulation)	EI 120 U/C
	2 PE-X/Al/PE	≤ 26	3,0	≤ 9,0 (PE insulation)	
	3 corrugated PA pipes with cable type A1	≤ 26	0,5	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

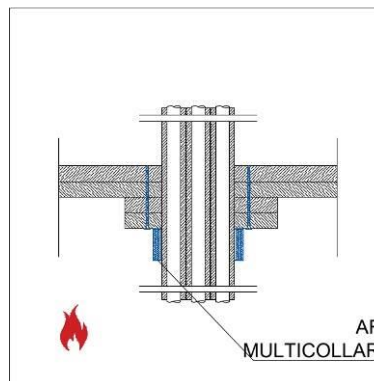
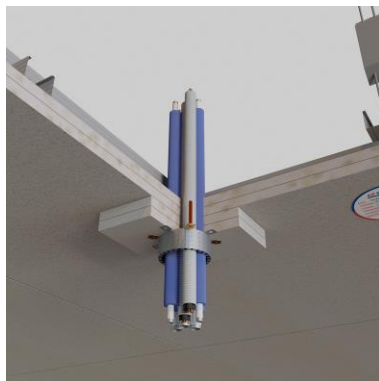
A.3.2.4 Rigid floor**A.3.2.4.1 150 mm thick rigid floor**

Overall diameter (mm)	Pipe material and number	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	9 PE-X/Al/HDPE	≤ 20	3,0	≤ 6,0 (PE insulation)	EI 180 U/C

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes (maximum 9 pipes as given in the above table) can be reduced provided that the collar is closely fitted around the pipes.

A.3.2.5 False ceiling**A.3.2.5.1 50 mm thick false ceiling**

Overall diameter (mm)	Pipe material and number	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	2 PE-X/Al/PE-RT	≤ 16	2,0	≤ 6,0 (PE insulation)	EI 120 U/C
	2 PE-X/Al/PE-RT	≤ 26	3,0	≤ 9,0 (PE insulation)	
	2 corrugated PVC pipes with cable type A1	≤ 21	2,0	--	

Installation notes:

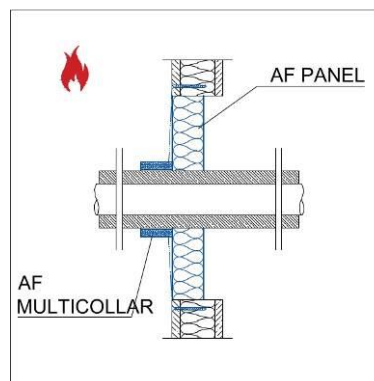
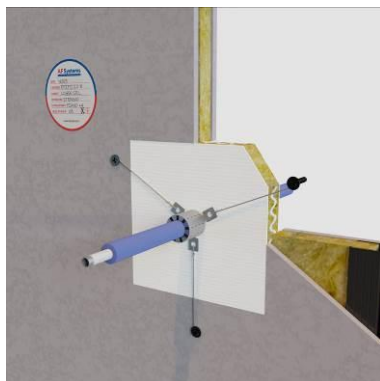
AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes (maximum 6 pipes as given in the above table) can be reduced provided that the collar is closely fitted around the pipes.

A.3.3 Multilayer composite pipes through AF PANEL

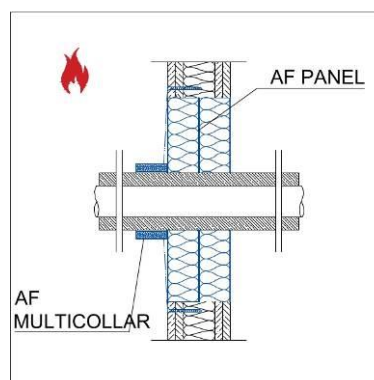
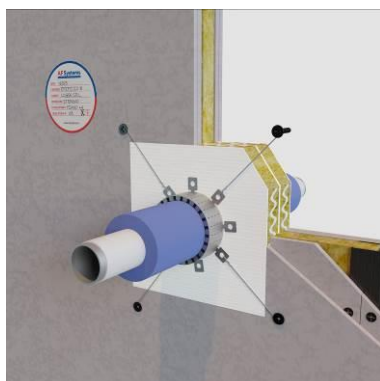
A.3.3.1 Flexible wall

A.3.3.1.1 80 mm thick flexible wall



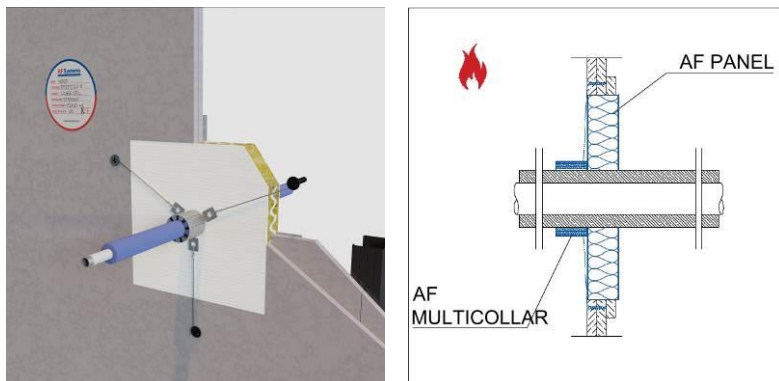
Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PE-X/Al/HDPE	≤ 16	2,0	9,0	EI 60 U/C

A.3.3.1.2 100 mm thick flexible wall

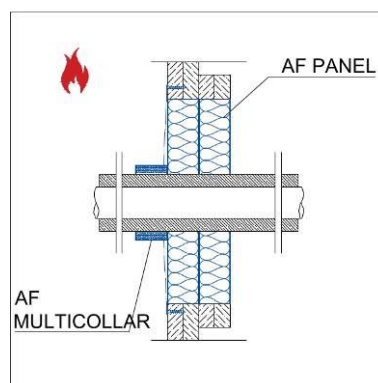
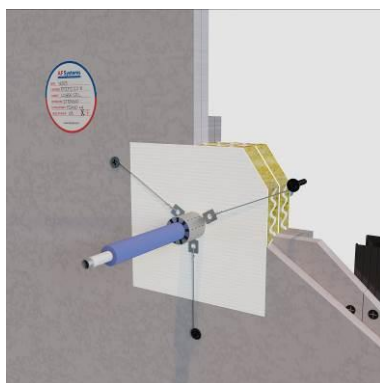
Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PE-X/Al/PE	≤ 16	2,0	--	EI 120 C/C
			≤ 6,0 (PE insulation)	EI 120 C/C
	≤ 25	2,5	--	EI 120 C/C
			≤ 9,0 (PE insulation)	EI 120 C/C
	≤ 26	3,0	--	EI 120 C/C
			≤ 9,0 (PE insulation)	EI 120 C/C
PE-X/Al/HDPE	≤ 16	2,0	--	EI 120 C/C
			≤ 9,0	EI 120 C/C
	≤ 20	3,0	≤ 6,0 (PE insulation)	EI 120 C/C
			--	EI 120 C/C
	≤ 26	3,0	--	EI 120 C/C
			≤ 9,0	EI 120 C/C
PE-X/Al/PE-RT	≤ 16	2,0	--	EI 120 C/C
	≤ 26	3,0	≤ 9,0 (PE insulation)	EI 120 C/C

A.3.3.2 Lining wall**A.3.3.2.1 30 mm thick lining wall**

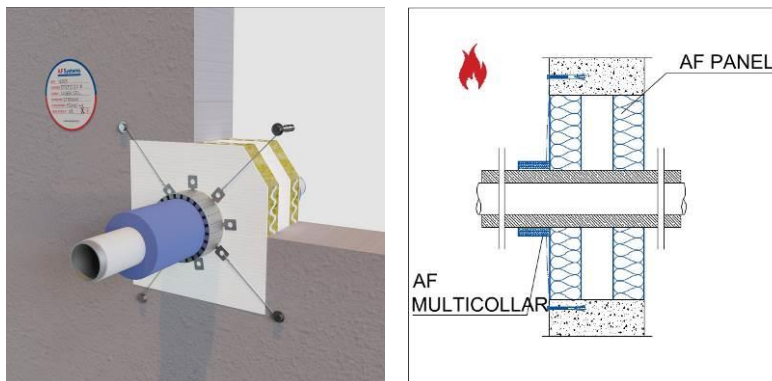
Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PE-X/Al/HDPE	≤ 16	2,0	9,0	EI 60 U/C

A.3.3.2.2 50 mm thick lining wall

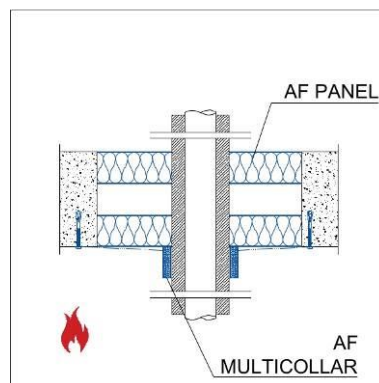
Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PE-X/Al/HDPE	≤ 16	2,0	9,0	EI 60 U/C
	≤ 20	3,0	≤ 6,0 (PE insulation)	EI 120 C/C

A.3.3.3 Rigid wall**A.3.3.3.1 150 mm thick rigid wall**

Collar at the fire exposed side only

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PE-X/Al/PE	≤ 16	2,0	--	EI 120 C/C
			≤ 6,0 (PE insulation)	EI 120 C/C
	≤ 25	2,5	--	EI 120 C/C
			≤ 9,0 (PE insulation)	EI 120 C/C
	≤ 26	3,0	--	EI 120 C/C
			≤ 9,0 (PE insulation)	EI 120 C/C
PE-X/Al/HDPE	≤ 16	2,0	≤ 7,0 (PE insulation)	EI 120 C/C
	≤ 20	3,0	≤ 7,0 (PE insulation)	EI 120 C/C
	≤ 26	3,0	--	EI 120 C/C
			≤ 9,0	EI 120 C/C
PE-X/Al/PE-RT	≤ 16	2,0	--	EI 120 C/C
	≤ 26	3,0	≤ 9,0 (PE insulation)	EI 120 C/C

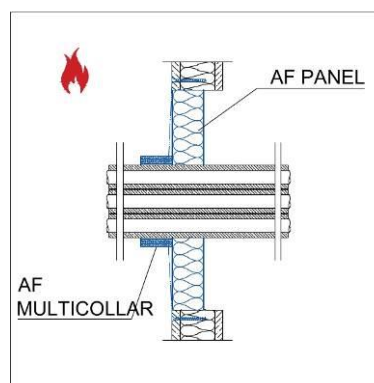
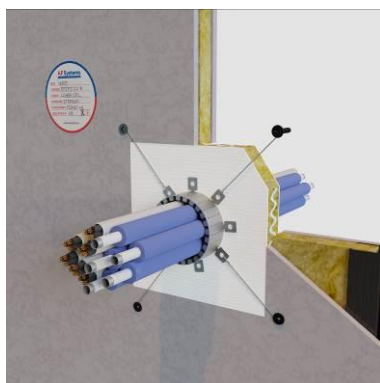
A.3.3.4 Rigid floor**A.3.3.4.1 150 mm thick rigid floor**

Pipe material	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
PE-X/Al/PE	≤ 63	8,7	19,0	EI 120 C/C
PE-X/Al/HDPE	≤ 20	3,0	≤ 6,0 (PE insulation)	EI 120 C/C

A.3.4 Multilayer composite pipes in bundles through AF PANEL

A.3.4.1 Flexible wall

A.3.4.1.1 80 mm thick flexible wall



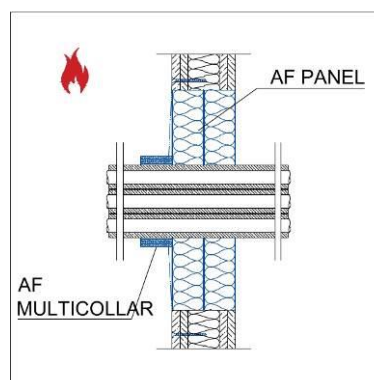
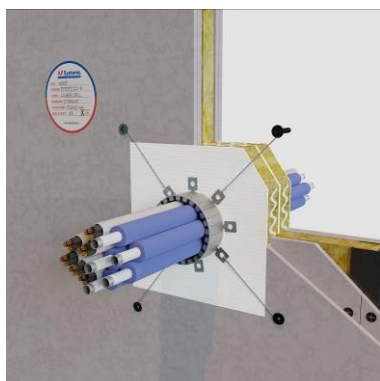
Collar at the fire exposed side only

Overall diameter (mm)	Pipe material and number	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	9,0	EI 60 U/C
	10 corrugated PVC pipes with cable type A1	≤ 20	2,0	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes (maximum 15 as given in the above table) can be reduced provided that the collar is closely fitted around the pipes.

A.3.4.1.2 100 mm thick flexible wall

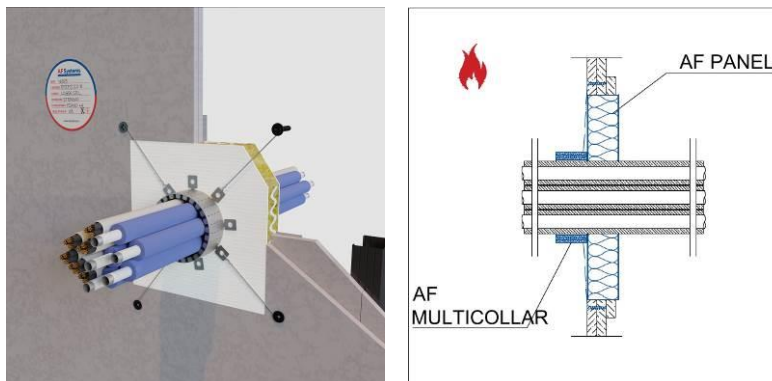
Collar at the fire exposed side only

Overall diameter (mm)	Pipe material and number	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 80	3 PE-X/Al/HDPE	≤ 20	3,0	≤ 6,0 (PE insulation)	EI 120 C/C
	3 corrugated PVC pipes with cable type A1	≤ 26	3,0	--	
≤ 110	4 PE-X/Al/HDPE	≤ 16	2,0	--	EI 60 U/C
	3 PE-X/Al/HDPE	≤ 26	3,0	--	
≤ 110	9 PE-X/Al/HDPE	≤ 20	3,0	≤ 6,0 (PE insulation)	EI 120 C/C
≤ 110	2 PE-X/Al/PE	≤ 16	2,0	--	EI 120 C/C
	2 PE-X/Al/PE			≤ 6,0 (PE insulation)	
	2 PE-X/Al/PE	≤ 25	2,5	-	
	2 PE-X/Al/PE			≤ 9,0 (PE insulation)	
≤ 110	2 PE-X/Al/PE-RT	≤ 16	2,0	--	EI 120 C/C
	2 PE-X/Al/PE			≤ 6,0 (PE insulation)	
	2 PE-X/Al/PE	≤ 25	2,5	-	
	2 PE-X/Al/PE			≤ 9,0 (PE insulation)	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	9,0	EI 60 U/C
	10 corrugated PVC pipes with cable type A1	≤ 20	2,0	--	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	≤ 9,0 (PE insulation)	EI 120 C/C
	2 PE-X/Al/PE	≤ 26	3,0	≤ 9,0 (PE insulation)	
	3 corrugated PA pipes with cable type A1	≤ 26	0,5	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

A.3.4.2 Lining wall**A.3.4.2.1 30 mm thick lining wall**

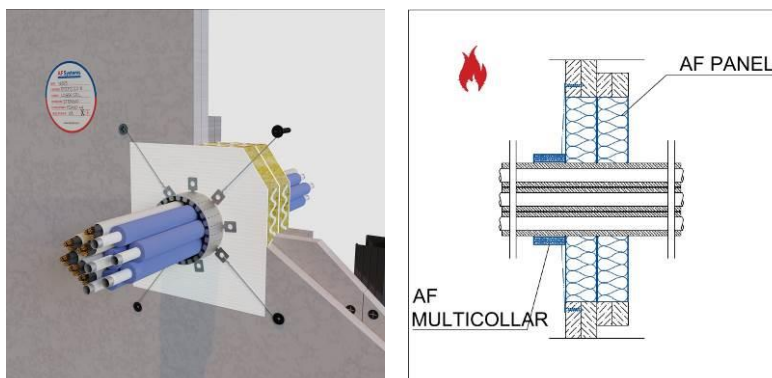
Collar at the fire exposed side only

Overall diameter (mm)	Pipe material and number	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	9,0	EI 60 U/C
	10 corrugated PVC pipes with cable type A1	≤ 20	2,0	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes (maximum 15 pipes as given in the above table) can be reduced provided that the collar is closely fitted around the pipes.

A.3.4.2.2 50 mm thick lining wall

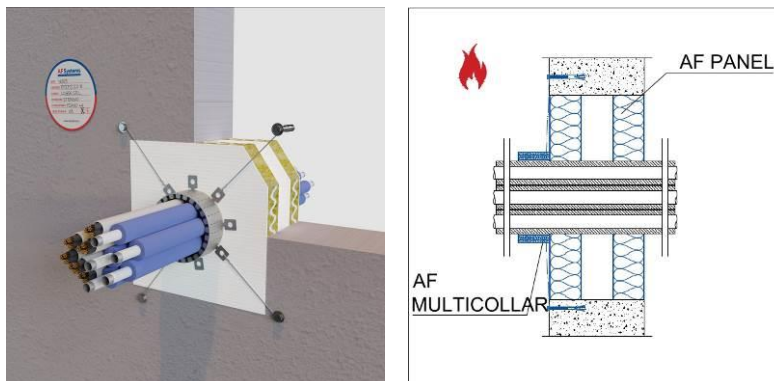
Collar at the fire exposed side only

Overall diameter (mm)	Pipe material and number	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 80	3 PE-X/Al/HDPE	≤ 20	3,0	≤ 6,0 (PE insulation)	EI 120 C/C
	3 corrugated PVC pipes with cable type A1	≤ 26	3,0	--	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	9,0	EI 60 U/C
	10 corrugated PVC pipes with cable type A1	≤ 20	2,0	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

A.3.4.3 Rigid wall**A.3.4.3.1 150 mm thick rigid wall**

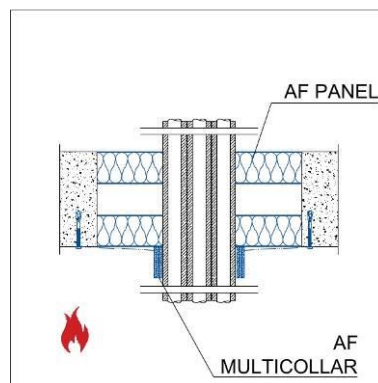
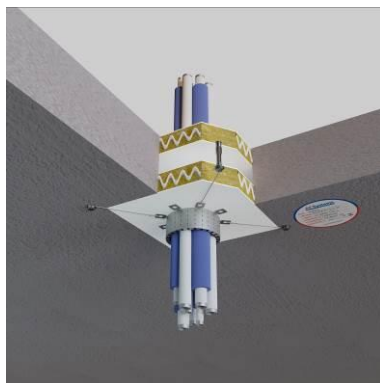
Collar at the fire exposed side only

Overall diameter (mm)	Pipe material and number	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	8 PE-X/Al/HDPE	≤ 16	2,0	≤ 7,0 (PE insulation)	EI 120 C/C
	2 PE-X/Al/HDPE	≤ 20	3,0	≤ 7,0 (PE insulation)	
≤ 110	4 PE-X/Al/HDPE	≤ 16	2,0	--	EI 60 U/C
	3 PE-X/Al/HDPE	≤ 26	3,0	--	
≤ 110	9 PE-X/Al/HDPE	≤ 20	3,0	≤ 6,0 (PE insulation)	EI 120 C/C
≤ 110	2 PE-X/Al/PE	≤ 16	2,0	--	EI 120 C/C
	2 PE-X/Al/PE			≤ 6,0 (PE insulation)	
	2 PE-X/Al/PE	≤ 25	2,5	-	
	2 PE-X/Al/PE			≤ 9,0 (PE insulation)	
≤ 110	2 PE-X/Al/PE-RT	≤ 16	2,0	--	EI 120 C/C
	2 PE-X/Al/PE			≤ 6,0 (PE insulation)	
	2 PE-X/Al/PE	≤ 25	2,5	-	
	2 PE-X/Al/PE			≤ 9,0 (PE insulation)	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	≤ 9,0 (PE insulation)	EI 120 C/C
	2 PE-X/Al/PE	≤ 26	3,0	≤ 9,0 (PE insulation)	
	3 corrugated PA pipes with cable type A1	≤ 26	0,5	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

A.3.4.4 Rigid floor**A.3.4.4.1 150 mm thick rigid floor**

Overall diameter (mm)	Pipe material and number	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	9 PE-X/Al/HDPE	≤ 20	3,0	≤ 6,0 (PE insulation)	EI 120 C/C

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

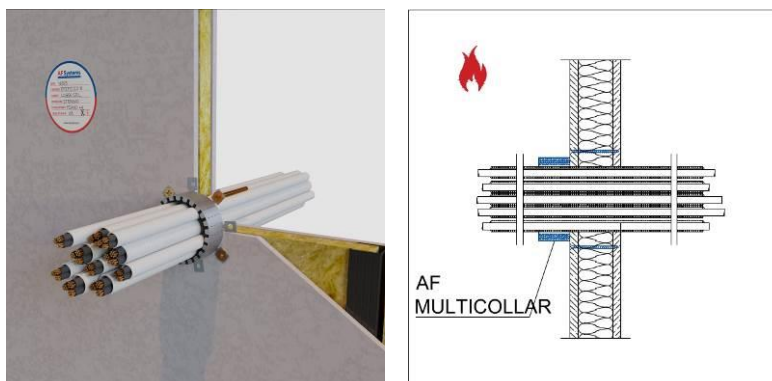
The number of pipes (maximum 9 pipes as given in the above table) can be reduced provided that the collar is closely fitted around the pipes.

A.4 Cables

A.4.1 Cable bundles through the constructive element

A.4.1.1 Flexible wall

A.4.1.1.1 80 mm thick flexible wall



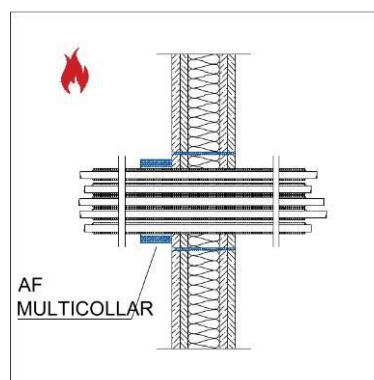
Collar at the fire exposed side only

Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	5 corrugated PVC pipes with cable type A1	≤ 32	2,0	--	EI 60 U/C
	4 corrugated PA pipes with cable type A1	≤ 24	0,5	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes and cables (maximum 9 pipes as given in the above table) can be reduced provided that the collar is closely fitted around the pipes.

A.4.1.1.2 100 mm thick flexible wall

Collar at the fire exposed side only

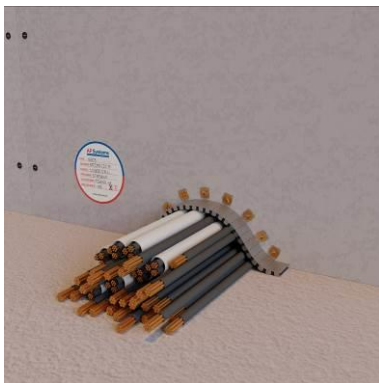
Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	5 corrugated PVC pipes with cable type A1	≤ 32	2,0	--	EI 60 U/C
	4 corrugated PA pipes with cable type A1	≤ 24	0,5	--	
≤ 110	10 cables type A1	--	--	--	EI 120
	10 cables type A2	--	--	--	
	10 cables type A3	--	--	--	
	2 cables type B	--	--	--	
≤ 110	10 cables type A1	--	--	--	EI 120 ⁽ⁱ⁾
	10 cables type A2	--	--	--	
	10 cables type A3	--	--	--	
	2 cables type B	--	--	--	
	4 corrugated PVC pipes with cable type A1	≤ 22	2,0	--	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	≤ 9,0 (PE insulation)	EI 120 U/C
	2 PE-X/Al/PE	≤ 26	3,0	≤ 9,0 (PE insulation)	
	3 corrugated PA pipes with cable type A1	≤ 26	0,5	--	
≤ 110	8 corrugated PVC pipes with cable type A1, A2 or A3	≤ 32	2,0	--	EI 120 U/C

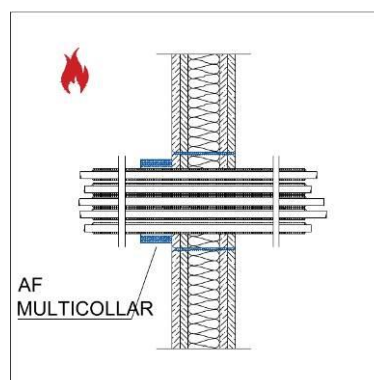
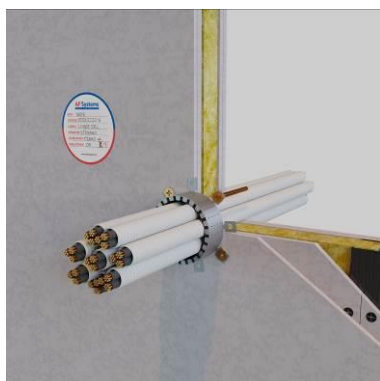
Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes or cables.

The number of pipes and cables (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

- (i) Test result representative for the end-use conditions of a cables bundle laying on a non-combustible floor. AF MULTICOLLAR is installed on top of the bundle in U-shape with the bottom part open, with a length (H) of the intumescent inlay of 50 mm and with 2 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 8 mm. See next figure.



A.4.1.1.3 125 mm thick flexible wall

Collar at the fire exposed side only

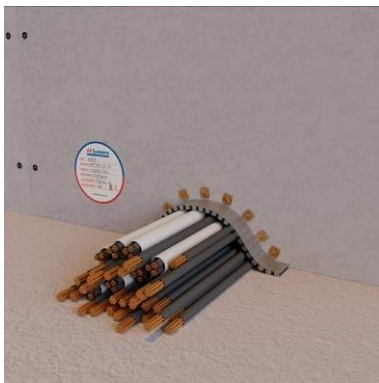
Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	5 corrugated PVC pipes with cable type A1	≤ 32	2,0	--	EI 60 U/C
	4 corrugated PA pipes with cable type A1	≤ 24	0,5	--	
≤ 110	10 cables type A1	--	--	--	EI 120
	10 cables type A2	--	--	--	
	10 cables type A3	--	--	--	
	2 cables type B	--	--	--	
≤ 110	10 cables type A1	--	--	--	EI 120 (i)
	10 cables type A2	--	--	--	
	10 cables type A3	--	--	--	
	2 cables type B	--	--	--	
	4 corrugated PVC pipes with cable type A1	≤ 22	2,0	--	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	≤ 9,0 (PE insulation)	EI 120 U/C
	2 PE-X/Al/PE	≤ 26	3,0	≤ 9,0 (PE insulation)	
	3 corrugated PA pipes with cable type A1	≤ 26	0,5	--	
≤ 110	1 PVC pipe	≤ 50	2,0	--	EI 120 U/C
	18 corrugated PVC pipes with cable type A1	≤ 20	2,0	--	

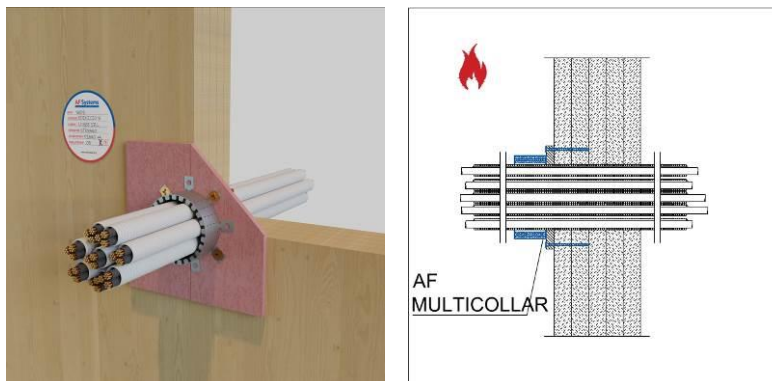
Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes or cables.

The number of pipes and cables (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

- (i) Test result representative for the end-use conditions of a cables bundle laying on a non-combustible floor. AF MULTICOLLAR is installed on top of the bundle in U-shape with the bottom part open, with a length (H) of the intumescent inlay of 50 mm and with 2 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 8 mm. See next figure.



A.4.1.2 Cross laminated timber (CLT) wall**A.4.1.2.1 137 mm thick CLT wall**

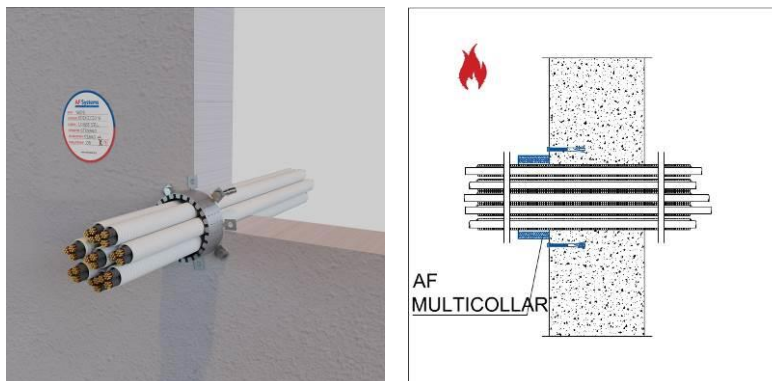
Collar at the fire exposed side only

Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 65	1 PE-X/Al/ PE-X	≤ 26	3,0	8,5	EI 120 U/C
	2 corrugated PVC pipes with cable type A2	≤ 24	2,0	--	
≤ 82	7 corrugated PVC pipes with cable type A2	≤ 24	2,0	--	EI 120 U/C

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes and cables (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

A.4.1.3 Rigid wall**A.4.1.3.1 150 mm thick rigid wall**

Collar at the fire exposed side only

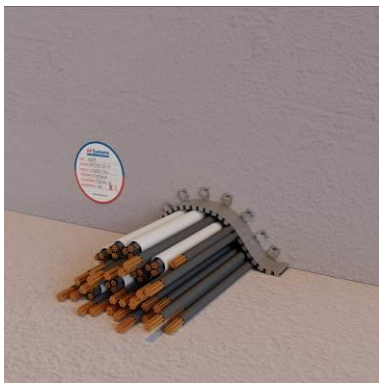
Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	5 corrugated PVC pipes with cable type A1	≤ 32	2,0	--	EI 60 U/C
	4 corrugated PA pipes with cable type A1	≤ 24	0,5	--	
≤ 110	10 cables type A1	--	--	--	EI 180
	10 cables type A2	--	--	--	
	10 cables type A3	--	--	--	
	2 cables type B	--	--	--	
≤ 110	10 cables type A1	--	--	--	EI 120 ⁽ⁱ⁾
	10 cables type A2	--	--	--	
	10 cables type A3	--	--	--	
	2 cables type B	--	--	--	
	4 corrugated PVC pipes with cable type A1	≤ 22	2,0	--	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	$\leq 9,0$ (PE insulation)	EI 120 U/C
	2 PE-X/Al/PE	≤ 26	3,0	$\leq 9,0$ (PE insulation)	
	3 corrugated PA pipes with cable type A1	≤ 26	0,5	--	
≤ 110	1 PVC pipe	≤ 50	2,0	--	EI 120 U/C
	18 corrugated PVC pipes with cable type A1	≤ 20	2,0	--	

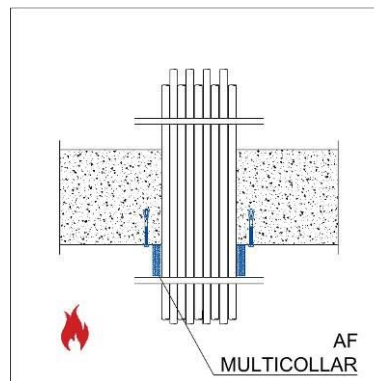
Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes or cables.

The number of pipes and cables (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

- (i) Test result representative for the end-use conditions of a cables bundle laying on a non-combustible floor. AF MULTICOLLAR is installed on top of the bundle in U-shape with the bottom part open, with a length (H) of the intumescent inlay of 50 mm and with 2 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 8 mm. See next figure.



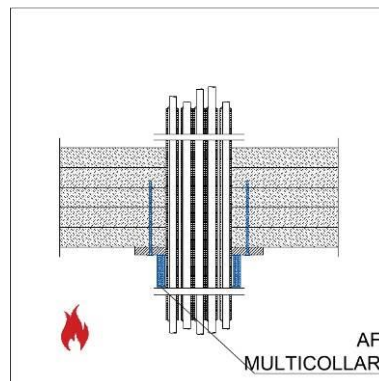
A.4.1.4 Rigid floor**A.4.1.4.1 150 mm thick rigid floor**

Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 100	10 cables type A1	--	--	--	EI 180
	10 cables type A3	--	--	--	
≤ 110	2 copper pipes	≤ 20	2,0	20	EI 180
	1 PVC pipe	≤ 40	3,7	--	
	1 corrugated PVC pipe with cable type A1	≤ 21,2	2,0	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes or cables.

The number of pipes and cables (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

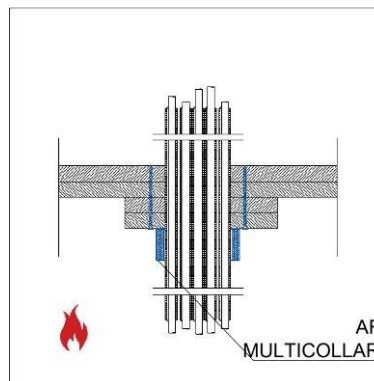
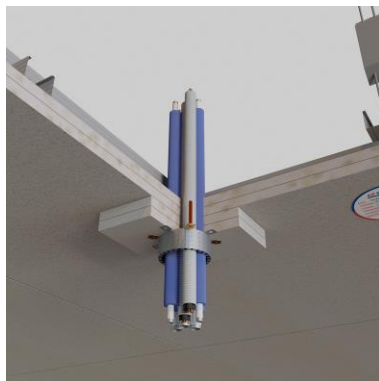
A.4.1.5 Cross laminated timber (CLT) floor**A.4.1.5.1 158 mm thick CLT floor**

Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	20 corrugated PVC with cable type A3	≤ 20	2,0	--	EI 120

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes and cables (maximum 20 pipes as given in the above table) can be reduced provided that the collar is closely fitted around the pipes.

A.4.1.6 False ceiling**A.4.1.6.1 50 mm thick false ceiling**

Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	2 PE-X/Al/PE-RT	≤ 26	3,0	≤ 9,0 (PE insulation)	EI 120 U/C
	2 PE-X/Al/PE-RT	≤ 16	2,0	≤ 6,0 (PE insulation)	
	2 corrugated PVC pipes with cable type A1	≤ 21	2,0	--	

Installation notes:

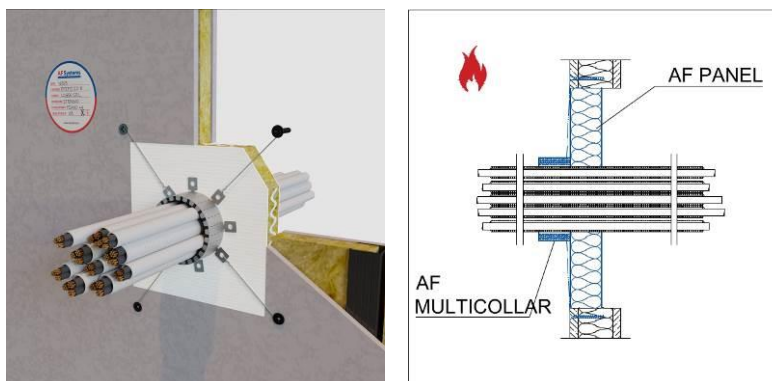
AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes and cables (maximum 6 pipes as given in the above table) can be reduced provided that the collar is closely fitted around the pipes.

A.4.2 Cable bundles through AF PANEL

A.4.2.1 Flexible wall

A.4.2.1.1 80 mm thick flexible wall



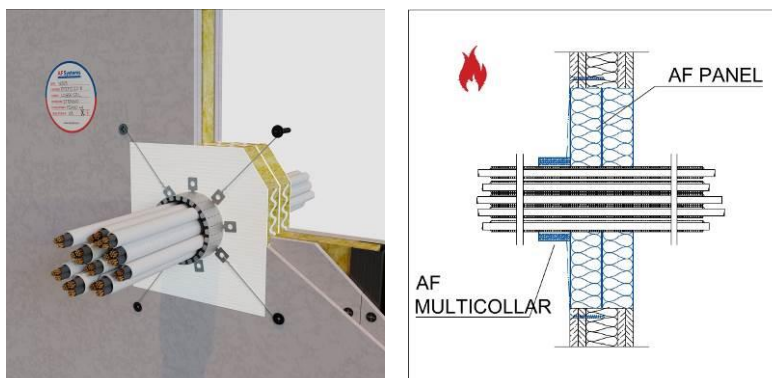
Collar at the fire exposed side only

Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	5 corrugated PVC pipes with cable type A1	≤ 32	2,0	--	EI 60 U/C
	4 corrugated PA pipes with cable type A1	≤ 24	0,5	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes and cables (maximum 9 pipes as given in the above table) can be reduced provided that the collar is closely fitted around the pipes.

A.4.2.1.2 100 mm thick flexible wall

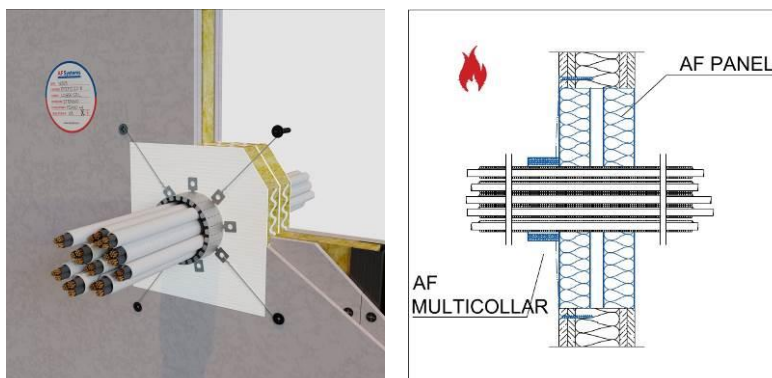
Collar at the fire exposed side only

Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	5 corrugated PVC pipes with cable type A1	≤ 32	2,0	--	EI 60 U/C
	4 corrugated PA pipes with cable type A1	≤ 24	0,5	--	
≤ 110	10 cables type A1	--	--	--	EI 120
	10 cables type A2	--	--	--	
	10 cables type A3	--	--	--	
	2 cables type B	--	--	--	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	≤ 9,0 (PE insulation)	EI 120 U/C
	2 PE-X/Al/PE	≤ 26	3,0	≤ 9,0 (PE insulation)	
	3 corrugated PA pipes with cable type A1	≤ 26	0,5	--	
≤ 110	8 corrugated PVC pipes with cable type A1, A2 or A3	≤ 32	2,0	--	EI 120 U/C

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes or cables.

The number of pipes and cables (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

A.4.2.1.3 120 mm thick flexible wall

Collar at the fire exposed side only

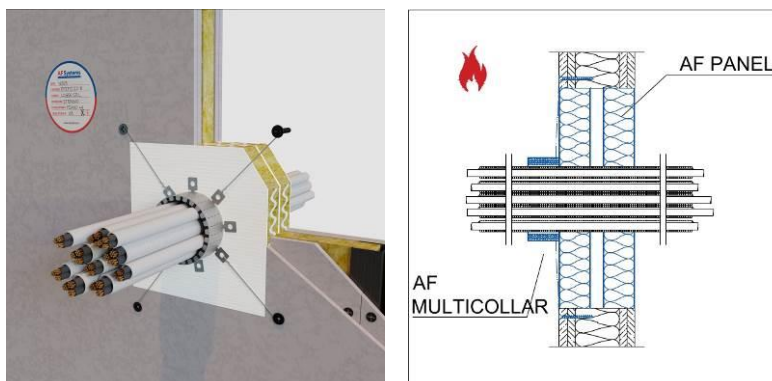
Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	5 corrugated PVC pipes with cable type A1	≤ 32	2,0	--	EI 60 U/C
	4 corrugated PA pipes with cable type A1	≤ 24	0,5	--	
≤ 110	10 cables type A1	--	--	--	EI 120
	10 cables type A2	--	--	--	
	10 cables type A3	--	--	--	
	2 cables type B	--	--	--	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	$\leq 9,0$ (PE insulation)	EI 120 U/C
	2 PE-X/Al/PE	≤ 26	3,0	$\leq 9,0$ (PE insulation)	
	3 corrugated PA pipes with cable type A1	≤ 26	0,5	--	
≤ 110	8 corrugated PVC pipes with cable type A1, A2 or A3	≤ 32	2,0	--	EI 120 U/C
$\leq^{(i)}$	1 PP pipe with 15 cables type A1	≤ 125	3,2	--	EI 120 U/C
	1 corrugated PVC pipe with 15 cables type A1	≤ 125	9,0	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes or cables.

The number of pipes and cables (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

- (i) The 2 pipes shall be aligned adjacent to each other (no gap between services). The number of pipes can be reduced to one, provided that AF MULTICOLLAR is closely fitted around the pipe and is installed with a length (H) of the intumescent inlay of 50 mm and with 3 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 12 mm.

A.4.2.1.4 125 mm thick flexible wall

Collar at the fire exposed side only

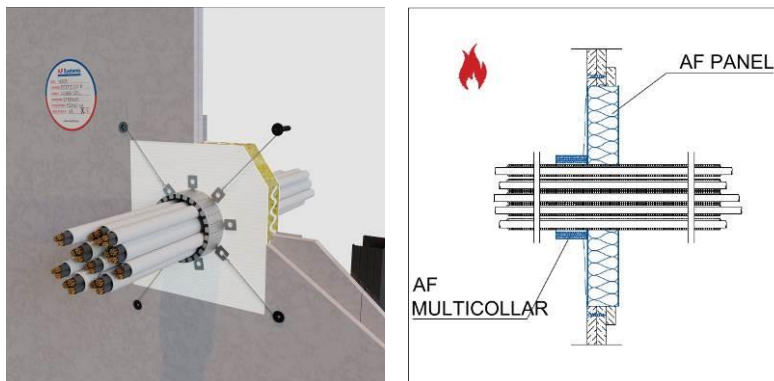
Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	5 corrugated PVC pipes with cable type A1	≤ 32	2,0	--	EI 60 U/C
	4 corrugated PA pipes with cable type A1	≤ 24	0,5	--	
≤ 110	10 cables type A1	--	--	--	EI 120
	10 cables type A2	--	--	--	
	10 cables type A3	--	--	--	
	2 cables type B	--	--	--	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	≤ 9,0 (PE insulation)	EI 120 U/C
	2 PE-X/Al/PE	≤ 26	3,0	≤ 9,0 (PE insulation)	
	3 corrugated PA pipes with cable type A1	≤ 26	0,5	--	
≤ 110	1 PVC pipe	≤ 50	2,0	--	EI 120 U/C
	18 corrugated PVC pipes with cable type A1	≤ 20	2,0	--	
≤ ⁽ⁱ⁾	1 PP pipe with 15 cables type A1	≤ 125	3,2	--	EI 120 U/C
	1 corrugated PVC pipe with 15 cables type A1	≤ 125	9,0	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes or cables.

The number of pipes and cables (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

- (i) The 2 pipes shall be aligned adjacent to each other (no gap between services). The number of pipes can be reduced to one, provided that AF MULTICOLLAR is closely fitted around the pipe and is installed with a length (H) of the intumescent inlay of 50 mm and with 3 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 12 mm.

A.4.2.2 Lining wall**A.4.2.2.1 30 mm thick lining wall**

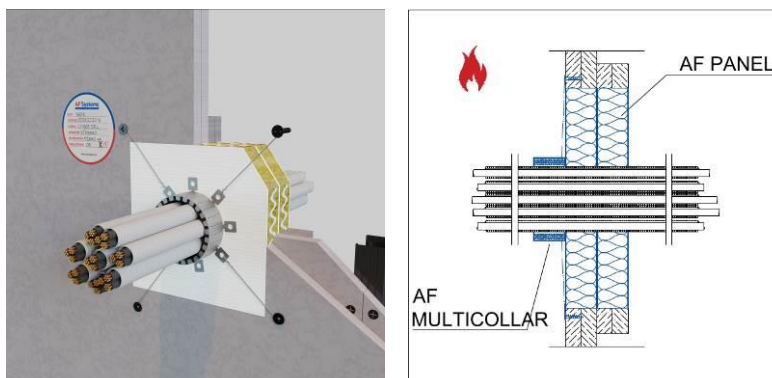
Collar at the fire exposed side only

Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	9,0	EI 60 U/C
	10 corrugated PVC pipes with cable type A1	≤ 20	2,0	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes and cables (maximum 15 pipes as given in the above table) can be reduced provided that the collar is closely fitted around the pipes.

A.4.2.2.2 50 mm thick lining wall

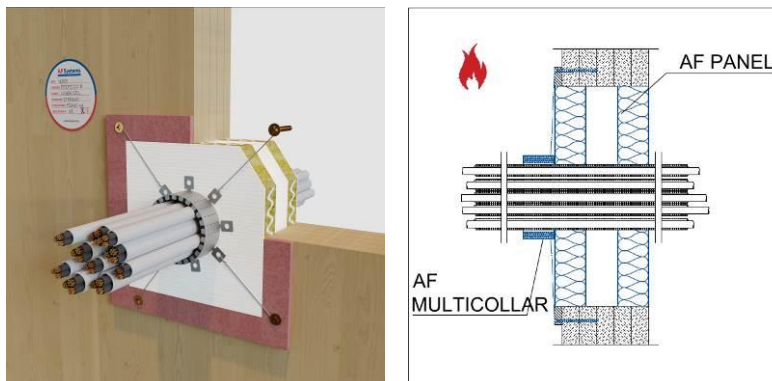
Collar at the fire exposed side only

Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 80	3 PE-X/Al/HDPE	≤ 20	3,0	≤ 6,0 (PE insulation)	EI 120 C/C
	3 corrugated PVC pipes with cable type A1	≤ 26	3,0	--	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	9,0	EI 60 U/C
	10 corrugated PVC pipes with cable type A1	≤ 20	2,0	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes and cables (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

A.4.2.3 Cross laminated timber (CLT) wall**A.4.2.3.1 137 mm thick CLT wall**

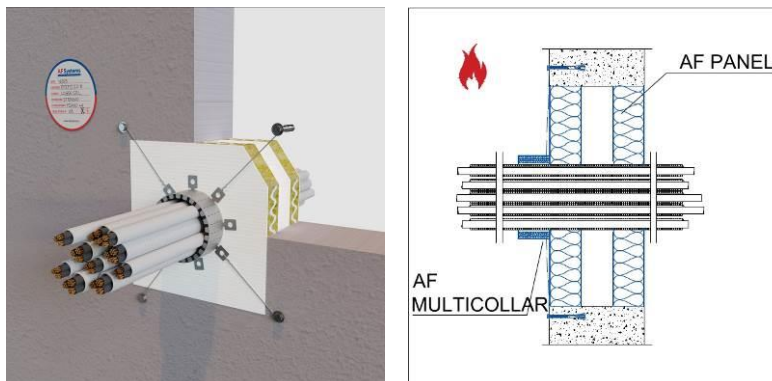
Collar at the fire exposed side only

Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 65	1 PE-X/Al/ PE-X	≤ 26	3,0	8,5	EI 120 U/C
	2 corrugated PVC pipes with cable type A2	≤ 24	2,0	--	
≤ 82	7 corrugated PVC pipes with cable type A2	≤ 24	2,0	--	EI 120 U/C

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes and cables (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

A.4.2.4 Rigid wall**A.4.2.4.1 150 mm thick rigid wall**

Collar at the fire exposed side only

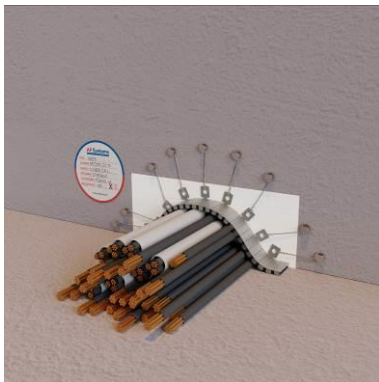
Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	5 corrugated PVC pipes with cable type A1	≤ 32	2,0	--	EI 60 U/C
	4 corrugated PA pipes with cable type A1	≤ 24	0,5	--	
≤ 110	10 cables type A1	--	--	--	EI 180
	10 cables type A2	--	--	--	
	10 cables type A3	--	--	--	
	2 cables type B	--	--	--	
≤ 110	10 cables type A1	--	--	--	EI 120 ⁽ⁱ⁾
	10 cables type A2	--	--	--	
	10 cables type A3	--	--	--	
	2 cables type B	--	--	--	
	4 corrugated PVC pipes with cable type A1	≤ 22	2,0	--	
≤ 110	5 PE-X/Al/HDPE	≤ 16	2,0	≤ 9,0 (PE insulation)	EI 120 U/C
	2 PE-X/Al/PE	≤ 26	3,0	≤ 9,0 (PE insulation)	
	3 corrugated PA pipes with cable type A1	≤ 26	0,5	--	
≤ 110	1 PVC pipe	≤ 50	2,0	--	EI 120 U/C
	18 corrugated PVC pipes with cable type	≤ 20	2,0	--	
≤ 125	7 corrugated PVC pipes with cable type A1	≤ 32	2,0	--	EI 180 C/U

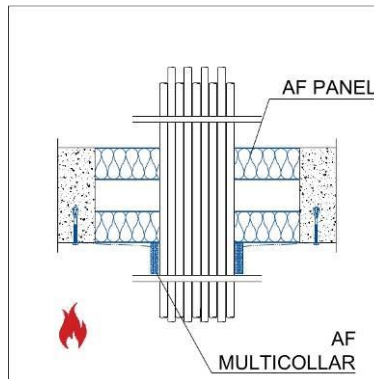
Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes or cables.

The number of pipes and cables (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

- (i) Test result representative for the end-use conditions of a cables bundle laying on a non-combustible floor. AF MULTICOLLAR is installed on top of the bundle in U-shape with the bottom part open, with a length (H) of the intumescent inlay of 50 mm and with 2 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 8 mm. See next figure.



A.4.2.5 Rigid floor**A.4.2.5.1 150 mm thick rigid floor**

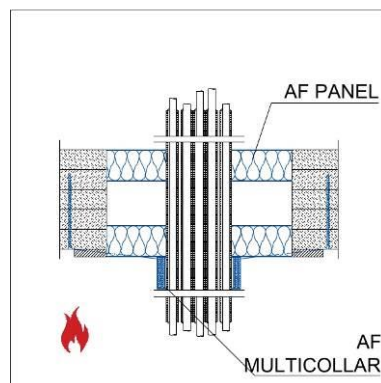
Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 100	10 cables type A1	--	--	--	EI 180
	10 cables type A3	--	--	--	
≤ 110	2 copper pipes	≤ 20	2,0	20	EI 180
	1 PVC pipe	≤ 40	3,7	--	
	1 corrugated PVC pipe with cable type A1	≤ 21,2	2,0	--	
≤ (i)	1 PP pipe with 11 cables type A1	≤ 125	3,2	--	EI 180 U/C
	1 corrugated PVC pipe with 10 cables type A1	≤ 125	9,0	--	

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes or cables.

The number of pipes and cables (maximum as given in the above table for every bundle) can be reduced provided that the collar is closely fitted around the pipes.

- (i) The 2 pipes shall be aligned adjacent to each other (no gap between services). The number of pipes can be reduced to one, provided that AF MULTICOLLAR is closely fitted around the pipes and is installed with a length (H) of the intumescent inlay of 50 mm and with 3 layers of intumescent strip for a total thickness (b) of the intumescent inlay of 12 mm.

A.4.2.6 Cross laminated timber (CLT) floor**A.4.2.6.1 158 mm thick CLT floor**

Overall diameter (mm)	Service description	Pipe diameter (mm)	Pipe wall thickness (mm)	Insulation thickness (mm)	Classification
≤ 110	20 corrugated PVC pipes with cable type A3	≤ 20	2,0	--	EI 120

Installation notes:

AF MULTICOLLAR is installed closely fitted around the bundle of pipes.

The number of pipes and cables (maximum 20 pipes as given in the above table) can be reduced provided that the collar is closely fitted around the pipes.

ANNEX B. Supporting constructive elements and installation criteria

B.1. General

The constructive elements where AF MULTICOLLAR may be installed are specified in this annex, together with the relevant installation conditions, to reach the resistance to fire performance given in Annex A:

- Flexible walls: section B.2.1.
- Lining walls: section B.2.2.
- Sandwich panels walls: section B.2.3.
- Timber walls: section B.2.4.
- Rigid walls: section B.2.5.
- Rigid floors: section B.3.1.
- Timber floors: section B.3.2.
- False ceilings: section B.3.3.

The constructive element where the penetration seal is installed must be classified in accordance with EN 13501-2 for the required fire resistance period. The rules given in section 13.3 of EN 1366-3 for supporting constructions can be applied regarding the field of direct application of test results.

The installation of AF MULTICOLLAR shall follow the procedure described in section B.4, except if otherwise specified in Annex A.

The additional components that make up the penetration seal, generically referred to in Annex A, shall meet the specification given in table B.2, except if otherwise specified in Annex A.

B.2. Specification of the supporting walls

B.2.1. Flexible walls ²⁶

B.2.1.1 Flexible wall of thickness 80 mm

Walls with a minimum thickness of 80 mm and resistance to fire EI 60.

When an opening in the wall is closed with AF PANEL, one layer is installed levelled to the surface at the fire exposed side of the wall. The maximum size of the opening is 550 mm x 600 mm.

²⁶ The flexible walls comprise timber or steel studs lined on both faces with minimum two layers of 12,5 mm thick 'Type F' or 'Type DF' gypsum plasterboards according to EN 520 (or minimum 1 layer of 15 mm in the case of the 80 mm thick flexible wall). In timber stud walls, no part of the penetration shall be closer than 100 mm to a stud, the cavity must be closed between the penetration seal and the stud and minimum 100 mm of insulation of reaction to fire class A1 or A2 according to EN 13501-1, is provided within the cavity between the penetration seal and the stud.

The resistance to fire performance given in Annex A for flexible walls may be applied to rigid constructions of an overall thickness equal to or greater and a minimum density of 350 kg/m³.

B.2.1.2 Flexible wall of thickness 100 mm

Walls with a minimum thickness of 100 mm and resistance to fire EI 120.

When an opening in the wall is closed with AF PANEL, two layers are installed levelled to the surface at both sides of the wall. The maximum size of the opening is 550 mm x 600 mm.

B.2.1.3 Flexible wall of thickness 120 mm

Walls with a minimum thickness of 120 mm and resistance to fire EI 120.

When an opening in the wall is closed with AF PANEL, two layers are installed levelled to the surface at both sides of the wall. The maximum size of the opening is 1750 mm x 1000 mm.

B.2.1.4 Flexible wall of thickness 125 mm

Walls with a minimum thickness of 125 mm and resistance to fire EI 120.

When an opening in the wall is closed with AF PANEL, two layers are installed levelled to the surface at both sides of the wall. The maximum size of the opening is 1750 mm x 1000 mm.

B.2.1.5 Flexible wall of thickness 135 mm

Walls with a minimum thickness of 135 mm and resistance to fire EI 120.

When an opening in the wall is closed with AF PANEL, two layers are installed levelled to the surface at both sides of the wall. The maximum size of the opening is 1750 mm x 1000 mm.

B.2.2. Lining walls

B.2.2.1 Lining wall of thickness 30 mm

One-sided flexible walls with a minimum thickness of 30 mm (boards only) and resistance to fire EI 60, which comprise a steel frame of a minimum thickness 50 mm (studs of 50 mm x 49 mm x 0,6 mm), lined at one side only with minimum two layers of 15 mm thick 'Type F' gypsum plasterboards according to EN 520.

When an opening in the wall is closed with AF PANEL, one layer is installed. A frame is installed around the opening, fixed to the wall plasterboards with self-tapping steel screws Ø 3,5 mm every 200 mm, made of strips (50 mm width and 15 mm thick) of 'Type F' gypsum plasterboards according to EN 520. The maximum size of the opening is 500 mm x 1060 mm.

B.2.2.2 Lining wall of thickness 50 mm

One-sided flexible walls with a minimum thickness of 50 mm (boards only) and resistance to fire EI 120, which comprise a steel frame of a minimum thickness 75 mm (studs of 75 mm x 50 mm x 0,6 mm), lined at one side only with minimum two layers of 25 mm thick 'Type GM-F' gypsum and vermiculite plasterboards, coated with fiberglass, according to EN 520.

When an opening in the wall is closed with AF PANEL, two layers are installed. A frame is installed around the opening, fixed to the wall plasterboards with self-tapping steel screws Ø 4 mm every 200 mm, made of strips (50 mm width and 25 mm thick, two layers for a total thickness of 50 mm) of 'Type GM-F' gypsum and vermiculite plasterboards, coated with fiberglass, according to EN 520. The maximum size of the opening is 550 mm x 1050 mm.

B.2.3. Self-supporting sandwich panels wall

Walls with a minimum thickness of 100 mm and resistance to fire EI 120, made of self-supporting sandwich panels with rock wool insulation core of density 100 kg/m³ faced at both sides with two corrugated galvanised steel sheets of thickness 0,5 mm. The sandwich panels have tongue and groove joint and are fixed to each other with steel rivets Ø3,5 mm x 14 mm, and to the rigid floors with steel L-profiles and steel anchors.

The opening in the sandwich panels wall is closed with two layers of AF PANEL. The maximum size of the opening is 600 mm x 1000 mm.

B.2.4. Timber wall

Walls with a minimum thickness of 137 mm and resistance to fire EI 120, made of cross laminated timber boards (X-LAM panels according to ETA 12/0347 or equivalent in accordance with EN 1366-3).

A plate of dimensions 300 mm x 300 mm, made of 12,5 mm thick 'Type F' gypsum plasterboards according to EN 520, is installed with the service axis in the centre as a support for AF MULTICOLLAR fixing.

When an opening in the wall is closed with AF PANEL, two layers are installed levelled to the surface at both sides of the wall. A frame is installed around the opening, fixed to the wall timber boards with self-tapping steel screws Ø6 mm every 200 mm, made of strips (100 mm width and 12,5 mm thick) of 'Type F' gypsum plasterboards according to EN 520. The maximum size of the opening is 600 mm x 600 mm.

B.2.5. Rigid walls

B.2.5.1 Rigid wall of thickness 150 mm

Concrete or masonry walls with a minimum thickness of 150 mm, minimum density of 550 kg/m³ and resistance to fire EI 180.

When an opening in the wall is closed with AF PANEL, two layers are installed levelled to the surface at both sides of the wall. The maximum size of the opening is 1800 mm x 650 mm.

B.2.5.2 Rigid wall of thickness 200 mm

Concrete or masonry walls with a minimum thickness of 200 mm, minimum density of 550 kg/m³ and resistance to fire EI 240.

When an opening in the wall is closed with AF PANEL, three layers are installed with the external panels levelled to the surface at both sides of the wall. The maximum size of the opening is 600 mm x 250 mm.

B.3. Specification of the supporting floors

B.3.1. Rigid floors

B.3.1.1 Rigid floor of thickness 150 mm

Concrete or other type of rigid floors with a minimum thickness of 150 mm, minimum density of 1600 kg/m³ and resistance to fire EI 180.

When an opening in the floor is closed with AF PANEL, two layers are installed levelled to the surface at both sides of the floor. The maximum size of the opening is 1000 mm x 500 mm. The maximum size can be enlarged up to 2000 mm x 1000 mm when supporting profiles are installed beneath the panels. Steel slotted profiles (30 mm width and 1 mm thick) placed under the panel's splices at maximum 500 mm, fixed to the floor at both profile's ends with expansion anchors Ø60 mm x 8 mm.

B.3.1.2 Rigid floor of thickness 200 mm

Concrete or other type of rigid floors (such as reinforced aerated concrete) with a minimum thickness of 200 mm, minimum density of 650 kg/m³ and resistance to fire EI 240.

When an opening in the floor is closed with AF PANEL, three layers are installed with the external panels levelled to the surface at both sides of the floor. The maximum size of the opening is 1360 mm x 200 mm.

B.3.2. Timber floor

Floors with a minimum thickness of 158 mm and resistance to fire EI 120, made of cross laminated timber boards (X-LAM panels according to ETA 12/0347 or equivalent in accordance with EN 1366-3).

A plate of dimensions 300 mm x 300 mm, made of 12,5 mm thick 'Type F' gypsum plasterboards according to EN 520, is installed with the service axis in the centre as a support for AF MULTICOLLAR fixing.

When an opening in the floor is closed with AF PANEL, two layers of AF PANEL are installed levelled to the surface at both sides of the floor. A frame is installed around the opening, fixed to the floor timber boards with self-tapping steel screws Ø 5 mm approximately every 175 mm, made of strips (110 mm width and 12,5 mm thick) of 'Type F' gypsum plasterboards according to EN 520. The maximum size of the opening is 700 mm x 500 mm.

B.3.3. False ceiling

False ceiling with a minimum thickness of 50 mm (boards only) and resistance to fire EI 120 (a ← b), which comprise a steel frame lined at the bottom side with minimum two layers of 25 mm thick 'Type F' gypsum plasterboards according to EN 520.

For passing services with a diameter up to 200 mm, a plate made of 2 layers of 25 mm thick 'Type F' gypsum plasterboards according to EN 520 is installed with the service axis in the centre as a support for AF MULTICOLLAR fixing (Ø8 mm x 100 mm self-tapping steel screws). For passing services with a higher diameter, the plate is made of 3 layers of 25 mm thick 'Type F' gypsum plasterboards and AF MULTICOLLAR is fixed with Ø8 mm x 125 mm self-tapping steel screws.

When an opening in the false ceiling is closed with AF PANEL, a frame made of strips (50 mm width and 25 mm thick, two layers for a total thickness of 50 mm) of 'Type GM-F' gypsum plasterboards coated with fiberglass, according to EN 15283-1, is installed around the opening in the false ceiling, fixed to the gypsum plasterboards with self-tapping steel screws approximately every 100 mm. The opening is closed with two layers of AF PANEL. The maximum size of the opening is 400 mm x 250 mm.

B.4. Installation AF MULTICOLLAR

B.4.1. General

AF MULTICOLLAR will be installed in accordance with the manufacturer instructions, which shall conform to the assessment carried out, and the provisions established in this section and in Annex A. The sequence of installation is described in figure B.1.

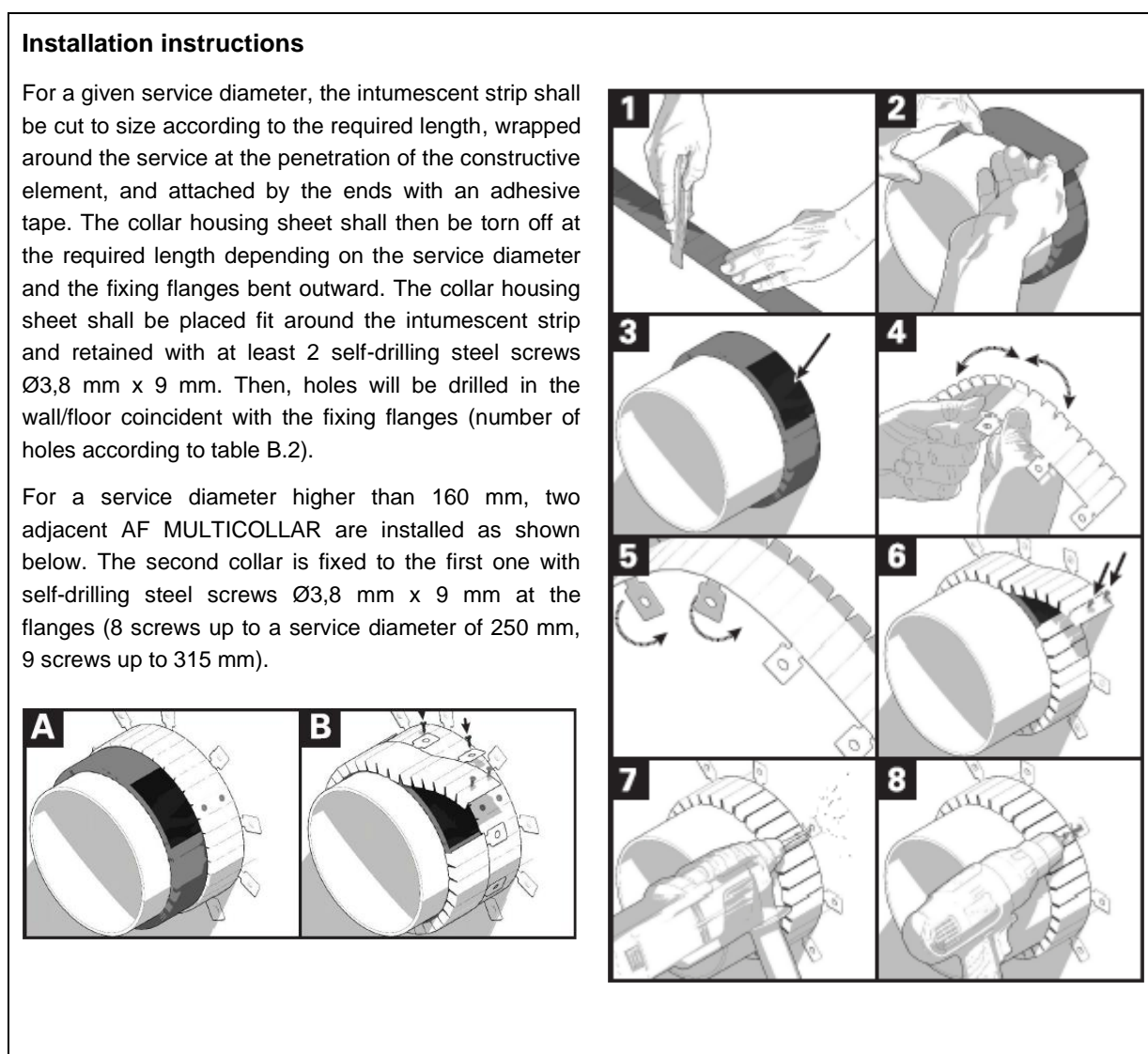


Figure B.1: Sequence of AF MULTICOLLAR installation.

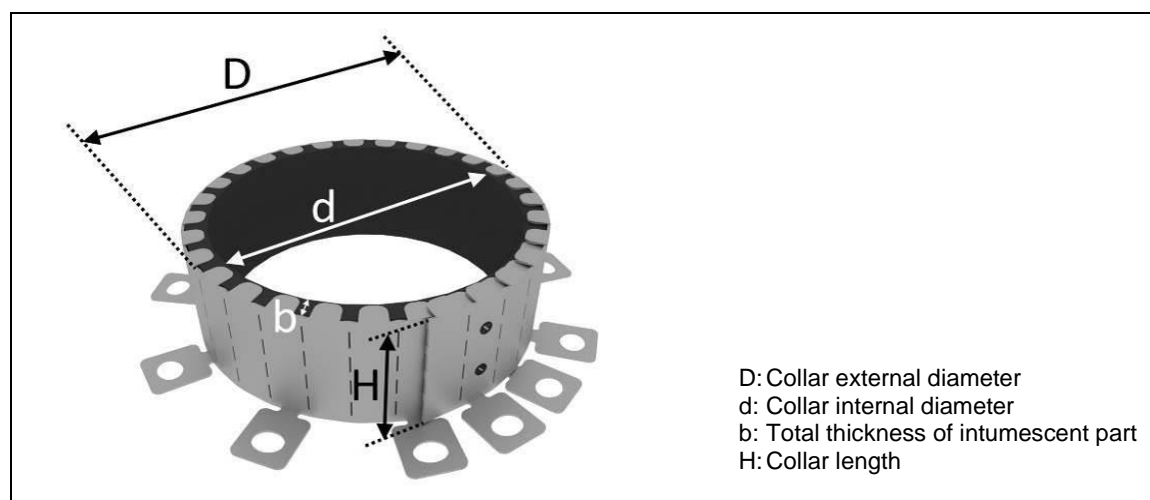
AF MULTICOLLAR is cut to suit the external diameter of the service to be protected (d in table B.1). The dimensions of AF MULTICOLLAR will be selected as given in table B.1 according to the external diameter of the service (including insulation thickness, when relevant), which will match parameter “ d ” in table B.1, except if otherwise specified in Annex A. Table B.1 is a non-exhaustive list for reference and not all service sizes are shown: the relevant information on the collar parameters (H , b and strip layers) is given in Annex A for those non-standard cases not considered in table B.2. The collar housing length and inlay strip length are cut to size for installation in accordance with the manufacturer instructions.

Table B.1: Dimensions of AF MULTICOLLAR (installed).

Type	d (mm)	D (mm)	H (mm)	b (mm)	N° of strip layers	N° of fixings
AF MULTICOLLAR 30	30	47	50	8	2	4
AF MULTICOLLAR 40	40	67	50	8	2	4
AF MULTICOLLAR 50	50	77	50	8	2	4
AF MULTICOLLAR 63	63	80	50	8	2	4
AF MULTICOLLAR 80	80	97	50	8	2	4
AF MULTICOLLAR 90	90	107	50	8	2	4
AF MULTICOLLAR 100	100	117	50	8	2	4
AF MULTICOLLAR 110	110	127	50	8	2	4
AF MULTICOLLAR 125	125	150	50	12	3	5
AF MULTICOLLAR 140	140	165	50	12	3	5
AF MULTICOLLAR 150	150	175	50	12	3	5
AF MULTICOLLAR 160	160	185	50	12	3	5
AF MULTICOLLAR 200	200	241	50	20	5	5
AF MULTICOLLAR 250	250	291	50	20	5	5
AF MULTICOLLAR 315	315	364	50	24	6	6

Notes:

- d, D, H and b refer to the dimensions of the collar once installed (see figure B.2).
- When the collar is used to seal plastic pipes with a service diameter higher than 160 mm, two adjacent AF MULTICOLLAR are installed as described in figure B.1 for a total length (H) of 100 mm. Additionally, this installation of a double collar for a total length (H) of 100 mm can also be required for specific cases, when indicated in Annex A.
- When the collar is used to seal insulated steel pipes, the collar is selected according to this table to fit the total service diameter (pipe plus insulation thickness), ensuring that the intumescent strip thickness (b) is at least 8 mm (2 layers) for insulation thicknesses ≤ 40 mm and 12 mm (3 layers) for insulation thicknesses between 40 mm and 60 mm (but, if the collar selected according to this table for a given diameter has a greater number of intumescent layers, the specification in the table shall be kept).
- For service diameters not given in this table, other sizes of AF MULTICOLLAR can be used according to the service diameter given in the relevant table of Annex A, provided that the collar parameters (H, b, strip layers and fixings) are kept in accordance with the next greater size of AF MULTICOLLAR as shown in this table (except for those non-standard cases explicitly specified in Annex A).

**Figure B.2:** Dimensions of AF MULTICOLLAR (installed).

In walls, AF MULTICOLLAR can be installed at both sides of the constructive element or only at the fire exposed side of the wall, as specified in Annex A. In floors, AF MULTICOLLAR is installed at the bottom side.

AF MULTICOLLAR shall be fixed to the constructive element as follows:

- In flexible walls, lining walls, timber walls and timber floors, by means of self-tapping galvanised steel screws of Ø8 mm and length depending on the wall thickness and collar size, according to the manufacturer's instructions.
- In sandwich panels walls, AF MULTICOLLAR is only assessed when installed on AF PANEL closing solution, fixed with Ø6 mm passing threaded steel bars, closed with nuts and washers.
- In rigid walls and rigid floors, by means of Ø8 mm x 60 mm galvanised steel class 8.8 expansion anchors.

The number of fixings will be in accordance with table B.1. The number of fixing flanges of the collar housing may be different from the required number of fixings. Fixings will be installed every other flange.

All gaps between penetrations and constructive elements will not be greater than 5 mm and shall be filled in with mortar (floors and rigid walls) or gypsum paste (flexible walls), also spread over the constructive element surface around the collar base.

The minimum distance between services is generally 100 mm, except if otherwise specified in Annex A (e.g., pipes in series, linear arrangement) or in the manufacturer's instructions based on specific test results.

The maximum distance from the constructive element to the adequate service support is 500 mm in case of walls (cold side) and floors (upper side).

The following installation provisions will be noted:

- The installation of the penetration seal will not have an effect on the stability of the adjacent building element, even in the event of fire.
- The structural elements related to the wall/floor in which the penetration seal is incorporated will be designed and fire protected in such a way that no additional mechanical load is imposed on the penetration seal.
- The thermal movements of the pipework will be accommodated in such a way that no resulting load is imposed on the penetration seal.
- The services are fixed to the building element in such a way that no additional mechanical load is imposed on the penetration seal in the event of fire.
- The support of the services is maintained during the required period of resistance to fire.
- Pneumatic dispatch systems, compressed air systems, etc. are switched off in the event of fire.

B.4.2. AF MULTICOLLAR installation on AF PANEL

AF PANEL closing solution will be installed in the constructive element in accordance with the provisions given in ETA 22/0853, section A.2, and the manufacturer's instructions.

The maximum size of the opening shut with AF PANEL is given in sections B.2 and B.3 of this ETA in relation to the supporting construction. In the case of walls, the given maximum size can be increased up to either 25 % in height or 25 % in width or 25 % in area according to table A.3 in EN 15882-3 ²⁷. If a blank seal (opening shut with AF PANEL without passing services) is installed, splices within the seal area have not been assessed.

The minimum distance from services to the edge of AF PANEL closure area, as well as the minimum distance between passing services, is generally 100 mm, except if otherwise specified in the manufacturer's instructions based on specific test results.

When AF MULTICOLLAR is installed on AF PANEL closing solution in walls, it is fixed with steel wires of minimum diameter 1 mm from the collar flanges to the wall, where the wires are fixed by the means described in section B.4.1 depending on the type of constructive element. The minimum number of wires to fix the collar shall be in accordance with the number of fixings given in table B.1. In the case of AF PANEL closing solution in a sandwich panels wall, AF MULTICOLLAR is fixed at the flanges with Ø6 mm passing threaded steel bars, closed with nuts and washers.

When AF MULTICOLLAR is installed on AF PANEL closing solution in floors, it is held at the bottom side with steel wires of minimum diameter 1 mm from the collar flanges, passing through AF PANEL and fixed to a protected supporting structure at the upper side of the floor. Alternatively, AF MULTICOLLAR can be fixed to AF PANEL with steel spiral pigtail screws of diameter 8 mm and length 160 mm, in those cases specified in Annex A.

AF SEAL W acrylic sealant is applied at an approximate dry thickness of 2 mm over the fire exposed surface of AF PANEL, completely covering the steel wires and their fixing to the constructive element.

B.4.3. AF MULTICOLLAR installation on AF BRICK

AF BRICK closing solution will be installed in the constructive element in accordance with the provisions given in ETA 21/0580, section A.2, and the manufacturer's instructions.

AF BRICK is placed inside the opening in the constructive element, orienting the brick side of 150 mm parallel to the thickness of the support, up to the complete obstruction of the opening. Small gaps between services and AF BRICK can be filled with AF GRAPHIT FOAM, particularly if they are greater than 5 mm.

The maximum seal size of the AF BRICK closing solution will be 0,6 m². If a blank seal (opening shut with AF BRICK without passing services) is installed, a reinforcement net made of 1 mm diameter steel cable is installed at the fire exposed side of the constructive element, supporting the AF BRICK blank seal (see ETA 21/0580, section A.2.2 for rigid and flexible walls and section A.2.3 for rigid floors). In the case of floors, a reinforcement net of 1 mm diameter steel cable is always installed below the seal in openings bigger than 0,4 m², also when services pass through (see ETA 21/0580, section A.2.3).

²⁷ EN 15882-3 Extended applications of results from fire resistance tests for service installations. Part 3: Penetration seals.

The minimum distance from services to the edge of AF BRICK closure area, as well as the minimum distance between passing services, is generally 100 mm, except if otherwise specified in the manufacturer's instructions based on specific test results.

When AF MULTICOLLAR is installed on AF BRICK closing solution in walls, it is fixed with steel wires of minimum diameter 1 mm from the collar flanges to the wall, where the wires are fixed by the means described in section B.4.1 depending on the type of constructive element. The minimum number of wires to fix the collar shall be in accordance with the number of fixings given in table B.1.

When AF MULTICOLLAR is installed on AF BRICK closing solution in floors, it is held at the bottom side with steel wires of minimum diameter 1 mm from the collar flanges to the floor, where the wires are fixed by means of Ø8 mm x 60 mm galvanised steel expansion anchors.

B.5. Additional components of the fire penetration seal

The additional components, generically referred to in Annex A, shall meet the following specification.

Table B.2: Specification of the fire penetration seal additional components.

Component	Specification
Steel pipes	The steel pipes will be made of steel with a minimum melting point of 1450 °C and a maximum thermal conductivity of 52 W/(m·K).
Insulation material for pipes (unless otherwise specified in Annex A)	Foamed elastomeric insulation material: <ul style="list-style-type: none"> • Continuous insulation. • Reaction to fire: from B_L-s1,d0 to D_L-s3,d0. • Maximum thermal conductivity (23 °C): $\lambda \leq 0,043 \text{ W/(m·K)}$. • Fixed around the pipe with a steel wire of diameter 1 mm.
Small-sheathed cables	Cables type group 1 according to Annex A of EN 1366-3: <ul style="list-style-type: none"> • Cables type A1 model "5×1,5 mm² CI 1 PVC/PVC 600/1000V NYYJ". • Cables type A2 model "5×1,5 mm² CI 5 Cu EPR/PCP 450/750V H07RN-F". • Cables type A3 model "5×1,5 mm² CI 1 Cu XLPE/LSZH 600/1000V N2XH-J". • Cables type B model "1×95 mm² CI 2 PVC/PVC 600/1000V NYY0".
AF PANEL	AF PANEL is CE marked based on ETA 21/0853, with which the product and installation conditions of AF PANEL shall conform.
AF BRICK	AF BRICK is CE marked based on ETA 21/0580, with which the product and installation conditions of AF BRICK shall conform.
AF SEAL W	AF SEAL W is CE marked based on ETA 23/0951, with which the product and installation conditions of AF SEAL W shall conform.