



Classification Report for Fire resistance classification of construction products and building elements in accordance with EN 13501-2: 2023

SPONSOR: FSi Promat

PRODUCT NAME: FC-MD

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UL International (UK) Ltd.
220, Cygnet Court, Centre Park, Warrington. WA1 1PP
Approved Body No. 0843
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1. Introduction

This classification report defines the classification assigned to the penetration seal designated as FSi FC-MD by the procedures given in

EN 13501-2: 2023 - Fire classification of construction products and building elements. - Part 2: Classification using data from fire resistance tests, excluding ventilation services

This classification report consists of 91 pages and may only be used or reproduced in its entirety.

2. Details of classification product

2.1. General

The product designated as FSi FC-MD is a pipe closure device used to provide a penetration seal where walls and floors are penetrated by essential services.

2.2. Product description

The penetration seal designated as FSi FC-MD is fully described in the test reports provided in support of Classification, detailed in clause 3.1.

3. Test reports in support of classification

3.1. Summary of test reports

Name of laboratory	Name of sponsor	Test reference	Test date	Test method
PAVUS, a. s. NB No. 1391	Promat Research and Technology Centre NV	Pr-17-2.110-En	2017.06.08	EN 1366-3:2009
		Pr-17-2.192-En	2017.10.24	EN 1366-3:2009
		Pr-17-2.193-En	2017.11.22	EN 1366-3:2009
		Pr-17-2.228-En	2017.12.11	EN 1366-3:2009
		Pr-18-2.031-En	2018.02.06	EN 1366-3:2009
		Pr-18-2.045-En	2018.02.27	EN 1366-3:2009
		Pr-18-2.249-En	2018.11.05	EN 1366-3:2009
		Pr-18-2.250-En	2018.11.06	EN 1366-3:2009
		Pr-18-2.251-En	2018.12.11	EN 1366-3:2009
		Pr-18-2.180-En	2018.10.02	EN 1366-3:2009
		Pr-18-2.114-En	2018.05.03	EN 1366-3:2009
		077/van/18 from day	2018-02-14	Critical pipes
WFRGENT NV NB No. 1173	Etex Building Performance NV	20164A	2020.03.02	EN 1366-3:2009
		20381A	2020.05.25	EN 1366-3:2009
Warringtonfire NB No. 0833	FSi Ltd	398296 Issue 2	2018.05.15	EN 1366-3:2009

3.2. Results

Summary of report No.: Pr-17-2.110-En

A fire resistance test in accordance with EN 1366-3: 2009, on 2017.06.08. The results of the test were as follows:

FSi FC-MD with PP pipe in annular space made of PROMASTOP®-M (specimens No 1, 2)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min, no failure
- cotton pad	132 min, no failure
- sustained flaming	132 min, no failure
Insulation (I)	132 min, no failure

FSi FC-MD with PP pipe in annular space made of PROMASTOP®-M (specimen No 3)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	121 min
- cotton pad	121 min
- sustained flaming	121 min
Insulation (I)	121 min

Summary of report No.: Pr-17-2.192-En

A fire resistance test in accordance with EN 1366-3: 2009, on 2017.10.24 The results of the test were as follows:

FSi FC-MD with PP pipe in annular space made of gypsum filler (specimens No 9 to 14)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min, no failure 132 min, no
- cotton pad	failure
- sustained flaming	132 min, no failure
Insulation (I)	132 min, no failure

FSi FC-MD with PP pipe in annular space made of gypsum filler (specimens No 16, 17)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min, no failure 132 min, no
- cotton pad	failure 132 min, no failure
- sustained flaming	
Insulation (I)	132 min, no failure

FSi FC-MD with PE pipe in annular space made of gypsum filler (specimens No 1 to 6)	
Fire scenario	<i>standard temperature / time curve</i>
Direction of exposure	<i>from one side</i>
Supporting construction	<i>flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m⁻³</i>
Pipe end configuration inside/outside the furnace	<i>uncapped/capped (U/U)</i>
Pipe orientation	<i>90°(perpendicular to the seal)</i>
Integrity (E)	
- cracks or openings	<i>132 min, no failure 132 min, no failure</i>
- cotton pad	<i>132 min, no failure</i>
- sustained flaming	
Insulation (I)	<i>132 min, no failure</i>

Summary of report No.: Pr-17-2.193-En

A fire resistance test in accordance with EN 1366-3: 2009, on 2017.10.24 The results of the test were as follows:

FSi FC-MD with PP pipe in annular space made of gypsum filler (specimens No 11, 12)	
Fire scenario	<i>standard temperature / time curve</i>
Direction of exposure	<i>from one side</i>
Supporting construction	<i>flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m⁻³</i>
Pipe end configuration inside/outside the furnace	<i>uncapped/uncapped (U/U)</i>
Pipe orientation	<i>90°(perpendicular to the seal)</i>
Integrity (E)	
- cracks or openings	<i>133 min, no failure 133 min, no failure</i>
- cotton pad	<i>failure 133 min, no failure</i>
- sustained flaming	
Insulation (I)	<i>133 min, no failure</i>

FSi FC-MD with PE pipe in annular space made of gypsum filler (specimen No 13)

Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	133 min, no failure 133 min, no failure
- cotton pad	133 min, no failure
- sustained flaming	
Insulation (I)	128 min

FSi FC-MD with PE pipe in annular space made of gypsum filler (specimen No 14)

Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	133 min, no failure 133 min, no failure
- cotton pad	failure 133 min, no failure
- sustained flaming	
Insulation (I)	103 min

FSi FC-MD with Geberit Silent-PP (PP-C / PP-MD / PP-C) compound pipe in annular space made of gypsum filler (specimen No 3)

Fire scenario	<i>standard temperature / time curve</i>
Direction of exposure	<i>from one side</i>
Supporting construction	<i>flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m⁻³</i>
Pipe end configuration inside/outside the furnace	<i>uncapped/uncapped (U/U)</i>
Pipe orientation	<i>90°(perpendicular to the seal)</i>
Integrity (E)	
- cracks or openings	<i>133 min, no failure 133 min, no failure</i>
- cotton pad	<i>133 min, no failure</i>
- sustained flaming	
Insulation (I)	<i>133 min, no failure</i>

FSi FC-MD with Geberit Silent-PP (PP-C / PP-MD / PP-C) compound pipe in annular space made of gypsum filler (specimen No 4)

Fire scenario	<i>standard temperature / time curve</i>
Direction of exposure	<i>from one side</i>
Supporting construction	<i>flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m⁻³</i>
Pipe end configuration inside/outside the furnace	<i>uncapped/uncapped (U/U)</i>
Pipe orientation	<i>90°(perpendicular to the seal)</i>
Integrity (E)	
- cracks or openings	<i>133 min, no failure 133 min, no</i>
- cotton pad	<i>failure 133 min, no failure</i>
- sustained flaming	
Insulation (I)	<i>121 min</i>

FSi FC-MD with Geberit Silent-Pro (PP-MX) compound pipe in annular space made of gypsum filler (specimen No 5)

Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	133 min, no failure 133 min, no failure
- cotton pad	133 min, no failure
- sustained flaming	
Insulation (I)	133 min, no failure

FSi FC-MD with Geberit Silent-Pro (PP-MX) compound pipe in annular space made of gypsum filler (specimen No 6)

Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	133 min, no failure 133 min, no
- cotton pad	failure 133 min, no failure
- sustained flaming	
Insulation (I)	102 min

FSi FC-MD with Rehau Raupiano Plus (PP-MD) compound pipe in annular space made of gypsum filler (specimens No 7, 8)

Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	133 min, no failure 133 min, no failure
- cotton pad	133 min, no failure
- sustained flaming	
Insulation (I)	133 min, no failure

FSi FC-MD with Geberit Silent-db20 (PE-S2) compound pipe in annular space made of gypsum filler (specimens No 1, 2)

Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	133 min, no failure 133 min, no failure
- cotton pad	failure 133 min, no failure
- sustained flaming	
Insulation (I)	133 min, no failure

FSi FC-MD with PVC-U compound pipe in annular space made of gypsum filler (specimen No 9)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	133 min, no failure 133 min, no failure
- cotton pad	133 min, no failure
- sustained flaming	
Insulation (I)	133 min, no failure

FSi FC-MD with PVC-U compound pipe in annular space made of gypsum filler (specimen No 10)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	122 min, no failure 122 min, no failure
- cotton pad	failure 122 min, no failure
- sustained flaming	
Insulation (I)	122 min, no failure

Summary of report No.: Pr-18-2.045-En

A fire resistance test in accordance with EN 1366-3: 2009, on 2018.02.27. The results of the test were as follows:

FSi FC-MD with PVC compound pipe in annular space made of gypsum filler (specimen No 10)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	133 min, no failure
- cotton pad	133 min, no failure
- sustained flaming	133 min, no failure
Insulation (I)	133 min, no failure

Summary of report No.: Pr-17-2.228-En

A fire resistance test in accordance with EN 1366-3: 2009, on 2017.12.11. The results of the test were as follows:

FSi FC-MD with PP pipe in annular space made of PROMASTOP®-M (specimens No 7 to 10, 13, 16)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min, no failure
- cotton pad	132 min, no failure
- sustained flaming	132 min, no failure
Insulation (I)	132 min, no failure
FSi FC-MD with PP pipe in annular space made of PROMASTOP®-M (specimen No 11)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	129 min
- cotton pad	129 min
- sustained flaming	129 min
Insulation (I)	127 min

FSi FC-MD with PE pipe in annular space made of PROMASTOP®-M (specimens No 1, 2, 4, 5, 6)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min, no failure
- cotton pad	132 min, no failure
- sustained flaming	132 min, no failure
Insulation (I)	132 min, no failure
FSi FC-MD with PE pipe in annular space made of PROMASTOP®-M (specimen No 15)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	120 min
- cotton pad	120 min
- sustained flaming	120 min
Insulation (I)	120 min
FSi FC-MD with Geberit Silent-PP (PP-C / PP-MD / PP-C) compound pipe in annular space made of PROMASTOP®-M (specimens No 21, 22)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min, no failure
- cotton pad	132 min, no failure
- sustained flaming	132 min, no failure
Insulation (I)	132 min, no failure

FSi FC-MD with Geberit Silent-Pro (PP-MX) compound pipe in annular space made of PROMASTOP®-M (specimens No 23, 24)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min, no failure
- cotton pad	132 min, no failure
- sustained flaming	132 min, no failure
Insulation (I)	132 min, no failure
FSi FC-MD with Rehau Raupiano Plus (PP-MD) compound pipe in annular space made of PROMASTOP®-M (specimen No 25)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min, no failure
- cotton pad	132 min, no failure
- sustained flaming	132 min, no failure
Insulation (I)	132 min, no failure
FSi FC-MD with Rehau Raupiano Plus (PP-MD) compound pipe in annular space made of PROMASTOP®-M (specimen No 26)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	120 min
- cotton pad	120 min
- sustained flaming	120 min
Insulation (I)	120 min

FSi FC-MD with Geberit Silent-db20 (PE-S2) compound pipe in annular space made of PROMASTOP®-M (specimens No 19, 20)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min, no failure
- cotton pad	132 min, no failure
- sustained flaming	132 min, no failure
Insulation (I)	132 min, no failure
FSi FC-MD with PVC-U compound pipe in annular space made of PROMASTOP®-M (specimen No 27)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min, no failure
- cotton pad	132 min, no failure
- sustained flaming	132 min, no failure
Insulation (I)	132 min, no failure
FSi FC-MD with PVC-U compound pipe in annular space made of PROMASTOP®-M (specimen No 28)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	99 min
- cotton pad	99 min
- sustained flaming	99 min
Insulation (I)	91 min

Summary of report No.: Pr-18-2.031-En

A fire resistance test in accordance with EN 1366-3: 2009, on 2018.02.06. The results of the test were as follows:

FSi FC-MD with PP pipe in annular space made of PROMASTOP®-M (specimen No 8)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	90 min, no failure 90 min, no failure
- cotton pad	90 min, no failure
- sustained flaming	
Insulation (I)	90 min, no failure
FSi FC-MD with PP pipe in annular space made of PROMASTOP®-M (specimen No 9)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	90 min, no failure
- cotton pad	90 min, no failure 90 min, no failure
- sustained flaming	
Insulation (I)	90 min, no failure

FSi FC-MD with Rehau Raupiano Plus (PP-MD) compound pipe in annular space made of PROMASTOP®-M (specimen No 10)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	90 min, no failure 90 min, no failure
- cotton pad	90 min, no failure
- sustained flaming	
Insulation (I)	90 min, no failure
FSi FC-MD with PVC-U compound pipe in annular space made of PROMASTOP®-M (specimen No 11)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	90 min, no failure 90 min, no failure
- cotton pad	90 min, no failure
- sustained flaming	
Insulation (I)	90 min, no failure

Summary of report No.: Pr-18-2.249-En

A fire resistance test in accordance with EN 1366-3: 2009, on 2018.11.05. The results of the test were as follows:

FSi FC-MD with PE pipe in annular space made of PROMASEAL®-A and stone wool (specimen No 4)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	120 min
FSi FC-MD with PP-H pipe in annular space made of PROMASEAL®-A and stone wool (specimen No 5)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min

FSi FC-MD with PP-H pipe in annular space made of PROMASEAL®-A and stone wool (specimen No 6)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	100 min
FSi FC-MD with PE pipes in annular space made of gypsum filler (specimens No 11, 12)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min

FSi FC-MD with PP-H pipes in annular space made of gypsum filler (specimens No 13, 14)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 100 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min

Summary of report No.: 20381A

A fire resistance test in accordance with EN 1366-3: 2009, on 2020.05.25. The results of the test were as follows:

FSi FC-MD with Henco Standard (PE-Xc/Al/PE-Xc) pipes in annular space made of PROMASEAL®-A (specimen No 1a) with additional protection	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 45 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min

FSi FC-MD with Henco Standard (PE-Xc/Al/PE-Xc) pipes with covering in annular space made of PROMASEAL®-A (specimen No 1b) with PE corrugated jacket and additional protection

Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 45 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min

FSi FC-MD with Henco Standard (PE-Xc/Al/PE-Xc) pipes in annular space made of PROMASEAL®-A (specimens No 1c, 1d) with PE insulation and additional protection

Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 45 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min

FSi FC-MD with Henco Standard (PE-Xc/Al/PE-Xc) pipes in annular space made of PROMASEAL®-A (specimen No 2a)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 45 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	99 min
FSi FC-MD with Henco Standard (PE-Xc/Al/PE-Xc) pipes with covering in annular space made of PROMASEAL®-A (specimen No 2b) with PE corrugated jacket	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 45 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min

FSi FC-MD with Henco Standard (PE-Xc/Al/PE-Xc) pipes in annular space made of PROMASEAL®-A (specimens No 2c, 2d) with PE insulation	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	flexible wall th. 100 mm, made of gypsum plasterboards, 2 x 12.5 mm on each side, steel studs 50 mm x 50 mm, mineral wool insulation th. 40 mm, density 45 kg.m ⁻³
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min

Summary of report No.: Pr-18-2.114-En

A fire resistance test in accordance with EN 1366-3: 2009, on 2018.05.03. The results of the test were as follows:

FSi FC-MD with pipe bundle made of PVC-U pipes in annular space made of PROMASTOP®-M (specimen No 27)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	90 min
- cotton pad	90 min
- sustained flaming	90 min
Insulation (I)	90 min

Summary of report No.: Pr-18-2.250-En

A fire resistance test in accordance with EN 1366-3: 2009, on 2018.11.06. The results of the test were as follows:

FSi FC-MD with pipe bundle made of PP-H pipes in annular space made of PROMASTOP®-M (specimen No 2)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	133 min
- cotton pad	133 min
- sustained flaming	133 min
Insulation (I)	133 min
FSi FC-MD with pipe bundle made of PE pipes in annular space made of PROMASTOP®-M (specimen No 3)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	133 min
- cotton pad	133 min
- sustained flaming	133 min
Insulation (I)	133 min

FSi FC-MD with pipe bundle made of PE, PVC-U and PP-H pipes in annular space made of PROMASTOP®-M (specimen No 4)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	117 min
- cotton pad	117 min
- sustained flaming	117 min
Insulation (I)	117 min
FSi FC-MD with PP-H pipe in coated batt seal made of 2x50 mm STOPSEAL BATT (specimen No 18)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	90 min
- cotton pad	90 min
- sustained flaming	90 min
Insulation (I)	90 min
FSi FC-MD with PP-H pipe in annular space made of PROMASTOP®-M (specimen No 14)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	133 min
- cotton pad	133 min
- sustained flaming	133 min
Insulation (I)	133 min

FSi FC-MD with PE pipes in annular space made of PROMASTOP®-M (specimens No 12, 13)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	133 min
- cotton pad	133 min
- sustained flaming	133 min
Insulation (I)	133 min

Summary of report No.: Pr-18-2.251-En

A fire resistance test in accordance with EN 1366-3: 2009, on 2018.12.11. The results of the test were as follows:

FSi FC-MD with POLOPLAST POLO-KAL NG (PP/PP-MV/PP) pipes in annular space made of PROMASTOP®-M (specimen No 2)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	120 min
- cotton pad	120 min
- sustained flaming	120 min
Insulation (I)	120 min

FSi FC-MD with POLOPLAST POLO-KAL 3S (PP/PP-MV/PP) pipes in annular space made of PROMASTOP®-M (specimen No 3)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	120 min
- cotton pad	120 min
- sustained flaming	120 min
Insulation (I)	120 min
FSi FC-MD with PE pipe with coupling in annular space made of PROMASTOP®-M (specimen No 9)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	120 min
- cotton pad	120 min
- sustained flaming	120 min
Insulation (I)	111 min
FSi FC-MD with PP-H pipe with coupling in annular space made of (specimens No 10, 11)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	120 min
- cotton pad	120 min
- sustained flaming	120 min
Insulation (I)	120 min

FSi FC-MD with PE pipe in coated batt seal made of 2x50 mm STOPSEAL BATT (specimen No D1)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	120 min
- cotton pad	120 min
- sustained flaming	120 min
Insulation (I)	120 min
FSi FC-MD with PP-H pipe in coated batt seal made of 2x50 mm STOPSEAL BATT (specimens No D2, D3)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	120 min
- cotton pad	120 min
- sustained flaming	120 min
Insulation (I)	120 min
FSi FC-MD with PE pipe in coated batt seal made of 2x50 mm STOPSEAL BATT (specimen No E1)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	120 min
- cotton pad	120 min
- sustained flaming	120 min
Insulation (I)	120 min

FSi FC-MD with PP-H pipe in coated batt seal made of 2x50 mm STOPSEAL BATT (specimen No E2)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	120 min
- cotton pad	120 min
- sustained flaming	120 min
Insulation (I)	120 min
FSi FC-MD with PP-H pipe in coated batt seal made of 2x50 mm STOPSEAL BATT (specimen No E3)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	116 min
- cotton pad	116 min
- sustained flaming	116 min
Insulation (I)	116 min
FSi FC-MD with Geberit Silent-PP (PP-C/PP-MD/PP-C) pipe in coated batt seal made of 2x50 mm STOPSEAL BATT (specimen No C1)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	120 min
- cotton pad	120 min
- sustained flaming	120 min
Insulation (I)	115 min

FSi FC-MD with Rehau Raupiano Plus (PP/PP-MD/PP) pipe in coated batt seal made of 2x50 mm STOPSEAL BATT (specimen No C2)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	98 min
- cotton pad	98 min
- sustained flaming	98 min
Insulation (I)	98 min
FSi FC-MD with Dyka Sono Blue (PVC-U) pipe in coated batt seal made of 2x50 mm STOPSEAL BATT (specimen No C3)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	120 min
- cotton pad	120 min
- sustained flaming	120 min
Insulation (I)	120 min
FSi FC-MD with PE pipe in coated batt seal made of 2x50 mm STOPSEAL BATT (specimen No A1)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	120 min
- cotton pad	120 min
- sustained flaming	120 min
Insulation (I)	116 min

FSi FC-MD with PP-H pipe in coated batt seal made of 2x50 mm STOPSEAL BATT (specimen No A2)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	102 min
- cotton pad	102 min
- sustained flaming	102 min
Insulation (I)	102 min
FSi FC-MD with PP-H pipe in annular space made of PROMASTOP®-M (specimen No 1)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	74 min
- cotton pad	74 min
- sustained flaming	74 min
Insulation (I)	74 min
FSi FC-MD with PP-H pipe in annular space made of PROMASTOP®-M (specimen No 15)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	120 min
- cotton pad	120 min
- sustained flaming	120 min
Insulation (I)	114 min

FSi FC-MD with PE pipe in annular space made of PROMASTOP®-M (specimens No 4, 14)

Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	120 min
- cotton pad	120 min
- sustained flaming	120 min
Insulation (I)	120 min

Summary of report No.: 20164A

A fire resistance test in accordance with EN 1366-3: 2009, on 2020.03.02. The results of the test were as follows:

FSi FC-MD corner application with PE pipe in annular space made of PROMASEAL®-A (specimen No 10)

Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min

FSi FC-MD corner application with PE pipe in annular space made of mortar (specimens No 11, 12)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min
FSi FC-MD corner application with PP pipe in annular space made of PROMASEAL®-A (specimen No 13)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min
FSi FC-MD corner application with PP-C pipe in annular space made of mortar (specimens No 14, 15)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min

FSi FC-MD corner application with PVC-U pipe in annular space made of PROMASEAL®-A (specimen No 16)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min
FSi FC-MD corner application with PVC-U pipe in annular space made of mortar (specimen No 17)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	126 min
FSi FC-MD corner application with PVC-U pipe in annular space made of mortar (specimen No 18)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	109 min
- cotton pad	109 min
- sustained flaming	109 min
Insulation (I)	109 min

FSi FC-MD with Henco Standard (PE-Xc/Al/PE-Xc) pipes in coated batt seal made of 2x50 mm STOPSEAL BATT and PROMASEAL®-A annular space (specimen No 19a) with additional protection	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	103 min
FSi FC-MD with Henco Standard (PE-Xc/Al/PE-Xc) pipes with covering in coated batt seal made of 2x50 mm STOPSEAL BATT and PROMASEAL®-A annular space (specimen No 19b) with additional protection	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min

FSi FC-MD with Henco Standard (PE-Xc/Al/PE-Xc) pipes with PE insulation in coated batt seal made of 2x50 mm STOPSEAL BATT and PROMASEAL®-A annular space (specimens No 19c, 19d) with additional protection	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min
FSi FC-MD with Henco Standard (PE-Xc/Al/PE-Xc) pipes in coated batt seal made of 2x50 mm STOPSEAL BATT and PROMASEAL®-A annular space (specimen No 20a)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	44 min

FSi FC-MD with Henco Standard (PE-Xc/Al/PE-Xc) pipes with covering in coated batt seal made of 2x50 mm STOPSEAL BATT and PROMASEAL®-A annular space (specimen No 20b)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min
FSi FC-MD with Henco Standard (PE-Xc/Al/PE-Xc) pipes with PE insulation in coated batt seal made of 2x50 mm STOPSEAL BATT and PROMASEAL®-A annular space (specimens No 20c, 20d)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min
FSi FC-MD with Henco Standard (PE-Xc/Al/PE-Xc) pipes in coated batt seal made of 2x50 mm STOPSEAL BATT and PROMASEAL®-A annular space (specimen No 22b)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	46 min

FSi FC-MD with Henco Standard (PE-Xc/Al/PE-Xc) pipes in coated batt seal made of 2x50 mm STOPSEAL BATT and PROMASEAL®-A annular space (specimen No 22c) with additional protection

Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	115 min

Summary of report No.: Pr-18-2.180-En

A fire resistance test in accordance with EN 1366-3: 2009, on 2018.10.02. The results of the test were as follows:

FSi FC-MD with PP-H pipes in annular space made of PROMASTOP®-M (specimens No 4, 5)

Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/U)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	132 min
- cotton pad	132 min
- sustained flaming	132 min
Insulation (I)	132 min

FSi FC-MD with PP-H pipe in annular space made of PROMASTOP®-M (specimen No 6)	
Fire scenario	standard temperature / time curve
Direction of exposure	from one side
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/capped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	109 min
- cotton pad	109 min
- sustained flaming	109 min
Insulation (I)	109 min

Summary of report No.: 398296 Issue 2

A fire resistance test in accordance with EN 1366-3: 2009, on 2018.05.15. The results of the test were as follows:

FSi Pipebloc PCP with PVC pipe in Stopseal Board (specimen E1)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	147 min
- cotton pad	144 min
- sustained flaming	144 min
Insulation (I)	144 min

FSi Pipebloc PCP with PVC pipe in Stopseal Board (specimen E2)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	169 min
- cotton pad	164 min
- sustained flaming	164 min
Insulation (I)	164 min

FSi Pipebloc PCP with PE pipe in Stopseal Board (specimen E3)	
Fire scenario	standard temperature / time curve
Direction of exposure	from underside
Supporting construction	rigid floor with low density $\geq 650 \text{ kg/m}^3$ made of YTONG panels th. 150 mm
Pipe end configuration inside/outside the furnace	uncapped/uncapped (U/C)
Pipe orientation	90°(perpendicular to the seal)
Integrity (E)	
- cracks or openings	169 min
- cotton pad	164 min
- sustained flaming	164 min
Insulation (I)	164 min

Classification and field of application

3.3. Reference of classification

This classification has been carried out in accordance with Clause 7 of EN 13501-2: 2023.

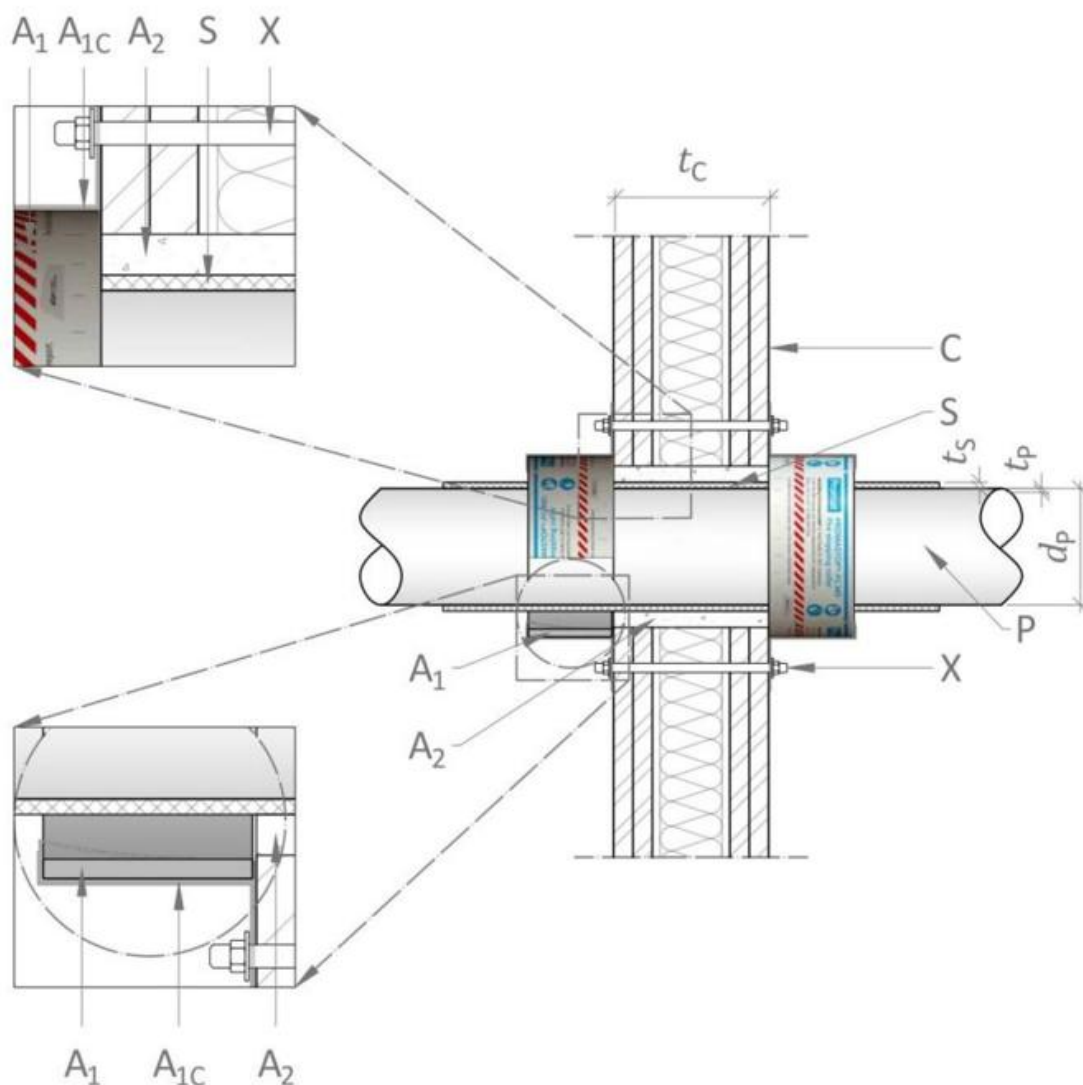
3.4. Classification

The penetration seal designated as FSi FC-MD is classified according to the following combinations of performance parameters and classes as appropriate.

R	E	I	W		t	t	-	M	S	-	C	IncSlow	Sn	Ef	r
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FSi FC-MD pipe collars in flexible walls

Flexible walls minimum 100mm thick and with minimum 2 layers of 12.5mm thick gypsum boards to both faces.
 Fsi FC-MD pipe collars fitted around the plastic pipes up to 125mm diameter and to both faces of the wall



Key

A₁ – FSi FC-MD

A_{1C} – Fixing bracket type C

A₂ – Annular gap sealing, e.g. using gypsum or Pyrocoustic Sealant ≥10mm on full depth stone wool

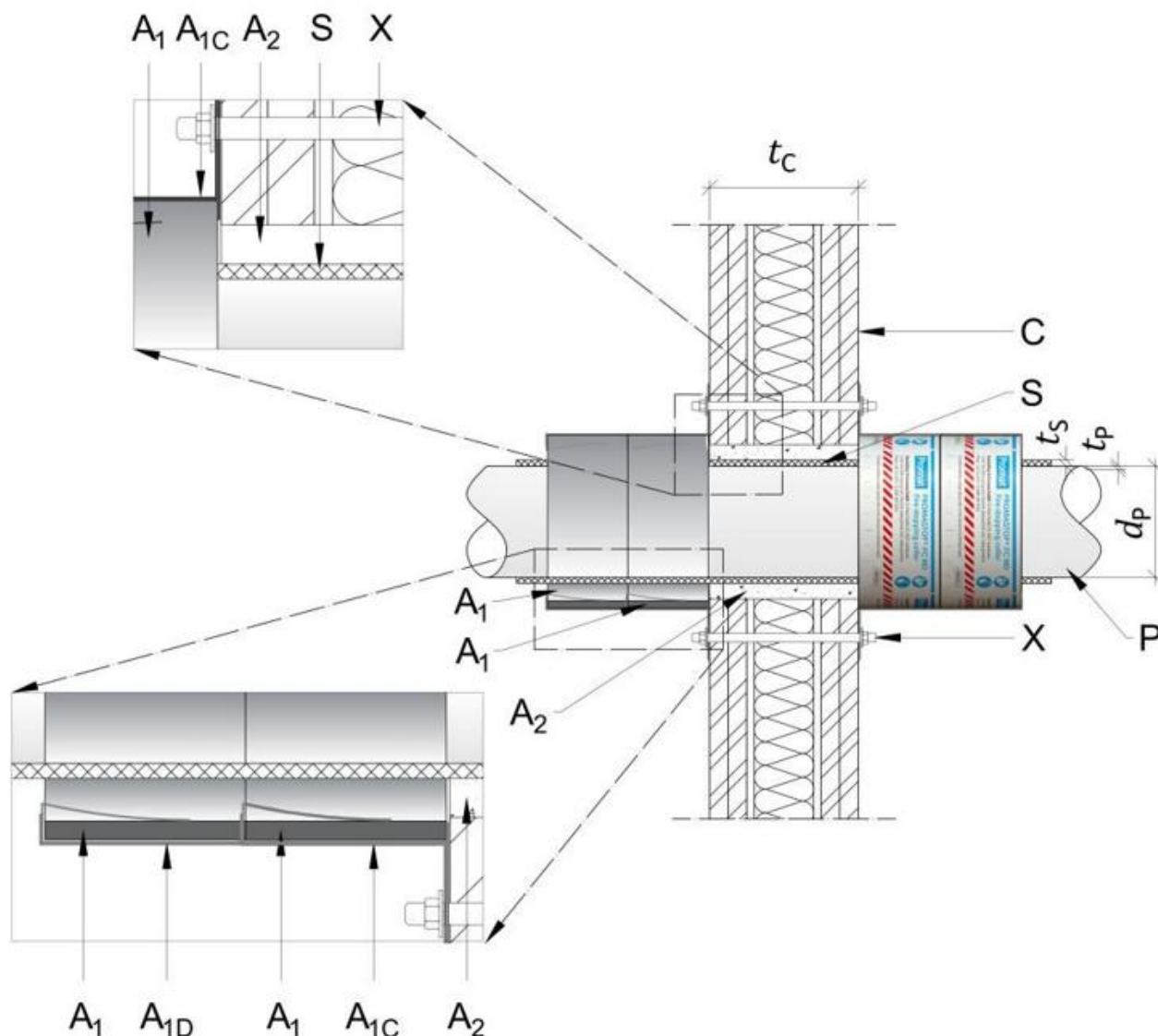
C – Flexible wall construction with thickness $t_c \geq 100\text{mm}$

P – Plastic pipe with diameter d_p and wall thickness t_p

S – Sound-decoupling strip with thickness $t_s \leq 4\text{mm}$ (optional)

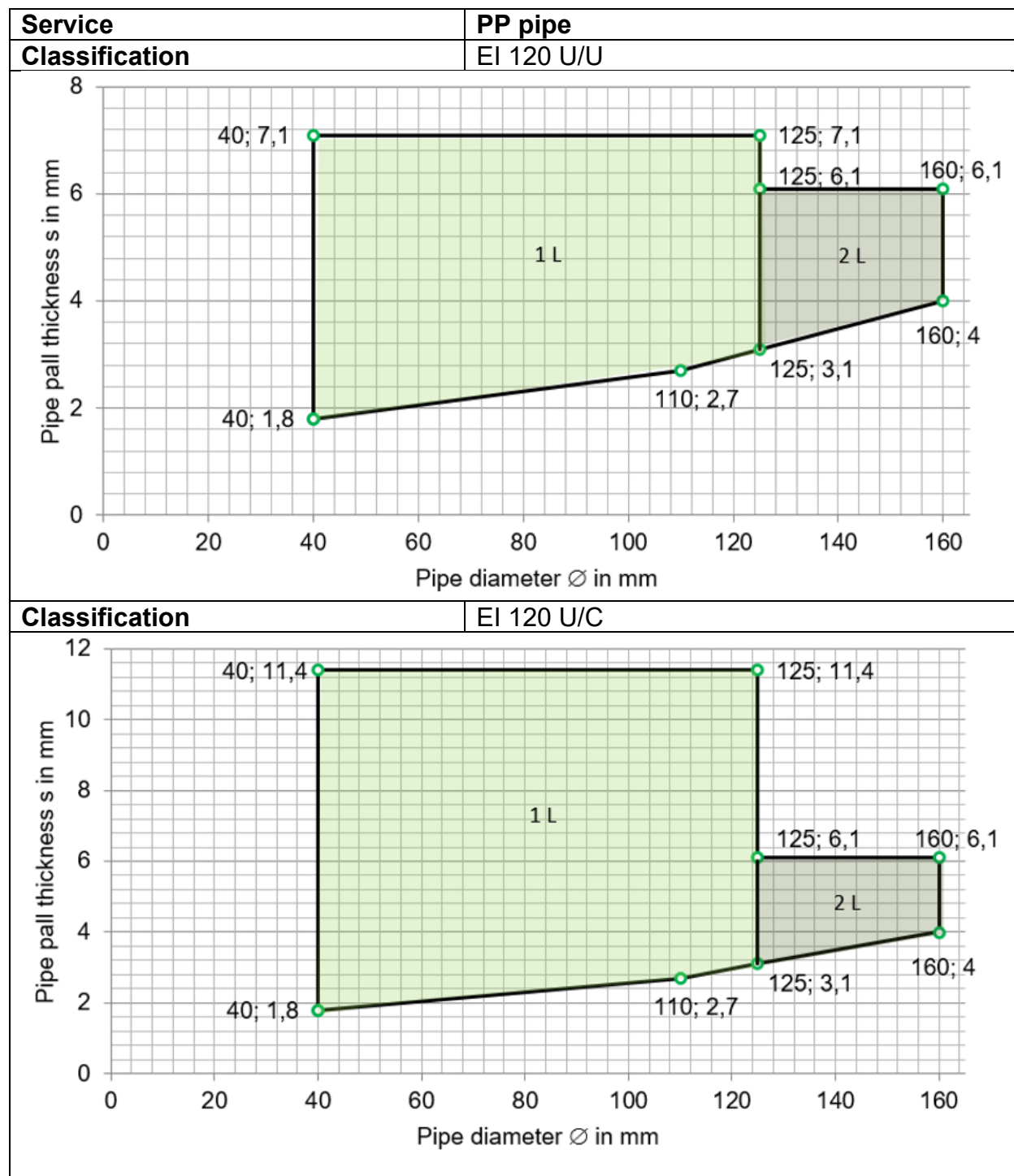
X – Fixing material, threaded bars $\geq \text{M6}$

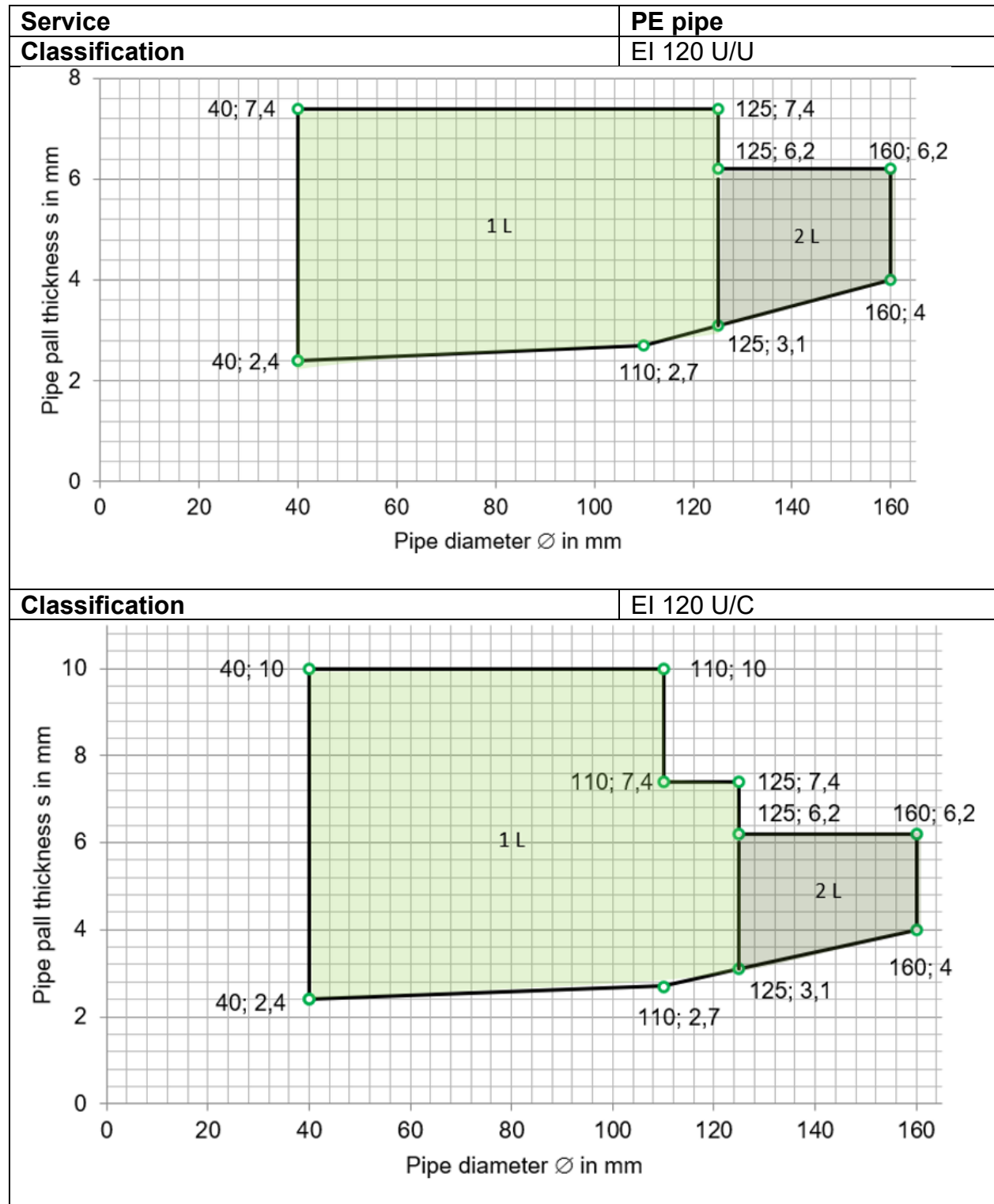
**Flexible walls minimum 100mm thick and with minimum 2 layers of 12.5mm thick gypsum boards to both faces.
 Fsi FC-MD pipe collars fitted around the plastic pipes greater than 125mm diameter and to both faces of the wall**

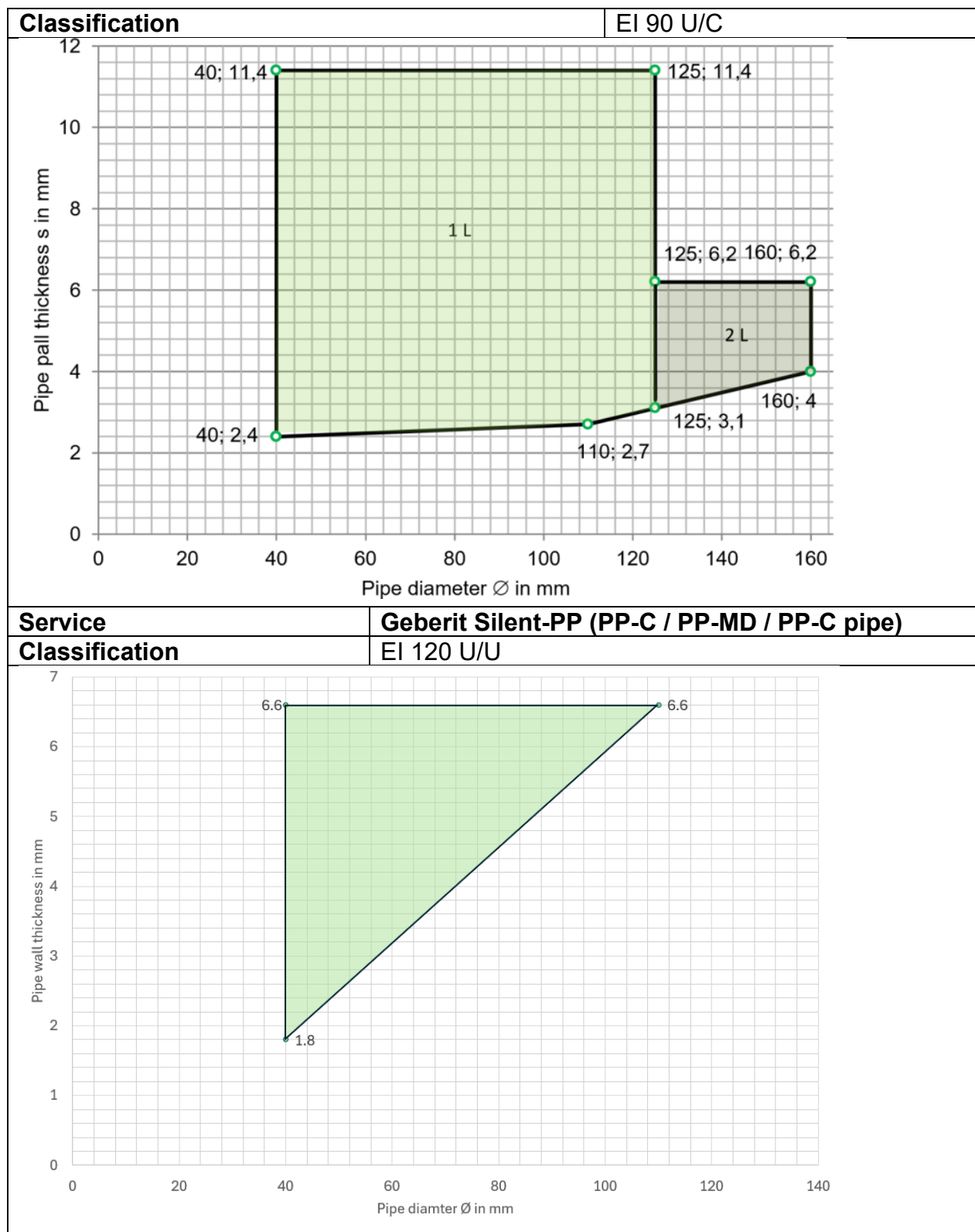


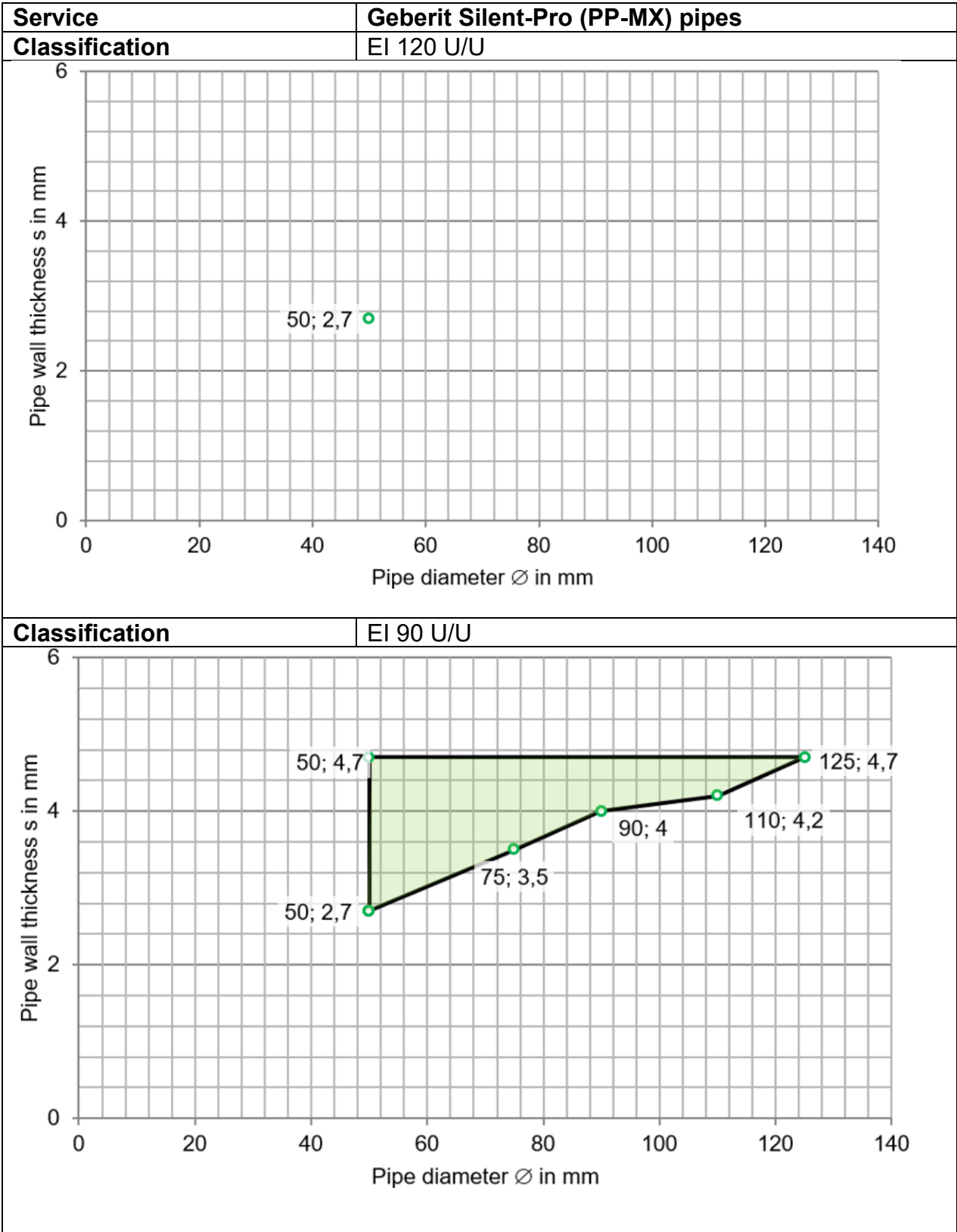
Key

- A₁ – FSi FC-MD
- A_{1C} – Fixing bracket type C
- A_{1D} – Fixing bracket type D
- A₂ – Annular gap sealing, e.g. using gypsum or Pyrocoustic Sealant ≥10mm on full depth stone wool
- C – Flexible wall construction with thickness $t_c \geq 100\text{mm}$
- P – Plastic pipe with diameter d_p and wall thickness t_p
- S – Sound-decoupling strip with thickness $t_s \leq 4\text{mm}$ (optional)
- X – Fixing material, threaded bars $\geq \text{M6}$

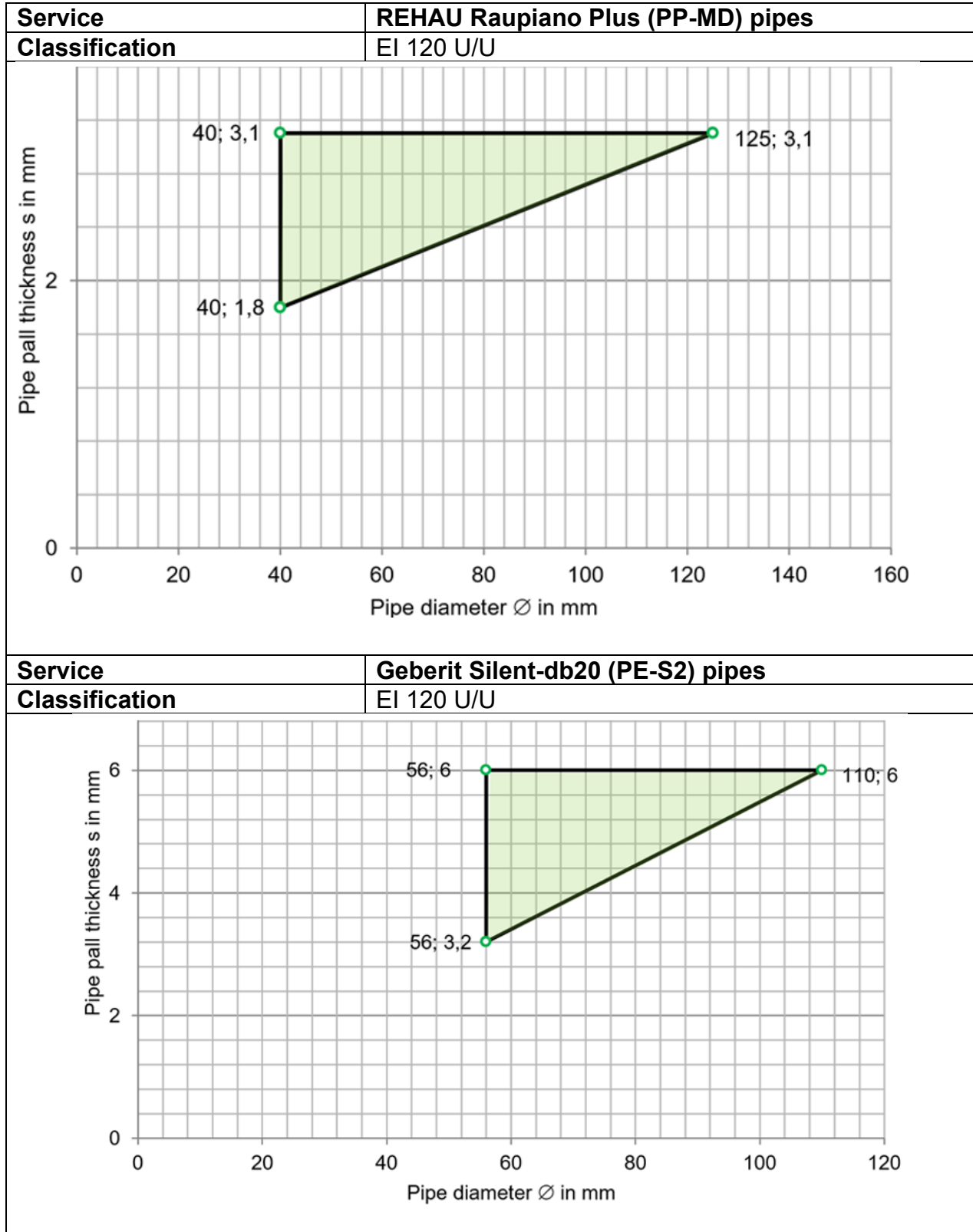


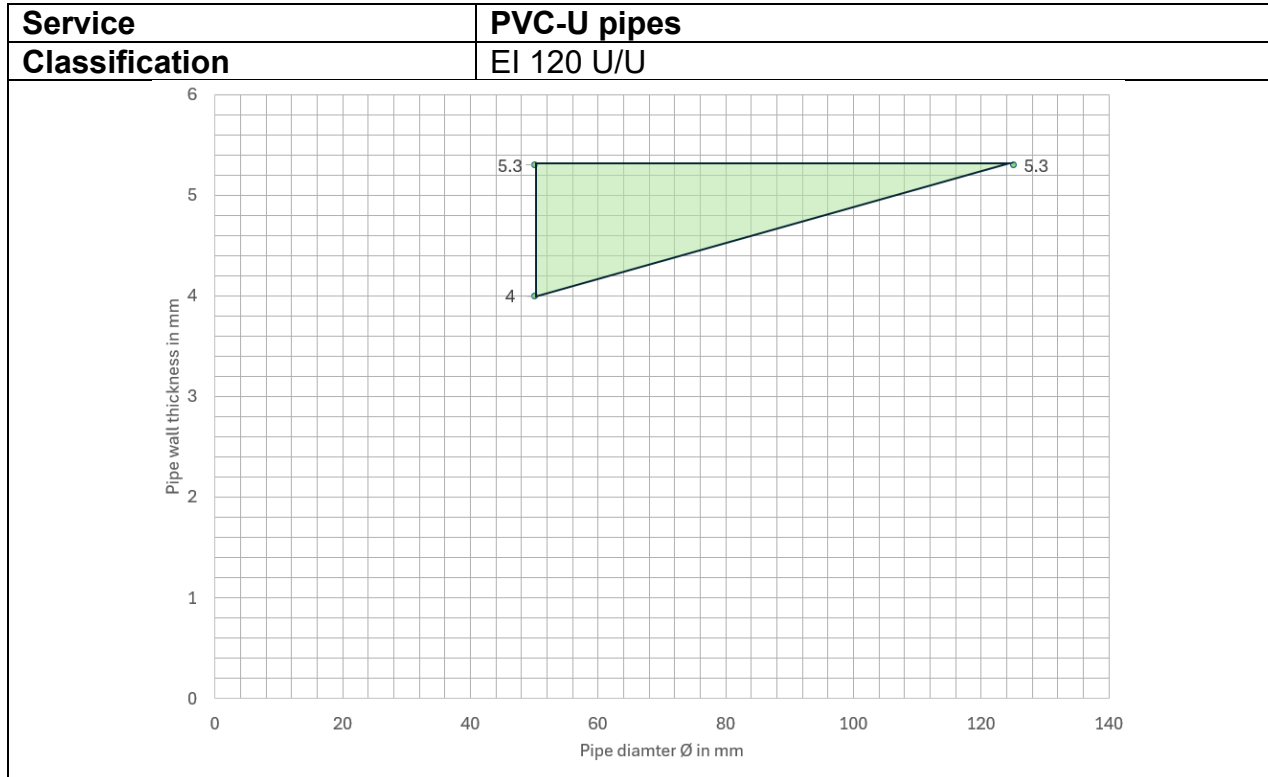






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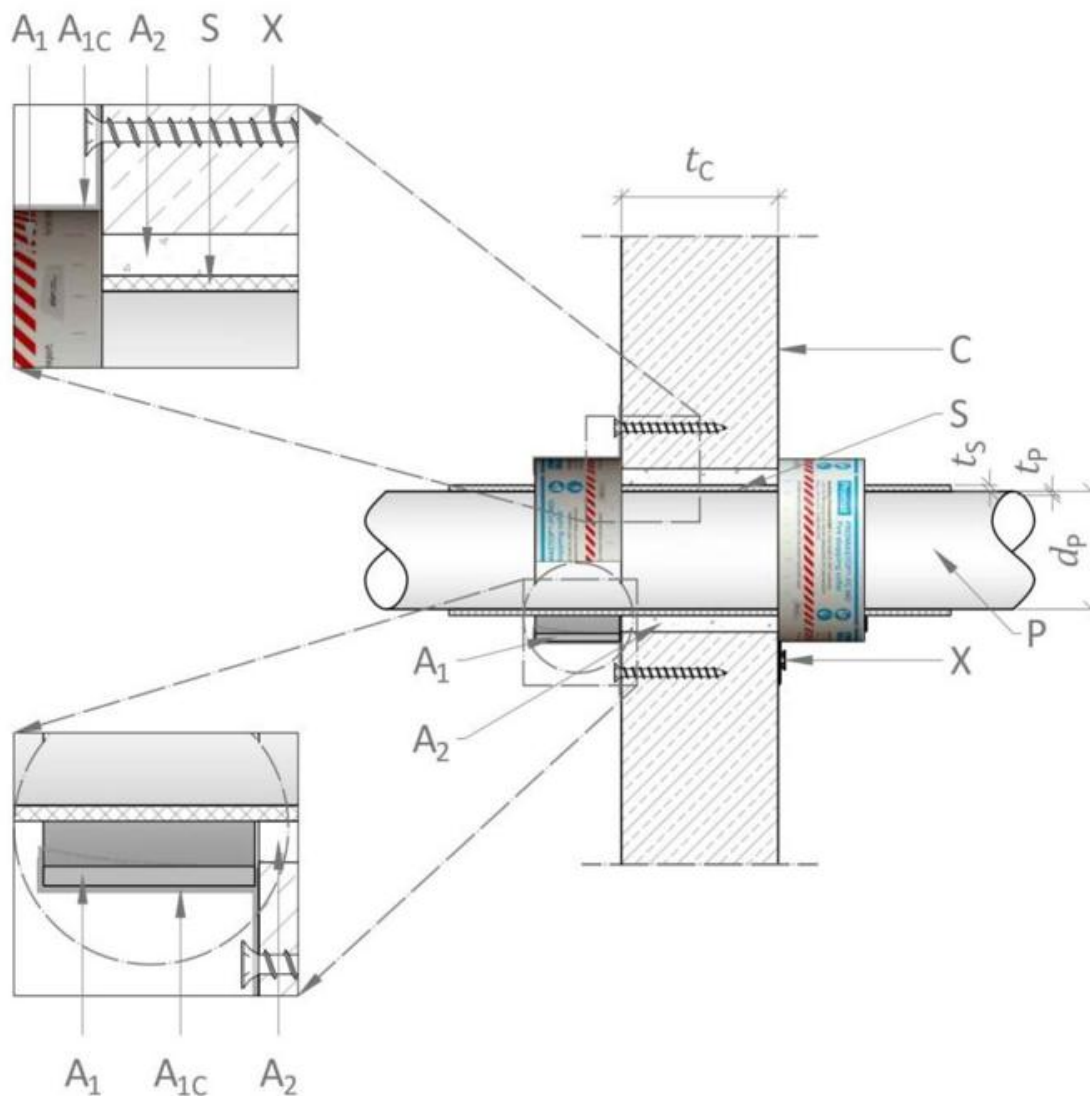




FSi FC-MD pipe collars in rigid walls

Concrete and masonry walls minimum 100mm thick

Fsi FC-MD pipe collars fitted around plastic pipes up to 125mm diameter and to both faces of the wall



Key

A₁ – FSi FC-MD

A_{1C} – Fixing bracket type C

A₂ – Annular gap sealing, e.g. using Silverseal Compound

C – Rigid wall construction with thickness $t_c \geq 100\text{mm}$

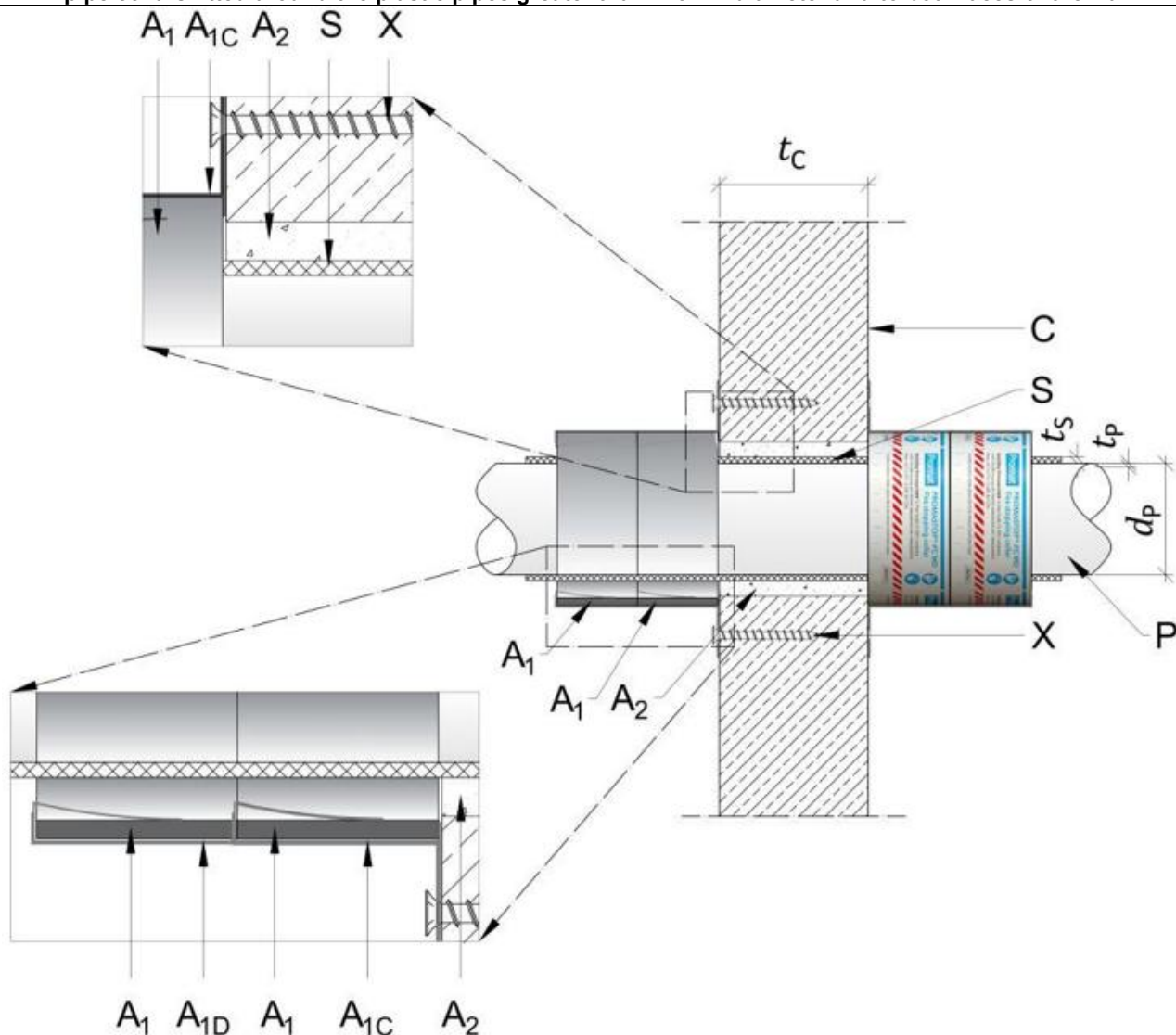
P – Plastic pipe with diameter d_p and wall thickness t_p

S – Sound-decoupling strip with thickness $t_s \leq 4\text{mm}$ (optional)

X – Appropriate fixing material, 7.5 x 72 mm or larger steel screws

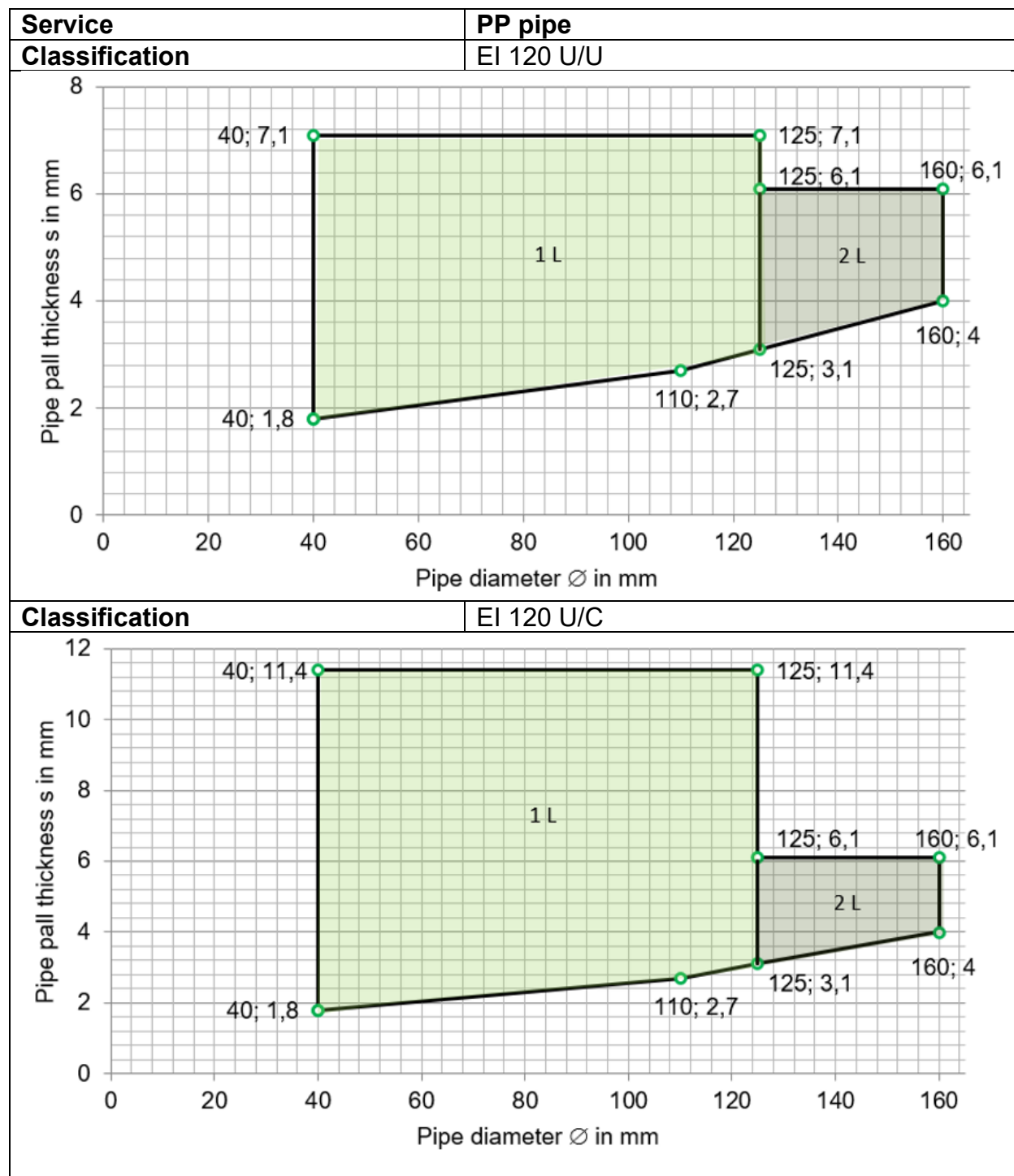
Rigid walls minimum 100mm thick

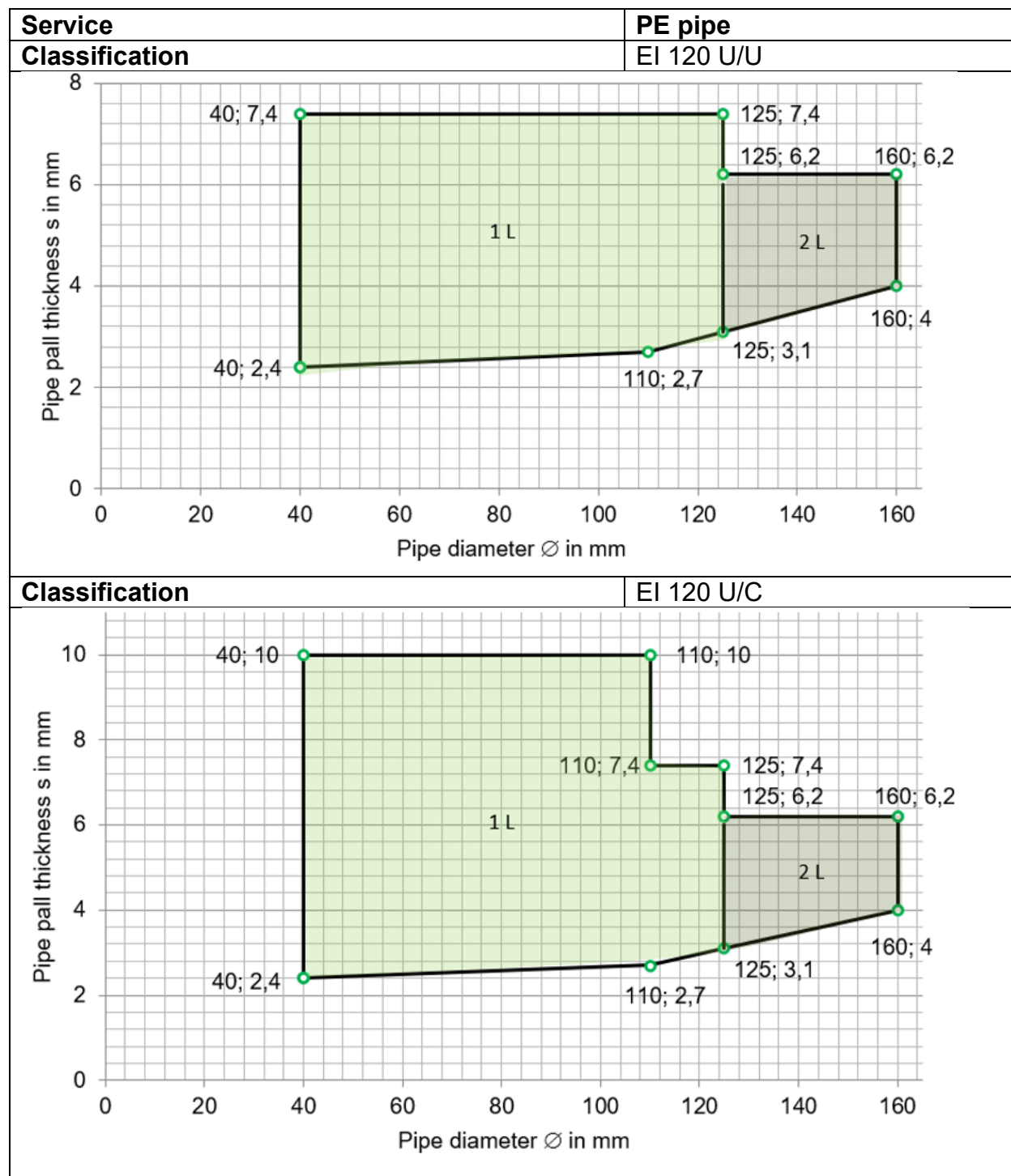
Fsi FC-MD pipe collars fitted around the plastic pipes greater than 125mm diameter and to both faces of the wall

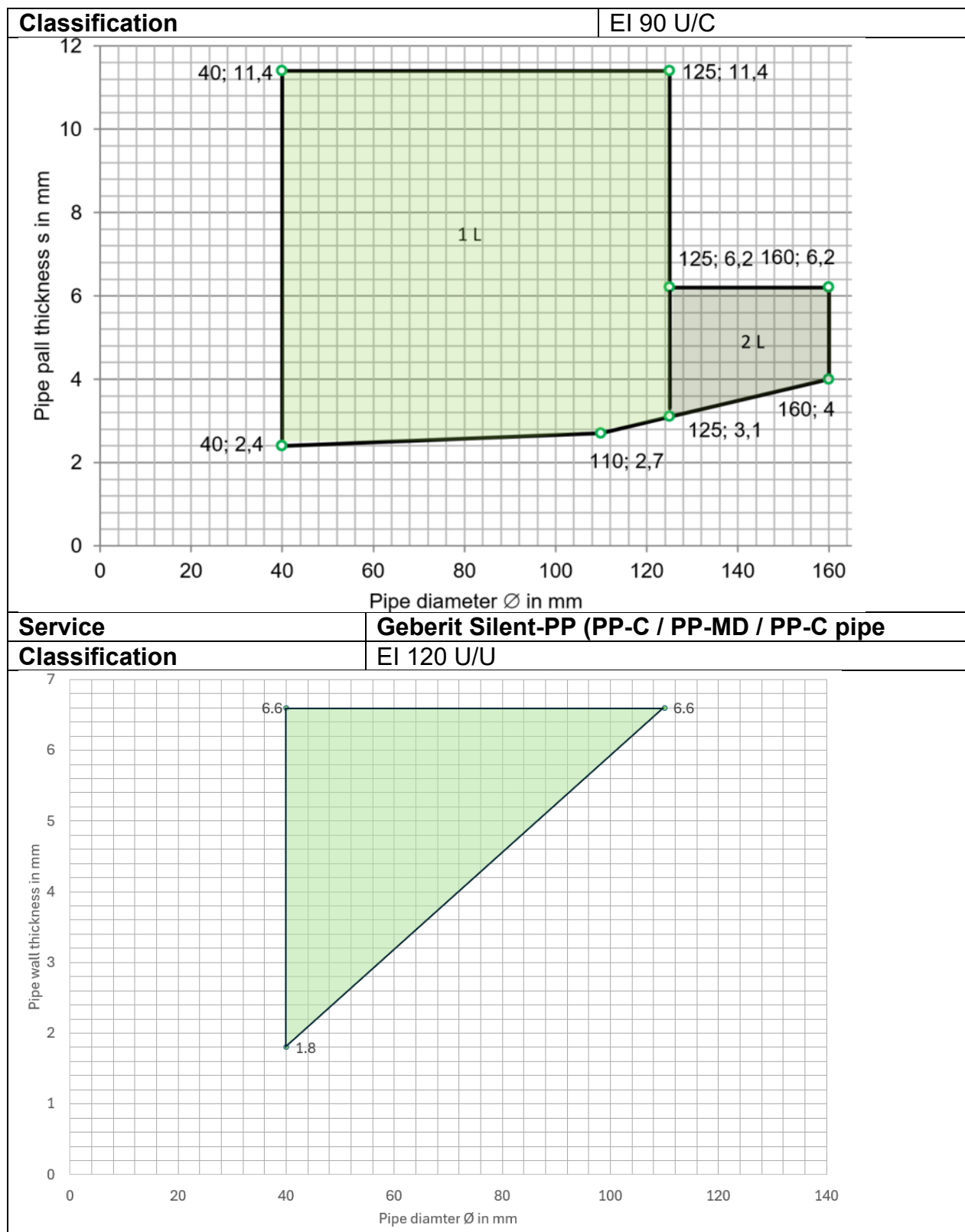


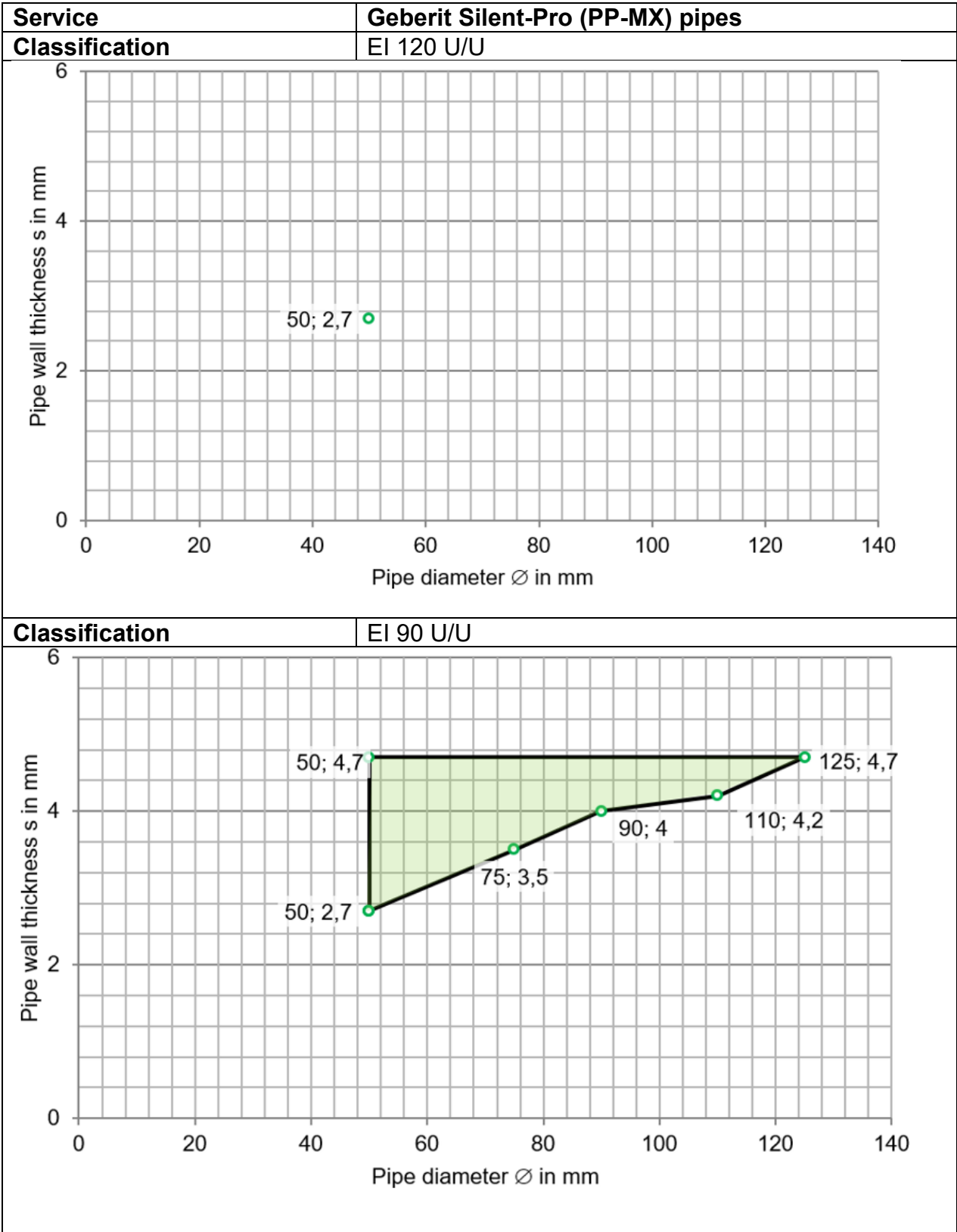
Key

- A₁ – FSi FC-MD
- A_{1C} – Fixing bracket type C
- A_{1D} – Fixing bracket type D
- A₂ – Annular gap sealing, e.g. using Silverseal Compound
- C – Flexible wall construction with thickness $t_c \geq 100\text{mm}$
- P – Plastic pipe with diameter d_p and wall thickness t_p
- S – Sound-decoupling strip with thickness $t_s \leq 4\text{mm}$ (optional)
- X – Appropriate fixing material, steel screws minimum 7.5 x 72 mm

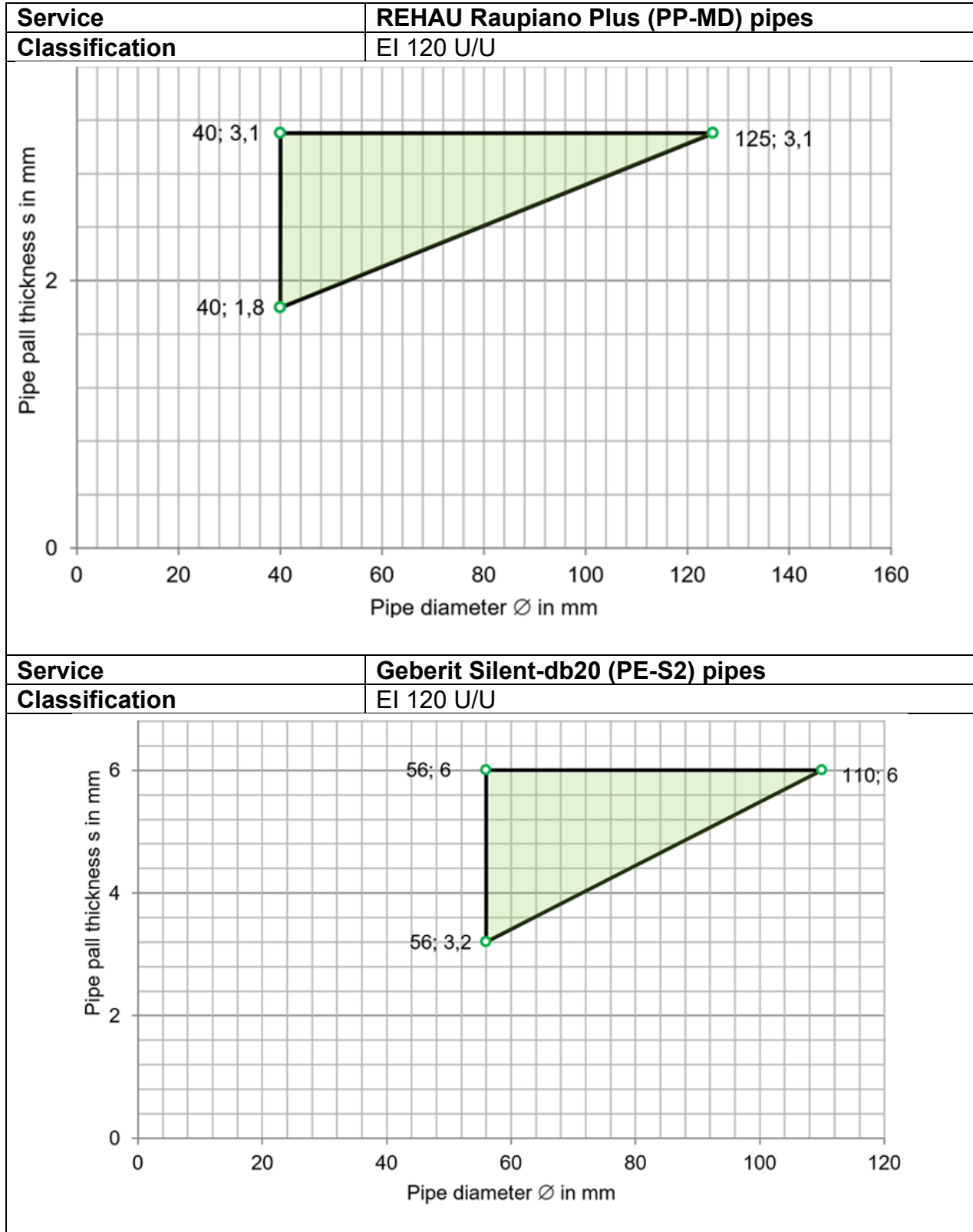


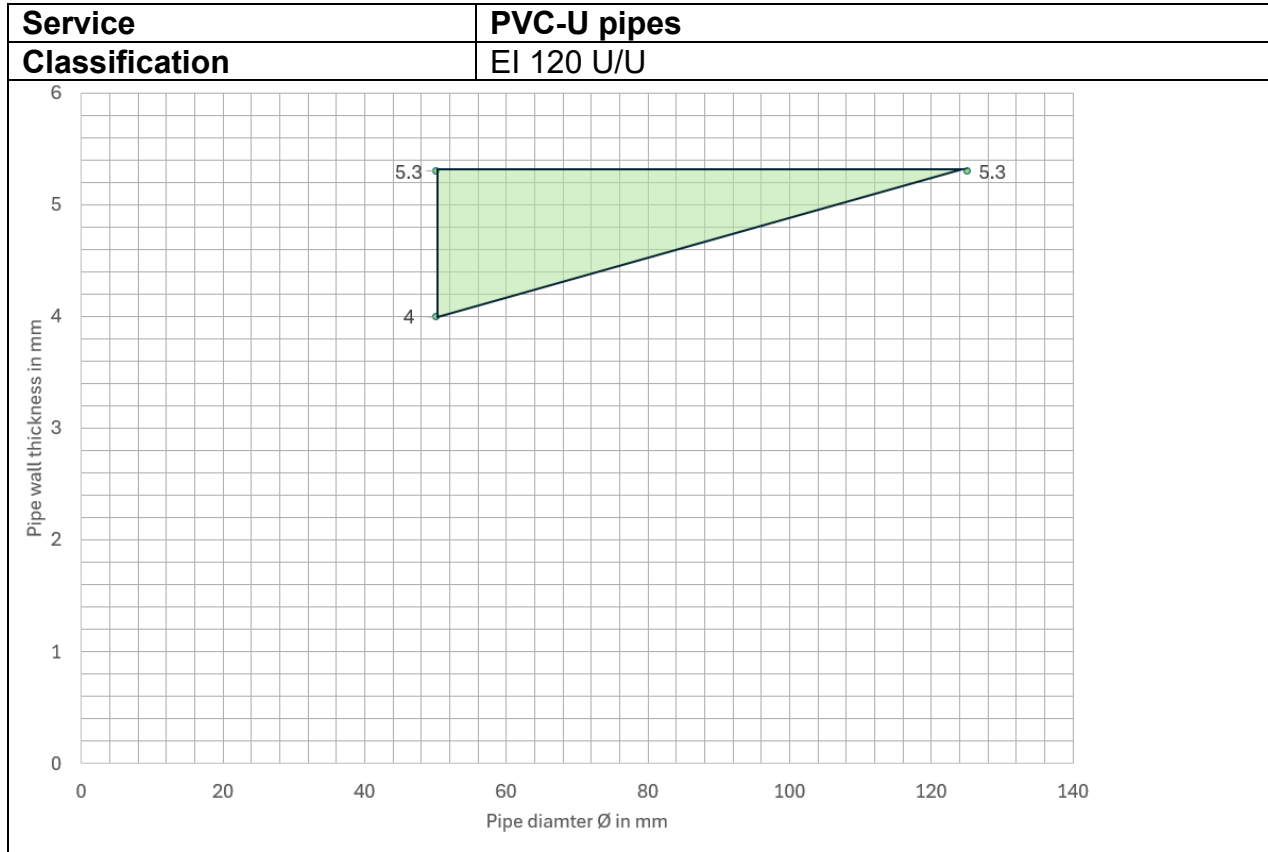




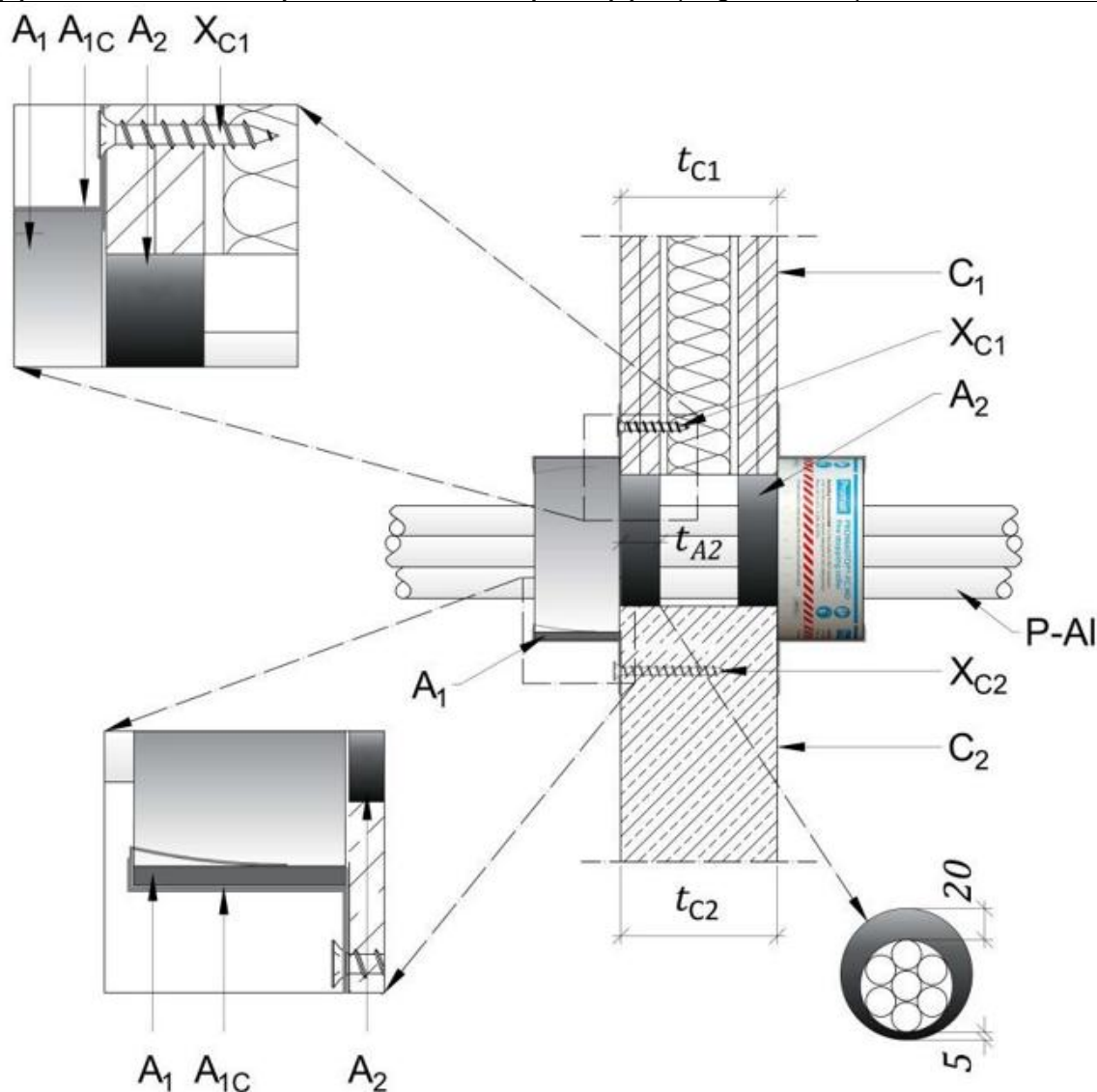


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Fsi FC-MD pipe collars fitted around plastic/aluminium compound pipes (single or bundle) and to both faces of the wall



A₁ – FSi FC-MD

A_{1C} – Fixing bracket type C

A_{1D} – Fixing bracket type D

A₂ – Firestop Sealant, Pyrocoustic Sealant with thickness $t_{A2} \geq 25\text{mm}$ and width w_{A2} 5-20mm

C₁ – Flexible wall construction with thickness $t_{c1} \geq 100\text{mm}$

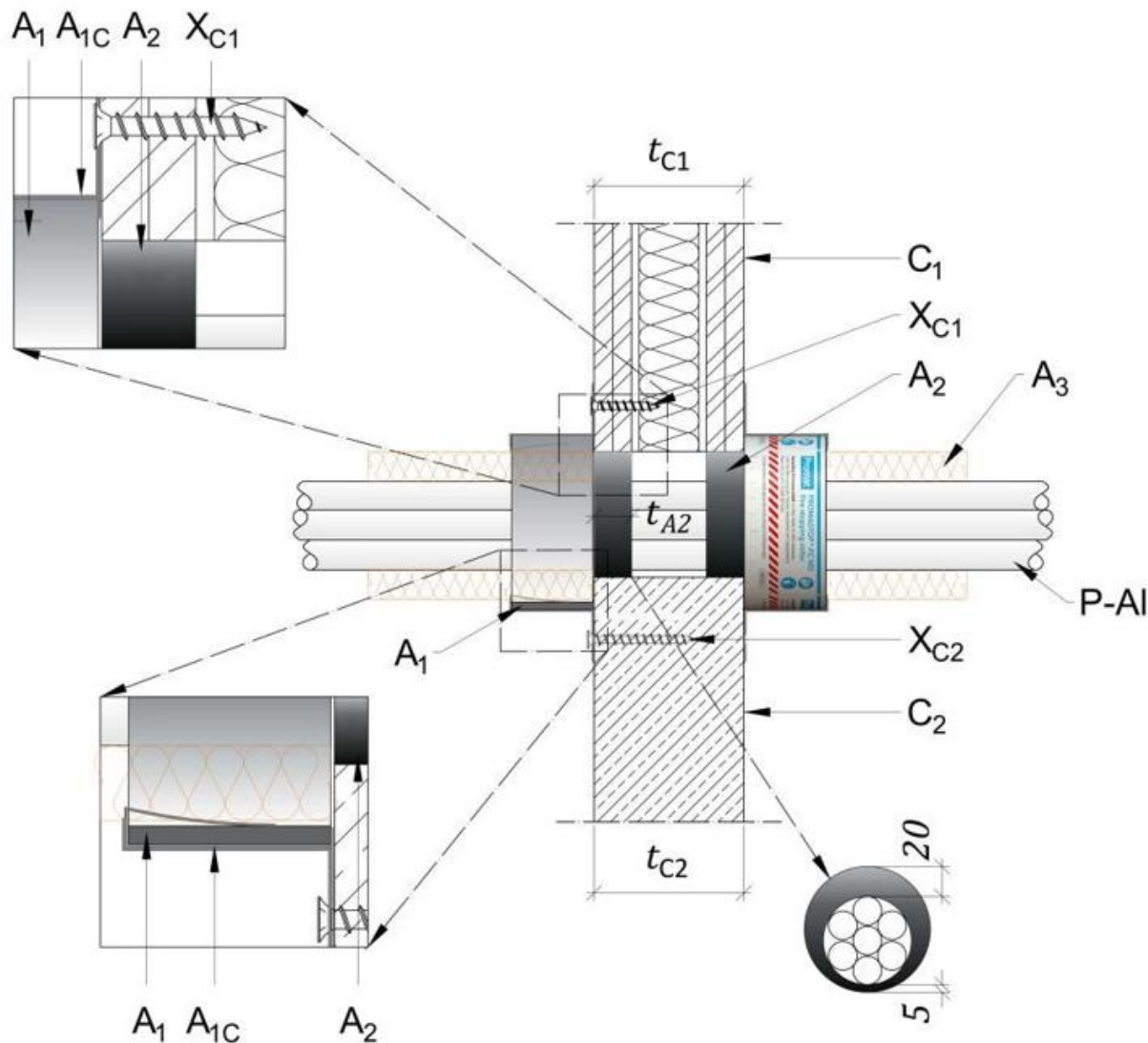
C₂ – Rigid wall construction with thickness $t_{c2} \geq 100\text{mm}$

P-Al – Plastic pipe with diameter d_p and wall thickness t_p

X_{C1} – Fixing material e.g. steel screws minimum 7.5 x 72 mm or threaded rods ≥ M6

X_{C2} – Appropriate fixing material, steel screws minimum 7.5 x 72 mm

Flexible & Rigid walls minimum 100mm thick
Fsi FC-MD pipe collars fitted around plastic/aluminium compound pipes (single or bundle) with additional protection and to both faces of the wall



Key

- A₁ – FSI FC-MD
- A_{1C} – Fixing bracket type C
- A_{1D} – Fixing bracket type D
- A₂ – Firestop Sealant, Pyrocoustic Sealant with thickness $t_{A2} \geq 25\text{mm}$ and width w_{A2} 5-20mm
- A₃ – Additional protection, stone wool, length $\geq 150\text{mm}$
- C₁ – Flexible wall construction with thickness $t_{C1} \geq 100\text{mm}$
- C₂ – Rigid wall construction with thickness $t_{C2} \geq 100\text{mm}$
- P-Al – Plastic pipe with diameter d_p and wall thickness t_p
- X_{C1} – Fixing material e.g. steel screws minimum 7.5 x 72 mm or threaded rods $\geq M6$
- X_{C2} – Appropriate fixing material, steel screws minimum 7.5 x 72 mm

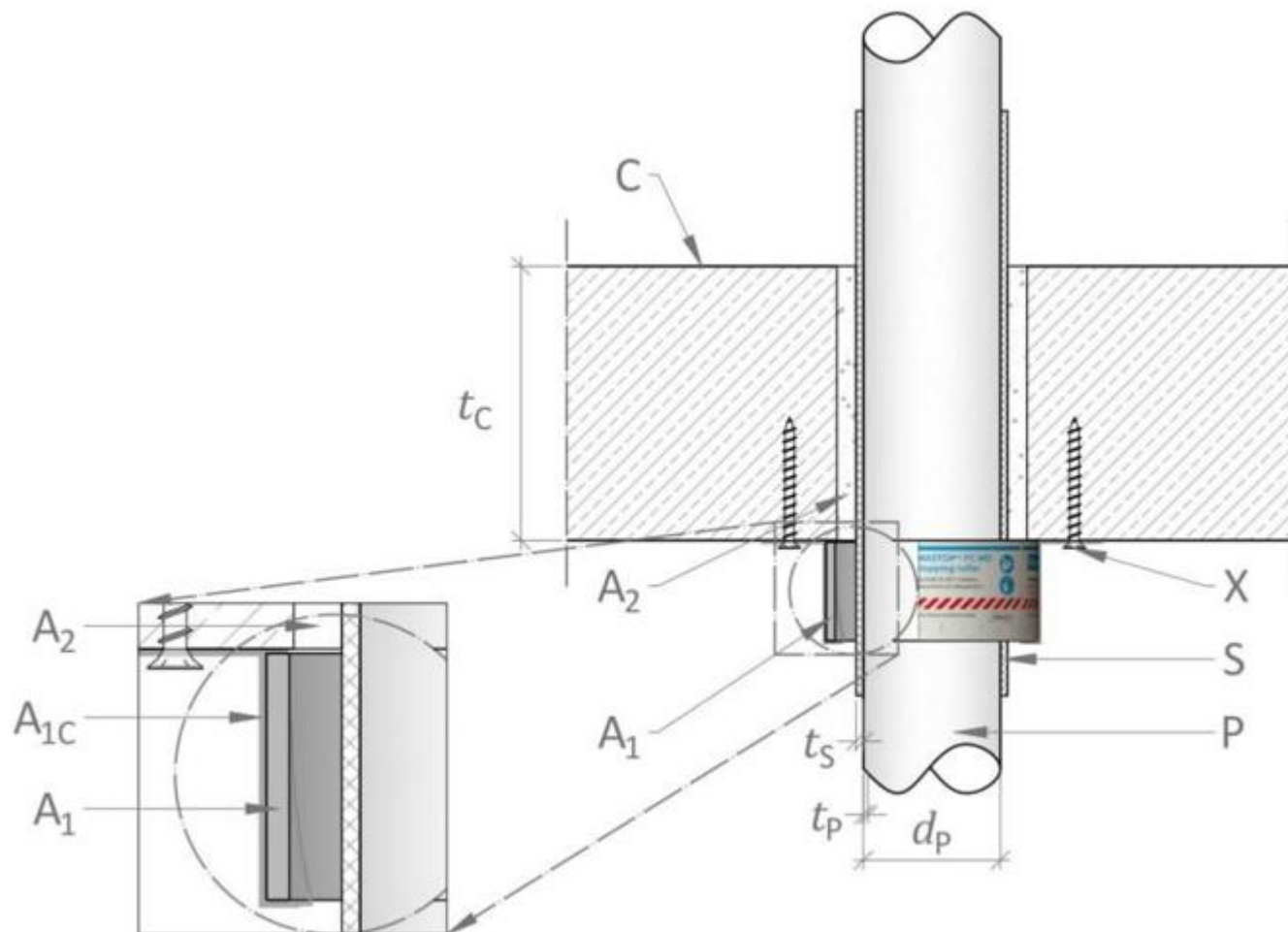
Service	Plastic/Aluminum compound pipes Henco Standard (PE-c/Al/PE-Xc)			
Bundles made of Henco standard pipes (with or without insulation, with and without additional protection), or single pipe penetration seals (the amount of pipe may be decreased)				
Pipes (max. bundle)	Insulation	Annular space	Additional protection	Classification
1x Ø 16 x 2 mm 1x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 32 x 3 mm 1x Ø 40 x 3.5 mm 1x Ø 50 x 4 mm	-	Without backfilling possible. Covering depth: ≥ 25 mm Pyrocoustic Sealant on both sides in the wall Annular space width: 5 - 20 mm	Stone wool (class A1 acc. EN 13501-1, density ≥ 35 kg/m³), thickness 50 mm, 150 mm length on each side of the wall around the pipe bundle, in the collar.	EI 120 – U/C
1x Ø 14 x 2 mm 2x Ø 16 x 2 mm 1x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 26 x 3 mm 1x Ø 32 x 3 mm	Corrugated cover made of PE. Case: CS	Without backfilling possible. Covering depth: ≥ 25 mm Pyrocoustic Sealant on both sides in the wall Annular space width: 5 - 20 mm	Stone wool (class A1 acc. EN 13501-1, density ≥ 35 kg/m³), thickness 50 mm, 150 mm length on each side of the wall around the pipe bundle, in the collar.	EI 120 – U/C
1x Ø 14 x 2 mm 1x Ø 16 x 2 mm 1x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 26 x 3 mm 1x Ø 32 x 3 mm	PE foam (class E acc. EN 13501-1) Thickness: 6 mm Case: CS	Without backfilling possible. Covering depth: ≥ 25 mm Pyrocoustic Sealant on both sides in the wall Annular space width: 5 - 20 mm	Stone wool (class A1 acc. EN 13501-1, density ≥ 35 kg/m³), thickness 20 mm, 150 mm length on each side of the wall around the pipe bundle, in the collar.	EI 120 – U/C
1x Ø 16 x 2 mm 1x Ø 20 x 2 mm 1x Ø 32 x 3 mm	PE foam (class E acc. EN 13501-1) Thickness: 13 mm Case: CS	Without backfilling possible. Covering depth: ≥ 25 mm Pyrocoustic Sealant on both sides in the wall Annular space width: 5 - 20 mm	Stone wool (class A1 acc. EN 13501-1, density ≥ 35 kg/m³), thickness 20 mm, 150 mm length on each side of the wall around the pipe bundle, in the collar.	EI 120 – U/C
1x Ø 16 x 2 mm 1x Ø 20 x 2 mm 1x Ø 32 x 3 mm	PE foam (class E acc. EN 13501-1) Thickness: 6 - 13 mm Case: CS	Without backfilling possible. Covering depth: ≥ 25 mm Pyrocoustic Sealant on both sides in the wall Annular space width: 5 - 20 mm	Stone wool (class A1 acc. EN 13501-1, density ≥ 35 kg/m³), thickness 20 mm, 150 mm length on each side of the wall around the pipe bundle, in the collar.	EI 120 – U/C

Pipes (max. bundle)	Insulation	Annular space	Additional protection	Classification
1x Ø 16 x 2 mm 1x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 32 x 3 mm 1x Ø 40 x 3.5 mm 1x Ø 50 x 4 mm	without	Without backfilling possible. Covering depth: ≥ 25 mm Pyrocoustic Sealant on both sides in the wall Annular space width: 5 - 20 mm	-	E 120 – U/C EI 90 – U/C
1x Ø 14 x 2 mm 2x Ø 16 x 2 mm 1x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 26 x 3 mm 1x Ø 32 x 3 mm	Corrugated cover made of PE. Case: CS	Without backfilling possible. Covering depth: ≥ 25 mm Pyrocoustic Sealant on both sides in the wall Annular space width: 5 - 20 mm	-	EI 120 – U/C
1x Ø 14 x 2 mm 1x Ø 16 x 2 mm 1x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 26 x 3 mm 1x Ø 32 x 3 mm	PE foam (class E acc. EN 13501-1) Thickness: 6 mm Case: CS	Without backfilling possible. Covering depth: ≥ 25 mm Pyrocoustic Sealant on both sides in the wall Annular space width: 5 - 20 mm	-	EI 120 – U/C
1x Ø 16 x 2 mm 1x Ø 20 x 2 mm 1x Ø 32 x 3 mm	PE foam (class E acc. EN 13501-1) Thickness: 13 mm Case: CS	Without backfilling possible. Covering depth: ≥ 25 mm Pyrocoustic Sealant on both sides in the wall Annular space width: 5 - 20 mm	-	EI 120 – U/C
1x Ø 16 x 2 mm 1x Ø 20 x 2 mm 1x Ø 32 x 3 mm	PE foam (class E acc. EN 13501-1) Thickness: 6 - 13 mm Case: CS	Without backfilling possible. Covering depth: ≥ 25 mm Pyrocoustic Sealant on both sides in the wall Annular space width: 5 - 20 mm	-	EI 120 – U/C

FSi FC-MD pipe collars in rigid floors

Concrete floors minimum 150mm thick

Fsi FC-MD pipe collars fitted around the plastic pipes up to 125mm diameter and to the soffit



Key

A₁ – FSi FC-MD

A_{1C} – Fixing bracket type C

A₂ – Annular gap sealing, e.g. using Silverseal Compound

C – Rigid floor construction with thickness $t_c \geq 150\text{mm}$

P – Plastic pipe with diameter d_p and wall thickness t_p

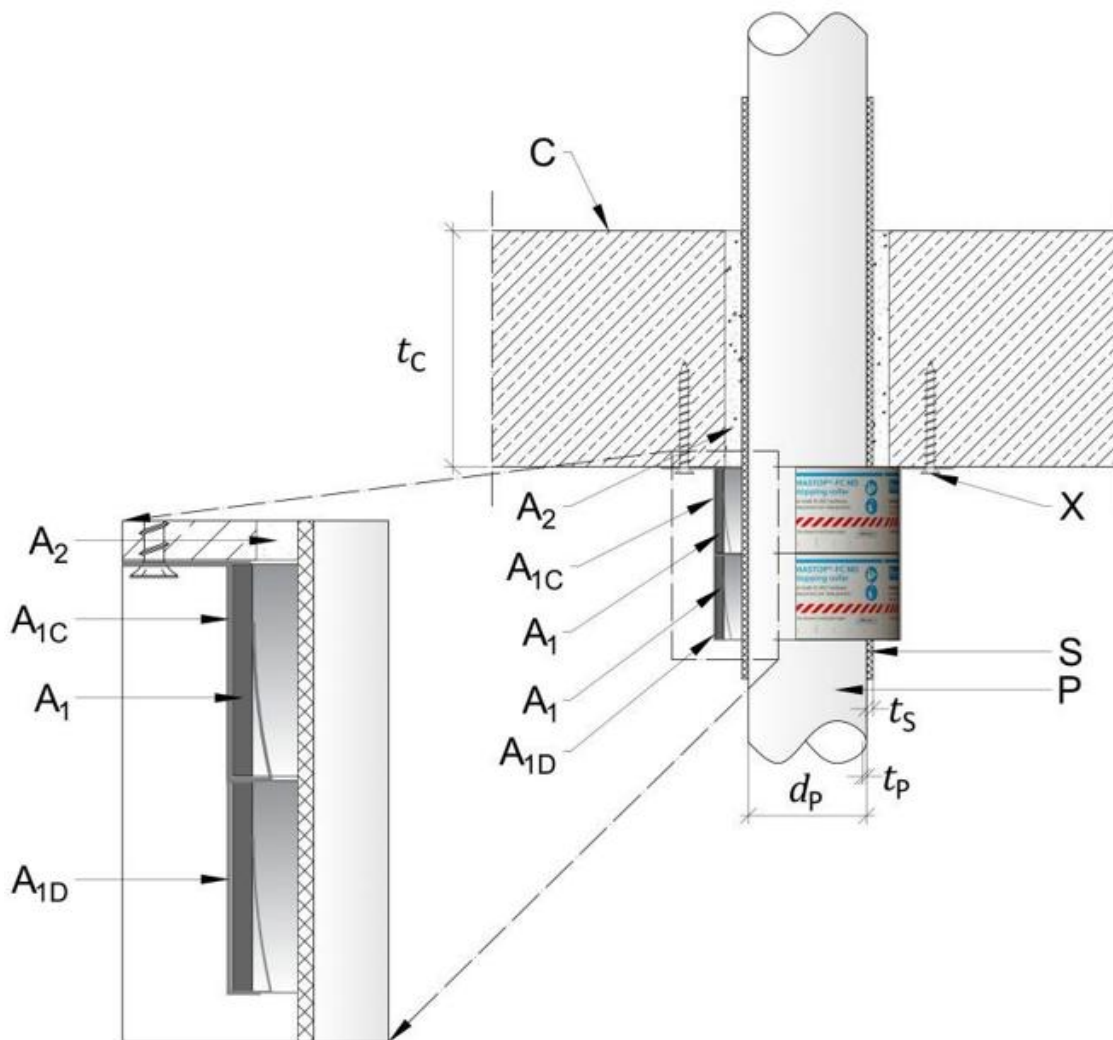
S – Sound-decoupling strip with thickness $t_s \leq 4\text{mm}$ (optional)

X – Appropriate fixing material, 7.5 x 72 mm or larger steel screws

FSi FC-MD pipe collars in rigid floors

Concrete floors minimum 150mm thick

Fsi FC-MD pipe collars fitted around the plastic pipes greater than 125mm diameter and to the soffit



Key

A₁ – FSi FC-MD

A_{1C} – Fixing bracket type C

A_{1D} – Fixing bracket type D

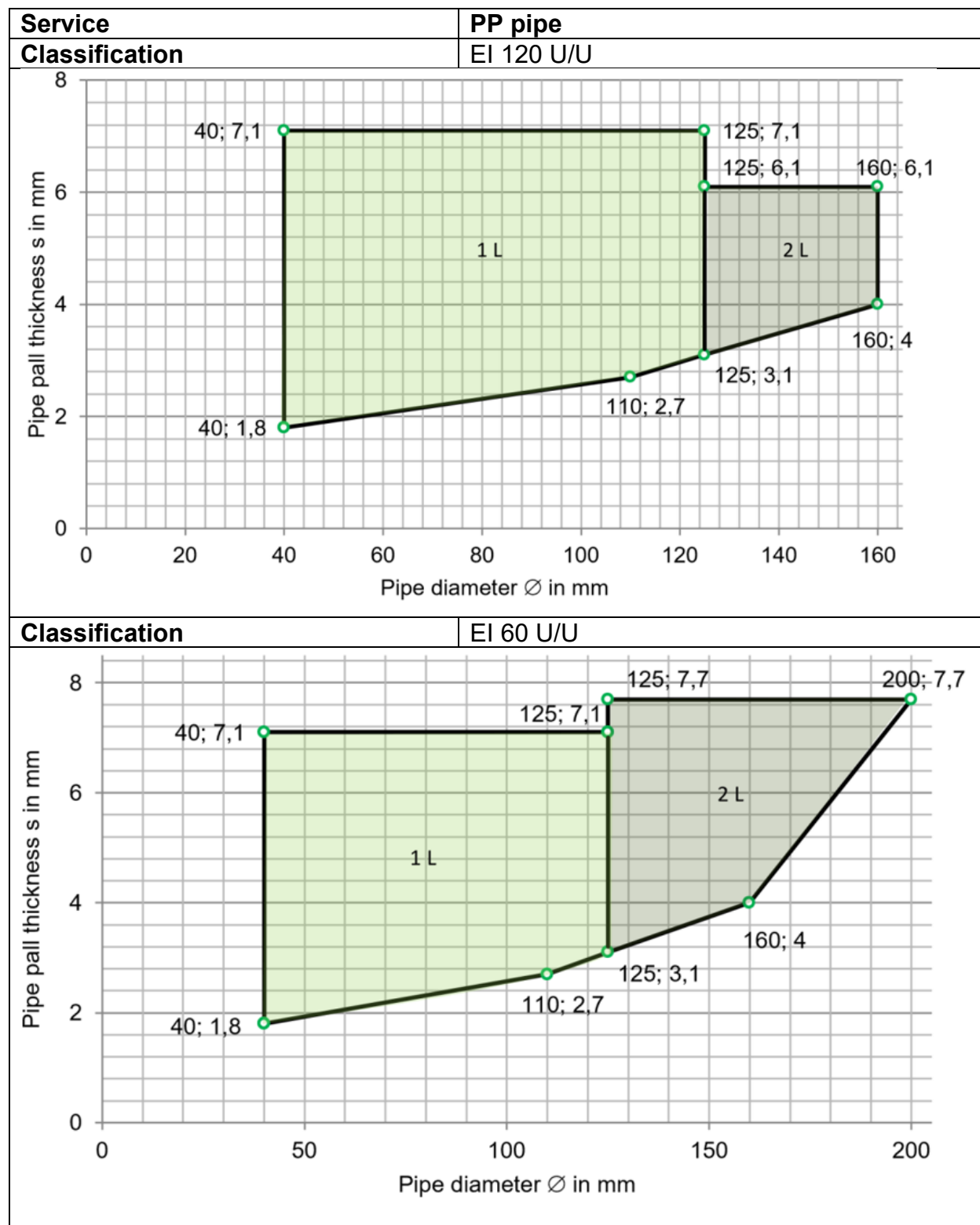
A₂ – Annular gap sealing, e.g. using Silverseal Compound

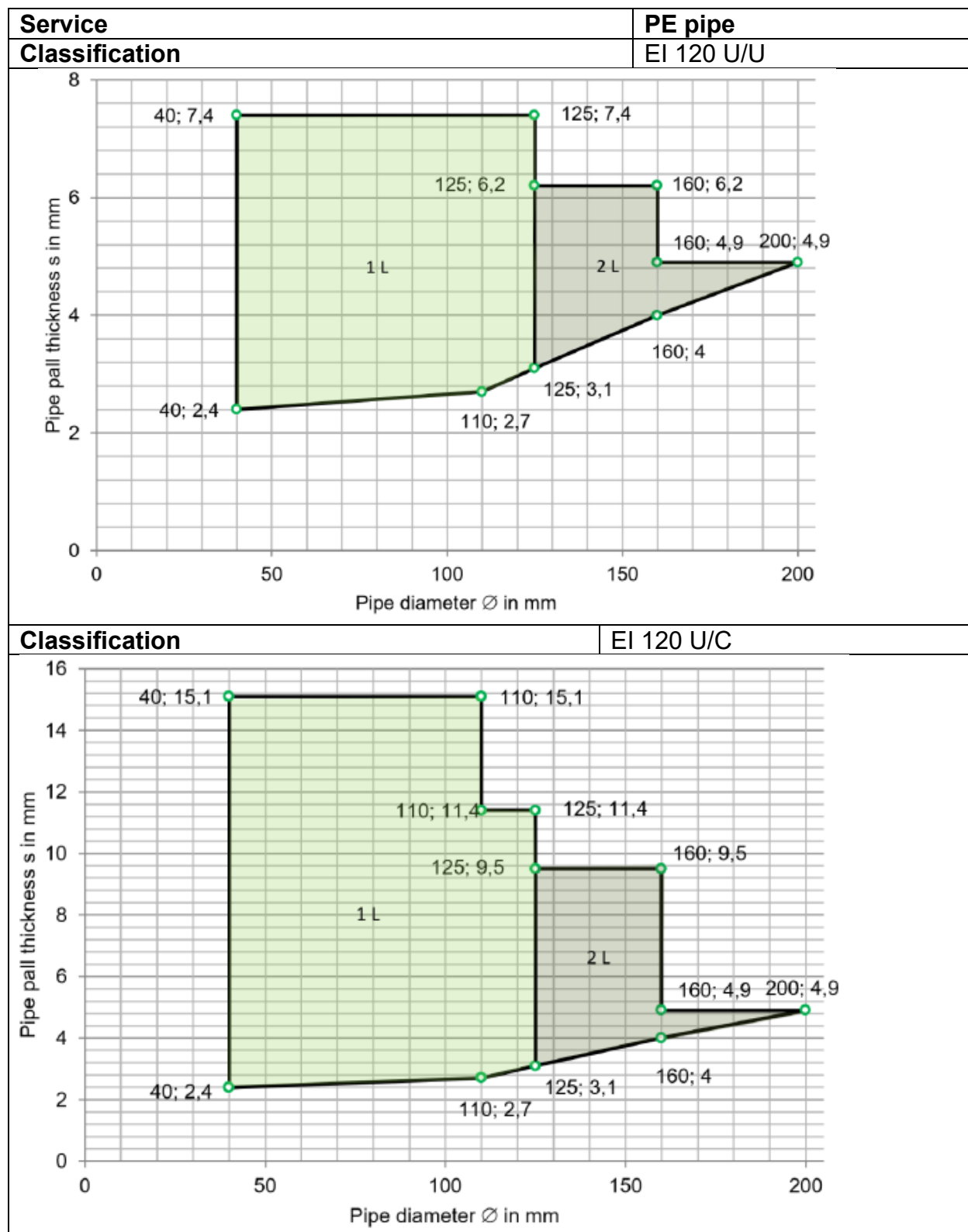
C – Rigid floor construction with thickness $t_c \geq 150\text{mm}$

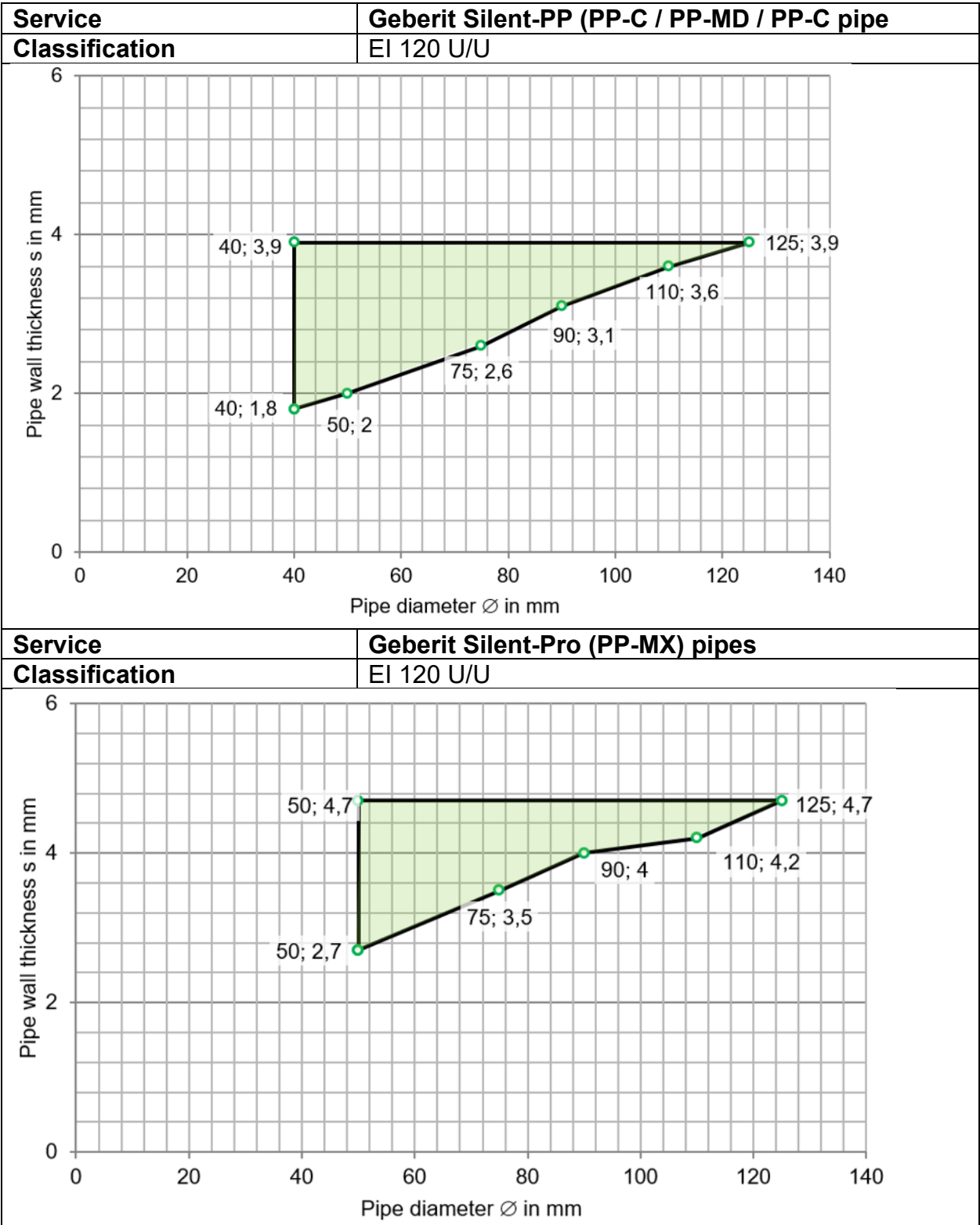
P – Plastic pipe with diameter d_p and wall thickness t_p

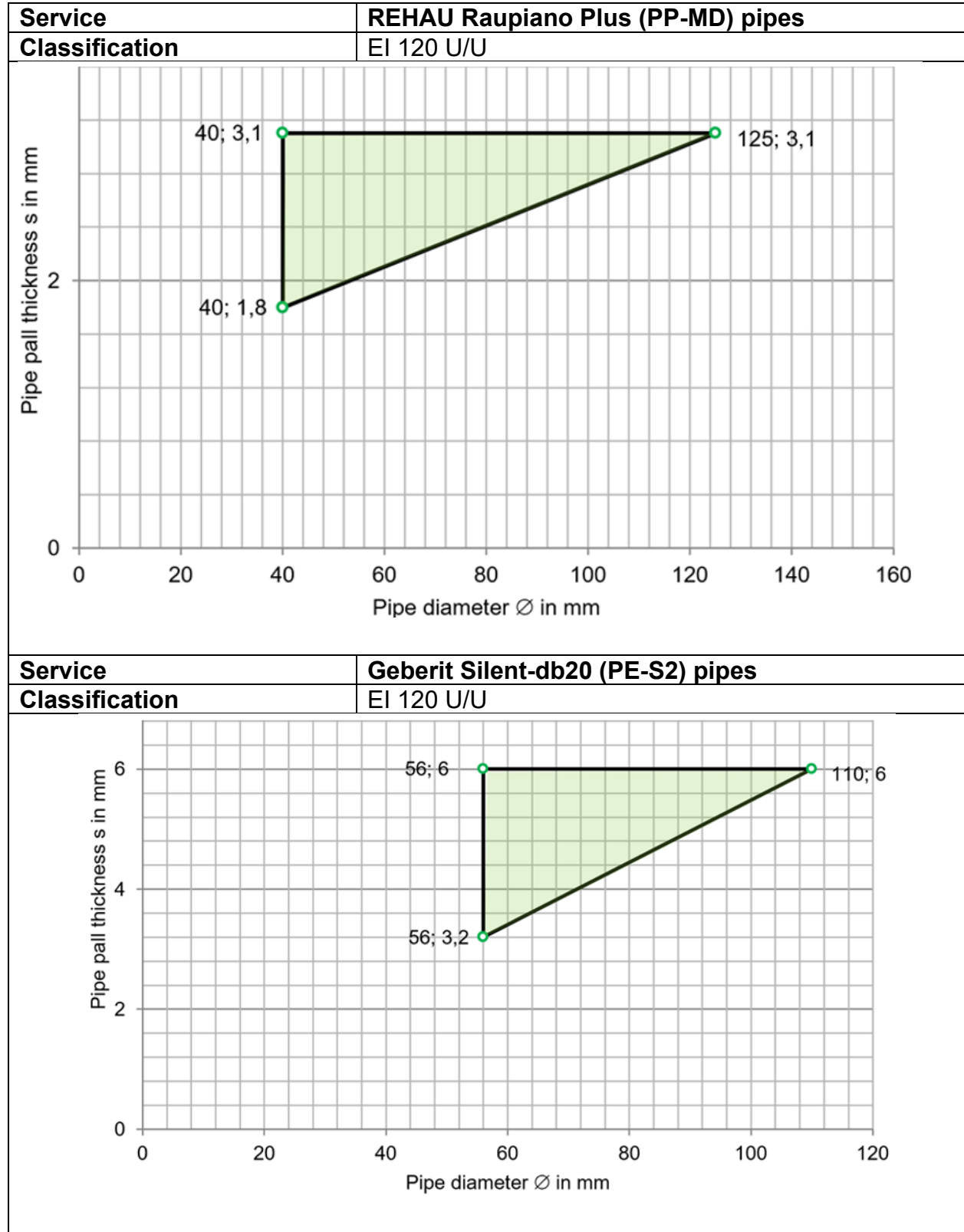
S – Sound-decoupling strip with thickness $t_s \leq 4\text{mm}$ (optional)

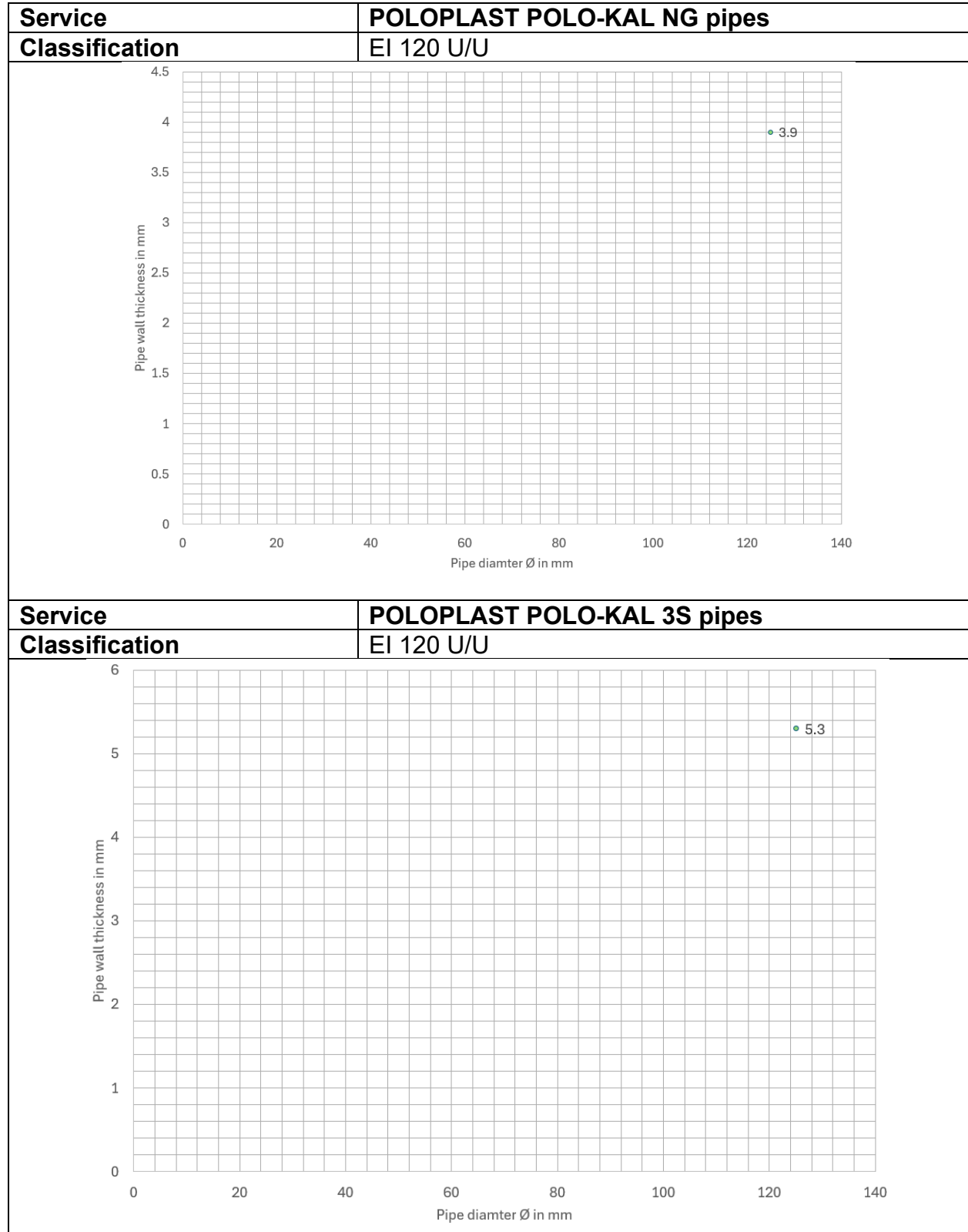
X – Appropriate fixing material, 7.5 x 72 mm or larger steel screws



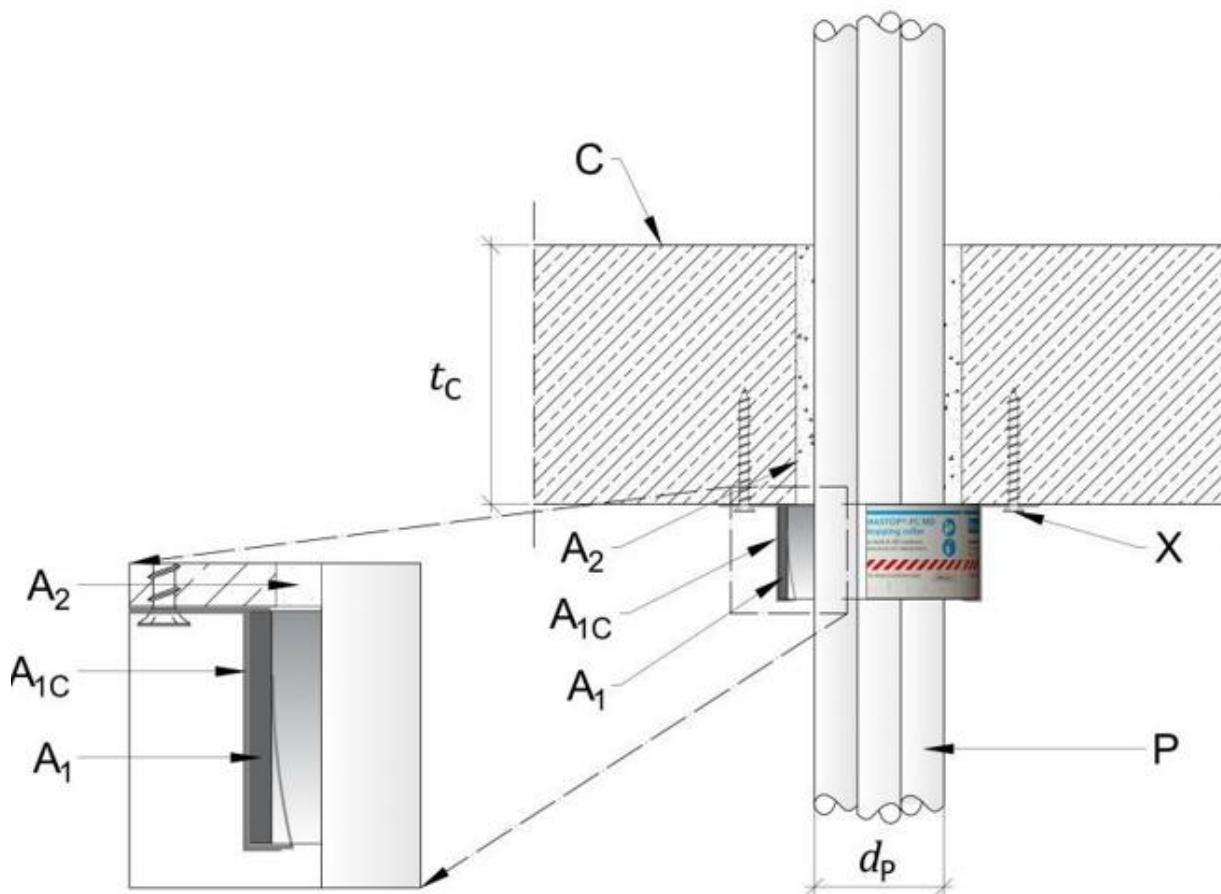








Concrete floors minimum 150mm thick
Fsi FC-MD pipe collars fitted around the plastic pipe bundles and to the soffit

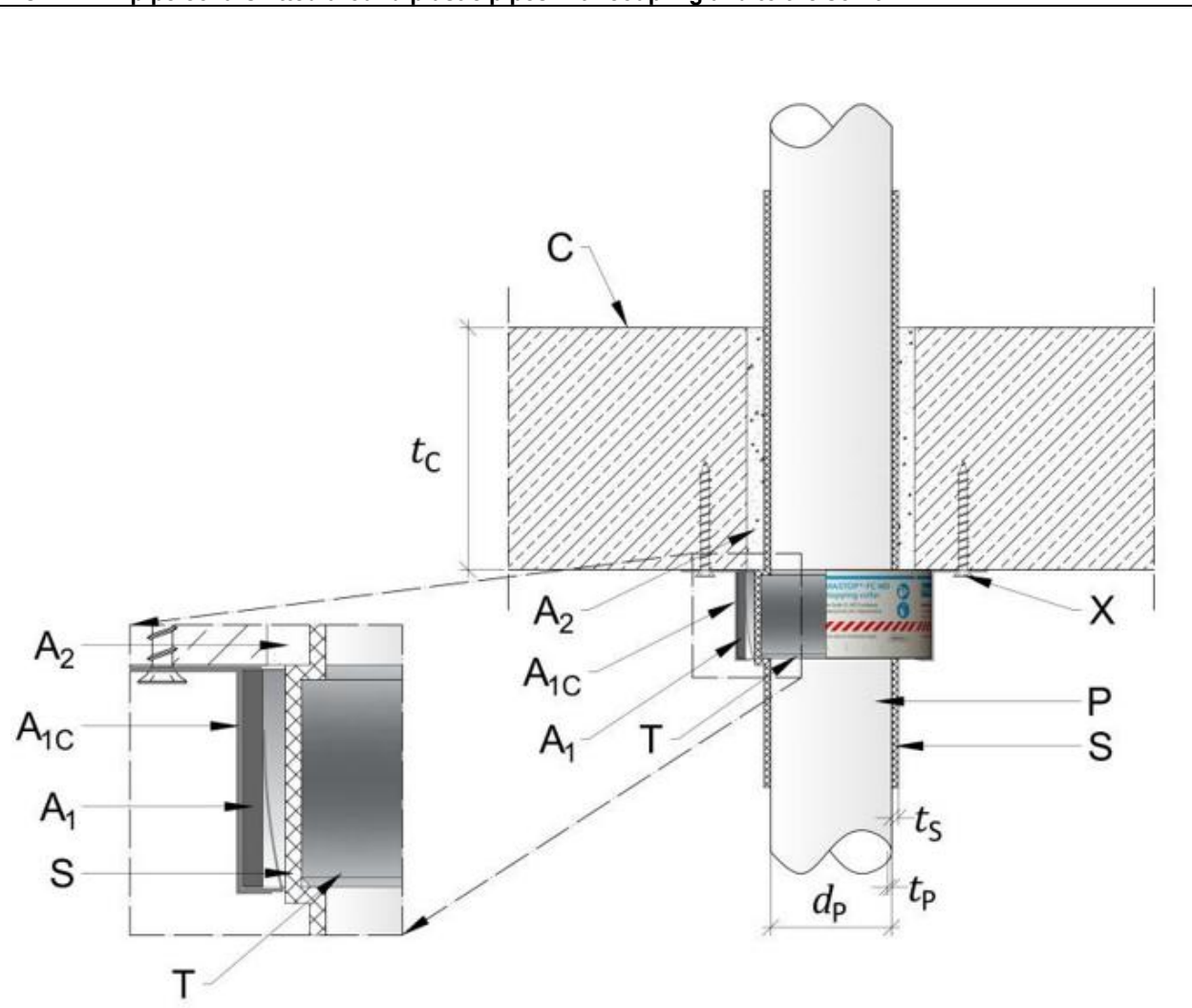


Key

- A₁ – FSi FC-MD
- A_{1C} – Fixing bracket type C
- A₂ – Annular gap sealing, e.g. using Silverseal Compound
- C – Rigid floor construction with thickness $t_c \geq 150\text{mm}$
- P – Plastic pipe (bundle) with diameter d_p and wall thickness t_p
- S – Sound-decouling strip with thickness $t_s \leq 4\text{mm}$ (optional)
- X – Appropriate fixing material, 7.5 x 72 mm or larger steel screws

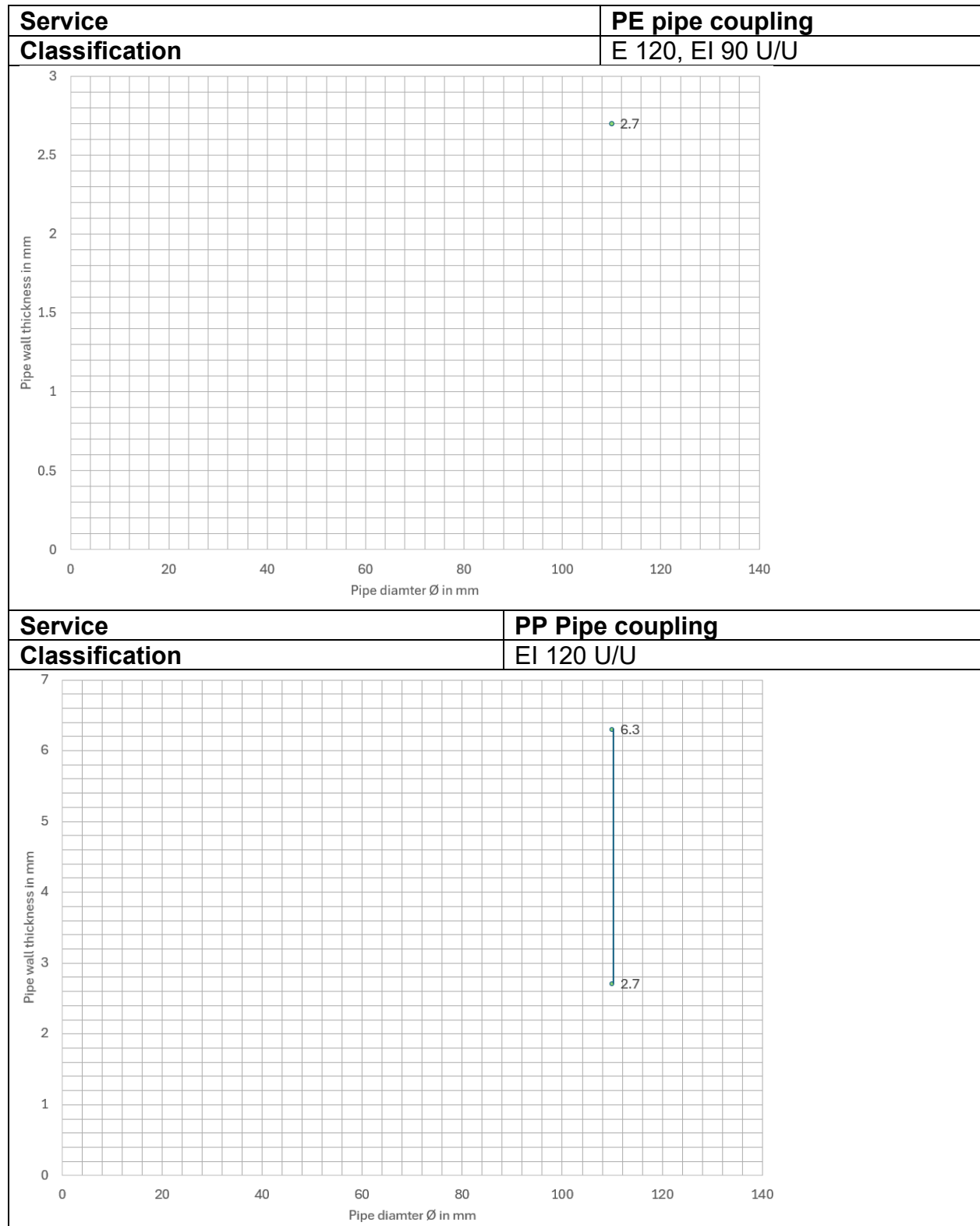
Service PVC-U pipe bundles		
Pipes (max. bundle)	Annular space	Classification
1x Ø 32 x 3.6 mm 1x Ø 50 x 1.8 mm 1x Ø 75 x 1.8 mm	Silverseal Compound Covering depth: ≤ 150 mm Annular space width: ≤ 40 mm	EI 60 – U/U
Service PP-H pipe bundles		
Pipes (max. bundle)	Annular space	Classification
1x Ø 32 x 2.9 mm 1x Ø 50 x 2.9 mm 1x Ø 75 x 4.3 mm	Silverseal Compound Covering depth: ≤ 150 mm Annular space width: ≤ 40 mm	EI 120 – U/U
Service PE pipe bundles		
Pipes (max. bundle)	Annular space	Classification
1x Ø 32 x 2 mm 1x Ø 50 x 3 mm 1x Ø 75 x 2,3 mm	Silverseal Compound Covering depth: ≤ 150 mm Annular space width: ≤ 40 mm	EI 120 – U/U
Service PVC-U, PE & PP-H mixed pipe bundles		
Pipes (max. bundle)	Annular space	Classification
PVC-U 1x Ø 32 x 3.6 mm PP-H 1x Ø 50 x 2 mm PE 1x Ø 75 x 2.3 mm	SILVERSEAL COMPOUND firestop mortar Covering depth: ≤ 150 mm Annular space width: ≤ 40 mm	EI 90 – U/U

Concrete floors minimum 150mm thick
Fsi FC-MD pipe collars fitted around plastic pipes with coupling and to the soffit



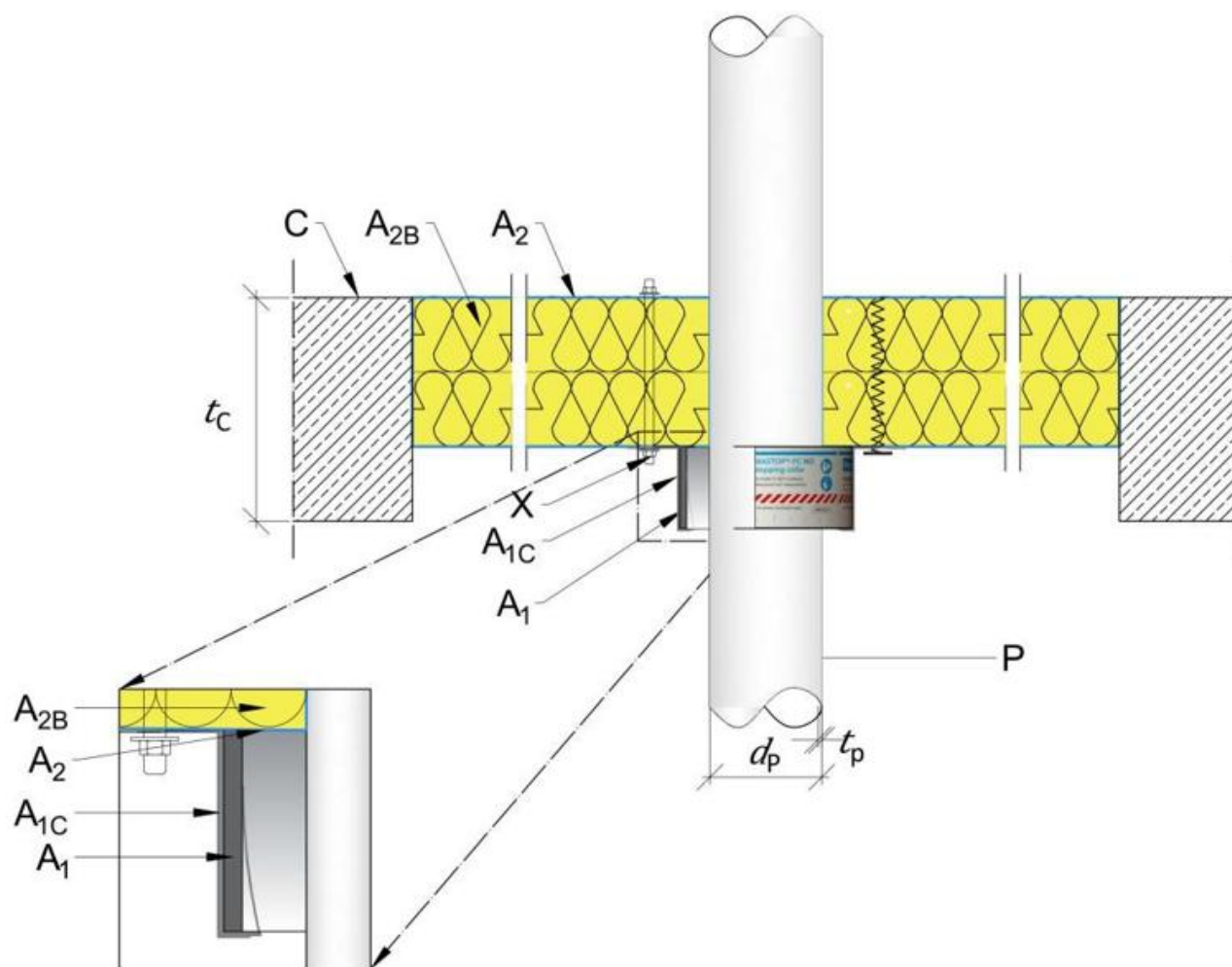
Key

- A₁ – FSi FC-MD
- A_{1C} – Fixing bracket type C
- A₂ – Annular gap sealing, e.g. using Silverseal Compound
- C – Rigid floor construction with thickness $t_c \geq 150\text{mm}$
- P – Plastic pipe with diameter d_p and wall thickness t_p
- S – Sound-decoupling strip with thickness $t_s \leq 4\text{mm}$ (optional)
- X – Appropriate fixing material, 7.5 x 72 mm or larger steel screws
- T - Coupling



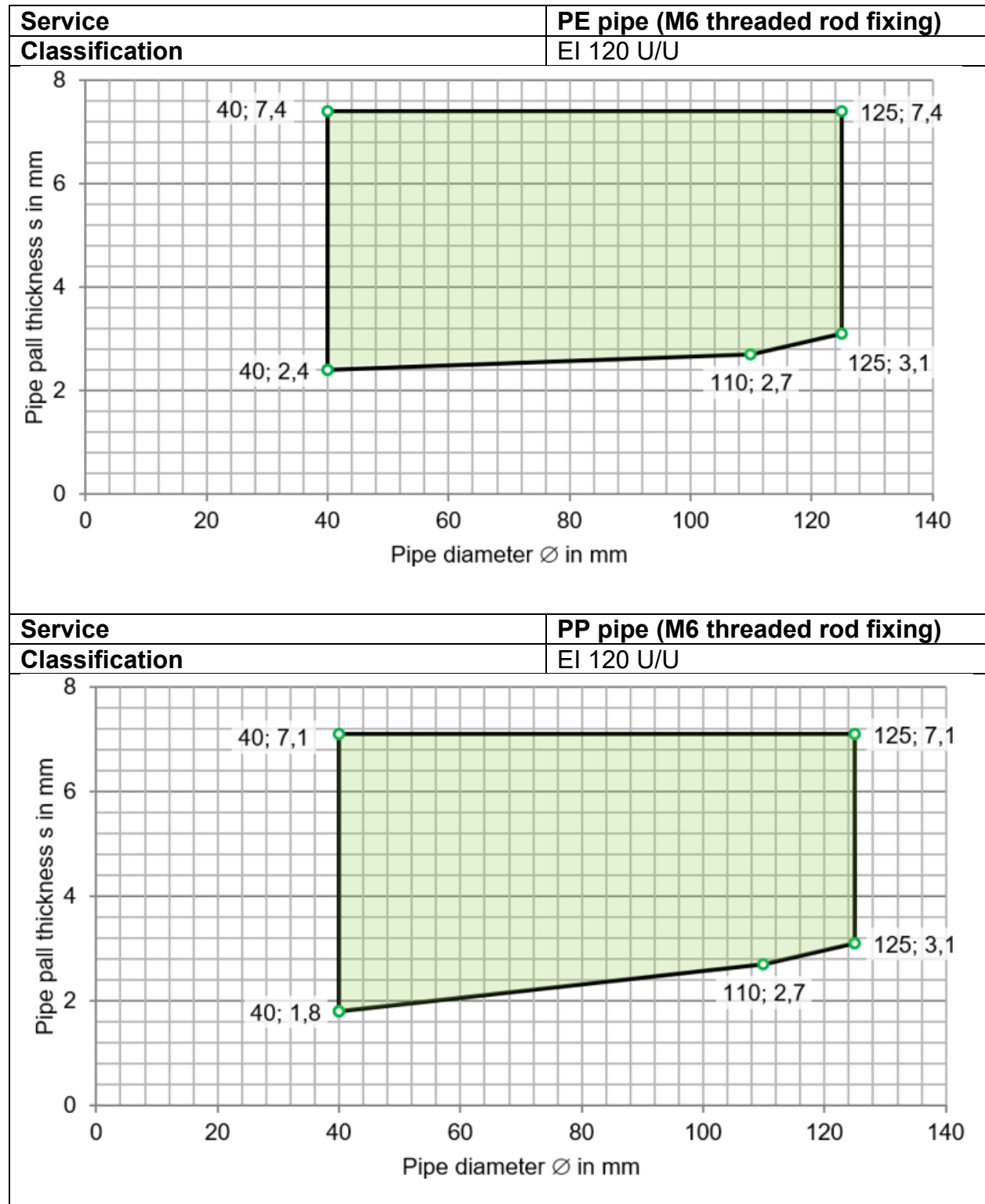
FSi FC-MD pipe collars in coated board seals, in rigid floors

Concrete floors minimum 150mm thick and aperture sealed with minimum 2 layers of 50 mm thick Stopseal Board Fsi FC-MD pipe collars fitted around plastic pipes and to the soffit of the coated boards. Maximum dimensions of the coated board seal 350 x 1000 mm.

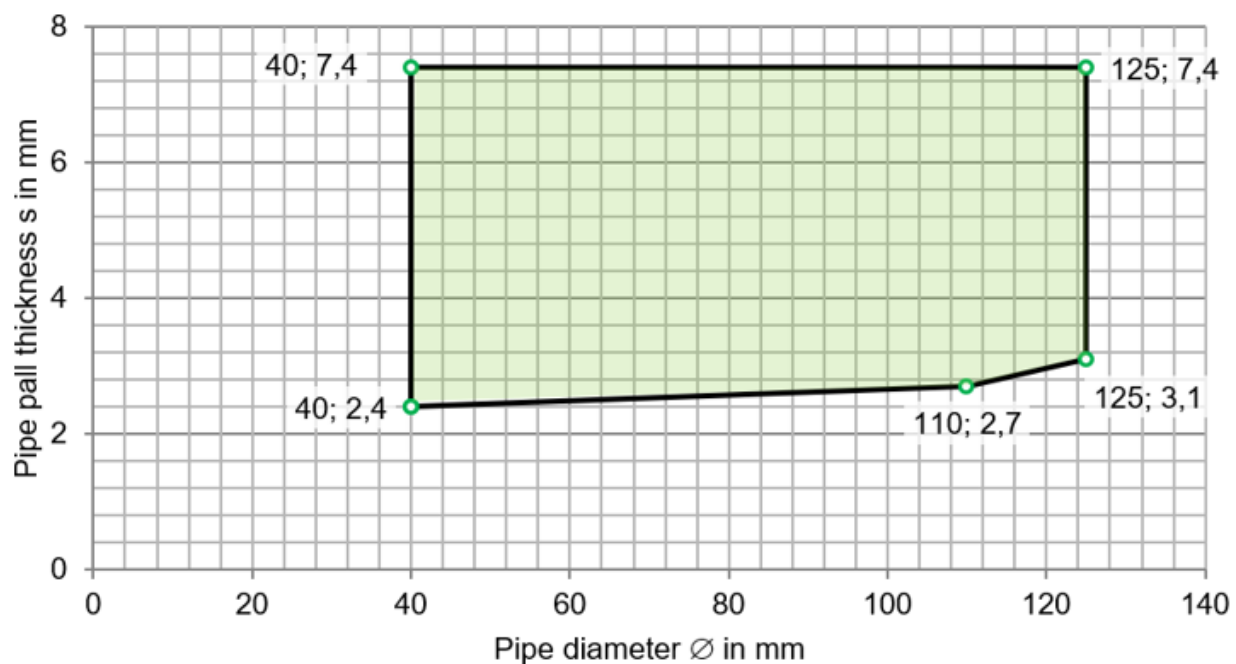


Key

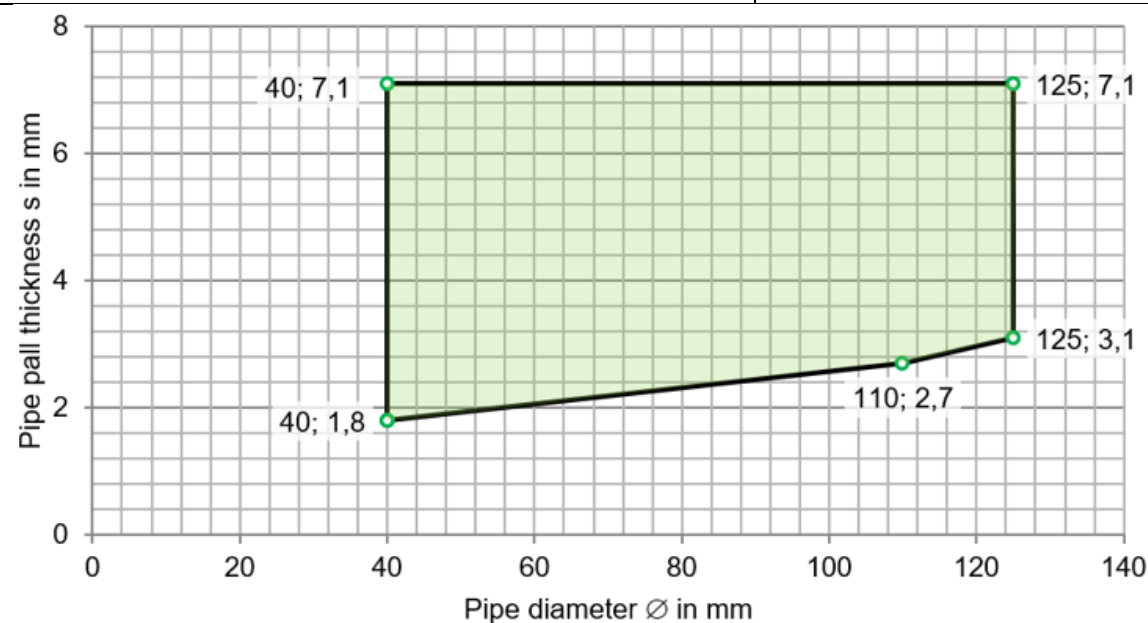
- A₁ – FSi FC-MD
- A_{1C} – Fixing bracket type C
- A₂ – Coated batt seal Stopseal Board
- A_{2B} – Stone wool boards
- C – Rigid floor construction with thickness $t_c \geq 150\text{mm}$
- P – Plastic pipe with diameter d_p and wall thickness t_p
- X – Fixing material, e.g. threaded rods $\geq \text{M6}$ (EI 120) or steel spiral screws $\geq 8 \times 100\text{mm}$ (EI 90)



Service	PE pipe (spiral screw fixing)
Classification	EI 90 U/U

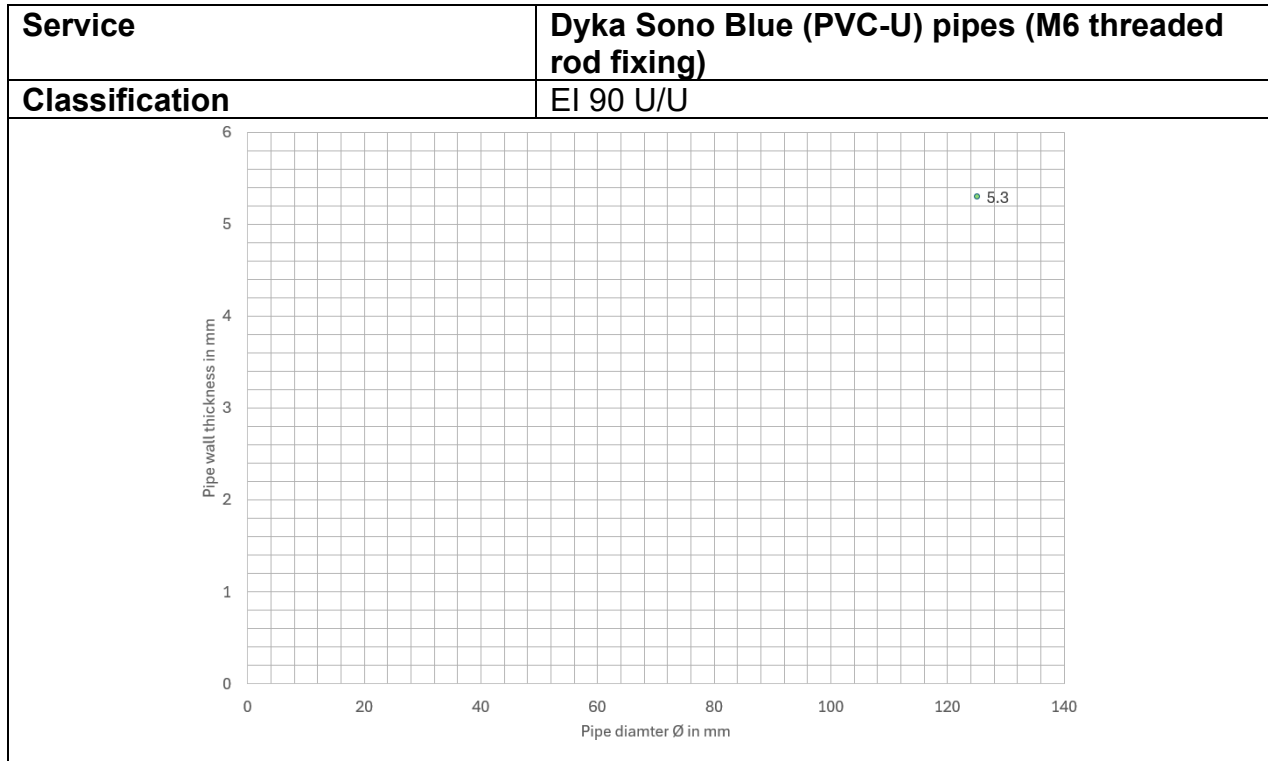


Service	PP pipe (spiral screw fixing)
Classification	EI 90 U/U

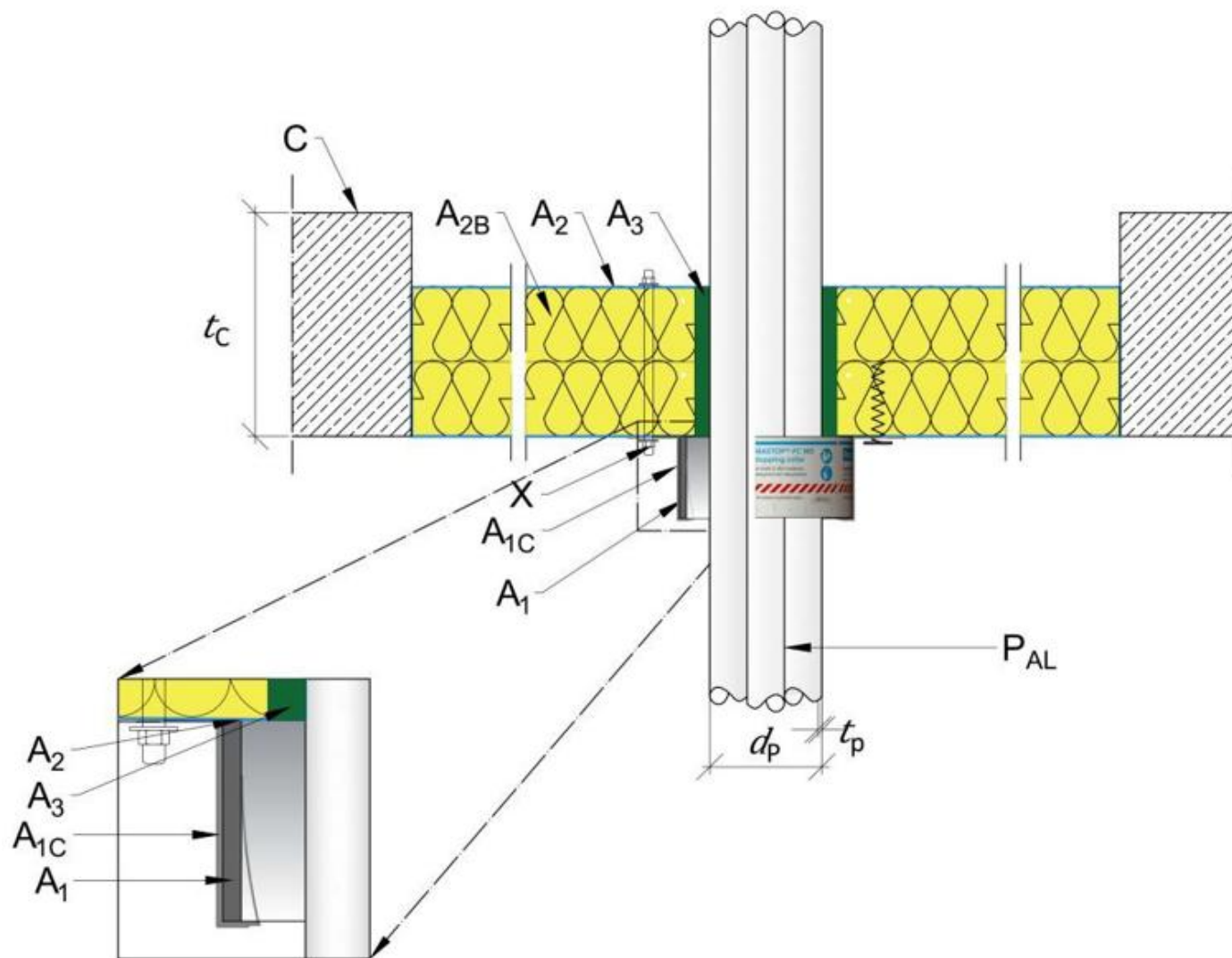




Service	Geberit Silent-PP (PP-C / PP-MD / PP-C pipe (M6 threaded rod fixing)
Classification	EI 90 U/U
The graph displays Pipe wall thickness in mm on the y-axis (0 to 4.5) against Pipe diameter Ø in mm on the x-axis (0 to 140). A single data point is plotted at approximately (110, 3.9).	
Service	REHAU Raupiano Plus (PP-MD) pipes (M6 threaded rod fixing)
Classification	EI 90 U/U
The graph displays Pipe wall thickness in mm on the y-axis (0 to 3.5) against Pipe diameter Ø in mm on the x-axis (0 to 140). A single data point is plotted at approximately (125, 3.1).	



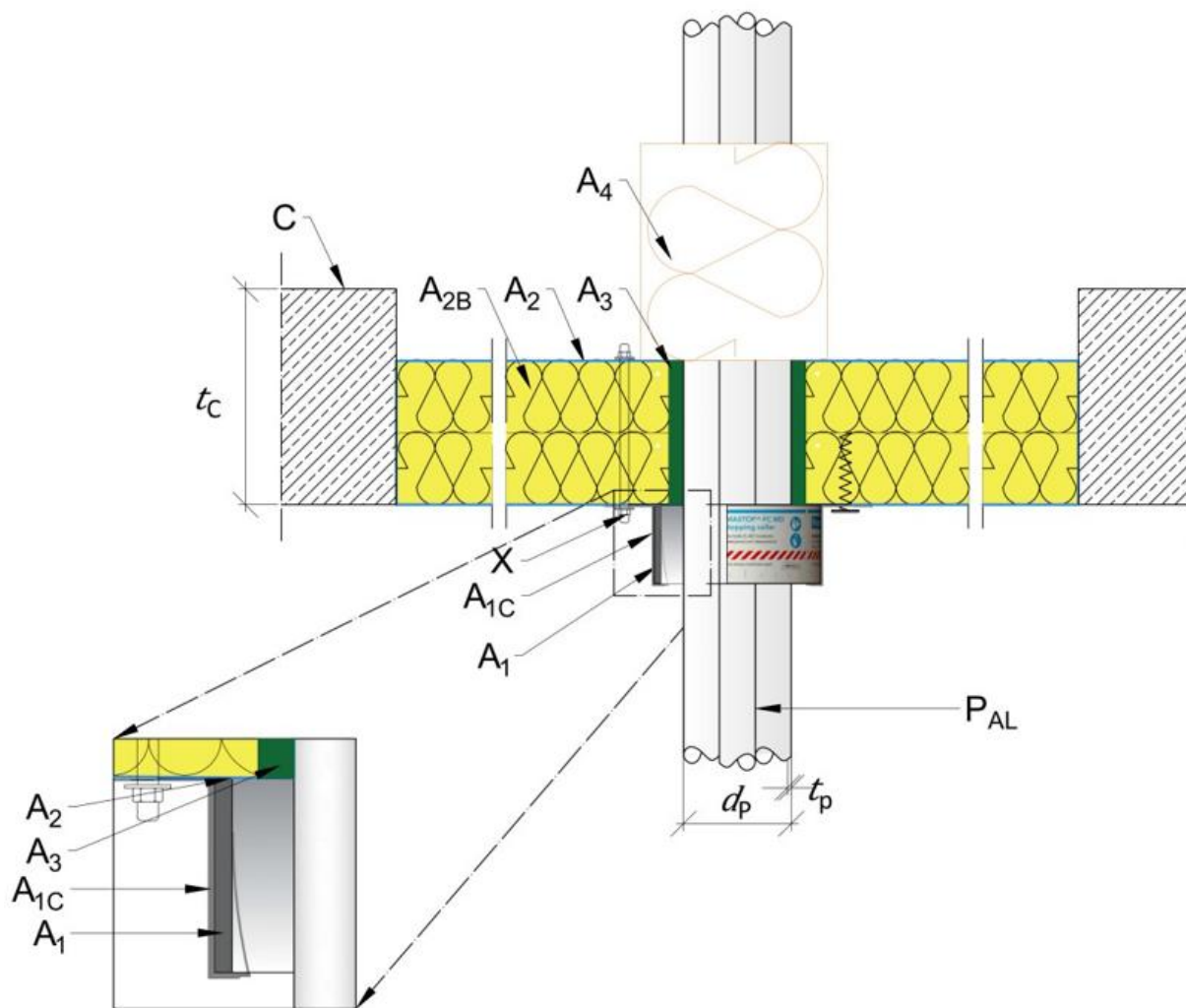
**Concrete floors minimum 150mm thick and aperture sealed with minimum 2 layers of 50 mm thick Stopseal Board
 Fsi FC-MD pipe collars fitted around plastic/aluminium pipes (single or bundle) and to the soffit of the coated boards.
 Maximum dimensions of the coated board seal 350 x 1000 mm.**



Key

- A₁ – FSi FC-MD
- A_{1C} – Fixing bracket type C
- A₂ – Coated batt seal StopSeal Board
- A_{2B} – Stone wool boards
- A₃ – Firestop sealant Pyrocoustic Sealant
- C – Rigid floor construction with thickness $t_c \geq 150\text{mm}$
- P_{AL} – Plastic/Aluminium compound pipes (with or without insulation or PE corrugated cover)
- X – Fixing material, e.g. threaded rods $\geq \text{M6}$ or steel spiral screws $\geq 8 \times 45\text{mm}$

**Concrete floors minimum 150mm thick and aperture sealed with minimum 2 layers of 50 mm thick Stopseal Board
 Fsi FC-MD pipe collars fitted around plastic/aluminium pipes (single or bundle) with additional protection and to the soffit of the coated boards. Maximum dimensions of the coated board seal 350 x 1000 mm.**



Key

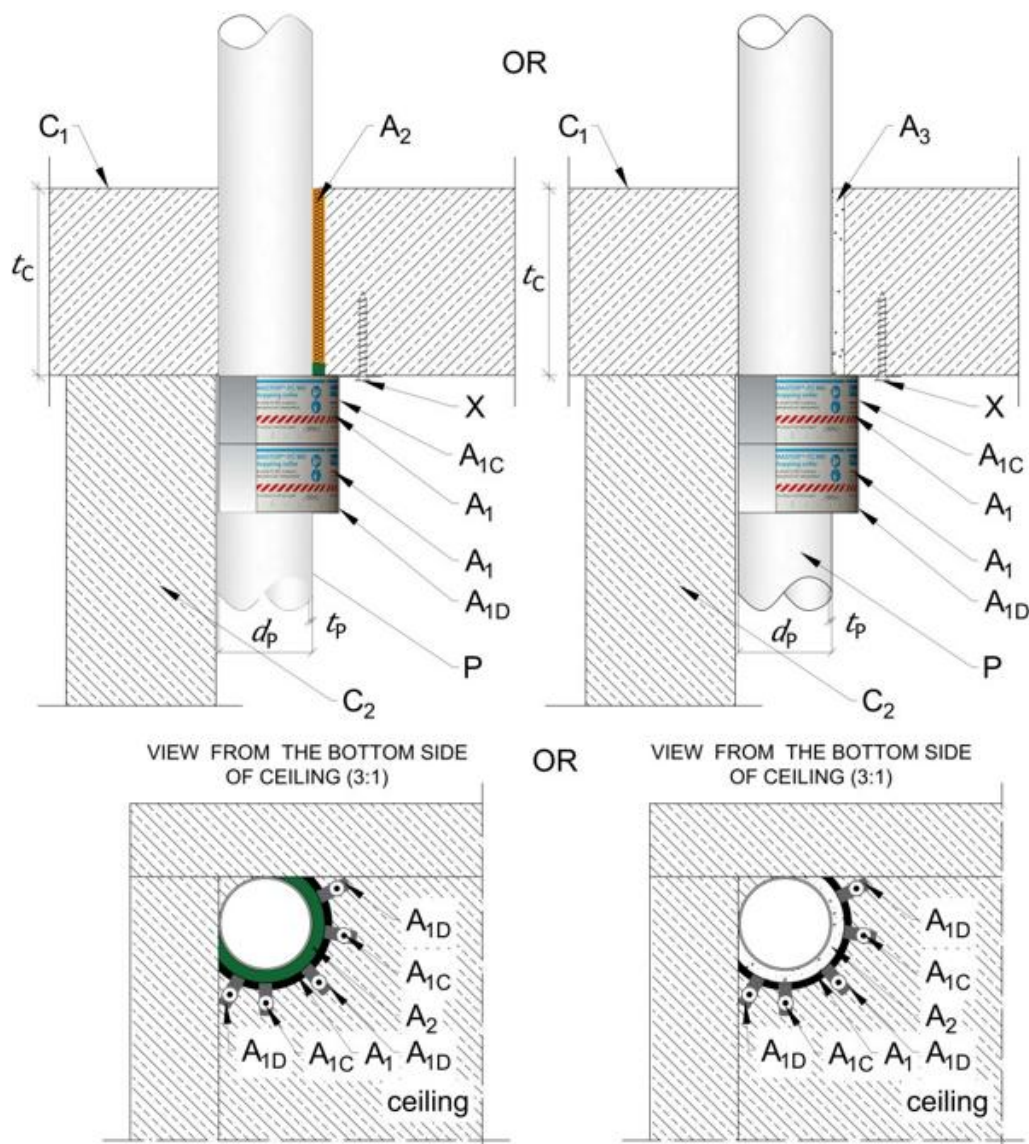
- A₁ – FSi FC-MD
- A_{1C} – Fixing bracket type C
- A₂ – Coated batt seal StopSeal Board
- A_{2B} – Stone wool boards
- A₃ – Firestop sealant Pyrocoustic Sealant
- A₄ – Additional protection, stone wool, length ≥ 150 mm
- P_{AL} – Plastic/Aluminium compound pipes (with or without insulation or PE corrugated cover)
- X – Fixing material, e.g. threaded rods ≥ M6 or steel spiral screws ≥ 8x45mm

Service	Plastic/Aluminum compound pipes Henco Standard (PE-c/Al/PE-Xc)			
Bundles made of Henco standard pipes (with or without insulation, with and without additional protection), or single pipe penetration seals (the amount of pipe may be decreased)				
Pipes (max. bundle)	Insulation	Annular space	Additional protection	Classification
1x Ø 16 x 2 mm 1x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 26 x 3 mm 1x Ø 32 x 3 mm 1x Ø 40 x 3.5 mm 1x Ø 63 x 4.5 mm	-	Covering depth: 100 mm Pyrocoustic Sealant in the coated batt seal Annular space width: 10 mm	Stone wool (class A1 acc. EN 13501-1, density ≥ 30 kg/m³), thickness 50 mm, 150 mm length on the unexposed side around pipe bundle.	E 120 – U/C EI 90 – U/C
1x Ø 14 x 2 mm 1x Ø 16 x 2 mm 3x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 26 x 3 mm 1x Ø 32 x 3 mm	Corrugated cover made of PE. Case: CS	Covering depth: 100 mm Pyrocoustic Sealant in the coated batt seal Annular space width: 10 mm	Stone wool (class A1 acc. EN 13501-1, density ≥ 30 kg/m³), thickness 50 mm, 150 mm length on the unexposed side around pipe bundle.	EI 120 – U/C
1x Ø 14 x 2 mm 1x Ø 16 x 2 mm 1x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 26 x 3 mm 1x Ø 32 x 3 mm	PE foam (class E acc. EN 13501-1) Thickness: 6 mm Case: CS	Covering depth: 100 mm Pyrocoustic Sealant in the coated batt seal Annular space width: 10 mm	Stone wool (class A1 acc. EN 13501-1, density ≥ 30 kg/m³), thickness 50 mm, 150 mm length on the unexposed side around the pipe bundle.	EI 120 – U/C
1x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 26 x 3 mm 1x Ø 32 x 3 mm	PE foam (class E acc. EN 13501-1) Thickness: 13 mm Case: CS	Covering depth: 100 mm Pyrocoustic Sealant in the coated batt seal Annular space width: 10 mm	Stone wool (class A1 acc. EN 13501-1, density ≥ 30 kg/m³), thickness 50 mm, 150 mm length on the unexposed side around the pipe bundle.	EI 120 – U/C
1x Ø 16 x 2 mm 1x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 26 x 3 mm 1x Ø 32 x 3 mm 1x Ø 40 x 3.5 mm 1x Ø 63 x 4.5 mm	-	Covering depth: 100 mm Pyrocoustic Sealant in the coated batt seal Annular space width: 10 mm	-	E 120 – U/C EI 30 – U/C

Pipes (max. bundle)	Insulation	Annular space	Additional protection	Classification
1x Ø 14 x 2 mm 1x Ø 16 x 2 mm 3x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 26 x 3 mm 1x Ø 32 x 3 mm	Corrugated cover made of PE. Case: CS	Covering depth: 100 mm Pyrocoustic Sealant in the coated batt seal Annular space width: 10 mm	-	EI 120 – U/C
1x Ø 14 x 2 mm 1x Ø 16 x 2 mm 1x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 26 x 3 mm 1x Ø 32 x 3 mm	PE foam (class E acc. EN 13501-1) Thickness: 6 mm Case: CS	Covering depth: 100 mm Pyrocoustic Sealant in the coated batt seal Annular space width: 10 mm	-	EI 120 – U/C
1x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 26 x 3 mm 1x Ø 32 x 3 mm	PE foam (class E acc. EN 13501-1) Thickness: 13 mm Case: CS	Covering depth: 100 mm Pyrocoustic Sealant in the coated batt seal Annular space width: 10 mm	-	EI 120 – U/C
3x Ø 16 x 2 mm 1x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 26 x 3 mm 1x Ø 32 x 3 mm 1x Ø 40 x 3.5 mm 1x Ø 50 x 4 mm	-	Covering depth: 100 mm Pyrocoustic Sealant in the coated batt seal Annular space width: 10 mm	-	E 120 – U/C EI 45 – U/C
3x Ø 16 x 2 mm 1x Ø 18 x 2 mm 1x Ø 20 x 2 mm 1x Ø 26 x 3 mm 1x Ø 32 x 3 mm 1x Ø 40 x 3.5 mm 1x Ø 50 x 4 mm	-	Covering depth: 100 mm Pyrocoustic Sealant in the coated batt seal Annular space width: 10 mm	Stone wool (class A1 acc. EN 13501-1, density ≥ 30 kg/m ³), thickness 50 mm, 150 mm length on the unexposed side around the pipe bundle.	E 120 – U/C EI 90 – U/C

Concrete floors minimum 150mm thick

Fsi FC-MD pipe collars fitted around plastic pipes in corner application and to the soffit



Key

A1 – FSi FC-MD

A1C – Fixing bracket type C

A1D – Fixing bracket type D

A2 – Annular space sealing, Pyrocoustic Sealant and stone wool backfilling

A3 – Annular space sealing, Silverseal Compound

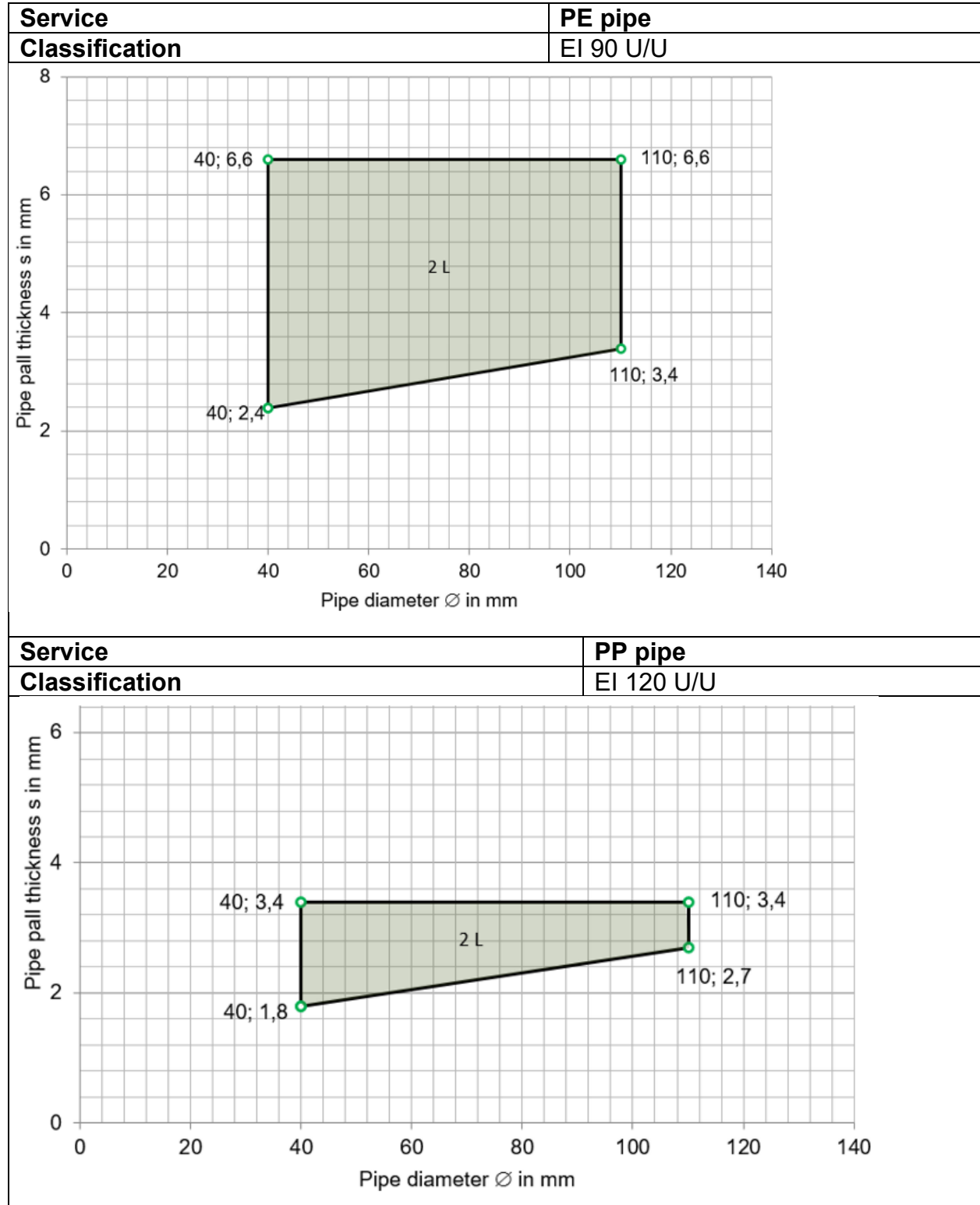
A3 – Firestop sealant Pyrocoustic Sealant

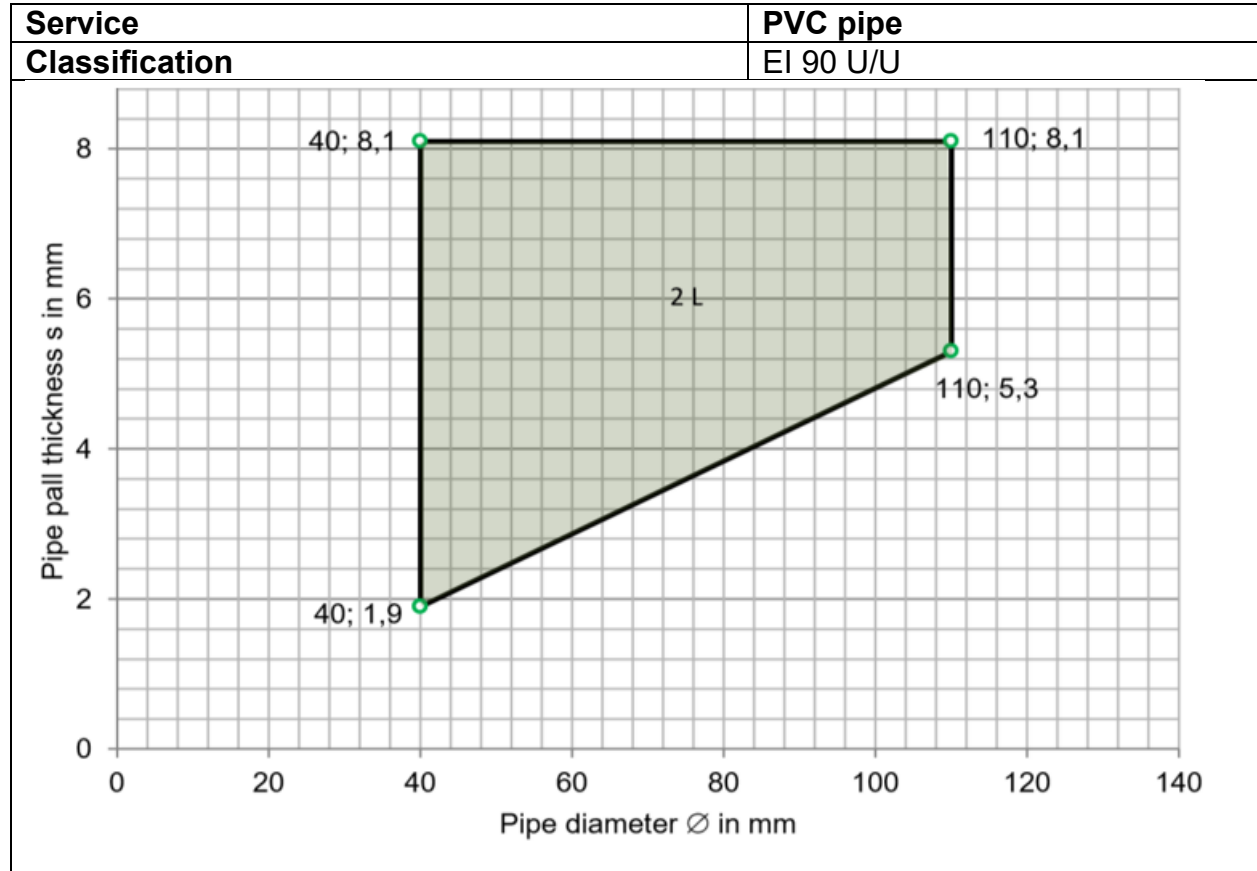
C1 – Rigid floor construction with thickness $t_c \geq 150\text{mm}$

C2 – Wall construction

P – Plastic pipes with pipe diameter d_p and wall thickness t_p

X – Fixing material, e.g. steel screw $\geq 7.5 \times 72\text{mm}$





3.5. Field of Application

This classification is valid for the following end use applications where relevant rules of EN 1366-3:2009: 13 and EN 15882-3 were used:

- Test results are applicable to the orientation in which the penetration sealing systems were tested.
- Test results obtained with rigid floor standard supporting constructions may be applied to concrete or masonry separating elements of a thickness equal to or greater than 150 mm that of the supporting construction used in the test and density equal to or greater than 650 kg/m^3 that of the supporting construction used in the test. This rule does not apply to pipe closure devices positioned within the supporting construction in case of higher thickness of the supporting construction unless the length of the seal is increased by an equal amount and the distance from the surface of the supporting construction remains the same on both sides.
- Test results obtained with the standard flexible wall constructions cover all flexible wall constructions of the same fire resistance classification provided:
 - the construction is classified in accordance with EN 13501-2;
 - the construction has an overall thickness not less than the minimum thickness of the range given in Table 3 of EN 1366-3:2009 for the standard flexible wall used in the test. This rule does not apply to pipe closure devices positioned within the supporting construction unless the length of the seal is increased by an equal amount and the distance from the surface of the supporting construction remains the same on both sides;
 - in the case of penetration seals installed within the wall and where a flexible wall with insulation was used in the test an aperture framing shall be used in practice. The aperture frame and aperture lining shall be made from studs and boards of the same specification as those used in the wall in practice. The thickness of the aperture lining shall be minimum 12.5 mm;
- the number of board layers and the overall board layer thickness is equal or greater than that tested when no aperture framing is used;
- flexible wall constructions with timber studs are constructed with at least the same number of layers as given in Table 3 of EN 1366-3:2009, no part of the penetration seal is closer than 100 mm to a stud, the cavity is closed between the penetration seal and the stud, and minimum 100 mm of insulation of class A1 or A2 according to EN 13501-1 is provided within the cavity between the penetration seal and the stud.
- The standard flexible wall construction does not cover sandwich panel constructions and flexible walls where the lining does not cover the studs on both sides.
- Test results obtained with flexible supporting walls may be applied to concrete or masonry elements of an overall thickness equal to or greater than that of the element used in the tests. This rule does not apply to pipe closure devices positioned within the supporting construction unless the length of the seal is increased by an equal amount and the distance from the surface of the supporting construction remains the same on both sides.

- Test results obtained from tests with plastic pipes having both ends uncapped (test condition U/U) are valid for all other test conditions of table below. Test results obtained from tests with plastic pipes and plastic aluminum compound pipes having test condition U/C are valid for test conditions U/C and C/C.

	Tested				
		U/U	C/U	U/C	C/C
Covered	U/U	Y	N	N	N
	C/U	Y	Y	N	N
	U/C	Y	Y	Y	N
	C/C	Y	Y	Y	Y
Y = acceptable, N = not acceptable					

- Where single pipes penetrate directly through the structural associated construction (masonry walls, flexible walls, concrete floors) the annular space between the pipe and the supporting construction shall remain within the tested range (10 to 47 mm). Separation a2 (between penetration seals) may be increased (relevant distances are given in the Test reports described in cl. 3 of this Classification report).
- The pipes must be suspended in supporting distance ≤ 335 mm on both sides from walls and ≤ 525 mm on top of floor constructions.
- Sound decoupling strips based on PE-foam (class E according to EN 13501-1 or higher rated) with a max. thickness of 4 mm may be used.

- Filling of annular space In flexible and rigid walls:

For all pipes* $\varnothing \leq 160$ mm	For up to EI 120: gypsum filler, width ≤ 31 mm,
For PP, PE and PVC pipes $\varnothing \leq 125$ mm	For up to EI 90: gypsum filler, width ≤ 31 mm
	For up to EI 90: Backfilling: Stone wool (class A1 acc. EN 13501-1) Covering depth: ≥ 10 mm Pyrocoustic Sealant on both sides in the wall Annular space width: ≤ 10 mm
For Henco Standard pipes (plastic aluminum compound pipes)	Without backfilling possible. Covering depth: ≥ 25 mm Pyrocoustic Sealant on both sides in the wall Annular space width: 5 - 20 mm

**no plastic aluminum compound pipes*

In rigid floors:

For pipes with coupling	For up to EI 90: SILVERSEAL COMPOUND or mortar with min. class M5 acc. EN 998-2, width $\leq$ 31 mm
For pipes and pipe bundles	For up to EI 120: SILVERSEAL COMPOUND or mortar with min. class M5 acc. EN 998-2, width $\leq$ 47 mm
For corner application	For up to EI 120 and pipe $\varnothing$ 40 mm: SILVERSEAL COMPOUND or mortar with min. class M5 acc. EN 998-2, width $\leq$ 30 mm or: Backfilling: Stone wool (class A1 acc. EN 13501-1) Covering depth: $\geq$ 10 mm Pyrocoustic Sealant on the bottom side of the floor Annular space width: $\leq$ 10 mm
	For up to EI 120 and pipe $> \varnothing$ 40 mm and $\leq \varnothing$ 110 mm: SILVERSEAL COMPOUND or mortar with min. class M5 acc. EN 998-2, width $\leq$ 30 mm

In coated batt seals:

STOPSEAL BATT (2x50 mm) coated batt seal For plastic aluminum compound pipes	Pyrocoustic Sealant over complete depth of the coated batt seal and in between the pipe gussets
STOPSEAL BATT (2x50 mm) coated batt seal	Stone wool backfilling, and covering with STOPSEAL firestop coating

- Fixing material

Flexible walls	For up to EI 120: Threaded rods $\geq$ M6 with nuts and washers
Rigid walls	For up to EI 120: Appropriate fixing material, e.g. screws min. 7.5x42 mm
For Henco Standard pipes (plastic aluminum compound pipes) in flexible walls	Screws min. 7.5x42 mm
	Threaded rods $\geq$ M6 with nuts and washers
Rigid floors	For up to EI 120: Appropriate fixing material, e.g. screws min. 7.5x72 mm
STOPSEAL BATT (2x50 mm) coated batt seal	For up to EI90: Spiral screws made of steel, $\geq$ 8 x 100 mm, for PP, PE and PVC pipes $\varnothing \leq$ 125 mm
	For up to EI 120: Threaded rods $\geq$ M6 with nuts and washers
STOPSEAL BATT (2x50 mm) coated batt seal	For up to EI 90: threaded rods $\geq$ M6 with nuts and washers or spiral screws made of steel, $\geq$ 8 x 100 mm, for PP, PE and PVC pipes $\varnothing \leq$ 125 mm
For Henco Standard pipes (plastic aluminum compound pipes) STOPSEAL BATT (2x50 mm) coated batt seal (rigid floor only)	Spiral screws made of steel, $\geq$ 8 x 45 mm
	Threaded rods $\geq$ M6 with nuts and washers
Additional protection	Using of steel wire (minimum thickness 0.6 mm)

- Distances

Flexible and rigid wall	
FSi FC-MD – FSi FC-MD	≥ 60 mm
Flexible and rigid wall, STOPSEAL BATT coated batt seal	
FSi FC-MD – FSi FC-MD	≥ 100 mm
FSi FC-MD – horizontal aperture on top	≥ 60 mm
FSi FC-MD – lateral aperture	≥ 60 mm
Rigid floor	
FSi FC-MD – FSi FC-MD	≥ 88 mm
Rigid floor, STOPSEAL BATT coated batt seal	
FSi FC-MD – FSi FC-MD	≥ 70 mm
FSi FC-MD – lateral aperture	≥ 50 mm
Rigid floor, STOPSEAL BATT coated batt seal	
FSi FC-MD – FSi FC-MD	≥ 95 mm
FSi FC-MD – lateral aperture	≥ 50 mm

Any other distance: ≥ 100 mm

- Pipe couplings

FSi FC-MD can be used to seal plastic pipe couplings under the following conditions:

- Horizontal compartmentation
- Pipe orientation 90° to the compartmentation
- Pipe material PE-HD, PP-H, PP-R, and PVC, see clause 4.2.16, 4.2.17, 4.2.18
- Maximum pipe diameter 125 mm
- Classification **E 120, EI 90 – U/U**
- The number of “C” brackets must be increased by one acc. the standard application, see clause 4.3.17
- Sound decoupling strips based on PE-foam (class E according to EN 13501-1 or higher rated) with a max. thickness of 4 mm may be used.

- FSi FC-MD corner application

- Horizontal compartmentation
- Two walls or columns are forming the corner (90°)
- Pipe orientation 90° to the compartmentation
- Pipe material PE-HD, PP-H, PP-R, PP-C and PVC, see clause 4.2.40, 4.2.41, 4.2.42
- Pipe directly mounted in the corner
- 2 layers of FSi FC-MD shall be used at any time
- For pipe diameter Ø 40 mm, 1 “C” bracket for the first collar and 2 “D” brackets for the second collar shall be used
- For pipe diameter > Ø 40 mm and ≤ Ø 110 mm, 2 “C” brackets for the first collar and 3 “D” brackets for the second collar shall be used
- No “A” and “B” brackets are required

- Distance of the FSi FC-MD collar around the pipe, about 10 mm
- FSi FC-MD collar does not completely cover the circumference (about three quarters circumferential) of the pipe
 - Available brackets for FSi FC-MD

Type A	Closing bracket for the one end of the FSi FC-MD, used together with type B bracket
Type B	Closing bracket for the one end of the FSi FC-MD, used together with type A bracket
Type C	Fixing bracket for one or the first collar of FSi FC-MD
Type D	Fixing bracket for the second collar on top of the first collar of FSi FC-MD

- FSi FC-MD collar and brackets consumption table – perpendicular pipes or bundles* made of plastic aluminum compound pipes

Pipe outer diameter (mm)	Number of collars	Number of “C” brackets	Number of “D” brackets
40 – 50	1	2	-
64 – 110	1	3	-
125	1	4	-
> 125 – 200	2	2 (first collar)	4 (second collar)

** max. bundle diameter, 110 mm, plastic aluminum compound pipes made by Henco, type Standard.*

The number of brackets may be increased.

- FSi FC-MD collar and brackets consumption table – pipes with couplings (4.2.16, 4.2.17, 4.2.18)

Pipe outer diameter (mm)	Number of collars	Number of “C” brackets	Number of “D” brackets
40 – 50	1	3	-
64 – 110	1	4	-
125	1	5	-

The number of brackets may be increased.

- FSi FC-MD collar and brackets consumption table – pipes in corners of walls/columns (4.2.40, 4.2.41, 4.2.42)

Pipe outer diameter (mm)	Number of layers	Number of “C” brackets	Number of “D” brackets
40	2	1 (first collar)	2 (second collar)
> 40 – 110	2	2 (first collar)	3 (second collar)

For corner application, no Type “A” and Type “B” bracket may be used. 2 layers of FSi FC-MD shall be used at any time. The number of brackets may be increased.

4. Limitations

This classification report does not represent type approval or certification of the product.

5. Signatories

Report prepared by:



Chris Johnson
Senior Staff Engineer
Built Environment

Reviewed/Approved by:



David Yates
Staff Engineer
Built Environment

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

5.1. Amendments

See table for details of amendments to original Classification report template:

Version	Date	Changes	Creator / Approver
1.0	2025-12-17	Initial issue	C. Johnson / D. Yates

END OF REPORT