

DECLARATION OF PERFORMANCE

No: DoP 2/2024

1. Unique identification code of product-type:

INTU FR COLLAR L SLIM

2. Intended uses:

The intended use of INTU FR COLLAR L SLIM is to reinstate the fire resistance performance of flexible wall, rigid wall and rigid floor constructions, where they are penetrated by pipes, cables, conduits and bundles

3. Manufacturer:

**INTUSEAL Sp. z o.o.
ul. Kineskopowa 1, 05-500 Piaseczno**

4. Authorized representative:

Not applicable

5. System or systems of Assessment and Verification of Constancy of Performance (AVCP):

System 1

6a. Harmonised standard:

Not applicable

Notified body or bodies:

Not applicable

6b. European Assessment Document:

EAD 350454-00-1104

European Technical Assessment:

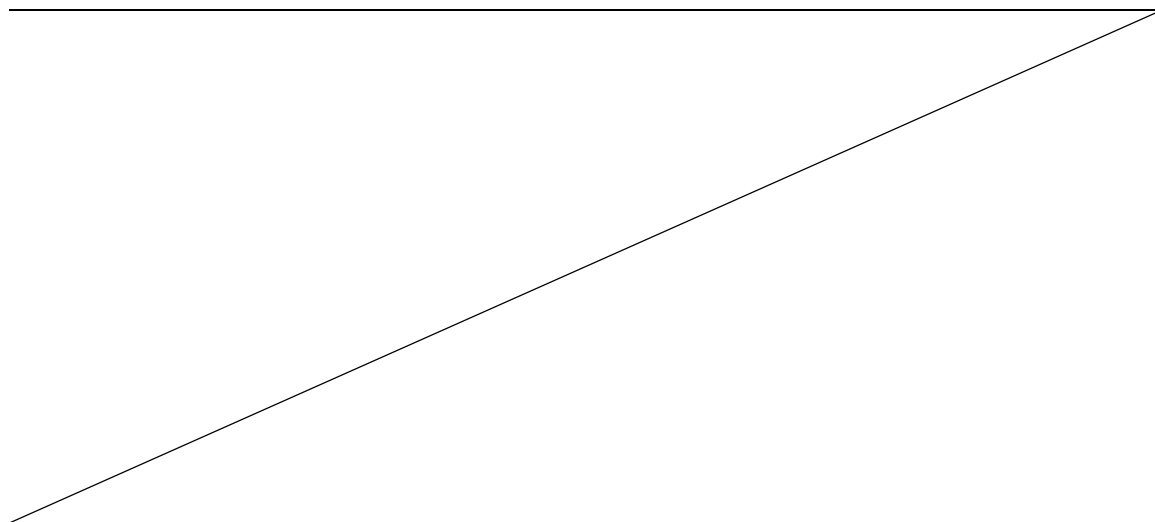
ETA-24/0497 of 26/08/2024

Technical Assessment Body:

ITB, ul. Filtrowa 1, 00-611 Warszawa

Notified body or bodies:

No. 1488



7. Declared performance:

Basic requirements	Performance characteristics
BWR 2 Safety in case to fire	
Reaction to fire	Class E
Resistance to fire	Tables B1. ÷ B33.

Table B1. Resistance to fire classification of plastic pipes without insulation penetration seals in flexible or rigid wall thickness of: $t \geq 100$ mm, made with use of double-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
COOL-FIT 2.0 ¹⁾	D = 75 / 125	6,8 / 3,8 ²⁾	50	4 x 30,0 x 14,0	EI 120-U/C EI 120-C/C
	D = 90 / 140	8,2 / 4,0 ²⁾	50	4 x 30,0 x 14,0	
Geberit Silent dB20	D ≤ 56	3,2	-	2 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	56 < D ≤ 63	3,2	-	2 x 30,0 x 4,0	
	63 < D ≤ 75	3,6	-	2 x 30,0 x 4,0	
	75 < D ≤ 90	4,6	-	2 x 30,0 x 8,0	
	90 < D ≤ 110	6,0	-	2 x 30,0 x 10,0	
	110 < D ≤ 135	6,5	-	4 x 30,0 x 14,0	
	135 < D ≤ 160	7,0	-	4 x 30,0 x 18,0	
Magnaplast Ultra dB	D ≤ 50	2,0	-	2 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	50 < D ≤ 75	2,3	-	2 x 30,0 x 4,0	
	75 < D ≤ 110	3,4	-	2 x 30,0 x 10,0	EI 90 / E 120-U/C
PE-HD / PE / PE-X / ABS / SAN + PVC	D ≤ 32	2,0 – 2,3	-	2 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
		2,4 – 4,6	-	2 x 30,0 x 4,0	EI 120-U/U
		4,7 – 6,8	-	2 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	32 < D ≤ 50	2,4 – 4,6	-	2 x 30,0 x 4,0	EI 120-U/U
		4,7 – 6,8	-	2 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	50 < D ≤ 63	2,7	-	2 x 30,0 x 4,0	
		2,8 – 4,5	-	2 x 30,0 x 4,0	
		-	-	2 x 30,0 x 6,0	EI 60-U/U
	63 < D ≤ 75	4,6 – 6,8	-	2 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
		3,0 – 3,1	-	2 x 30,0 x 4,0	
		3,2 – 4,4	-	2 x 30,0 x 4,0	EI 60-U/U
		-	-	2 x 30,0 x 8,0	
	75 < D ≤ 90	4,5 – 6,8	-	2 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
		3,5	-	2 x 30,0 x 8,0	EI 120-U/C EI 120-C/C
		3,6 – 4,3	-	2 x 30,0 x 8,0	
		-	-	2 x 30,0 x 8,0	EI 60-U/U
		4,4 – 8,2	-	2 x 30,0 x 8,0	EI 120-U/C EI 120-C/C
	90 < D ≤ 110	4,2	-	2 x 30,0 x 10,0	
		-	-	2 x 30,0 x 10,0	EI 60-U/U
		4,3 – 10,0	-	2 x 30,0 x 10,0	EI 120-U/C EI 120-C/C
	110 < D ≤ 125	4,4 – 9,9	-	4 x 30,0 x 14,0	
	125 < D ≤ 160	4,9 – 9,5	-	4 x 30,0 x 18,0	
	160 < D ≤ 180	8,4 – 10,7	-	4 x 30,0 x 20,0	EI 90-U/C EI 90-C/C
	180 < D ≤ 200	11,9	-	4 x 30,0 x 20,0	

Table B2. Resistance to fire classification of MLC pipes without insulation penetration seals in flexible or rigid wall thickness of: $t \geq 100$ mm, made with use of double-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PE-RT/AL/PE-RT	$D \leq 20$	2,0	-	$2 \times 30,0 \times 4,0$	EI 120-U/C EI 120-C/C
	$20 < D \leq 25$	2,5	-	$2 \times 30,0 \times 4,0$	EI 45 / E 120-U/C EI 45 / E 120-C/C
	$25 < D \leq 32$	3,0	-	$2 \times 30,0 \times 4,0$	
	$32 < D \leq 40$	4,0	-	$2 \times 30,0 \times 4,0$	
	$40 < D \leq 50$	4,8	-	$2 \times 30,0 \times 4,0$	
	$50 < D \leq 63$	6,0	-	$2 \times 30,0 \times 4,0$	
	$63 < D \leq 75$	7,5	-	$2 \times 30,0 \times 4,0$	
PE-X/AL/PE-X	$D \leq 20$	2,0	-	$2 \times 30,0 \times 4,0$	EI 120-U/C EI 120-C/C
	$20 < D \leq 25$	2,5	-	$2 \times 30,0 \times 4,0$	EI 45 / E 120-U/C EI 45 / E 120-C/C
	$25 < D \leq 32$	3,0	-	$2 \times 30,0 \times 4,0$	
	$32 < D \leq 40$	4,0	-	$2 \times 30,0 \times 4,0$	
	$40 < D \leq 50$	4,8	-	$2 \times 30,0 \times 4,0$	
	$50 < D \leq 63$	6,0	-	$2 \times 30,0 \times 4,0$	
PE-Xb/AL/PE-Xb	$D \leq 20$	2,0	-	$2 \times 30,0 \times 4,0$	EI 90 / E 120-U/C
	$20 < D \leq 26$	3,0	-	$2 \times 30,0 \times 4,0$	EI 90 / E 120-C/C
PP-R/AL/PP-R	$D \leq 20$	$\geq 2,8$	-	$2 \times 30,0 \times 4,0$	EI 120-U/C EI 120-C/C
	$20 < D \leq 25$	$\geq 3,3$	-	$2 \times 30,0 \times 4,0$	
	$25 < D \leq 32$	4,0 – 12,5	-	$2 \times 30,0 \times 4,0$	
	$32 < D \leq 40$	4,8 – 12,5	-	$2 \times 30,0 \times 4,0$	
	$40 < D \leq 50$	5,9 – 12,5	-	$2 \times 30,0 \times 4,0$	
	$50 < D \leq 63$	7,2 – 12,5	-	$2 \times 30,0 \times 4,0$	
	$63 < D \leq 75$	8,4 – 12,5	-	$2 \times 30,0 \times 4,0$	
	$75 < D \leq 90$	10,1 – 15,0	-	$2 \times 30,0 \times 8,0$	
	$90 < D \leq 110$	12,3 – 18,3	-	$2 \times 30,0 \times 10,0$	

Table B3. Resistance to fire classification of MLC pipes without insulation penetration seals in rigid wall thickness of: $t \geq 150$ mm, made with use of double-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
Geberit Mepla	$D \leq 20$	2,5	-	$2 \times 30,0 \times 4,0$	EI 120-U/C EI 120-C/C
	$20 < D \leq 25$	3,0	-	$2 \times 30,0 \times 4,0$	
	$25 < D \leq 32$	3,0	-	$2 \times 30,0 \times 4,0$	
	$32 < D \leq 40$	3,5	-	$2 \times 30,0 \times 4,0$	EI 90 / E 120-U/C EI 90 / E 120-C/C
	$40 < D \leq 50$	4,5	-	$2 \times 30,0 \times 4,0$	EI 45 / E 120-U/C EI 45 / E 120-C/C
	$50 < D \leq 63$	4,5	-	$2 \times 30,0 \times 4,0$	

Table B4. Resistance to fire classification of plastic pipes without insulation at 45° angle penetration seals in rigid wall thickness of: $t \geq 100$ mm, made with use of double-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PE-HD / PE / PE-X / ABS / SAN + PVC	$D \leq 110$	4,2	-	2 x 30,0 x 10,0	EI 60-U/C EI 60-C/C
PP	$D \leq 110$	2,7	-	2 x 30,0 x 10,0	EI 45 / E 60-U/C EI 45 / E 60-C/C
PVC-U / PVC-C	$D \leq 110$	3,2	-	2 x 30,0 x 10,0	EI 120-U/C EI 120-C/C

Table B5. Resistance to fire classification of plastic pipes without insulation penetration seals in flexible or rigid wall thickness of: $t \geq 100$ mm, made with use of double-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PE-Xa	$D \leq 20$	2,0	-	2 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$20 < D \leq 25$	2,3	-	2 x 30,0 x 4,0	
	$25 < D \leq 32$	3,0	-	2 x 30,0 x 4,0	
	$32 < D \leq 40$	3,7	-	2 x 30,0 x 4,0	
	$40 < D \leq 50$	4,6	-	2 x 30,0 x 4,0	
	$50 < D \leq 63$	5,8	-	2 x 30,0 x 4,0	
PP	$D \leq 32$	1,8 – 8,3	-	2 x 30,0 x 4,0	EI 120-U/U
		8,4 – 12,5	-	2 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$32 < D \leq 50$	1,8 – 8,3	-	2 x 30,0 x 4,0	EI 120-U/U
		8,4 – 12,5	-	2 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$50 < D \leq 63$	1,9	-	2 x 30,0 x 4,0	
		2,0 – 7,1	-	2 x 30,0 x 4,0	EI 120-U/U
			-	2 x 30,0 x 6,0	EI 120-U/U
		7,2 – 7,3	-	2 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
			-	2 x 30,0 x 6,0	EI 60-U/U
		7,4 – 12,5	-	2 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$63 < D \leq 75$	1,9 – 2,1	-	2 x 30,0 x 4,0	
		2,2 – 6,0	-	2 x 30,0 x 4,0	EI 120-U/U
			-	2 x 30,0 x 8,0	EI 120-U/C EI 120-C/C
		6,1 – 6,4	-	2 x 30,0 x 4,0	EI 60-U/U
		6,5 – 12,5	-	2 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$75 < D \leq 90$	2,2 – 2,3	-	2 x 30,0 x 8,0	EI 120-U/C EI 120-C/C
		2,4 – 4,6	-	2 x 30,0 x 8,0	EI 120-U/U
			-	2 x 30,0 x 8,0	EI 60-U/U
		4,7 – 5,3	-	2 x 30,0 x 8,0	EI 120-U/C EI 120-C/C
		5,4 – 15,0	-	2 x 30,0 x 8,0	
	$90 < D \leq 110$	2,7	-	2 x 30,0 x 10,0	EI 120-U/U
		2,8 – 3,8	-	2 x 30,0 x 10,0	EI 60-U/U
			-	2 x 30,0 x 10,0	EI 120-U/C EI 120-C/C
		3,9 – 18,3	-	2 x 30,0 x 10,0	
	$110 < D \leq 125$	3,1 – 17,2	-	4 x 30,0 x 14,0	EI 60-U/C EI 60-C/C
	$125 < D \leq 160$	4,0 – 14,6	-	4 x 30,0 x 18,0	
	$160 < D \leq 180$	5,9 – 11,2	-	4 x 30,0 x 20,0	
	$180 < D \leq 200$	7,7	-	4 x 30,0 x 20,0	

Table B5, cont. Resistance to fire classification of plastic pipes without insulation penetration seals in flexible or rigid wall thickness of: $t \geq 100$ mm, made with use of double-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PP-HT	$D \leq 50$	1,8	-	$2 \times 30,0 \times 4,0$	EI 120-U/C EI 120-C/C
	$50 < D \leq 75$	1,9	-	$2 \times 30,0 \times 4,0$	
	$75 < D \leq 90$	2,2	-	$2 \times 30,0 \times 8,0$	
	$90 < D \leq 110$	2,7	-	$2 \times 30,0 \times 10,0$	
	$110 < D \leq 125$	3,1	-	$4 \times 30,0 \times 14,0$	EI 60-U/C EI 60-C/C
	$125 < D \leq 160$	3,9	-	$4 \times 30,0 \times 18,0$	
PP-R	$D \leq 20$	$\geq 2,3$	-	$2 \times 30,0 \times 4,0$	EI 120-U/C EI 120-C/C
	$20 < D \leq 25$	$\geq 2,5$	-	$2 \times 30,0 \times 4,0$	
	$25 < D \leq 32$	3,3 – 12,5	-	$2 \times 30,0 \times 4,0$	
	$32 < D \leq 40$	3,9 – 12,5	-	$2 \times 30,0 \times 4,0$	
	$40 < D \leq 50$	4,8 – 12,5	-	$2 \times 30,0 \times 4,0$	
	$50 < D \leq 63$	5,8 – 12,5	-	$2 \times 30,0 \times 4,0$	
	$63 < D \leq 75$	6,8 – 12,5	-	$2 \times 30,0 \times 4,0$	
	$75 < D \leq 90$	8,2 – 15,0	-	$2 \times 30,0 \times 8,0$	
PVC-U / PVC-C	$D \leq 32$	1,2 – 5,6	-	$2 \times 30,0 \times 4,0$	EI 120-U/U
	$32 < D \leq 50$	1,2 – 5,6	-	$2 \times 30,0 \times 4,0$	EI 120-U/C EI 120-C/C
	$50 < D \leq 63$	1,4	-	$2 \times 30,0 \times 6,0$	EI 30-U/U
			-	$2 \times 30,0 \times 6,0$	EI 120-U/C EI 120-C/C
		1,5 – 2,6	-	$2 \times 30,0 \times 4,0$	EI 30-U/U
			-	$2 \times 30,0 \times 6,0$	EI 120-U/C EI 120-C/C
		2,7 – 5,6	-	$2 \times 30,0 \times 4,0$	EI 60-U/U
			-	$2 \times 30,0 \times 6,0$	EI 120-U/C EI 120-C/C
		5,7 – 6,1	-	$2 \times 30,0 \times 6,0$	EI 60-U/U
			-	$2 \times 30,0 \times 6,0$	EI 120-U/C EI 120-C/C
	$63 < D \leq 75$	1,5 – 1,7	-	$2 \times 30,0 \times 8,0$	EI 30-U/U
		1,8 – 4,0	-	$2 \times 30,0 \times 4,0$	EI 120-U/C EI 120-C/C
			-	$2 \times 30,0 \times 8,0$	EI 30-U/U
		4,1 – 5,6	-	$2 \times 30,0 \times 4,0$	EI 120-U/C EI 120-C/C
			-	$2 \times 30,0 \times 8,0$	EI 60-U/U
		5,7 – 6,6	-	$2 \times 30,0 \times 8,0$	EI 60-U/U
PVC-U / PVC-C	$75 < D \leq 90$	1,7 – 5,7	-	$2 \times 30,0 \times 8,0$	EI 30-U/U
			-	$2 \times 30,0 \times 8,0$	EI 120-U/C EI 120-C/C
		5,8 – 7,3	-	$2 \times 30,0 \times 8,0$	EI 60-U/U
			-	$2 \times 30,0 \times 8,0$	EI 120-U/C EI 120-C/C
	$90 < D \leq 110$	2,0 – 8,0	-	$2 \times 30,0 \times 10,0$	EI 30-U/U
			-	$2 \times 30,0 \times 10,0$	EI 120-U/C EI 120-C/C
		8,1	-	$2 \times 30,0 \times 10,0$	EI 60-U/U
			-	$2 \times 30,0 \times 10,0$	EI 60-U/U
	$110 < D \leq 125$	2,4 – 8,5	-	$4 \times 30,0 \times 14,0$	EI 120-U/C EI 120-C/C
	$125 < D \leq 160$	3,2 – 9,5	-	$4 \times 30,0 \times 18,0$	
	$160 < D \leq 180$	4,4 – 5,4	-	$4 \times 30,0 \times 22,0$	EI 60-U/C EI 60-C/C
		5,5 – 8,6	-	$4 \times 30,0 \times 20,0$	EI 120-U/C EI 120-C/C
		8,7 – 9,3	-	$4 \times 30,0 \times 22,0$	EI 60-U/C EI 60-C/C
		5,6 – 7,6	-	$4 \times 30,0 \times 24,0$	
	$180 < D \leq 200$	7,7	-	$4 \times 30,0 \times 20,0$	EI 120-U/C EI 120-C/C
		7,8 – 9,1	-	$4 \times 30,0 \times 24,0$	EI 60-U/C EI 60-C/C
	$200 < D \leq 250$	8,6	-	$4 \times 30,0 \times 30,0$	
Wavin SiTech+	$D \leq 50$	1,8	-	$2 \times 30,0 \times 4,0$	EI 120-U/C EI 120-C/C
	$50 < D \leq 75$	2,6	-	$2 \times 30,0 \times 4,0$	
	$75 < D \leq 90$	3,1	-	$2 \times 30,0 \times 8,0$	
	$90 < D \leq 110$	3,4	-	$2 \times 30,0 \times 10,0$	
	$110 < D \leq 125$	3,9	-	$4 \times 30,0 \times 14,0$	
	$125 < D \leq 160$	4,9	-	$4 \times 30,0 \times 18,0$	

Table B6. Resistance to fire classification of plastic pipes without insulation at 45° angle penetration seals in flexible or rigid wall thickness of: $t \geq 100$ mm, made with use of double-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PP	$D \leq 110$	2,7	-	2 x 30,0 x 10,0	EI 45-U/C EI 45-C/C

Table B7. Resistance to fire classification of plastic pipes without insulation at 87,5° pipe elbow penetration seals in flexible or rigid wall thickness of: $t \geq 100$ mm, made with use of double-sided INTU FR COLLAR L SLIM (U-shaped on elbow side):

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PP	$D \leq 110$	2,7	-	2 x 30,0 x 10,0	EI 90-U/C EI 90-C/C
PVC-U / PVC-C	$D \leq 110$	3,2	-	2 x 30,0 x 10,0	EI 120-U/C EI 120-C/C

Table B8. Resistance to fire classification of composite pipes without insulation penetration seals in flexible or rigid wall thickness of: $t \geq 100$ mm, made with use of double-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PP-R/PP-R-GF/PP-R	$D \leq 20$	$\geq 2,8$	-	2 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$20 < D \leq 25$	$\geq 3,5$	-	2 x 30,0 x 4,0	
	$25 < D \leq 32$	4,4 – 12,5	-	2 x 30,0 x 4,0	
	$32 < D \leq 40$	5,5 – 12,5	-	2 x 30,0 x 4,0	
	$40 < D \leq 50$	6,9 – 12,5	-	2 x 30,0 x 4,0	
	$50 < D \leq 63$	8,7 – 12,5	-	2 x 30,0 x 4,0	
	$63 < D \leq 75$	10,3 – 12,5	-	2 x 30,0 x 4,0	
	$75 < D \leq 90$	11,2 – 12,3	-	2 x 30,0 x 8,0	EI 90 / E 120-U/C
		12,4 – 15,0	-	2 x 30,0 x 8,0	EI 90 / E 120-C/C
	$90 < D \leq 110$	12,3 – 15,0	-	2 x 30,0 x 10,0	EI 120-U/C EI 120-C/C
		15,1 – 18,3	-	2 x 30,0 x 10,0	EI 90 / E 120-C/C
					EI 120-U/C EI 120-C/C

Table B9. Resistance to fire classification of penetration seals in flexible or rigid wall thickness of: $t \geq 100$ mm, of following mixed bundle consisting of pipes without insulation:

- PVC-U (plastic), diameter of: $D \leq 50$ mm and pipe wall thickness of: $t = 1,5$ mm,
- PP-R (plastic), diameter of: $D \leq 50$ mm and pipe wall thickness of: $t = 8,3$ mm,
- PP-R/PP-R-GF/PP-R (composite), diameter of: $D \leq 50$ mm and pipe wall thickness of: $t = 6,9$ mm,

made with use of double-sided INTU FR COLLAR L SLIM (2 x 30,0 x 10,0 mm – number of collars x intumescent material length x thickness)

Fire resistance class:: EI 120-U/C EI 120-C/C

Table B10. Resistance to fire classification of metal pipes with flexible elastomeric foam (FEF) continuous insulation (case CS) penetration seals in flexible or rigid wall thickness of: $t \geq 100$ mm, made with use of double-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
copper	$D \leq 12,7$	$\geq 0,8$	9	2 x 30,0 x 4,0	EI 60 / E 120-C/U
	$12,7 < D \leq 22,23$	$\geq 1,0$	9	2 x 30,0 x 4,0	EI 60 / E 120-C/C
steel	$D \leq 18,0$	$\geq 1,2$	9	2 x 30,0 x 4,0	EI 120-C/U EI 120-C/C
			10 – 25	2 x 30,0 x 6,0	
	$18,0 < D \leq 28,0$	1,2 – 1,4	9	2 x 30,0 x 4,0	EI 45 / E 120-C/U
					EI 45 / E 120-C/C
		1,5 – 1,9	9	2 x 30,0 x 4,0	EI 120-C/U EI 120-C/C
			10 – 32	2 x 30,0 x 6,0	
		$\geq 2,0$	9	2 x 30,0 x 4,0	
			10 – 32	2 x 30,0 x 6,0	
			33 – 50	2 x 30,0 x 8,0	EI 90 / E 120-C/U
					EI 90 / E 120-C/C
	$28,0 < D \leq 42,4$	1,2 – 1,4	9	2 x 30,0 x 4,0	EI 45 / E 120-C/U
					EI 45 / E 120-C/C
		1,5 – 1,9	9	2 x 30,0 x 4,0	EI 90 / E 120-C/U
			10 – 31	2 x 30,0 x 6,0	EI 90 / E 120-C/C
		$\geq 2,0$	32	2 x 30,0 x 6,0	EI 120-C/U EI 120-C/C
			9	2 x 30,0 x 4,0	EI 90 / E 120-C/U
			10 – 31	2 x 30,0 x 6,0	EI 90 / E 120-C/C
			32	2 x 30,0 x 6,0	EI 120-C/U EI 120-C/C
	$42,4 < D \leq 66,7$	1,2 – 1,4	9	2 x 30,0 x 4,0	EI 45 / E 120-C/U
					EI 45 / E 120-C/C
		1,5 – 1,9	9	2 x 30,0 x 4,0	EI 90 / E 120-C/U
			10 – 31	2 x 30,0 x 6,0	EI 90 / E 120-C/C
		$\geq 2,0$	32	2 x 30,0 x 6,0	EI 120-C/U EI 120-C/C
			9	2 x 30,0 x 4,0	EI 90 / E 120-C/U
			10 – 31	2 x 30,0 x 6,0	EI 90 / E 120-C/C
			32	2 x 30,0 x 6,0	EI 120-C/U EI 120-C/C
			33 – 50	2 x 30,0 x 8,0	EI 90 / E 120-C/U
	$66,7 < D \leq 108,0$	$\geq 2,0$	32	2 x 30,0 x 6,0	
			33 – 50	2 x 30,0 x 8,0	
	$108,0 < D \leq 114,3$	$\geq 3,6$	32	2 x 30,0 x 6,0	EI 90 / E 120-C/C
			33 – 50	2 x 30,0 x 8,0	
	$114,3 < D \leq 168,3$	$\geq 4,0$	32	2 x 30,0 x 6,0	EI 60 / E 120-C/U
					EI 60 / E 120-C/C
			33 – 49	2 x 30,0 x 8,0	EI 60 / E 90-C/U
					EI 60 / E 90-C/C
			50	2 x 30,0 x 8,0	EI 90-C/U EI 90-C/C

Table B11. Resistance to fire classification of mixed bundle of single copper pipe (C/U end configuration) with flexible elastomeric foam (FEF) continuous insulation (case CS), with additional single cable 4 x 1,5 mm² and single PVC-U pipe (U/C end configuration) diameter of: $D \leq 25$ mm and pipe wall thickness of: 1,5 mm penetration seal in flexible or rigid wall thickness of: $t \geq 100$ mm, made with use of double-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
single copper pipe	$D \leq 12,7$	$\geq 0,8$	9	2 x 30,0 x 4,0	EI 60 / E 120
	$12,7 < D \leq 22,23$	$\geq 1,0$	9	2 x 30,0 x 4,0	

Table B12. Resistance to fire classification of mixed bundle of double copper pipe (C/U end configuration) with flexible elastomeric foam (FEF) continuous insulation (case CS), with additional single cable 4 x 1,5 mm² and single PVC-U pipe (U/C end configuration) diameter of: $D \leq 25$ mm and pipe wall thickness of: 1,5 mm penetration seal in flexible or rigid wall thickness of: $t \geq 100$ mm, made with use of double-sided INTU FR COLLAR L SLIM:

Pipe material	Copper pipe No. 1 max. diameter x min. wall thickness [mm]	Copper pipe No. 2 max. diameter x min. wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
double copper pipe	12,7 x 0,8	12,7 x 0,8	9	2 x 30,0 x 4,0	EI 60 / E 120
	12,7 x 0,8	22,23 x 1,0	9	2 x 30,0 x 4,0	

Table B13. Resistance to fire classification of mixed bundle of single copper pipe (C/U end configuration) with polyethylene foam (PE) (with reaction to fire class BL-s1, d0 according to EN 13501-1) continuous insulation (case CS), with additional single cable 4 x 1,5 mm² and single PVC-U pipe (U/C end configuration) diameter of: $D \leq 25$ mm and pipe wall thickness of: 1,5 mm penetration seal in flexible or rigid wall thickness of: $t \geq 100$ mm, made with use of double-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
single copper pipe	$D \leq 12,7$	$\geq 0,8$	9	2 x 30,0 x 4,0	EI 60 / E 120
	$12,7 < D \leq 22,23$	$\geq 1,0$	9	2 x 30,0 x 4,0	

Table B14. Resistance to fire classification of mixed bundle of double copper pipe (C/U end configuration) with polyethylene foam (PE) (reaction to fire class BL-s1, d0 according to EN 13501-1) continuous insulation (case CS), with additional single cable 4 x 1,5 mm² and single PVC-U pipe (U/C end configuration) diameter of: $D \leq 25$ mm and pipe wall thickness of: 1,5 mm penetration seal in flexible or rigid wall thickness of: $t \geq 100$ mm, made with use of double-sided INTU FR COLLAR L SLIM:

Pipe material	Copper pipe No. 1 max. diameter x min. wall thickness [mm]	Copper pipe No. 2 max. diameter x min. wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
double copper pipe	12,7 x 0,8	12,7 x 0,8	9	2 x 30,0 x 4,0	EI 60 / E 120
	12,7 x 0,8	22,23 x 1,0	9	2 x 30,0 x 4,0	

Table B15. Resistance to fire classification of AROT DVK conduits bundle with or without small cables ($\phi_{\text{cable}} \leq 21$ mm) or cable bundle ($\phi_{\text{bundle}} \leq$ conduit inner diameter, $\phi_{\text{cable}} \leq 21$ mm) penetration seals in flexible or rigid wall thickness of: $t \geq 100$ mm, made with use of double-sided INTU FR COLLAR L SLIM:

Diameter of single conduit in bundle [mm]	Conduit wave height [mm]	Service inside	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
$D \leq 50$	3,0	empty	2 x 30,0 x 10,0	EI 120-U/U
		small cable: $\phi_{\text{cable}} \leq 21$ mm	2 x 30,0 x 10,0	EI 120-U/U
		cable bundle: $\phi_{\text{bundle}} \leq D_{\text{in}}^{1)}$ $\phi_{\text{cable}} \leq 21$ mm	2 x 30,0 x 10,0	EI 120-U/U

¹⁾ D_{in} – conduit inner diameter

Table B16. Resistance to fire classification of PP pipes without insulation penetration seals in rigid wall thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x Intumescent material width x thickness [mm]	Fire resistance class
$D \leq 32$	1,8	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
$32 < D \leq 50$	1,8	-	1 x 30,0 x 4,0	
$50 < D \leq 63$	2,0	-	1 x 30,0 x 6,0	EI 60-U/C EI 60-C/C
$63 < D \leq 75$	2,2	-	1 x 30,0 x 8,0	
$75 < D \leq 90$	2,4	-	1 x 30,0 x 8,0	
$90 < D \leq 110$	2,7	-	1 x 30,0 x 10,0	
$D \leq 32$	1,8	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
$32 < D \leq 50$	1,8	-	1 x 30,0 x 4,0	
$50 < D \leq 63$	2,0	-	1 x 30,0 x 6,0	EI 90-U/C EI 90-C/C
$63 < D \leq 75$	2,2	-	1 x 30,0 x 8,0	
$75 < D \leq 90$	2,4	-	1 x 30,0 x 8,0	
$90 < D \leq 110$	2,7	-	1 x 30,0 x 10,0	
$D \leq 32$	1,8	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
$32 < D \leq 50$	1,8	-	1 x 30,0 x 4,0	
$50 < D \leq 63$	2,0	-	1 x 30,0 x 6,0	EI 60-U/C EI 60-C/C
$63 < D \leq 75$	2,2	-	1 x 30,0 x 8,0	
$75 < D \leq 90$	2,4	-	1 x 30,0 x 8,0	
$90 < D \leq 110$	2,7	-	1 x 30,0 x 10,0	

Table B17. Resistance to fire classification of plastic pipes without insulation penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
COOL-FIT 2.0 ¹⁾	$D = 90/140$	8,2 / 4,0 ²⁾	50	2 x 30,0 x 14,0	EI 120-U/C EI 120-C/C
Geberit Silent dB20	$D \leq 160$	7,0	-	1 x 30,0 x 18,0	EI 60-U/C EI 60-C/C
Geberit Silent PP	$D \leq 50$	1,8	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$50 < D \leq 75$	2,6	-	1 x 30,0 x 4,0	
	$75 < D \leq 90$	3,1	-	1 x 30,0 x 8,0	
	$90 < D \leq 110$	3,6	-	1 x 30,0 x 10,0	
	$110 < D \leq 125$	4,2	-	2 x 30,0 x 14,0	
	$125 < D \leq 160$	4,5	-	2 x 30,0 x 18,0	
Magnaplast Ultra dB	$D \leq 50$	2,0	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$50 < D \leq 75$	2,3	-	1 x 30,0 x 4,0	
	$75 < D \leq 110$	3,4	-	1 x 30,0 x 10,0	
	$110 < D \leq 125$	3,9	-	1 x 30,0 x 18,0	EI 30-U/C EI 30-C/C
			-	2 x 30,0 x 18,0	EI 120-U/C EI 120-C/C
	$125 < D \leq 160$	4,9	-	1 x 30,0 x 18,0	EI 30-U/C EI 30-C/C
			-	2 x 30,0 x 18,0	EI 120-U/C EI 120-C/C

Table B17, cont. Resistance to fire classification of plastic pipes without insulation penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PE-HD / PE / PE-X / ABS / SAN + PVC	$D \leq 32$	1,9	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
		2,0 – 4,6	-	1 x 30,0 x 4,0	EI 120-U/U
		4,7 – 6,8	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$32 < D \leq 50$	2,4 – 4,6	-	1 x 30,0 x 4,0	EI 120-U/U
		4,7 – 6,8	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$50 < D \leq 63$	2,7	-	1 x 30,0 x 4,0	
		2,8 – 3,9	-	1 x 30,0 x 4,0	
			-	1 x 30,0 x 6,0	EI 45 / E 120-U/U
	$50 < D \leq 63$	4,0 – 4,5	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
			-	1 x 30,0 x 6,0	EI 45 / E 120-U/U
			-	1 x 30,0 x 6,0	EI 60-U/U
		4,6 – 5,8	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
			-	1 x 30,0 x 6,0	EI 60-U/U
			-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$63 < D \leq 75$	3,0 – 3,1	-	1 x 30,0 x 4,0	
		3,2 – 4,4	-	1 x 30,0 x 4,0	
			-	1 x 30,0 x 8,0	EI 45 / E 120-U/U
		4,5 – 5,5	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
			-	1 x 30,0 x 8,0	EI 60-U/U
	$75 < D \leq 90$	3,5	-	1 x 30,0 x 8,0	EI 120-U/C EI 120-C/C
		3,6 – 4,3	-	1 x 30,0 x 8,0	
			-	1 x 30,0 x 8,0	EI 45 / E 120-U/U
		4,4 – 7,4	-	1 x 30,0 x 8,0	EI 120-U/C EI 120-C/C
		7,5 – 8,2	-	1 x 30,0 x 8,0	
	$90 < D \leq 110$	4,2 – 10,0	-	1 x 30,0 x 10,0	EI 120-U/C EI 120-C/C
		4,2	-	1 x 30,0 x 10,0	EI 45 / E 120-U/U
			-	1 x 30,0 x 10,0	EI 120-U/C EI 120-C/C
		4,3 – 9,9	-	1 x 30,0 x 10,0	EI 45 / E 60-U/U
			-	1 x 30,0 x 10,0	EI 120-U/C EI 120-C/C
		10,0	-	1 x 30,0 x 10,0	EI 60-U/U
	$110 < D \leq 125$	4,4 – 9,9	-	2 x 30,0 x 14,0	EI 120-U/C EI 120-C/C
	$125 < D \leq 160$	4,9 – 9,5	-	2 x 30,0 x 18,0	
	$160 < D \leq 180$	8,1 – 10,4	-	2 x 30,0 x 20,0	
	$180 < D \leq 200$	11,3	-	2 x 30,0 x 20,0	
PE-Xa	$D \leq 20$	2,0	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$20 < D \leq 25$	2,3	-	1 x 30,0 x 4,0	
	$25 < D \leq 32$	3,0	-	1 x 30,0 x 4,0	
	$32 < D \leq 40$	3,7	-	1 x 30,0 x 4,0	
	$40 < D \leq 50$	4,6	-	1 x 30,0 x 4,0	
	$50 < D \leq 63$	5,8	-	1 x 30,0 x 4,0	

Table B17, cont. Resistance to fire classification of plastic pipes without insulation penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PP	$D \leq 32$	1,8 – 8,3	-	1 x 30,0 x 4,0	EI 120-U/U
		8,4 – 12,5	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$32 < D \leq 50$	1,8 – 8,3	-	1 x 30,0 x 4,0	EI 120-U/U
		8,4 – 12,5	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$50 < D \leq 63$	1,9 – 2,1	-	1 x 30,0 x 4,0	
		2,2 – 7,3	-	1 x 30,0 x 4,0	EI 120-U/U
			-	1 x 30,0 x 6,0	EI 120-U/C EI 120-C/C
	$63 < D \leq 75$	1,9 – 2,5	-	1 x 30,0 x 4,0	
		2,6 – 6,4	-	1 x 30,0 x 4,0	EI 120-U/U
			-	1 x 30,0 x 8,0	EI 120-U/C EI 120-C/C
		6,5 – 12,5	-	1 x 30,0 x 4,0	
	$75 < D \leq 90$	2,2 – 3,0	-	1 x 30,0 x 8,0	EI 120-U/U
		3,1 – 5,3	-	1 x 30,0 x 8,0	EI 120-U/C EI 120-C/C
		5,4 – 15,0	-	1 x 30,0 x 8,0	
	$90 < D \leq 110$	2,7 – 3,7	-	1 x 30,0 x 10,0	EI 120-U/U
		3,8	-	1 x 30,0 x 10,0	EI 120-U/C EI 120-C/C
		3,9 – 18,3	-	1 x 30,0 x 10,0	
	$110 < D \leq 125$	3,1 – 15,7	-	2 x 30,0 x 14,0	EI 90-U/C EI 90-C/C
	$125 < D \leq 160$	3,9 – 9,5	-	2 x 30,0 x 18,0	
	$160 < D \leq 180$	5,8 – 8,6	-	2 x 30,0 x 20,0	EI 90-U/C EI 90-C/C
	$180 < D \leq 200$	7,7	-	2 x 30,0 x 20,0	
PP-HT	$D \leq 50$	1,8	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$50 < D \leq 75$	1,9	-	1 x 30,0 x 4,0	
	$75 < D \leq 90$	2,2	-	1 x 30,0 x 8,0	
	$90 < D \leq 110$	2,7	-	1 x 30,0 x 10,0	
PP-MF SILERE	$D \leq 58$	4,0	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$58 < D \leq 78$	4,5	-	1 x 30,0 x 8,0	
	$78 < D \leq 90$	4,9	-	1 x 30,0 x 8,0	
	$90 < D \leq 110$	5,4	-	1 x 30,0 x 10,0	
	$110 < D \leq 135$	5,6	-	2 x 30,0 x 14,0	
PP-ML TRIPLUS	$D \leq 50$	1,8	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$50 < D \leq 75$	2,6	-	1 x 30,0 x 4,0	
	$75 < D \leq 90$	3,1	-	1 x 30,0 x 8,0	
	$90 < D \leq 110$	3,4	-	1 x 30,0 x 10,0	
	$110 < D \leq 125$	3,9	-	2 x 30,0 x 14,0	
	$125 < D \leq 160$	4,9	-	2 x 30,0 x 18,0	
PP-R	$D \leq 20$	$\geq 2,3$	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$20 < D \leq 25$	$\geq 2,5$	-	1 x 30,0 x 4,0	
	$25 < D \leq 32$	3,3 – 12,5	-	1 x 30,0 x 4,0	
	$32 < D \leq 40$	3,9 – 12,5	-	1 x 30,0 x 4,0	
	$40 < D \leq 50$	4,8 – 12,5	-	1 x 30,0 x 4,0	
	$50 < D \leq 63$	5,8 – 12,5	-	1 x 30,0 x 4,0	
	$63 < D \leq 75$	6,8 – 12,5	-	1 x 30,0 x 4,0	
	$75 < D \leq 90$	8,2 – 15,0	-	1 x 30,0 x 8,0	
	$90 < D \leq 110$	10,0 – 18,3	-	1 x 30,0 x 10,0	

Table B17, cont. Resistance to fire classification of plastic pipes without insulation penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PVC-U / PVC-C	$D \leq 32$	1,2 – 5,6	-	1 x 30,0 x 4,0	EI 120-U/U
	$32 < D \leq 50$	1,2 – 5,6	-	1 x 30,0 x 4,0	
	$50 < D \leq 63$	1,4	-	1 x 30,0 x 6,0	EI 30 / E 45-U/U
			-	1 x 30,0 x 6,0	EI 120-U/C EI 120-C/C
		1,5 – 4,8	-	1 x 30,0 x 4,0	
			-	1 x 30,0 x 6,0	EI 30 / E 45-U/U
			-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
			-	1 x 30,0 x 6,0	
	$63 < D \leq 75$	1,5 – 1,7	-	1 x 30,0 x 8,0	EI 30 / E 45-U/U
			-	1 x 30,0 x 8,0	EI 120-U/C EI 120-C/C
		1,8 – 4,1	-	1 x 30,0 x 4,0	
			-	1 x 30,0 x 8,0	EI 30 / E 45-U/U
			-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
			-	1 x 30,0 x 8,0	
	$75 < D \leq 90$	1,7 – 3,2	-	1 x 30,0 x 8,0	EI 30 / E 45-U/U
			-	1 x 30,0 x 8,0	EI 120-U/C EI 120-C/C
		3,3 – 7,3	-	1 x 30,0 x 8,0	
	$90 < D \leq 110$	2,0	-	1 x 30,0 x 10,0	EI 30 / E 45-U/U
			-	1 x 30,0 x 10,0	EI 120-U/C EI 120-C/C
		2,1 – 8,1	-	1 x 30,0 x 10,0	
	$110 < D \leq 125$	2,4 – 8,5	-	2 x 30,0 x 14,0	
	$125 < D \leq 160$	3,2 – 9,5	-	2 x 30,0 x 18,0	
	$160 < D \leq 180$	3,6 – 6,7	-	2 x 30,0 x 20,0	
		6,8 – 9,3	-	2 x 30,0 x 20,0	EI 30-U/C EI 30-C/C
	$180 < D \leq 200$	3,9	-	2 x 30,0 x 20,0	EI 120-U/C EI 120-C/C
		4,0 – 9,0	-	2 x 30,0 x 22,0	EI 30-U/C EI 30-C/C
	$200 < D \leq 250$	5,8 – 8,5	-	2 x 30,0 x 26,0	
	$250 < D \leq 315$	7,7	-	2 x 30,0 x 30,0	EI 60-U/C EI 60-C/C

Table B18. Resistance to fire classification of MLC pipes without insulation penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
Geberit Mepla	$D \leq 20$	2,5	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$20 < D \leq 25$	3,0	-	1 x 30,0 x 4,0	
	$25 < D \leq 32$	3,0	-	1 x 30,0 x 4,0	
	$32 < D \leq 40$	3,5	-	1 x 30,0 x 4,0	
	$40 < D \leq 50$	4,5	-	1 x 30,0 x 4,0	
	$50 < D \leq 63$	4,5	-	1 x 30,0 x 4,0	

Table B18, cont. Resistance to fire classification of MLC pipes without insulation penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PE-RT/AL/ PE-RT	$D \leq 20$	2,0	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$20 < D \leq 25$	2,5	-	1 x 30,0 x 4,0	
	$25 < D \leq 32$	3,0	-	1 x 30,0 x 4,0	
	$32 < D \leq 40$	4,0	-	1 x 30,0 x 4,0	
	$40 < D \leq 50$	4,8	-	1 x 30,0 x 4,0	
	$50 < D \leq 63$	6,0	-	1 x 30,0 x 4,0	
	$63 < D \leq 75$	7,5	-	1 x 30,0 x 4,0	
PE-X/AL/ PE-X	$D \leq 20$	2,0	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$20 < D \leq 25$	2,5	-	1 x 30,0 x 4,0	
	$25 < D \leq 32$	3,0	-	1 x 30,0 x 4,0	
	$32 < D \leq 40$	4,0	-	1 x 30,0 x 4,0	
	$40 < D \leq 50$	4,8	-	1 x 30,0 x 4,0	
	$50 < D \leq 63$	6,0	-	1 x 30,0 x 4,0	
PE-Xb/AL/ PE-Xb	$D \leq 32$	3,0	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$32 < D \leq 40$	3,5	-	1 x 30,0 x 4,0	
	$40 < D \leq 63$	4,5	-	1 x 30,0 x 4,0	
PP-R/AL/ PP-R	$D \leq 20$	$\geq 2,8$	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$20 < D \leq 25$	$\geq 3,3$	-	1 x 30,0 x 4,0	
	$25 < D \leq 32$	4,0 – 12,5	-	1 x 30,0 x 4,0	
	$32 < D \leq 40$	4,8 – 12,5	-	1 x 30,0 x 4,0	
	$40 < D \leq 50$	5,9 – 12,5	-	1 x 30,0 x 4,0	
	$50 < D \leq 63$	7,2 – 12,5	-	1 x 30,0 x 4,0	
	$63 < D \leq 75$	8,4 – 12,5	-	1 x 30,0 x 4,0	
	$75 < D \leq 90$	10,1 – 15,0	-	1 x 30,0 x 8,0	
	$90 < D \leq 110$	12,3 – 18,3	-	1 x 30,0 x 10,0	

Table B19. Resistance to fire classification of plastic pipes without insulation with 90° pipe elbow penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM (U-shaped on elbow side):

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PE-HD / PE / PE-X / ABS / SAN + PVC	$D \leq 110$	6,6	-	1 x 30,0 x 10,0	EI 120-U/C EI 120-C/C
PP	$D \leq 110$	2,7	-	1 x 30,0 x 10,0	EI 90-U/C EI 90-C/C

Table B20. Resistance to fire classification of plastic pipes without insulation with 87,5° pipe elbow penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM (U-shaped on elbow side):

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PVC-U / PVC-C	$D \leq 110$	3,2	-	1 x 30,0 x 10,0	EI 120-U/C EI 120-C/C

Table B21. Resistance to fire classification of plastic pipes without insulation in wall corner penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM (U-shaped):

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PE-HD / PE / PE-X / ABS / SAN + PVC	$D \leq 110$	4,2	-	1 x 30,0 x 10,0	EI 120-U/C EI 120-C/C
PP	$D \leq 110$	3,9	-	1 x 30,0 x 10,0	EI 120-U/C EI 120-C/C
PVC-U / PVC-C	$D \leq 110$	3,2	-	1 x 30,0 x 10,0	EI 120-U/C EI 120-C/C

Table B22. Resistance to fire classification of plastic pipes without insulation in pipe socket on collar side penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PP	$D \leq 110$	3,9	-	2 x 30,0 x 10,0	EI 120-U/C EI 120-C/C

Table B23. Resistance to fire classification of composite pipes without insulation penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PP-R/PP-R-GF/PP-R	$D \leq 20$	$\geq 2,8$	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$20 < D \leq 25$	$\geq 3,5$	-	1 x 30,0 x 4,0	
	$25 < D \leq 32$	4,4 – 12,5	-	1 x 30,0 x 4,0	
	$32 < D \leq 40$	5,5 – 12,5	-	1 x 30,0 x 4,0	
	$40 < D \leq 50$	6,9 – 12,5	-	1 x 30,0 x 4,0	
	$50 < D \leq 63$	8,7 – 12,5	-	1 x 30,0 x 4,0	
	$63 < D \leq 75$	10,3 – 12,5	-	1 x 30,0 x 4,0	
	$75 < D \leq 90$	12,4 – 15,0	-	1 x 30,0 x 8,0	
	$90 < D \leq 110$	15,1 – 18,3	-	1 x 30,0 x 10,0	
Raupiano Plus / PP/PP-MF/PP	$D \leq 50$	1,8	-	1 x 30,0 x 4,0	EI 120-U/C EI 120-C/C
	$50 < D \leq 75$	1,9	-	1 x 30,0 x 4,0	
	$78 < D \leq 90$	2,2	-	1 x 30,0 x 8,0	
	$90 < D \leq 110$	2,7	-	1 x 30,0 x 10,0	
	$110 < D \leq 125$	3,1	-	2 x 30,0 x 14,0	
	$125 < D \leq 160$	4,0	-	2 x 30,0 x 18,0	

Table B24. Resistance to fire classification of plastic pipes without insulation penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PE-HD / PE / PE-X / ABS / SAN + PVC	$D \leq 110$	4,2	-	1 x 30,0 x 10,0	EI 120-U/C EI 120-C/C
PP	$D \leq 110$	2,7	-	1 x 30,0 x 10,0	EI 60-U/C EI 60-C/C

Table B25. Resistance to fire classification of plastic pipes with or without heating cable, with flexible elastomeric foam (FEF) continuous insulation (case CS) penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
Geberit Silent dB20	$D \leq 110$	6,0	13	2 x 30,0 x 14,0	EI 90-U/C EI 90-C/C
PE-HD	$D \leq 110$	4,2	13	2 x 30,0 x 14,0	EI 120-U/C EI 120-C/C

Table B26. Resistance to fire classification of plastic pipes with polyethylene foam (PE) (with reaction to fire class EL according to EN 13501-1) local sustained insulation (case LS) penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PP	$D \leq 110$	2,7	9 x 100	1 x 30,0 x 12,0	EI 90-U/C EI 90-C/C

Table B27. Resistance to fire classification of steel pipes with flexible elastomeric foam (FEF) continuous insulation (case CS) penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
stal	$D \leq 18,0$	$\geq 1,2$	9	1 x 30,0 x 4,0	EI 120-C/U EI 120-C/C
			10 – 25	1 x 30,0 x 6,0	
	$18,0 < D \leq 28,0$	1,5 – 1,9	9	1 x 30,0 x 4,0	
			10 – 32	1 x 30,0 x 6,0	
		2,0 – 3,9	9	1 x 30,0 x 4,0	
			10 – 32	1 x 30,0 x 6,0	
		$\geq 4,0$	33 – 50	1 x 30,0 x 8,0	EI 90 / E 120-C/U EI 90 / E 120-C/C
			9	1 x 30,0 x 4,0	EI 120-C/U EI 120-C/C
			10 – 32	1 x 30,0 x 6,0	
			33 – 50	1 x 30,0 x 8,0	
			33 – 50	1 x 30,0 x 8,0	

Table B27, cont. Resistance to fire classification of steel pipes with flexible elastomeric foam (FEF) continuous insulation (case CS) penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
stal	28,0 < D ≤ 42,4	1,5 – 1,9	9	1 x 30,0 x 4,0	
			10 – 32	1 x 30,0 x 6,0	
		2,0 – 3,9	9	1 x 30,0 x 4,0	
			10 – 32	1 x 30,0 x 6,0	
			33 – 50	1 x 30,0 x 8,0	EI 90 / E 120-C/U EI 90 / E 120-C/C
			9	1 x 30,0 x 4,0	EI 120-C/U EI 120-C/C
		≥ 4,0	10 – 32	1 x 30,0 x 6,0	
			33 – 50	1 x 30,0 x 8,0	
	42,4 < D ≤ 66,7	1,5 – 1,9	9	1 x 30,0 x 4,0	
			10 – 32	1 x 30,0 x 6,0	
		2,0 – 3,9	9	1 x 30,0 x 4,0	
			10 – 32	1 x 30,0 x 6,0	
			33 – 50	1 x 30,0 x 8,0	EI 90 / E 120-C/U EI 90 / E 120-C/C
		≥ 4,0	9	1 x 30,0 x 4,0	EI 120-C/U EI 120-C/C
			10 – 32	1 x 30,0 x 6,0	
			33 – 50	1 x 30,0 x 8,0	
			32	1 x 30,0 x 6,0	
	66,7 < D ≤ 108,0	2,0 – 3,5	33 – 50	1 x 30,0 x 8,0	EI 90 / E 120-C/U EI 90 / E 120-C/C
			≥ 3,6	33 – 50	1 x 30,0 x 8,0
	108,0 < D ≤ 114,3	≥ 3,6	32	1 x 30,0 x 6,0	EI 120-C/U EI 120-C/C
			33 – 50	1 x 30,0 x 8,0	
	114,3 < D ≤ 168,3	≥ 4,0	32	1 x 30,0 x 6,0	
			33 – 50	1 x 30,0 x 8,0	

Table B28. Resistance to fire classification of mixed bundle of single copper pipe (C/U end configuration) with flexible elastomeric foam (FEF) local sustained insulation (case LS), with additional single cable 4 x 1.5 mm² and single PVC-U pipe (U/C end configuration) diameter of: D ≤ 25 mm and pipe wall thickness of: 1,5 mm penetration seal in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
single copper pipe	D ≤ 12,7	≥ 0,8	9 x 400	1 x 30,0 x 4,0	EI 120
	12,7 < D ≤ 22,23	≥ 1,0	9 x 400	1 x 30,0 x 4,0	

Table B29. Resistance to fire classification of mixed bundle of double copper pipe (C/U end configuration) with flexible elastomeric foam (FEF) local sustained insulation (case LS), with additional single cable 4 x 1.5 mm² and single PVC-U pipe (U/C end configuration) diameter of: D ≤ 25 mm and pipe wall thickness of: 1,5 mm penetration seal in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
double copper pipe	12,7 x 0,8	12,7 x 0,8	9 x 400	1 x 30,0 x 4,0	EI 120
	12,7 x 0,8	22,23 x 1,0	9 x 400	1 x 30,0 x 4,0	

Table B30. Resistance to fire classification of mixed bundle of single copper pipe (C/U end configuration) with polyethylene foam (PE) (with reaction to fire class BL-s1, d0 according to EN 13501-1) local sustained insulation (case LS), with additional single cable 4 x 1.5 mm² and single PVC-U pipe (U/C end configuration) diameter of: $D \leq 25$ mm and pipe wall thickness of: 1,5 mm penetration seal in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
single copper pipe	$D \leq 12,7$	$\geq 0,8$	9 x 400	1 x 30,0 x 4,0	EI 120
	$12,7 < D \leq 22,23$	$\geq 1,0$	9 x 400	1 x 30,0 x 4,0	

Table B31. Resistance to fire classification of mixed bundle of double copper pipe (C/U end configuration) with polyethylene foam (PE) (with reaction to fire class BL-s1, d0 according to EN 13501-1) local sustained insulation (case LS), with additional single cable 4 x 1.5 mm² and single PVC-U pipe (U/C end configuration) diameter of: $D \leq 25$ mm and pipe wall thickness of: 1,5 mm penetration seal in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Copper pipe No. 1 max. diameter x min. wall thickness [mm]	Copper pipe No. 2 max. diameter x min. wall thickness [mm]	Insulation thickness x length [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
double copper pipe	12,7 x 0,8	12,7 x 0,8	9 x 400	1 x 30,0 x 4,0	EI 120
	12,7 x 0,8	22,23 x 1,0	9 x 400	1 x 30,0 x 4,0	

Table B32. Resistance to fire classification of bundle of AROT DVK conduits consisting of max. 4 conduits, empty or filled with small cables ($\phi_{\text{cable}} \leq 21$ mm) or cable bundles ($\phi_{\text{bundle}} \leq$ conduit inner diameter, $\phi_{\text{cable}} \leq 21$ mm) penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Diameter of single conduit in bundle [mm]	Conduit wave height [mm]	Service inside	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
D ≤ 50	3,0	empty	1 x 30,0 x 10,0	EI 120-U/U
		small cable: $\varnothing_{\text{cable}} \leq 21 \text{ mm}$	1 x 30,0 x 10,0	EI 120-U/U
		cable bundle: $\varnothing_{\text{bundle}} \leq D_{\text{in}}^{1)}$ $\varnothing_{\text{cable}} \leq 21 \text{ mm}$	1 x 30,0 x 10,0	EI 120-U/U
¹⁾ D _{in} – conduit inner diameter				

Table B33. Resistance to fire classification of PVC-U pipes without insulation penetration seals in rigid floor thickness of: $t \geq 150$ mm, made with use of one-sided INTU FR COLLAR L SLIM:

Pipe material	Pipe diameter [mm]	Pipe wall thickness [mm]	Insulation thickness [mm]	Number of collars x intumescent material width x thickness [mm]	Fire resistance class
PVC-U / PVC-C	$D \leq 110$	3,2 – 8,0	-	1 x 30,0 x 10,0	EI 45 / E 60-U/C EI 45 / E 60-C/C
		8,1	-	1 x 30,0 x 10,0	EI 120-U/C EI 120-C/C

BWR 3 Hygiene, health and the environment	
Air permeability	NPD
Water permeability	NPD
Content, emission, release of dangerous substances	NPD
BWR 4 Safety and accessibility in use	
Mechanical resistance and stability	NPD
Resistance to impact/movement	NPD
Adhesion	NPD
Durability	Z ₂
BWR 5 Protection against noise	
Aireborne sound insulation	NPD
BWR 6 Energy economy and heat retention	
Thermal properties	NPD
Water vapour permeability	NPD

8. Appropriate technical documentation or special technical documentation:

Not applicable

The performance of the product identified above is in conformity with the set of declared performance/s. This declaration of performance is issued, in accordance with Regulation (EU) No 305/2011, under the sole responsibility of the manufacturer identified above.

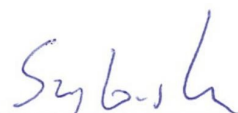
Signed for and on behalf of the manufacturer by:

Name: Michał Szykowski

Position: President of the Management Board

Piaseczno, 10.09.2024

Place, date


Signature