

RIIFO



Plumbing System

Technical Manual

RIIFO EUROPE

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1 | About RIIFO

RIIFO is a leading international company offering one-stop piping system solutions. RIIFO systems are used in the residential, commercial, agricultural, industrial and infrastructure sectors. With more than 8,000 employees, 70 branches and subsidiaries, and 300,000 distributors, we serve our customers in more than 100 countries and regions. With an integrated value chain, from R&D through production to distribution, we strive to fulfil our mission to offer integrated solutions and services related to pipe systems to everyone around the world.

Quality and environmental friendliness are key objectives in our development and manufacturing processes. Our products and systems have obtained quality certificates all over the world and we are the proud holder of several ISO certificates like ISO

9001:2015, ISO14001:2015 and ISO 45001:2018. All the RIIFO system components offer complete reliability for the variety of applications they were designed for e.g. drinking water installations, radiator connections as well as radiant heating and cooling. The installation of the RIIFO system is particularly simple and economical. From riser to tap, from residential to commercial installations, RIIFO offers the perfect solution for every situation.

This manual presents the specific features of the individual products in the RIIFO product family. Features and areas of application are described. You will also find assembly instructions and technical background information. If you have any further questions after consulting this manual, do not hesitate to contact us.

2 | Innovation

Believing that innovation is the key to go beyond the ordinary, RIIFO has founded world-class labs recognized and certified by CNAS. Over 600 innovation talents are sparing no effort to challenge industrial boundaries, achieving 923 patents and 20 technology awards.

And this innovative passion has translated perfectly into high-quality products and excellent service. We strive to provide ideal piping solutions for everyone.



3 | Scale

We adopt highly automated production lines with the most rigorous and comprehensive production controls, and management systems in order to handle such a powerful production.

3.1 Capacity

Production Capacity

- Pipe: 3.2 billion m³/yr
- Fitting: 1.3 billion pcs/yr

Storage Capacity

- 1,735,000 m³ ≈ 61,950 TEU (20 GP Containers)

11

global production bases

200

hectares area total

4,000+

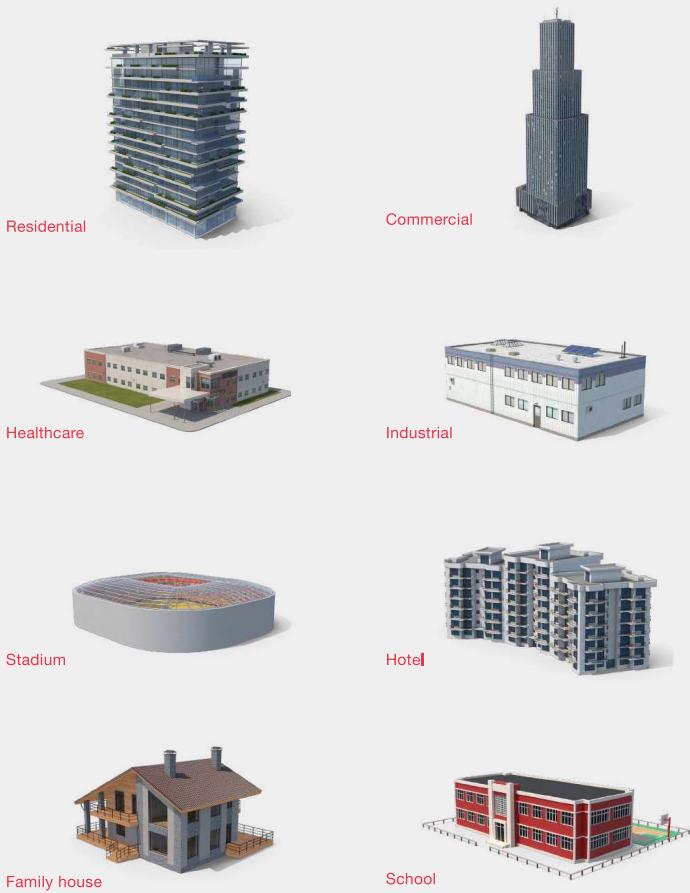
automated production lines

5,200+

production staff



4 Segments



5 Quality

RiIFO adheres to the concept of quality priority, and all RiIFO products are produced under rigorous quality control with excelsior manufacturing. Until now, RiIFO has gained over 50 certificates, such as NSF, KIWA, DVGW, NF, WRAS, AENOR, Watermark, etc. These worldwide certificates underline our technical and quality know-how. Furthermore, we can provide you with a 25-year system warranty backed up by an international insurance company.

5.1 Environmental and quality management systems



5.2 Company accreditation



5.3 Certificates



6 Multilayer plumbing system



6.1 Multilayer pipes - B1

6.1.1 Composition

The RIIFO multilayer pipe unites the advantages of plastic and metal pipes. The inner and outer layers of polyethylene provide flexibility and lightness. The smoothness of the inner polyethylene layer reduces flow noise transmission and prevents corrosion. The longitudinally welded aluminium layer ensures the dimensional stability of the pipe and prevents oxygen penetration. The aluminium layer is also crucial for the strength and the thermal expansion of the pipe. Since the permanent bond between the polyethylene layers and the aluminium layer, the linear expansion of the pipe is determined by the expansion factor of the aluminium which roughly corresponds to that of a metal pipe. The RIIFO multilayer pipe offers a high degree of flexibility and durability, combined with high pressure and temperature resistance.

The RIIFO multilayer pipes satisfy the highest demands. All pipes are food-safe and completely free of physiological risks. To ensure safe drinking water

installations, the pipes are delivered with end caps to protect against contamination during transport, storage or on site. The pipes are 100% impermeable to oxygen, which is particularly important for heating installations. The RIIFO multilayer pipes can be delivered as coils or as straight lengths.

The RIIFO PEX/AL/PEX pipe consists of a longitudinal welded aluminium pipe, to which an inner and outer layer of crosslinked polyethylene (PEX) is applied.

Crosslinked means "bound together" or "interconnected". Polyethylene consists of polymer chains and crosslinking is the process of forming bonds to join these polymer chains together. RIIFO applies the silane crosslinking technology to connect the polymer chains. By this way, the polyethylene obtains a superior mechanical performance and an increased temperature and pressure resistance.



6.1.2 Advantages



High pressure and temperature
resistant 10 bar / 95°C



Very flexible, yet dimensionally stable



Lightweight and easy to install



Low thermal linear expansion



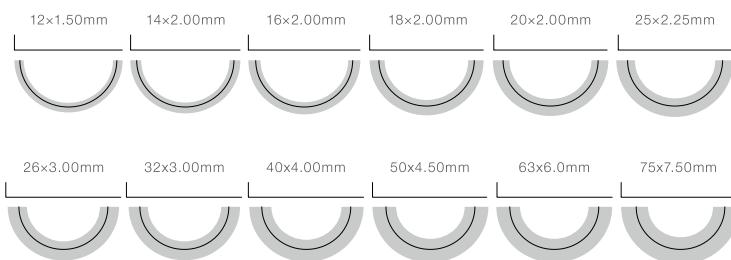
Impermeable to oxygen and light
Low pressure loss due to smooth
inner layer



Corrosion resistant
Hygienic

6.1.3 Technical data

Nominal size (D x e)	12x1.5	14x2.0	16x2.0	18x2.0	20x2.0	25x2.5	26x3.0	32x3.0	40x4.0	50x4.5	63x6.0	75x7.5
Outside diameter (mm)	12	14	16	18	20	25	26	32	40	50	63	75
Tolerance of outer diameter (mm)	Min. 12.25	14.2	16.2	18.2	20.2	25.2	26.2	32.2	40.3	50.3	63.4	75.6
Inside diameter (mm)	9	10	12	14	16	20	20	26	32	41	51	60
Tolerance of inner diameter (mm)	Min. 8.85	9.5	11.5	13.5	15.4	19.6	19.6	25.5	30.8	39.6	49.4	58
Max. 8.85	10.2	12.2	14.2	16.2	20.4	24.4	26.4	32.3	41.3	51.4	60.6	
Wall thickness (mm)	1.7	2	2	2	2	2.5	3	3	4	4.5	6	7.5
Tolerance of wall thickness (mm)	Min. 2	1.7	2	2	2	2.4	2.9	2.9	4	4.5	6	7.5
Max. 2.25	2.25	2.25	2.25	2.3	2.7	3.2	3.25	4.6	5.2	6.8	8.5	
Weight (kg/m)	0.075	0.096	0.13	0.14	0.153	0.232	0.271	0.352	0.849	1.322	1.993	2.617
Volume (L/m)	0.30	0.56	0.70	0.53	0.84	1.46	1.58	2.43	3.31	5.52	8.62	14.57
Roughness (mm)										0.0007		
Density (g/cm³)										0.926-0.959		
Modulus of elasticity (MPa)										7200		
Thermal conductivity (w/mK)										0.45		
Coefficient of thermal expansion (mm/mK)										0.025		
Max. working temperature (°C)										95		
Max. working pressure (bar)										10		



6.1.4 Applications

The RIIFO multilayer pipes can be used for different applications. Key applications include plumbing and heating systems for residential, commercial or industrial buildings:



Drinking water:

As a pipe for hot and cold water distribution of every drinking water quality.



Heating:

As a pipe for high temperature heating systems like radiators within the prescribed load values. System separation is required for specific systems like solar and district heating.



Radiant heating and cooling systems:

As a pipe for low temperature heating and cooling systems.



Compressed air:

As a compressed air pipe in systems with preceding oil filter (oil-free).



Rain water:

As a rain water piping system inside buildings and separately installed from the drinking water installation. The pH-value of the water must be higher than 6.



Other applications:

The pipe can be used for many other applications and with other media. Please contact us for more information.

6.1.5 Classification service conditions

The performance requirements for multilayer piping systems conforming to ISO 21003 are specified for four different application classes.

The selection of the applicable class conforming to the table shall be agreed upon by the parties concerned for any application. Each application class shall be combined with a design pressure, PD, of 4 bar, 6 bar, 8 bar or 10 bar, as applicable (1 bar = 0.1 MPa).

Application class	Design temperature T_0 °C	Time ^b at T_D	T_{max}	Time at T_{max}	T_{mid}	Time at T_{mid}	Typical field of application
1a	60	49	80	1	95	100	Hot water supply (60°C)
2a	70	49	80	1	95	100	Hot water supply (70°C)
4b	20 plus cumulative	2.5	70	2.5	100	100	Underfloor heating and low-temperature radiators
	40 plus cumulative	20					
	60	25					
5b	20 plus cumulative	14	90	1	100	100	High-temperature radiators
	60 plus cumulative	20					
	80	10					

a. A country may select either class 1 or class 2 in conformity with its national regulations.

b. Where more than one design temperature for time and associated temperature appears for any class, they should be aggregated. "Plus cumulative" in the table implies a temperature profile of the mentioned temperature over time (e.g. the design temperature profile for 50 years for class 5 is 20 °C for 14 years followed by 60 °C for 25 years, 80 °C for 10 years, 90 °C for 1 year and 100 °C for 100 h).
NOTE - For values of T_D , T_{max} and T_{mid} in excess of those in the table, this International Standard does not apply.

6.1.6 Pressure loss

Calculation formula

$$r = f \times \frac{L}{D} \times P \times \frac{V^2}{2}$$

$$\frac{1}{\sqrt{f}} = -2 \log \left(\frac{e}{3.7D} + \frac{2.51}{Re\sqrt{f}} \right)$$

$$Re = \frac{\rho \times V \times D}{\mu}$$

Where:

r = heat loss, Pa

f = friction factor

ρ = density of the fluid, kg/m³

V = the velocity of the fluid, m.

D = the pipe inter dia

L = pipe length, m

e = relative roughness

Re = reynolds number

μ = dynamic viscosity, Pa·s

Pressure loss table of PEX/AL/PEX pipe, water temperature = 70°C																													
14×2.0			16×2.0			18×2.0			20×2.0			25×2.5			26x3.0			40x4.0			50x4.5			63x6.0			75x7.5		
Power (kW)	Flow (l/s)	Speed (m/s)	ΔP (mbar/m)	ΔP (m/s)	Speed (m/s)	ΔP (mbar/m)																							
1	42	0.15	0.45	0.10	0.23	0.08	0.13	0.06	0.09	0.04	0.03	0.02	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00						
2	84	0.30	1.47	0.21	0.74	0.15	0.42	0.12	0.25	0.07	0.11	0.04	0.04	0.03	0.02	0.02	0.01	0.01	0.00	0.01	0.00	0.01	0.00						
3	126	0.45	2.95	0.31	1.49	0.20	0.84	0.17	0.51	0.11	0.20	0.07	0.08	0.04	0.04	0.03	0.02	0.02	0.01	0.01	0.00	0.01	0.00						
4	168	0.59	4.87	0.41	2.46	0.30	1.38	0.23	0.84	0.15	0.37	0.09	0.14	0.06	0.06	0.04	0.03	0.02	0.01	0.02	0.01	0.01	0.00						
5	210	0.74	7.21	0.52	3.64	0.38	2.04	0.29	1.26	0.19	0.54	0.11	0.20	0.07	0.09	0.04	0.04	0.03	0.02	0.02	0.01	0.01	0.00						
6	252	0.89	9.93	0.62	5.00	0.46	2.81	0.35	1.70	0.22	0.74	0.13	0.28	0.09	0.13	0.05	0.05	0.03	0.02	0.02	0.01	0.01	0.00						
7	294	1.04	13.03	0.72	6.56	0.53	3.68	0.41	2.23	0.26	0.97	0.15	0.36	0.10	0.17	0.06	0.07	0.04	0.03	0.03	0.02	0.02	0.01						
8	336	1.19	16.51	0.83	8.30	0.61	4.65	0.46	2.81	0.30	1.22	0.18	0.46	0.12	0.21	0.07	0.08	0.05	0.04	0.03	0.02	0.02	0.01						
9	378	1.34	20.34	0.93	10.23	0.68	5.72	0.52	3.46	0.33	1.50	0.20	0.56	0.13	0.26	0.08	0.10	0.05	0.04	0.04	0.03	0.02	0.01						
10	420	1.49	24.52	1.03	12.32	0.76	6.89	0.58	4.17	0.37	1.80	0.22	0.67	0.15	0.31	0.09	0.12	0.06	0.05	0.04	0.03	0.02	0.01						
11	462	1.63	29.05	1.14	14.59	0.83	8.16	0.64	4.93	0.41	2.13	0.24	0.80	0.16	0.37	0.10	0.14	0.06	0.06	0.05	0.03	0.02	0.01						
12	504	1.78	33.92	1.24	17.03	0.91	9.52	0.70	5.75	0.45	2.48	0.26	0.93	0.17	0.43	0.11	0.17	0.07	0.05	0.04	0.03	0.02	0.01						
13	546	1.93	39.12	1.34	19.63	0.99	10.97	0.75	6.63	0.48	2.86	0.29	1.07	0.19	0.49	0.11	0.19	0.07	0.09	0.05	0.04	0.03	0.02						
14	588	2.08	44.65	1.45	22.40	1.06	12.51	0.81	7.56	0.52	3.26	0.31	1.21	0.20	0.56	0.12	0.22	0.08	0.10	0.06	0.05	0.04	0.03						
15	630	2.23	50.52	1.55	25.33	1.14	14.14	0.87	8.54	0.56	3.68	0.33	1.37	0.22	0.63	0.13	0.25	0.09	0.11	0.08	0.06	0.05	0.04						
16	672	2.38	56.68	1.66	28.42	1.21	15.86	0.93	9.58	0.59	4.13	0.35	1.54	0.23	0.70	0.14	0.28	0.09	0.12	0.07	0.07	0.06	0.05						
17	714	2.53	63.19	1.75	31.67	1.29	17.67	0.99	10.67	0.63	4.59	0.37	1.71	0.25	0.78	0.15	0.31	0.10	0.14	0.07	0.07	0.06	0.05						
18	756	2.68	70.11	1.86	35.08	1.37	19.56	1.05	11.81	0.67	5.00	0.40	1.89	0.26	0.87	0.16	0.34	0.10	0.15	0.07	0.08	0.06	0.05						
19	798	2.82	77.14	1.96	38.64	1.44	21.55	1.10	13.00	0.71	5.60	0.42	2.08	0.28	0.95	0.17	0.38	0.11	0.17	0.08	0.09	0.07	0.06						
20	841	2.97	84.59	2.06	42.36	1.52	23.61	1.16	14.25	0.74	6.13	0.44	2.28	0.29	1.04	0.18	0.41	0.11	0.18	0.08	0.10	0.07	0.06						
21	883	3.12	92.35	2.17	46.23	1.59	27.77	1.25	15.54	0.78	6.68	0.46	2.46	0.30	1.14	0.19	0.45	0.12	0.20	0.09	0.11	0.08	0.07						
22	925	3.27	100.41	2.27	50.25	1.67	28.00	1.28	16.89	0.82	7.26	0.48	2.70	0.32	1.23	0.19	0.49	0.13	0.21	0.09	0.12	0.08	0.07						
23	967	3.42	108.78	2.37	54.43	1.74	30.32	1.34	18.28	0.85	7.86	0.51	2.92	0.33	1.33	0.20	0.52	0.13	0.23	0.09	0.13	0.08	0.07						
24	1009	3.57	117.45	2.48	58.75	1.82	32.73	1.39	19.73	0.89	8.48	0.53	3.15	0.35	1.44	0.21	0.57	0.14	0.25	0.10	0.14	0.09	0.08						
25	1051	3.72	126.42	2.58	63.22	1.90	35.21	1.45	21.23	0.93	9.12	0.55	3.38	0.36	1.55	0.22	0.61	0.14	0.27	0.10	0.15	0.10	0.09						
26	1093	3.86	135.70	2.68	67.85	1.97	37.76	1.51	22.77	0.97	9.78	0.57	3.63	0.38	1.66	0.23	0.65	0.15	0.29	0.11	0.16	0.11	0.10						
27	1135	4.01	145.27	2.79	72.62	2.05	40.43	1.57	24.36	1.00	10.46	0.59	3.84	0.39	1.77	0.24	0.70	0.15	0.31	0.11	0.17	0.11	0.16						
28	1177	4.16	155.14	2.89	77.53	2.12	43.16	1.63	26.00	1.04	11.16	0.62	4.14	0.41	1.89	0.25	0.74	0.16	0.33	0.12	0.18	0.11	0.17						
29	1219	4.31	165.30	2.99	82.59	2.20	45.97	1.68	27.69	1.08	11.84	0.64	4.40	0.42	2.01	0.26	0.79	0.17	0.35	0.12	0.19	0.11	0.18						
30	1261	4.46	175.75	3.10	87.80	2.28	48.86	1.74	29.43	1.11	12.63	0.66	4.68	0.44	2.13	0.27	0.84	0.17	0.37	0.12	0.20	0.11	0.19						
31	1303	4.61	186.50	3.20	93.15	2.35	51.83	1.80	31.21	1.15	13.39	0.68	4.96	0.45	2.26	0.27	0.89	0.18	0.39	0.13	0.21	0.11	0.20						
32	1345	4.76	197.54	3.30	98.65	2.43	54.88	1.86	33.05	1.19	14.17	0.70	5.25	0.46	2.39	0.28	0.94	0.18	0.41	0.13	0.22	0.11	0.21						
33	1387	4.90	208.87	3.41	104.28	2.50	58.00	1.92	34.93	1.23	14.97	0.73	5.54	0.48	2.53	0.29	0.99	0.19	0.44	0.14	0.24	0.11	0.23						
34	1429	5.05	111.06	2.58	61.21	1.97	36.85	1.26	15.60	0.75	5.85	0.49	2.67	0.30	1.05	0.19	0.46	0.14	0.25	0.12	0.24	0.11	0.23						
35	1471	5.61	115.99	2.65	64.50	2.03	38.82	1.30	16.64	0.77	6.16	0.51	2.81	0.31	1.10	0.20	0.48	0.14	0.26	0.12	0.25	0.11	0.24						
36	1513	5.72	122.05	2.73	67.66	2.09	40.84	1.34	17.50	0.79	6.48	0.52	2.95	0.32	1.16	0.21	0.51	0.15	0.28	0.12	0.26	0.11	0.25						
37	1555	5.82	128.26	2.81	71.30	2.15	42.91	1.37	18.38	0.81	6.80	0.54	3.10	0.33	1.22	0.21	0.53	0.15	0.29	0.12	0.27	0.11	0.26						
38	1597	5.92	134.60	2.85	74.02	2.21	45.02	1.41	19.29	0.84	7.13	0.55	3.25	0.34	1.27	0.22	0.56	0.16	0.30	0.12	0.28	0.11	0.27						
39	1639	4.03	141.09	2.76	78.41	2.26	47.18	1.45	20.21	0.86	7.47	0.57	3.40	0.34	1.33	0.22	0.59	0.16	0.32	0.12	0.29	0.11	0.28						
40	1681	4.13	147.72	3.03	82.06	2.32	49.39	1.49	21.15	0.88	7.82	0.58	3.56	0.35	1.40	0.23	0.61	0.17	0.33	0.12	0.30	0.11	0.29						
41	1723	4.23	154.48	3.11	85.83	2.38	51.64	1.52	22.11	0.90	8.17	0.60	3.72	0.36	1.46	0.23	0.64	0.17	0.35	0.12	0.31	0.11	0.30						

Medium: Water; 1 mbar/m = 100 Pa/m³; Heating, max.: 1 m/s; Plumbing, max.: 3 m/s

Pressure loss table of PEX/AL/PEX pipe, water temperature = 70°C

Power (kW)	Flow (l/h)	14×2.0		16×2.0		18×2.0		20×2.0		25×2.5		26x3.0		40x4.0		50x4.5		63x6.0		75x7.5	
		Speed (m/s)	ΔP (mbar/m)																		
42	1765	4.34	161.39	3.19	89.66	2.44	53.93	1.56	25.09	0.92	8.53	0.61	3.89	0.37	1.52	0.24	0.67	0.17	0.36		
43	1807	4.44	160.43	3.26	93.56	2.50	56.27	1.60	24.08	0.95	8.90	0.62	4.05	0.38	1.59	0.25	0.70	0.18	0.38		
44	1849	4.54	175.61	3.34	97.54	2.55	58.66	1.63	25.10	0.97	9.27	0.64	4.22	0.39	1.65	0.25	0.73	0.18	0.39		
45	1891	4.64	182.87	3.41	101.59	2.61	61.09	1.67	26.14	0.99	9.65	0.65	4.39	0.40	1.72	0.26	0.75	0.19	0.41		
46	1933	4.75	190.33	3.49	105.71	2.67	63.57	1.71	27.19	1.01	10.04	0.67	4.57	0.41	1.79	0.26	0.78	0.19	0.43		
47	1975	4.85	197.91	3.56	109.92	2.73	66.09	1.75	28.27	1.03	10.44	0.68	4.75	0.42	1.86	0.27	0.82	0.19	0.44		
48	2017	4.95	205.64	3.64	114.20	2.79	68.65	1.78	29.36	1.06	10.84	0.70	4.93	0.42	1.93	0.27	0.85	0.20	0.46		
49	2059	5.05	213.38	2.84	71.26	1.82	30.47	1.08	11.25	0.71	5.12	0.43	2.04	0.28	0.28	0.08	0.20	0.48			
50	2101	5.17	123.00	2.90	73.92	1.86	31.60	1.10	11.66	0.73	5.31	0.44	2.08	0.29	0.91	0.21	0.49				
51	2143	5.37	127.50	2.96	76.62	1.90	32.75	1.12	12.09	0.74	5.50	0.45	2.15	0.29	0.94	0.21	0.51				
52	2185	5.54	132.04	3.02	79.36	1.93	33.92	1.14	12.52	0.75	5.69	0.46	2.23	0.30	0.98	0.21	0.53				
53	2227	5.70	136.69	3.08	82.15	1.97	36.11	1.17	12.95	0.77	5.89	0.47	2.30	0.30	1.01	0.22	0.55				
54	2269	5.10	141.41	3.14	84.98	2.01	36.31	1.19	13.39	0.78	6.09	0.48	2.38	0.31	1.04	0.22	0.56				
55	2311	4.17	148.21	3.19	87.65	2.04	37.54	1.21	13.84	0.80	6.29	0.49	2.46	0.31	1.08	0.23	0.58				
56	2353	4.25	151.08	3.25	90.77	2.08	38.78	1.23	14.30	0.81	6.50	0.50	2.54	0.32	1.11	0.23	0.60				
57	2395	4.32	156.03	3.31	93.74	2.12	40.04	1.25	14.76	0.83	6.71	0.50	2.62	0.33	1.15	0.24	0.62				
58	2437	4.40	161.05	3.37	96.74	2.16	41.32	1.28	15.23	0.84	6.92	0.51	2.71	0.33	1.18	0.24	0.64				
59	2480	4.47	166.14	3.43	99.79	2.19	42.62	1.30	15.71	0.86	7.14	0.52	2.79	0.34	1.22	0.24	0.66				
60	2522	4.55	171.30	3.48	102.89	2.23	43.93	1.32	16.19	0.87	7.36	0.53	2.88	0.34	1.26	0.25	0.68				
61	2564	4.63	176.54	3.54	106.03	2.27	45.27	1.34	16.68	0.89	7.58	0.54	2.96	0.35	1.30	0.25	0.70				
62	2606	4.70	181.85	3.60	109.21	2.30	46.62	1.36	17.18	0.90	7.80	0.55	3.05	0.35	1.33	0.26	0.72				
63	2648	4.78	187.23	3.66	112.43	2.34	47.99	1.39	17.68	0.91	8.03	0.56	3.14	0.36	1.37	0.26	0.74				
64	2690	4.85	192.68	3.72	115.70	2.38	49.38	1.41	18.19	0.93	8.26	0.57	3.23	0.37	1.41	0.26	0.76				
65	2732	4.93	198.21	3.77	119.01	2.42	50.78	1.43	18.70	0.94	8.49	0.57	3.32	0.37	1.45	0.27	0.79				
66	2774	5.03	122.33	2.45	52.21	1.45	19.23	0.96	8.73	0.58	3.41	0.38	1.49	0.27	0.81						
67	2816	5.09	125.73	2.49	53.65	1.47	19.75	0.97	8.97	0.59	3.50	0.38	1.53	0.28	0.83						
68	2858	5.15	129.17	2.53	55.11	1.50	20.29	0.99	9.21	0.60	3.60	0.39	1.57	0.28	0.85						
69	2900	5.01	132.65	2.56	56.59	1.52	20.83	1.00	9.46	0.61	3.69	0.39	1.61	0.28	0.87						
70	2942	4.06	136.17	2.60	56.09	1.54	21.38	1.02	9.71	0.62	3.79	0.40	1.66	0.29	0.90						
71	2984	4.12	139.74	2.64	59.60	1.56	21.93	1.03	9.96	0.63	3.89	0.41	1.70	0.29	0.92						
72	3026	4.18	143.35	2.68	61.14	1.58	22.50	1.05	10.21	0.64	3.99	0.41	1.74	0.30	0.94						
73	3068	4.24	147.00	2.71	62.69	1.61	23.06	1.06	10.47	0.65	4.08	0.42	1.79	0.30	0.97						
74	3110	4.30	150.69	2.75	64.26	1.63	23.64	1.07	10.73	0.65	4.19	0.42	1.83	0.31	0.99						
75	3152	4.35	154.43	2.79	65.84	1.65	24.22	1.09	10.99	0.66	4.29	0.43	1.87	0.31	1.01						
76	3194	4.41	158.21	2.82	67.45	1.67	24.81	1.10	11.26	0.67	4.39	0.43	1.92	0.31	1.04						
77	3236	4.47	162.03	2.86	69.07	1.69	25.40	1.12	11.52	0.68	4.50	0.44	1.96	0.32	1.06						
78	3278	4.53	165.69	2.90	70.71	1.72	26.00	1.13	11.79	0.69	4.60	0.45	2.01	0.32	1.09						
79	3320	4.59	169.79	2.94	72.36	1.74	26.61	1.15	12.07	0.70	4.71	0.45	2.06	0.33	1.11						
80	3362	4.64	173.74	2.97	74.04	1.76	27.22	1.16	12.35	0.71	4.81	0.46	2.10	0.33	1.14						
81	3404	4.70	177.73	3.01	75.73	1.78	27.84	1.18	12.63	0.72	4.92	0.46	2.15	0.33	1.16						
82	3446	4.76	181.76	3.05	77.44	1.80	28.46	1.19	12.91	0.73	5.03	0.47	2.20	0.34	1.19						

Medium: Water 1 mbar/m = 100 Pa/m Heating, max.: 1 m/s Plumbing, max.: 3 m/s,

Pressure loss table of PEX/AL/PEX pipe, water temperature = 70°C

Power (kW)	Flow (l/h)	14×2.0		16×2.0		18×2.0		20×2.0		25×2.5		26x3.0		40x4.0		50x4.5		63x6.0		75x7.5		
		Speed (m/s)	ΔP (mbar/m)																			
83	3488	4.82	195.83	3.08	79.17	1.82	29.10	1.20	13.19	0.73	5.14	0.47	2.25	0.34	1.21							
84	3530	4.88	189.94	3.12	80.91	1.85	29.73	1.22	13.48	0.74	5.26	0.48	2.30	0.35	1.24							
85	3572	4.94	194.10	3.16	82.67	1.87	30.38	1.23	13.77	0.75	5.37	0.49	2.34	0.35	1.27							
86	3614	4.99	198.30	3.20	84.45	1.89	31.03	1.25	14.07	0.76	5.48	0.49	2.39	0.36	1.29							
87	3656	5.23	86.25	1.91	31.69	1.26	14.36	0.77	5.60	0.50	2.44	0.36	1.32									
88	3698	5.27	88.06	1.93	32.35	1.28	14.66	0.78	5.71	0.50	2.50	0.36	1.35									
89	3740	5.34	89.89	1.96	33.02	1.29	14.97	0.79	5.83	0.51	2.55	0.37	1.38									
90	3782	5.34	91.74	1.98	33.70	1.31	15.27															

Pressure loss table of PEX/AL/PEX pipe, water temperature = 70°C																				
	14x2.0		16x2.0		18x2.0		20x2.0		25x2.5		26x3.0		40x4.0		50x4.5		63x6.0		75x7.5	
Power (kW)	Flow (l/h)	Speed (m/s)	ΔP (mbar/m)																	
124	5211							4.61	164.86	2.73	60.35	1.80	27.30	1.10	10.61	0.71	4.62	0.51	2.49	
125	5253							4.64	167.30	2.75	61.24	1.81	27.70	1.11	10.76	0.71	4.69	0.52	2.53	
126	5295							4.68	169.77	2.77	62.14	1.83	28.11	1.11	10.92	0.72	4.76	0.52	2.56	
127	5337							4.72	172.25	2.79	63.04	1.84	28.51	1.12	11.08	0.73	4.83	0.52	2.60	
128	5379							4.76	174.75	2.81	63.95	1.86	28.92	1.13	11.23	0.73	4.89	0.53	2.64	
129	5421							4.79	177.26	2.84	64.87	1.87	29.33	1.14	11.39	0.74	4.96	0.53	2.68	
130	5463							4.83	179.79	2.86	65.79	1.89	29.75	1.15	11.55	0.74	5.03	0.54	2.71	
131	5505							4.87	182.34	2.88	66.72	1.90	30.17	1.16	11.72	0.75	5.10	0.54	2.75	
132	5547							4.90	184.90	2.90	67.65	1.92	30.59	1.17	11.88	0.75	5.17	0.54	2.79	
133	5589							4.94	187.49	2.92	68.59	1.93	31.01	1.18	12.04	0.76	5.25	0.55	2.83	
134	5631							4.98	190.08	2.95	69.54	1.95	31.44	1.18	12.21	0.77	5.32	0.55	2.87	
135	5673							2.97	70.49	1.96	31.87	1.19	12.37	0.77	5.39	0.56	2.90			
136	5715							2.99	71.45	1.97	32.30	1.20	12.54	0.78	5.46	0.56	2.94			
137	5758							3.01	72.41	1.99	32.73	1.21	12.71	0.78	5.53	0.57	2.98			
138	5800							3.03	73.38	2.00	33.17	1.22	12.88	0.79	5.61	0.57	3.02			
139	5842							3.06	74.36	2.01	33.61	1.23	13.05	0.79	5.68	0.57	3.06			
140	5884							3.08	75.34	2.03	34.05	1.24	13.22	0.80	5.75	0.58	3.10			
141	5926							3.10	76.33	2.05	34.49	1.25	13.39	0.81	5.83	0.58	3.14			
142	5968							3.12	77.32	2.06	34.94	1.26	13.56	0.81	5.90	0.59	3.18			
143	6010							3.14	78.32	2.07	35.39	1.26	13.73	0.82	5.98	0.59	3.22			
144	6052							3.17	79.33	2.09	35.84	1.27	13.91	0.82	6.05	0.59	3.26			
145	6094							3.19	80.34	2.10	36.30	1.28	14.08	0.83	6.13	0.60	3.30			
146	6136							3.21	81.36	2.12	36.75	1.29	14.26	0.83	6.21	0.60	3.34			
147	6178							3.23	82.38	2.13	37.21	1.30	14.44	0.84	6.28	0.61	3.38			
148	6220							3.25	83.41	2.15	37.66	1.31	14.62	0.85	6.36	0.61	3.43			
149	6262							3.28	84.44	2.16	38.14	1.32	14.80	0.85	6.44	0.62	3.47			
150	6304							3.30	85.48	2.18	38.61	1.33	14.98	0.86	6.52	0.62	3.51			
151	6346							3.32	86.53	2.19	39.08	1.34	15.16	0.86	6.60	0.62	3.55			
152	6388							3.34	87.56	2.21	39.56	1.34	15.34	0.87	6.68	0.63	3.60			
153	6430							3.36	88.64	2.22	40.03	1.35	15.53	0.87	6.76	0.63	3.64			
154	6472							3.39	89.71	2.24	40.51	1.36	15.71	0.88	6.84	0.64	3.68			
155	6514							3.41	90.78	2.25	40.99	1.37	15.90	0.89	6.92	0.64	3.73			
156	6556							3.43	91.85	2.26	41.48	1.38	16.08	0.89	7.00	0.64	3.77			
157	6598							3.45	92.94	2.28	41.96	1.39	16.27	0.90	7.08	0.65	3.81			
158	6640							3.47	94.03	2.29	42.45	1.40	16.46	0.90	7.16	0.65	3.85			
159	6682							3.50	95.12	2.31	42.94	1.41	16.65	0.91	7.24	0.66	3.90			
160	6724							3.52	96.22	2.32	43.44	1.41	16.84	0.91	7.33	0.66	3.94			
161	6766							3.54	97.33	2.34	43.94	1.42	17.03	0.92	7.41	0.66	3.99			
162	6808							3.56	98.44	2.35	44.44	1.43	17.23	0.93	7.49	0.67	4.03			
163	6850							3.58	99.56	2.37	44.94	1.44	17.42	0.93	7.58	0.67	4.08			
164	6892							3.61	100.68	2.38	45.44	1.45	17.62	0.94	7.66	0.68	4.12			

Pressure loss table of PEX/AL/PEX pipe, water temperature = 70°C																					
		14×2.0		16×2.0		18×2.0		20×2.0		25×2.5		26×3.0		40×4.0		50×4.5		63×6.0		75×7.5	
Power (kW)	Flow (l/h)	Speed (m/s)	ΔP (mbar/m)																		
165	6934									3.63	101.81	2.40	45.95	1.46	17.81	0.94	7.75	0.68	4.17		
166	6976									3.65	102.94	2.41	46.46	1.47	18.01	0.95	7.83	0.69	4.22		
167	7018									3.67	104.09	2.42	46.97	1.48	18.21	0.95	7.92	0.69	4.26		
168	7060									3.69	105.23	2.44	47.49	1.49	18.41	0.96	8.00	0.69	4.31		
169	7102									3.72	106.39	2.45	48.01	1.49	18.61	0.97	8.09	0.70	4.35		
170	7144									3.74	107.54	2.47	48.53	1.50	18.81	0.97	8.18	0.70	4.40		
171	7186									3.76	108.71	2.48	49.05	1.51	19.01	0.98	8.26	0.71	4.45		
172	7228									3.78	109.88	2.50	49.58	1.52	19.21	0.98	8.35	0.71	4.50		
173	7270									3.80	111.06	2.51	50.11	1.53	19.41	0.99	8.44	0.71	4.54		
174	7312									3.83	112.24	2.53	50.64	1.54	19.62	0.99	8.53	0.72	4.59		
175	7354									3.85	113.43	2.54	51.17	1.55	19.83	1.00	8.62	0.72	4.64		
176	7397									3.87	114.62	2.55	51.71	1.56	20.03	1.01	8.71	0.73	4.68		
177	7439									3.89	115.82	2.57	52.25	1.57	20.24	1.01	8.80	0.73	4.73		
178	7481									3.91	117.03	2.58	52.79	1.57	20.45	1.02	8.89	0.73	4.78		
179	7523									3.94	118.24	2.60	53.33	1.58	20.66	1.02	8.98	0.74	4.83		
180	7565									3.96	119.46	2.61	53.88	1.59	20.87	1.03	9.07	0.74	4.88		
181	7607									3.98	120.68	2.63	54.43	1.60	21.08	1.03	9.16	0.75	4.93		
182	7649									4.00	121.91	2.64	54.98	1.61	21.29	1.04	9.25	0.75	4.98		
183	7691									4.02	123.14	2.66	55.54	1.62	21.51	1.05	9.35	0.76	5.03		
184	7733									4.05	124.38	2.67	56.09	1.63	21.72	1.05	9.44	0.76	5.08		
185	7775									4.07	125.63	2.69	56.65	1.64	21.94	1.06	9.53	0.76	5.13		
186	7817									4.09	126.88	2.70	57.21	1.64	22.15	1.06	9.63	0.77	5.18		
187	7859									4.11	128.14	2.71	57.78	1.65	22.37	1.07	9.72	0.77	5.23		
188	7901									4.13	129.40	2.73	58.35	1.66	22.59	1.07	9.82	0.78	5.28		
189	7943									4.16	130.67	2.74	58.92	1.67	22.81	1.08	9.91	0.78	5.33		
190	7985									4.18	131.95	2.76	59.49	1.68	23.03	1.09	10.01	0.78	5.38		
191	8027									4.20	133.23	2.77	60.06	1.69	23.25	1.09	10.10	0.79	5.43		
192	8069									4.22	134.52	2.79	60.64	1.70	23.48	1.10	10.20	0.79	5.49		
193	8111									4.24	135.81	2.80	61.22	1.71	23.70	1.10	10.29	0.80	5.54		
194	8153									4.27	137.11	2.82	61.81	1.72	23.92	1.11	10.39	0.80	5.59		
195	8195									4.29	138.41	2.83	62.39	1.72	24.15	1.11	10.49	0.81	5.64		
196	8237									4.31	139.72	2.84	62.98	1.73	24.38	1.12	10.59	0.81	5.69		
197	8279									4.33	141.04	2.86	63.57	1.74	24.60	1.13	10.69	0.81	5.75		
198	8321									4.35	142.36	2.87	64.16	1.75	24.83	1.13	10.78	0.82	5.80		
199	8363									4.38	143.69	2.89	64.76	1.76	25.06	1.14	10.88	0.82	5.85		
200	8405									4.40	145.02	2.90	65.36	1.77	25.29	1.14	10.98	0.83	5.91		
201	8447									4.42	146.36	2.92	65.96	1.78	25.52	1.15	11.08	0.83	5.96		
202	8489									4.44	147.70	2.93	66.56	1.79	25.76	1.15	11.18	0.83	6.01		
203	8531									4.46	149.06	2.95	67.17	1.79	25.99	1.16	11.28	0.84	6.07		
204	8573									4.49	150.41	2.96	67.78	1.80	26.22	1.17	11.38	0.84	6.12		
205	8615									4.51	151.77	2.98	68.39	1.81	26.46	1.17	11.49	0.85	6.18		

Medium: Water; 1 mbar/m = 100 Pa/m³ Heating, max.: 1 m/s Plumbing, max.: 3 m/s.

Medium: Water, 1 mbar/m = 100 Pa/m³ Heating, max.: 1 m/s Plumbing, max.: 3 m/s.

Medium: Water; 1 mbar/m = 100 Pa/m; Heating max.: 1 m/s; Plumbing max.: 3 m/s

Pressure loss table of PEX/AL/PEX pipe, water temperature = 35°C																					
	14×2.0		16×2.0		18×2.0		20×2.0		25×2.5		26x3.0		40x4.0		50x4.5		63x6.0		75x7.5		
Power (kW)	Flow (l/h)	Speed (m/s)	ΔP (mbar/m)																		
1	171	0.60	5.91	0.42	3.00	0.31	1.69	0.24	1.03	0.15	0.45	0.09	0.17	0.06	0.08	0.04	0.03	0.02	0.01	0.02	0.01
2	342	1.21	19.79	0.84	9.98	0.62	5.61	0.47	3.40	0.30	1.48	0.18	0.56	0.12	0.26	0.07	0.10	0.05	0.03	0.03	0.03
3	513	1.81	40.39	1.26	20.34	0.93	11.39	0.71	6.90	0.45	2.99	0.27	1.12	0.18	0.52	0.11	0.21	0.07	0.09	0.05	0.05
4	684	2.42	67.20	1.66	33.79	1.23	18.90	0.94	11.44	0.60	4.95	0.36	1.85	0.24	0.65	0.14	0.34	0.09	0.15	0.07	0.08
5	855	3.02	99.92	2.10	50.17	1.54	28.05	1.18	16.95	0.76	7.32	0.45	2.73	0.30	1.25	0.18	0.50	0.12	0.22	0.08	0.12
6	1026	3.63	136.31	2.52	69.39	1.85	38.75	1.42	23.41	0.91	10.10	0.54	3.76	0.35	1.73	0.22	0.68	0.14	0.30	0.10	0.16
7	1197	4.23	218.22	2.94	91.34	2.16	50.98	1.65	30.78	1.06	13.26	0.63	4.94	0.41	2.26	0.25	0.89	0.16	0.39	0.12	0.21
8	1368	4.84	231.49	3.36	115.96	2.47	64.68	1.89	39.03	1.21	16.80	0.72	6.25	0.47	2.86	0.29	1.13	0.19	0.50	0.13	0.27
9	1538		3.76	143.19	2.78	79.83	2.13	48.15	1.36	20.71	0.80	7.69	0.53	3.52	0.32	1.39	0.21	0.61	0.15	0.33	
10	1709		4.20	172.98	3.08	96.39	2.36	58.12	1.51	24.98	0.89	9.77	0.59	4.24	0.36	1.67	0.23	0.73	0.17	0.40	
11	1880		4.62	205.30	3.39	114.35	2.60	68.92	1.66	29.60	0.98	10.98	0.65	5.02	0.40	1.97	0.26	0.87	0.18	0.47	
12	2051																				
13	2222																				
14	2393																				
15	2564																				
16	2735																				
17	2906																				
18	3077																				
19	3248																				
20	3419																				
21	3590																				
22	3761																				
23	3932																				
24	4103																				
25	4274																				
26	4445																				
27	4615																				
28	4786																				
29	4957																				
30	5128																				
31	5299																				
32	5470																				
33	5641																				
34	5812																				
35	5983																				
36	6154																				
37	6325																				
38	6496																				
39	6667																				
40	6838																				
41	7009																				
42	7180																				
43	7351																				
44	7522																				
45	7693																				
46	7864																				
47	8035																				
48	8206																				
49	8377																				
50	8548																				
51	8719																				
52	8890																				
53	9061																				
54	9232																				
55	9403																				
56	9574																				
57	9745																				
58	9916																				
59	10087																				
60	10258																				
61	10429																				
62	10600																				
63	10771																				
64	10942																				
65	11113																				
66	11284																				
67	11455																				
68	11626																				
69	11797																				
70	11968																				
71	12139																				
72	12310																				
73	12481																				
74	12652																				
75	12823																				
76	13004																				
77	13175																				
78	13346																				
79	13517																				
80	13688																				
81	13859																				
82	14030																				
83	14201																				
84	14372																				
85	14543																				
86	14714																				
87	14885																				
88	15056																				
89	15227																				
90	15398																				
91	15569																				
92	15740																				
93	15911																				
94	16082																				
95	16253																				
96	16424																				
97	16595																				
98	16766																				
99	16937																				
100	17108					</td															

Medium: Water; 1 mbar/m = 100 Pa/m; Heating, max.: 1 m/s; Plumbing, max.: 3 m/s.

Pressure loss table of PEX/AL/PEX pipe, water temperature = 35°C																					
		14x2.0		16x2.0		18x2.0		20x2.0		25x2.5		26x3.0		40x4.0		50x4.5		63x6.0		75x7.5	
Power (kW)	Flow (l/s)	Speed (m/s)	ΔP (mbar/m)																		
46	7863																				
47	8034																				
48	8205																				
49	8376																				
50	8547																				
51	8718																				
52	8889																				
53	9060																				
54	9231																				
55	9402																				
56	9573																				
57	9744																				
58	9915																				
59	10086																				
60	10257																				
61	10428																				
62	10598																				
63	10769																				
64	10940																				
65	11111																				
66	11282																				
67	11453																				
68	11624																				
69	11795																				
70	11966																				
71	12137																				
72	12308																				
73	12479																				
74	12650																				
75	12821																				
76	12992																				
77	13163																				
78	13334																				
79	13505																				
80	13675																				
81	13846																				
82	14017																				
83	14188																				
84	14359																				
85	14530																				
86	14701																				
87	14872																				
88	15043																				
89	15214																				
90	15385																				

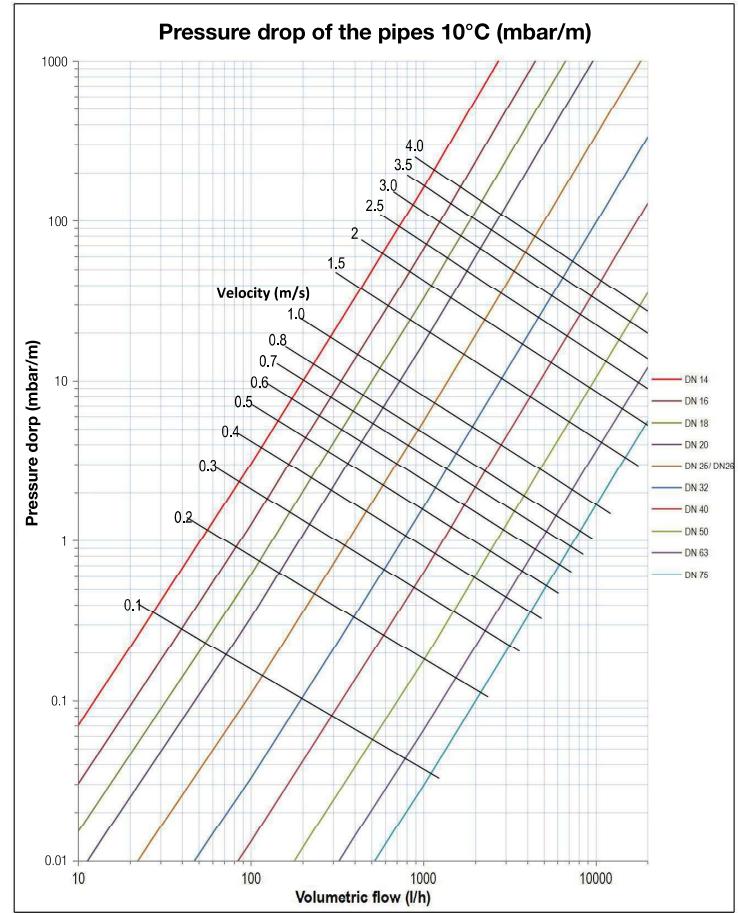
Medium: Water 1 mbar/m = 100 Pa/m² Heating, max. 1 m/s Plumbing, max. 3 m/s.

Pressure loss table of PEX/AL/PEX pipe, water temperature = 35°C																					
		14x2.0		16x2.0		18x2.0		20x2.0		25x2.5		26x3.0		40x4.0		50x4.5		63x6.0		75x7.5	
Power (kW)	Flow (l/s)	Speed (m/s)	ΔP (mbar/m)																		
91	15566																				
92	15727																				
93	15988																				
94	16069																				
95	16240																				
96	16411																				
97	16582																				
98	16752																				
99	16923																				
100	17094																				
101	17265																				
102	17436																				
103	17607																				
104	17778																				
105	17949																				
106	18120																				
107	18291																				
108	18462																				
109	18633																				
110	18804																				
111	18975																				
112	19146																				
113	19317																				
114	19488																				
115	19658																				
116	19829																				
117	20000																				
118	20171																				
119	20342																				
120	20513																				
121	20684																				
122	20855																				
123	21026																				
124	21197																				
125	21368																				
126	21539																				
127	21710																				
128	21881																				
129	22052																				
130	22223																				
131	22394																				
132	22565																				
133	22735																				
134	22906																				
135	23077																				

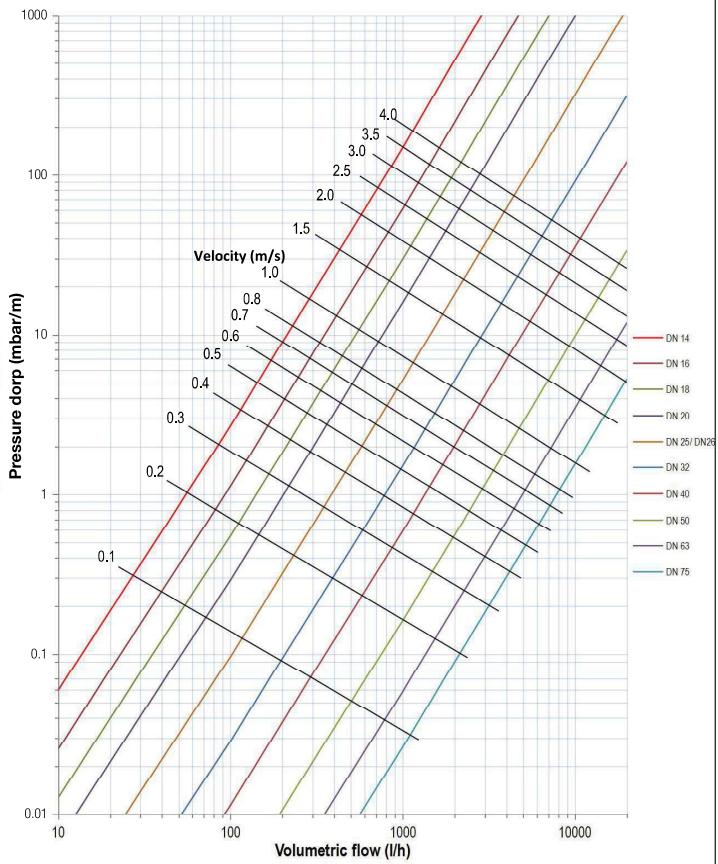
Medium: Water 1 mbar/m = 100 Pa/m² Heating, max. 1 m/s Plumbing, max. 3 m/s.

Pressure loss table of PEX/AL/PEX pipe, water temperature = 35°C																					
		14x2.0		16x2.0		18x2.0		20x2.0		25x2.5		26x3.0		40x4.0		50x4.5		63x6.0		75x7.5	
Power (kW)	Flow (l/h)	Speed (m/s)	ΔP (mbar/m)																		
136	23248																				
137	23419																				
138	23590																				
139	23761																				
140	23932																				
141	24103																				
142	24274																				
143	24445																				
144	24616																				
145	24787																				
146	24958																				
147	25129																				
148	25300																				
149	25471																				
150	25642																				
151	25812																				
152	25983																				
153	26154																				
154	26325																				
155	26496																				
156	26667																				
157	26838																				
158	27009																				
159	27180																				
160	27351																				
161	27522																				
162	27693																				
163	27864																				
164	28035																				
165	28206																				
166	28377																				
167	28548																				
168	28718																				
169	28889																				
170	29060																				
171	29231																				
172	29402																				
173	29573																				
174	29744																				
175	29915																				
176	30086																				
177	30257																				
178	30428																				

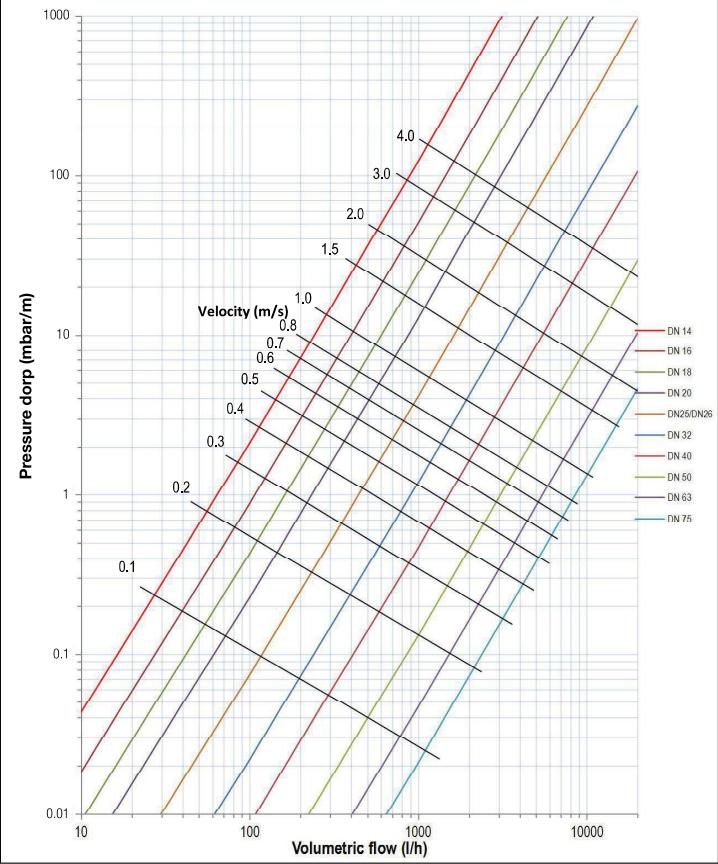
Medium: Water 1 mbar/m = 100 Pa/m Heating, max.: 1 m/s Plumbing, max.: 3 m/s



Pressure drop of the pipes 35°C (mbar/m)

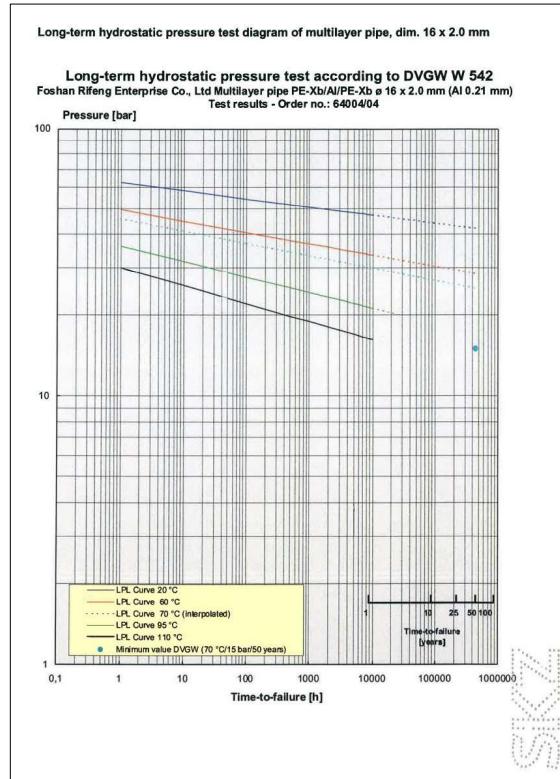


Pressure drop of the pipes 70°C (mbar/m)



6.1.7 Multilayer plumbing system

The service life of the multilayer pipe is determined by the temperature and the pressure at which the water is transported through the pipe. To simulate the working life, there are specific tests conducted by specialized test centers. The below diagram shows the result of such a test, performed by SKZ (das Kunststoff-Zentrum) in Germany in order to obtain the German DVGW (Deutsche Vereinigung des Gas- und Wasserfaches) certification.



6.1.8 Preinsulated pipes

The RIIFO preinsulated multilayer pipes consist of multilayer pipes foreseen with an insulating layer. The insulating layer consists of round extruded polyethylene foam with a closed cell structure. The polyethylene foam has a sturdy foil coating of vapour tight polyethylene coloured in red or blue. This outer layer protects the foam against possible damage.

Compared to pipes insulated on site, the pipes preinsulated in the factory are time and cost saving; they ensure a much quicker installation. Moreover, the good thermal insulation properties allow smaller outside pipe diameters.

Standard thicknesses of the insulating layers are 6, 8, 9, 10 and 13 mm. Thicker insulation is available on request. The preinsulated pipes are supplied in coils.



Advantages:

- Excellent insulation properties
- Prevents condensation
- Accommodates the expansion of the inner pipe
- Protects the inner pipe
- Prevents sound transmission
- Colour coded for hot and cold water
- Up to diameter 32



Properties:

Thermal conductivity :	0.040 W/mK at +40°C, 0.036 W/mK at +10°C
Sound reduction - DIN 52218 :	Up to 23 dB(A)
Water vapour diffusion resistance :	6315 mu
Temperature resistance :	-40°C to +100°C
Fire classification - EN 13501:	CL-s1-d0
Thickness :	6, 9, 13 mm - 20 mm and thicker on demand
Colours PE-shield :	Red and blue - grey or other colours on demand



6.1.9 Pipes with corrugated conduit

The RIIFO corrugator or ribbed conduit is made out of high density polyethylene. The corrugator is at the same time flexible (axially) and rigid (radially). The corrugator is designed to protect the multilayer pipe against external mechanical damage. The layer of air in between the corrugator and medium pipe has an insulating effect and gives the inner pipe the possibility to expand when necessary. Multilayer pipes with corrugator are also called pipe in pipe installations: they reduce the potential risk of water damages and allow in some cases to replace the medium pipe. At penetration points in floors or walls, we recommend to protect multilayer pipes via a corrugator or via insulation. The corrugators are available in different colours. The dimensions of the corrugators are as follows (ID/OD): 20/25, 23/28, 30/34 and 38/44. They can protect multilayer composite pipes up to diameter 32. The corrugated pipes are supplied in coils.

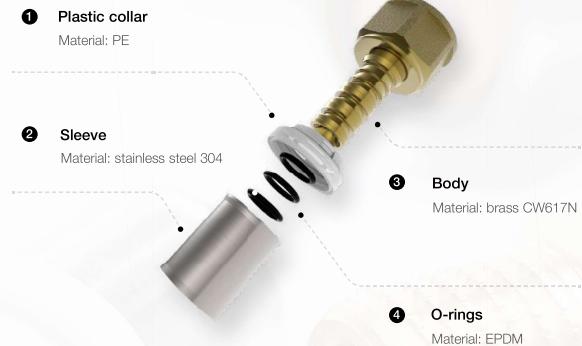
Advantages:

- Protects the inner pipe against mechanical damage
- Flexible (axially) and rigid (radially)
- Accommodates the expansion of the inner pipe
- Insulating effect
- Allows in cases to replace the medium pipe
- Colour coded for hot and cold water
- Up to diameter 32



6.2 Multiprofile press fittings - F18

6.2.1 Composition



6.2.2 Advantages

- | | | | |
|--|---|--|---|
| | TH - U - B - H - RFZ
pressing profiles | | The fitting is LBP and can still be adjusted after pressing |
| | Leak before press (LBP) | | Three O-rings for excellent sealing performance |

For multilayer pipes, PE-X and PE-RT pipes: diameters 12 to 75mm

6.2.3 Pressure Loss

F18 multiprofile press fittings												
Outside diameter [mm]	Ø 12	Ø 14	Ø 16	Ø 18	Ø 20	Ø 25	Ø 26	Ø 32	Ø 40	Ø 50	Ø 63	Ø 75
Zeta values ζ /Equivalent Pipe length eL [m]	ζ	eL										
Press elbow 90°	1.20	0.6	1.07	0.71	1.08	0.9	1.08	1.00	1.08	1.06	1.41	0.97
Equal straight union	—	0.76	0.38	0.62	0.41	0.62	0.52	—	0.54	0.58	0.56	0.73
Straight at flow speed	—	0.80	1.71	0.66	1.57	0.67	1.58	0.67	1.58	0.59	1.50	0.65
Branch at flow speed	—	0.40	0.86	0.44	1.05	0.56	1.32	0.56	1.32	0.63	1.62	0.87
Equal tee "Y" type	—	—	—	1.19	0.79	1.20	1.00	1.20	1.00	—	—	—
	2.00	0.93	2.31	1.08	0.90	1.08	0.90	1.20	0.6	—	0.76	0.38

6.3 Push fittings - F6

6.3.1 Composition



6.3.2 Advantages

- | | | | |
|--|--|--|---|
| | ASSURANCE
Visual confirmation via green indicator | | QUALITY
High-quality materials ensure excellent performance and a long service life |
| | HYGIENE
Fittings tested to safe drinking water standards AS/NZS 4020 | | SECURITY
2 seal rings, stainless grabrings and sleeves provide security |
| | EASE OF INSTALLATION
Fast and easy, no special tools needed | | DESIGN
Slim and sleek design for easy use |

For multilayer pipes, PE-X and PE-RT pipes: diameters 16 to 32mm



6.4 Compression fittings - F1

6.4.1 Composition

① **Compression ring**
Material: brass CW617N

② **Body**
Material: brass CW617N

③ **Nut**
Material: brass CW617N

④ **Spacer ring**
Material: PE

⑤ **O ring**
Material: EPDM

6.4.2 Advantages



Reusable



Excellent sealing performance
with double O-rings



Ease and security of installation

For multilayer pipes, PE-X and PE-RT pipes: diameters 12 to 32mm

6.4.3 Pressure loss

Outside diameter [mm]	Ø 12		Ø 16		Ø 20		Ø 26		Ø 32		
Zeta values ζ -equivalent Pipe length el. [m]	ζ	el.									
Press elbow 90°		-	-	1.20	0.60	1.07	0.71	1.08	0.90	1.00	1.08
Equal straight union		1.16	0.43	0.76	0.38	0.62	0.41	0.62	0.52	0.54	0.58
Straight at flow speed		-	-	0.80	0.40	0.66	0.44	0.67	0.56	0.59	0.63
Branch at flow speed		-	-	1.71	0.86	1.57	1.05	1.58	1.32	1.50	1.62

6.4.4 Eurocone connections

RIFO offers a selection of $\frac{3}{4}$ " eurocone fittings and $\frac{3}{4}$ " eurocone adapters for sanitary and heating or cooling applications.

The range of $\frac{3}{4}$ " eurocone fittings consists of T-pieces, bends and straight pieces.



The eurocone compression adapters (metal conus, split ring and nut) can be used to connect multilayer pipes to eurocone fittings and manifolds.



Different pipe diameters can be connected since the eurocone adapters are available in diameters 12 to 20. The eurocone fittings and adapters offer a very flexible solution. If you combine for example a straight eurocone fitting with a eurocone adapter of diameter 14 and 16, you create a straight reduction fitting. If you combine a straight eurocone fitting with a eurocone adapter of diameter 16 for multilayer pipe and a eurocone diameter 15 for copper, you create a transition fitting from multilayer 16 to copper 15. The connections can be processed with conventional tools. Not only manifolds for heating and sanitary but also radiator blocks often need to be connected via eurocone adapters.

6.5 Transition fittings

RIIFO offers a range of press and compression fittings or a combination of both to make the transition from a copper or metal system to a multilayer system.

Important in this context: if a fitting has a compression connection on the one side and a press connection on the other side, the compression side should be mounted first.

Press-fit adapter with copper pipe



Article Number	Specification
1100052138	16x10Cu
1100052139	16x12Cu
1100052140	16x15Cu
1100052141	20x18Cu
1100052142	20x22Cu
1100052143	26x22Cu
1100052144	26x28Cu
1100052145	32x28Cu

The copper pipe is suitable for pressing and compression only. No soldering!

Press-fit adapter to copper compression



Article Number	Specification
1100045780	16x15Cu
1100045781	20x22Cu
1100045782	26x22Cu

Press-fit adapter to copper press V/M/SA



Article Number	Specification
1100055638	16 x 12Cu V/M/SA
1100055639	16 x 15Cu V/M/SA
1100055640	20 x 15Cu V/M/SA
1100055641	20 x 22Cu V/M/SA
1100055642	26 x 22Cu V/M/SA
1100055643	32 x 28Cu V/M/SA

Elbow press-fit adapter to copper pipe, plated



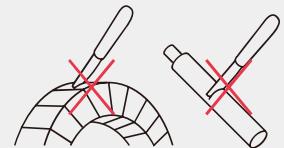
Article Number	Specification
1100058983	16x12Cu - 200 mm
1100052131	16x15Cu - 200 mm

6.6 Assembly guidelines – how to make a connection

6.6.1 Preparation of the pipe

Removing the packaging

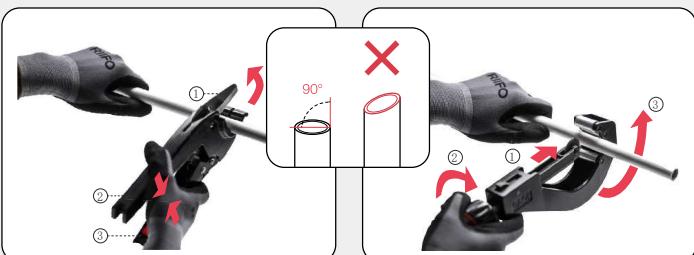
- Do not damage the pipe when removing the packaging.
- Never cut towards the pipe. Also when opening pre-insulated pipes, do not cut into the insulation!



Step 1. Cutting the pipe

- Make sure the end of the pipe is cut vertically.
- Starting from diameter 32 and bigger, circumferential or wheel pipe cutters are recommended.

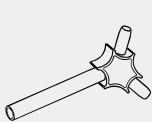
NOTICE!



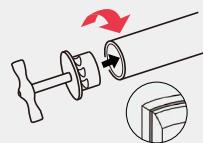
Incorrect cutting causes leakage of pipes.

Step 2. Calibrating and beveling

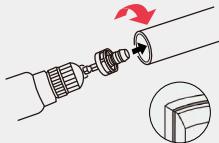
- Round and bevel the pipe ends with chamfering or beveling tools made for this purpose.
The tools are equipped with calibrating mandrels and beveling blades.
- Always make sure the diameter of the tool corresponds with the diameter of the pipe.
- All tools should be used by pushing them fully until the beveling blades into the pipe and turning them several times clockwise. The calibration mandrel will make the pipes round again, the blades will bevel the pipe end.
- Tools for (cordless) drills can only be used up to max. 500 rpm.
- Starting from diameter 40 and bigger, T-reamers are recommended.



Plastic star reamer



Metal T-reamer



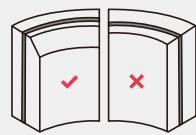
Metal beveling insert for cordless drill / screwdriver

Step 3. Visual inspection

Visual inspection of the pipe to check for damages or impurities and to ensure the pipe is beveled all around.



Visual inspection



Correctly beveled (OK) vs badly beveled (not OK)

6.6.2 Making a press connection

Step 1. Prepare the pipe

- Prepare the multilayer pipe: cut perpendicularly, calibrate and bevel the pipe. Refer to 6.6.1.



Visual inspection windows to confirm the proper insertion depth

Step 2. Insert the pipe up to the fitting shoulder

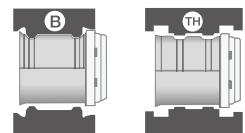
- Take a press fitting of the corresponding diameter.
- Bring the fitting in line with the pipe.
- Insert the fitting into the pipe, up to the fitting shoulder.
- Check the correct insertion depth which is indicated by the appearance of the pipe in the inspection windows.

Step 3. Select the correct press jaw

- Select the press jaw with the correct profile and diameter, then mount them in the pressing tool. It must be ensured that the pressing tools and jaws used are in a technically perfect condition.
- RIIFO press fittings are multijaw or multiprofile: they can be pressed with different profiles like TH, H, U or B. Open the jaw and position the jaw correctly on the stainless steel sleeve of the fitting.
- Important: the TH and B profile jaws are placed in a different way onto the press sleeve compared to the U and H profile press!

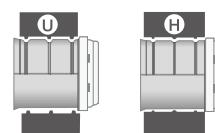
Positioning the TH or B profile jaw onto the fitting sleeve

Open and position the jaw. One wide rill of the press jaw is positioned onto the plastic fixing ring. Close the press jaw and start the pressing procedure.



Positioning the U profile jaw or H profile jaw onto the fitting sleeve

Open and position the jaw. The U/H press jaw fits exactly on the metal press sleeve and falls between the collar of the press sleeve and the fixing ring. Always use the edge of the fixing ring as an end stop for positioning of the press jaw on the press sleeve.



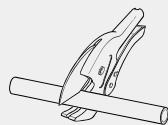
Step 4. Press the fitting onto the pipe

- Important! Pipe and fitting should be completely free of stress when making a connection.
- Once the tool is positioned correctly i.e. perpendicularly on the sleeve, close the press jaw and start the pressing process.
- The pressing process is finished when the press jaw is completely closed.
- The pressing process may only be carried out once!
- When using a battery or electrical (230V) press tool, you operate the device by keeping the switch pressed until the pressing cycle is finished. Once the cycle has ended, the jaw has been completely closed. Most machines will give a signal at the end of the pressing cycle.
- When using manual pressing tools (14 – 32 mm), close the handles in one flowing movement until the two touch points on the handles touch each other. Do not release the handles before the jaw is fully closed.
- Once the pressing process is finalized, open the press jaw again and lift the pressing tool from the connection.

6.6.3 Making a push connection

Step 1. Prepare the pipe

- Prepare the multilayer pipe: cut perpendicularly, calibrate and bevel the pipe. Refer to 6.6.1.



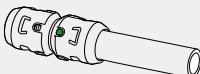
Step 2. Prepare the fitting

- Take a push fitting of the corresponding diameter, remove the protection cap.
- Make sure the pipe and fitting are clean and free of dirt and debris before making a connection.



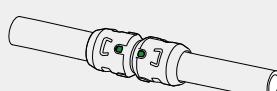
Step 3. Connect the fitting

- Bring the fitting in line with the pipe.
- Push the fitting firmly onto the pipe.
- Pay attention to not insert the pipe at an angle.



Step 4. Check the connection visually

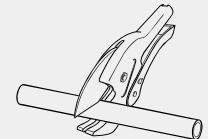
- Check for the green indicator ring. The correct insertion depth is indicated by the appearance of the green indicator ring in the inspection windows.



6.6.4 Making a compression connection

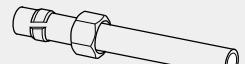
Step 1. Prepare the pipe

- Prepare the multilayer pipe: cut perpendicularly, calibrate and bevel the pipe. Refer to 6.6.1.



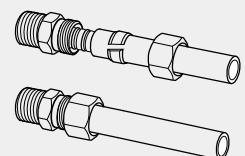
Step 2. Slide the nut and compressing ring over the pipe

- Take a compression fitting of the corresponding diameter.
- Slide the nut over the pipe, followed by compression or clamping ring.



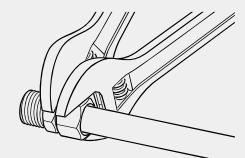
Step 3. Insert the fitting body completely into the pipe

- Bring the fitting body in line with the pipe.
- Insert the fitting body fully into the pipe.



Step 4. Tighten with a wrench

- Tighten the nut with your fingers first.
- Complete the connection by tightening the nut with a wrench.
- Make sure that the fitting is not pulled out of the pipe during tightening.
- The clamping or compression ring can only be used once.



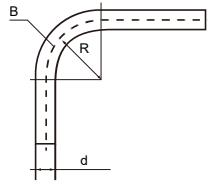
Pipe	Corresponding turning torque in Nm
14x2	40
16x2	50
18x2	55
20x2	60
26x3	75
32x3	100

7 General instructions

7.1 Bending pipes

RIIFO multilayer pipes up to diameter 26 can be bent by hand. For tight radii please use bending springs or bending tools. The minimum bending radii according to the following table must be respected.

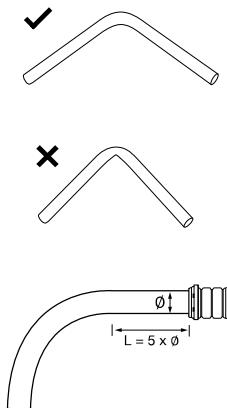
Pipe diameter in mm OD	Minimal bending radii (R) in mm		
	By hand	By spring	By bending tool
12	60 (5xd)	48 (4xd)	
16	80 (5xd)	60 (4xd)	2xd
18	90 (5xd)	72 (4xd)	
20	100 (5xd)	80 (4xd)	3xd
26	130 (5xd)	104 (4xd)	3xd



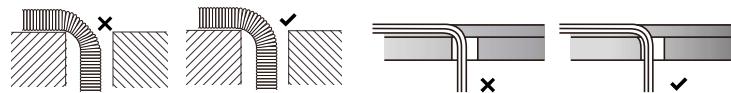
If tighter deflections than the minimum bending radius are needed, please use 90° angle fittings. For the dimensions bigger than diameter 26, RIIFO recommends the use of elbow fittings. For bending larger diameters than 32 RIIFO should always be consulted in advance. The bending process must not result in indentations or deformation on the inside of the pipe bend. The PEX outer layer of the pipes must not be damaged.

Kinks should be avoided at all times. Damaged or improperly processed pipes should never be installed. If a RIIFO pipe is installed and accidentally damaged in any way, the damaged area must be replaced immediately by a well bent pipe or a fitting.

The hot bending of RIIFO multilayer pipes by means of open flames or other heat sources (e.g. soldering flame, heat gun, industrial hair dryer) is not permitted. Repeated bending around the same bending point must be avoided. Very tight bending radii immediately after a connection must be avoided. The distance between a fitting and the beginning of the bend must be at least equal to $5 \times \text{outer diameter}$ of the pipe.



If a situation occurs that a pipe needs to be bent after a fitting has already been pressed onto the pipe, one has to make sure the bend is made without exercising any stress on the fitting.

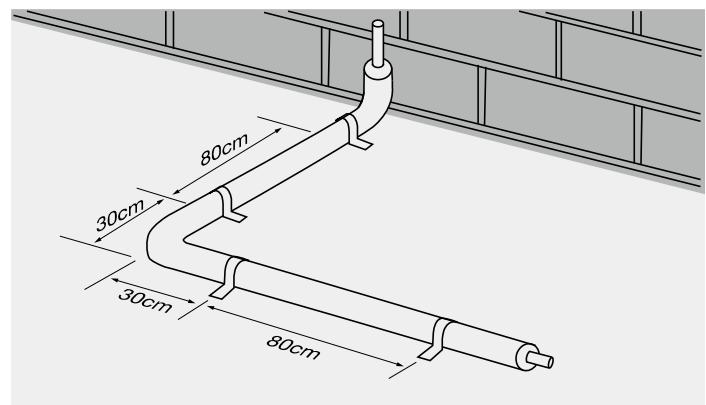


Never bend over sharp edges

Always chamfer edges

7.2 Mounting on bare floors

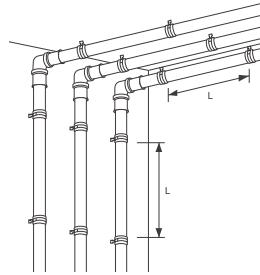
The pipes should be installed as much as possible in straight lines and parallel to each other and the wall. When installing pipes towards manifolds, wall penetrations should be avoided when possible. It is recommended to plan the pipe routing via the existing door openings. This often results in 90° angles. The bend radius of $5 \times \text{the outside diameter}$ must be respected when installing pipes with the appropriate conduit or insulation. When RIIFO multilayer pipes are installed directly on the floor or in the supporting floor, a fastening distance of 80 cm has to be respected. It is recommended to install 30 cm before and after each pipe bend or change of direction, a pipe clamp or fixing device.



7.3 Mounting on walls and ceilings

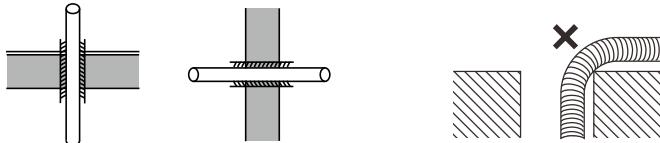
When RIIFO multilayer pipes are installed on surfaces like ceilings and walls, pipe clamps must be used. The pipe clamps are made of plastic or metal and have a rubber inlay or sound insulation layer suitable for contact with plastic. The type and the distance of the pipe brackets depend on the pressure, the temperature and the medium. The design of the pipe clamps has to be carried out accurately taking into account the overall mass (weight of the pipe + weight of the medium + weight of the corrugator / insulation) and observing the approved technical rules. All pipes must be installed so that length change due to thermal influences is not impeded; in this context, please also consult our chapter on linear expansion. The following chart shows the maximal fastening distances between the individual pipe clamps for the different dimensions.

Pipe diameter in mm OD	Maximum distance between pipe clamps (L)	
	Horizontal (m)	Vertical (m)
14	1.20	1.55
16	1.20	1.55
20	1.30	1.70
26	1.50	1.95
32	1.60	2.10
40	1.70	2.20
50	2.00	2.60
63	2.20	2.85
75	2.40	3.10



7.4 Wall and ceiling passages

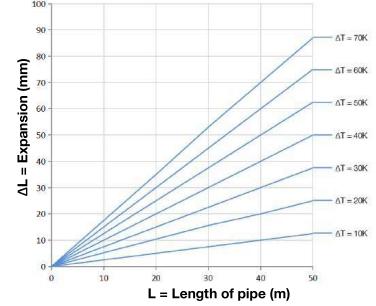
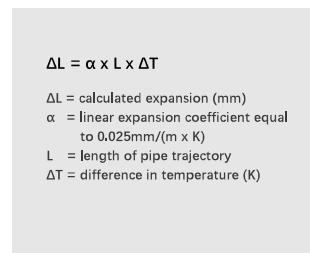
When installing pipes through walls, floors or ceilings, one should avoid direct contact between the bare pipe and the concrete, the bricks or other building materials of which walls and ceilings are made. When pipes are crossing walls or ceilings, the pipes should be foreseen with insulation or corrugated conduit in order to avoid direct contact with the pipe. Sharp edges at passages through walls or ceilings must be absolutely avoided.



7.5 Linear expansion

The thermal changes in length that occur due to changing operating temperatures are primarily dependent on the temperature difference (delta T) and the tube length (L). The linear expansion of RIIFO multilayer pipes must be taken into account in order to avoid excessive stress in the pipe material and potential damage to the connections. This applies for all installation variants, but in particular for freely movable pipes as well as for basement distribution and riser pipes. The coefficient of expansion for the RIIFO multilayer composite pipes is 0.025 mm/mK.

The change in length (Delta L) can be determined by means of a diagram or calculated with the following formula:

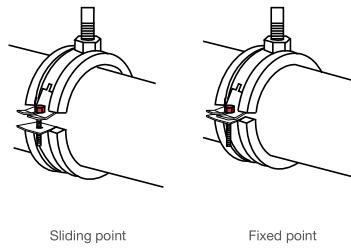


$\frac{\Delta T}{L}$	10	20	30	40	50	60	70	ΔL
0.1	0.025	0.050	0.075	0.100	0.125	0.150	0.175	1.5
0.2	0.050	0.100	0.150	0.200	0.250	0.300	0.350	3.0
0.3	0.075	0.150	0.225	0.300	0.375	0.450	0.525	4.5
0.4	0.100	0.200	0.300	0.400	0.500	0.600	0.700	6.0
0.5	0.125	0.250	0.375	0.500	0.625	0.750	0.875	7.5
0.6	0.150	0.300	0.450	0.600	0.750	0.900	1.050	9.0
0.7	0.175	0.350	0.525	0.700	0.875	1.050	1.225	10.5
0.8	0.200	0.400	0.600	0.800	1.000	1.200	1.400	12.0
0.9	0.225	0.450	0.675	0.900	1.125	1.350	1.575	13.5
1	0.250	0.500	0.750	1.000	1.250	1.500	1.750	15.0
2	0.500	1.000	1.500	2.000	2.500	3.000	3.500	30.0
3	0.750	1.500	2.250	3.000	3.750	4.500	5.250	45.0
4	1.000	2.000	3.000	4.000	5.000	6.000	7.000	60.0
5	1.250	2.500	3.750	5.000	6.250	7.500	8.750	75.0
6	1.500	3.000	4.500	6.000	7.500	9.000	10.500	90.0
7	1.750	3.500	5.250	7.000	8.750	10.500	12.250	105.0
8	2.000	4.000	6.000	8.000	10.000	12.000	14.000	120.0
9	2.250	4.500	6.750	9.000	11.250	13.500	15.750	135.0
10	2.500	5.000	7.500	10.000	12.500	15.000	17.500	150.0

7.6 Compensating linear expansion

7.6.1 Fixed points and sliding points

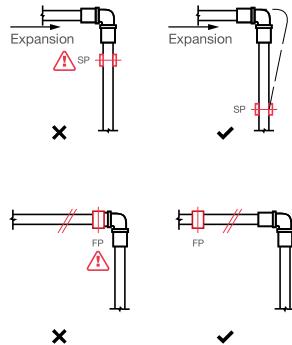
When planning and installing RIIFO multilayer pipes in distribution lines and risers, thermal expansion should always be taken into account. In case of surface-mounted pipes, pipe clamps should support the pipe network and at the same time accommodate temperature related changes in length during operation. Pipe clamps can be used in two ways as fixed points and as sliding points. Sliding points allow axial movements of the pipe. The pipes must be laid in such a way that changes in length are not impeded. Sliding points must be positioned so that they do not become fixed points during operation. Fixed points should never be located on connections or fittings. RIIFO multilayer pipes must not be installed rigidly between two fixed points; the change in length of the pipes must always be absorbed or directed. Expansion loops (also known as Lyra or mega bends) must be foreseen in long piping tracts where there is no change of direction.



It must be ensured that pipes in wall and floor openings can also expand. This can be achieved by a favourable positioning of the risers in the shaft, by a correspondingly large supply line, e.g. for the pipe branching off at the floor, or by installing an expansion bend.

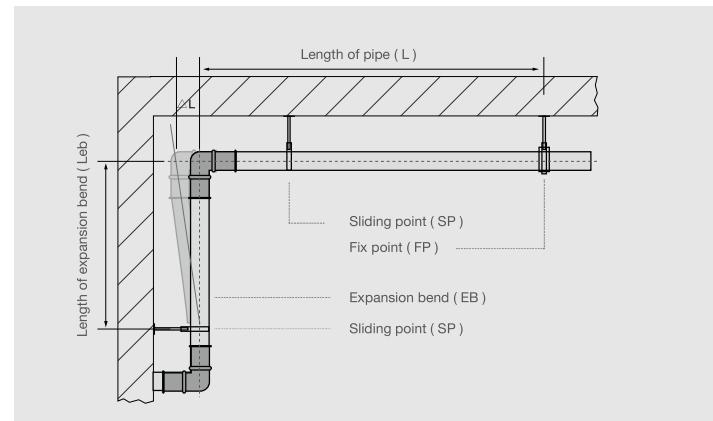
Sliding points must be positioned so that they do not become fixed points during operation.

Fixed points should never be located on connections or fittings.



7.6.2 Expansion bends and expansion loops

Expansion bends, when properly installed through the correct placement of sliding and fixing points, will compensate for thermal linear expansion. Expansion bends must always be used when a pipe system changes direction or when angled connections are used.



To determine the correct length of expansion bends, the following calculation formulas must be used:

Linear expansion:	$\Delta L = \alpha \cdot L \cdot \Delta T$	[mm]
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Length of the expansion bend:	$Leb = C \cdot \sqrt{OD \cdot \Delta T}$	[mm]
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LEGEND

α	coefficient of expansion	[mm/m·K]
C	material-dependent constant for RIIFO pipes	[≈33]
OD	pipe outside diameter	[mm]
L	pipe length	[m]
ΔL	linear expansion	[mm]
Leb	expansion bend length	[mm]
ΔT	temperature difference	[K]

Calculation example:

Given: $L = 12 \text{ m}$ $OD = 26 \text{ mm}$ $\Delta T = 50 \text{ K}$

Asked: $Leb = ?$

Solution: First calculate the linear expansion:

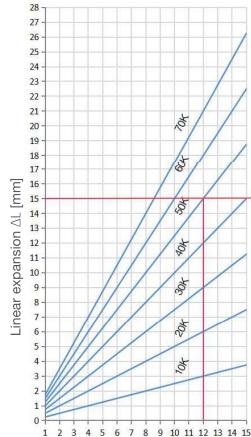
$$\Delta L = 0.025 \times 12 \times 50 = 15 \text{ mm}$$

Afterwards apply the formula for calculating the length of the expansion bend:

$$Leb = 33 \times \sqrt{26 \times 15}$$

$$Leb = 651.69 \text{ mm}$$

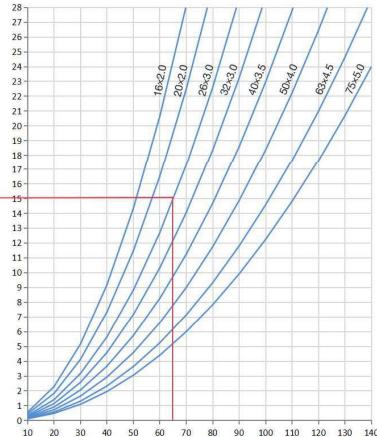
$$Leb = 65.17 \text{ cm}$$



Pipe length L [m]

Example:

Pipe length L: 12 m
Temperature difference ΔT : 50 K
Pipe outside diameter OD: 26mm



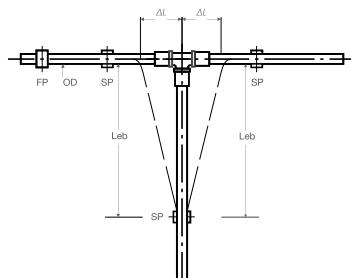
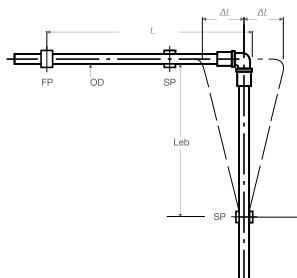
Expansion bend length Leb [m]

Solution:

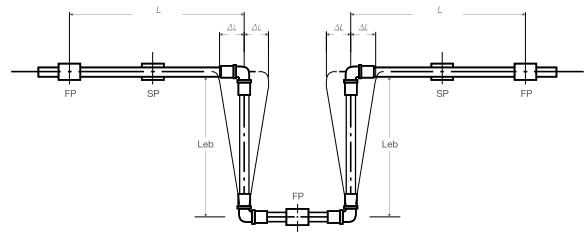
Linear expansion ΔL : 15mm
Expansion bend length Leb: 65.17cm

Application examples:

*Linear expansion compensated by an expansion bend Leb when changing direction.



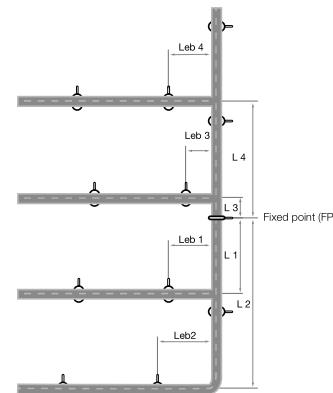
*Expansion loop, also called omega or lyra bend, to compensate linear expansion in long pipe tracts without change of direction.



*Compensation for length change always uses an expansion bend (Leb) in the riser pipe area.

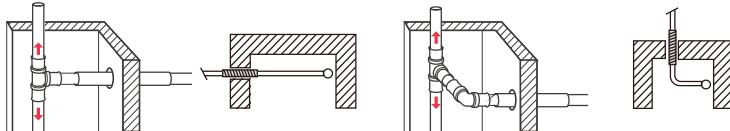
It must be ensured that the pipes can move freely when they are laid from a riser to the various floors. The change in length must be accommodated by an expansion bend or arm, which will absorb the upward and downward movements.

If possible, the fixed point (FP) should be in the centre of the riser. Each expansion bend or arm is calculated according to the distance from the fixed point of the riser : Leb1 is calculated with L1, Leb2 with L2 etc.



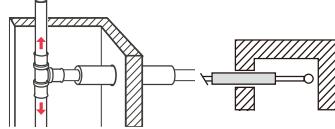
Examples of the installation of expansion arms in a service duct or shaft.

If there is sufficient room in the service duct to accommodate the calculated expansion elbow, it is sufficient to provide the pipe with a protective sleeve at the point where the pipe passes through the wall.



If the dimensions of the technical duct are not sufficient to contain the entire expansion arm, a sufficiently large opening must be made in the shaft to allow free movement of the expansion arm.

The arm must be protected by insulation or a foam shell.



7.7 Embedded fittings

Embedded brass fittings must be protected from corrosion that can result from contact with chemicals contained in plasters and mortars. This can be done by applying adhesive tapes specifically made for such applications, or by coverings in an expanded plastic material that has been adequately sealed.

RIIFO PPSU fittings can be embedded without protection.

7.8 Hazardous areas

If the system is or will be used in specific projects where it will be exposed to hazardous gases such as chlorine gases (swimming pools, spas or saunas...) or ammonia gases (stables, farms...), the brass fittings should be insulated from permanent exposure to such gases via adhesive tapes or other means of protection. If in doubt about any application, please contact us.

7.9 Frost protection and heat tracing

Electric heat tracing, heat tape or surface heating, can be used to maintain or raise the temperature of the RIIFO piping system, to prevent the water from freezing. Attachment of the auxiliary heater to the pipe is done in most cases via cables or adhesive tape. When using adhesive tape on the pipe, RIIFO should be consulted. When an additional heater is used the temperature of the drinking water should not exceed 60°C.

7.10 Allowed additives for different purposes

7.10.1 Anti-freeze

Avoid that water-filled pipes can freeze. For pipe networks that require frost protection we recommend using ethylene glycol to protect against freezing. Ethylene glycol can be used up to a maximum concentration of 45%. This concentration roughly corresponds to a frost resistance of -22°C. Check suitability/approval with the manufacturer or with RIIFO before using alternative frost protection additives.

7.10.2 Disinfection

The RIIFO multilayer piping system is suitable for chemical disinfection in accordance with table 1 of the DVGW guideline W557. Maximum concentrations, maximum duration and the active element indicated in the table must strictly be observed.

Designation	Commercial packaging	Max. concentration (*)	Max. duration and max. temperature
Hydrogen peroxide (H_2O_2)	Solution in water 50%	150 mg/l H_2O_2	Max. 24h Max. 25°C
Sodium hypochlorite NaClO	Aqueous solution with max. 150g/l <free chlorine>	60 mg/l chlorine	Max. 12h Max. 25°C
Chlorine dioxide ClO ₂		6mg/l ClO ₂	Max. 12h Max. 25°C

* The concentration indicated is the concentration of free chlorine.
Maximum frequency: once per year

7.11 Osmosis water

The RIIFO multilayer pipes are suitable for osmosis water, also called dimineralised water. However, brass fittings are not applicable, only RIIFO PPSU fittings can be used for this application.

7.12 Equipotential bonding or conduction

Since the RIIFO hot and cold water systems are not conductive pipe systems, they cannot be used for potential equalisation. They should therefore not be earthed. A certified electrician must check that the installation of the RIIFO system does not impair existing electrical protection and earthing measures.

7.13 UV resistance

RIIFO multilayer pipes must be protected from direct, intense sunlight and UV radiation. This applies both to the storage of the pipes and to the completed installation. Storage in the open air is therefore not permitted. Appropriate measures must be taken to protect finished systems and system components from the effects of UV radiation.

7.14 Storage and handling

RIIFO's system components are well protected in their original packaging. Guideline is therefore to leave the products in their packaging until the time of installation. All components i.e. fittings and pipes should be protected from mechanical damage, chemical contamination and environmental damage.

7.15 Installation temperature

The temperature during installation of RIIFO multilayer pipe systems should be higher than -15°C. Ideally, the multilayer piping system should be installed at temperatures between roughly 5°C and 35°C.

7.16 Fire classification

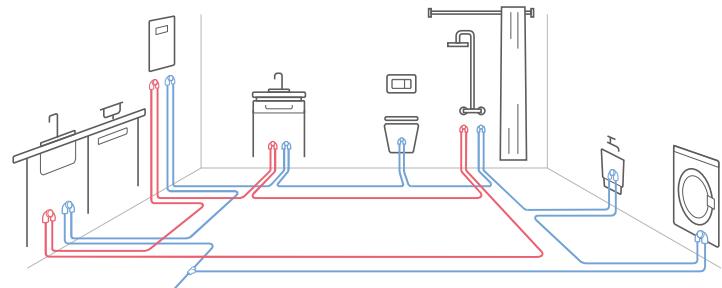
The RIIFO multilayer system has the classification class E - DIN EN 13501 and B2 – DIN 4102.

7.17 Installation variations

7.17.1 Loop installation

The U-profile tap elbow is used as the connection of the taps to the loop installation and route the pipe directly to the next tap. However, the piping will be routed back to the main line from the last object. Therefore, due to the optimized water circulation in the piping, the ring installation system is impeccable in terms of hygiene. In order to achieve a consistent hygienic flow in the loop installation, it is recommended to choose pipes with the same diameter as far as possible and less than that of the main stream path installation, as the objects are supplied from both sides.

New U-profile tap elbow perfectly fits into hygiene oriented and water flow rate optimized installations using different loop installation methods.

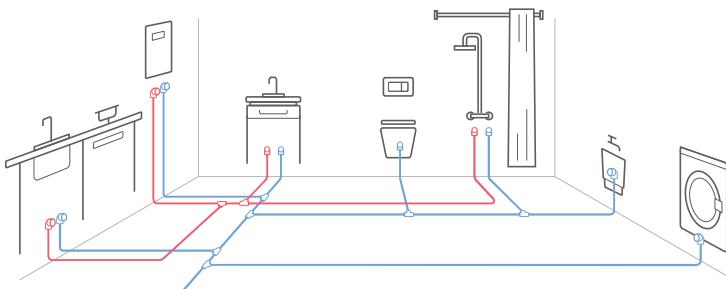


7.17.2 T-fitting installation

T-fitting installation, as the most commonly deployed installation method, the set-up usually starts with a larger dimension that is reduced gradually up to the last tap.

It is recommended that the T-fitting installation should only be used for daily or regular use of the tap. Otherwise, due to the stagnation of the water, there may be a risk to water sanitation.

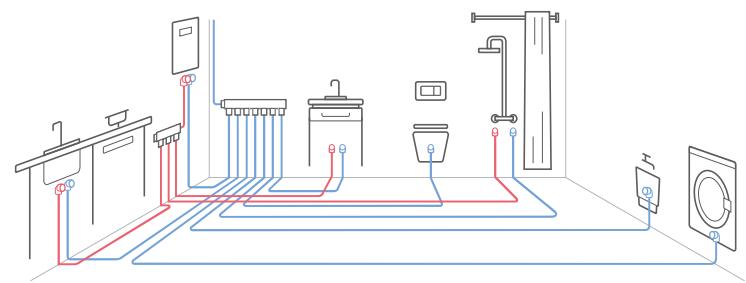
In addition, the T-fitting installation can reduce the usage amount of pipes, thus effectively controlling the overall cost.



7.17.3 Manifold installation

The plumbing manifold system consists of separate manifold for distributing hot and cold water. The cold water manifold feeds water through the main stream, and the hot water flows from the water heater and is separated from the cold water pipe.

The water pressure is maintained by the main stream, and the split system provides end-to-end installation, so that the flow path of each tap can be controlled individually, and the use of fittings is reduced, thereby reducing the risk of pressure drop and greatly reducing the risk of leakage.



7.18 Leak tightness and pressure resistance tests

A. Testing with drinking water

1.1 General

It is essential that a system pressure test is carried out in accordance with the relevant local regulations for the pipe systems used for drinking water or heating systems.

If no clear local regulations are available, RIIFO Europe recommends using the test procedures i.e. the test conditions, including the records to be kept, as mentioned below.

Due to the risk of high pressure, it is common and recommended to perform the water pressure test in 2 steps.

- 1) Checking the connections for leak tightness;
- 2) Checking the connections for pressure resistance.

Essential conditions:

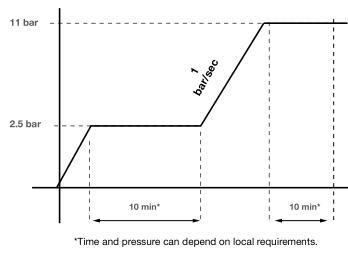
- The water medium must be drinking water; clean potable water.
- Installation components that cannot be subjected to a pressure test with the required pressure must be disconnected.
- The installed fittings must be subjected to a visual inspection first.
- Connections that need to be cast in concrete must be subjected to a pressure test before pouring the floors/walls.
- Avoid stagnant water in the pipes for a long period of time.
- The manometer must be installed at the lowest point of the installation.
- Ensure that safety measures are taken when piping systems are put under high pressure.
- The results of the tests should be recorded and signed.

1.2 Tightness test

- The tightness test is intended to detect non-pressed connections.
- The testing pressure is 2.5 bar (± 0.5 bar). Close the system afterwards. Gradually increase the pressure.
- Test time: 10 minutes, if the pressure remains the same. In case of pressure loss: find the leak, eliminate the fault and repeat the test.

1.3 Pressure test conform DIN EN 806-4

- After the tightness test the pressure must be increased to 1.1 times the maximum operating pressure (depending on the diameter and type of the pipe: 10 or 16 bar; DIN EN 806-4).
- Test time: 10 minutes, if the pressure remains the same. In case of pressure loss: find the leak, eliminate the fault and repeat the test.



*Time and pressure can depend on local requirements.

Step 1: Tightness test Step 2: Pressure test

B. Testing with compressed air or inert gas

2.1 General

It is essential that a system pressure test is carried out in accordance with the relevant local regulations for the pipe systems used for drinking water or heating systems.

If no clear local regulations are available, RIIFO Europe recommends using the test procedures i.e. the test conditions, including the records to be kept, as mentioned below.

Due to the risk of high pressure, it is common and recommended to perform the water pressure test in 2 steps.

- 1) Checking the connections for leak tightness;
- 2) Checking the connections for pressure resistance.

Essential conditions:

- The compressed air or inert gas medium must be free of oil.
- Pay attention to the suffocating effect of inert gas in confined spaces.
- The ambient temperature must not be higher than 25°C when testing the connections.
- Installation components that cannot be subjected to a pressure test with the required pressure must be disconnected.
- The installed fittings must be subjected to a visual inspection first.
- Connections that need to be cast in concrete must be subjected to a pressure test before pouring the floors/walls.
- The manometer must be installed at the lowest point of the installation.
- Ensure that safety measures are taken when piping systems are put under high pressure.
- The results of the tests should be recorded and signed.

2.2 Tightness test

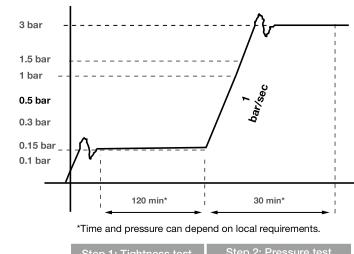
- Testing pressure of 0.5 bar ± 0.01 bar
- Test time after pressure stabilisation:
 - Up to 100 litres of pipeline volume: 120 minutes
 - For every additional 100 litres, extend the test time with 20 minutes
 - A pressure drop greater than 0.5% is not allowed

2.3 Pressure test

Testing pressure:

- 3 bar ± 0.2 bar for pipes $\leq \emptyset 63$ mm
- 1 bar ± 0.1 bar for pipes $> \emptyset 63$ mm

Test time after pressure stabilisation: 10 minutes
Release the pressure after completing the test.



*Time and pressure can depend on local requirements.

Step 1: Tightness test Step 2: Pressure test

7.18.1

TEST PROCEDURE WITH DRINKING WATER - SANITARY APPLICATIONS

TESTING PROCEDURE FOR SANITARY APPLICATIONS, ACCORDING TO DIN 1988

Project:

Installation site:

Name of person conducting the test:

Date: Ambient temperature (°C):

Type or identification of testing device:

Was system filled with clean water and vented? Yes No

Were the connections inspected visually? Yes No

TIGHTNESS TEST

Testing pressure: 2.5 bar - Testing time: 10 minutes. Max. accepted pressure loss per 5 minutes: 0.1 bar. Max. accepted pressure loss after the complete tightness test: 0.6 bar.

Pressure at start of test: bar Time at start of test:

Pressure at end of test : bar Time at end of test :

A leak was detected during the test? Yes No

Was the max. pressure loss exceeded during the test? Yes No

PRESSURE TEST

Immediately done after the tightness test. Testing pressure: 11 bar - Testing time: 10 minutes.

Max. accepted pressure loss after the complete tightness test: **0.2 bar**.

Pressure at start of test: bar Time at start of test:

Pressure at end of test : bar Time at end of test :

Was the max. pressure loss exceeded during the test? Yes No

If the pressure difference at the end of a pressure test exceeds **0.2 bar**, there is a leak or temperature influence (water has warmed up). Check all connections for leaks and/or extend the pressure test until the pressure remains constant. If leakage, rectify leak and re-run the test.

Signature of installer who conducted the test:

Signature of client (if applicable):

7.18.2

TEST PROCEDURE WITH COMPRESSED AIR OR INERT GAS - SANITARY APPLICATIONS

TESTING PROCEDURE FOR SANITARY APPLICATIONS, ACCORDING TO DIN 1988

Project:

Installation site:

Name of person conducting the test:

Date: Ambient temperature (°C):

Type or identification of testing device:

Was system filled with clean water and vented? Yes No

Were the connections inspected visually? Yes No

TIGHTNESS TEST

Testing pressure: **0.5 bar** (± 0.01 bar) - Testing time: **120 minutes** up to 100 litres of pipeline volume. For every additional 100 liters, extend test time with 20 minutes. Max. accepted pressure loss per 5 minutes: 0.5% or 0.0025 bar.

Pressure at start of test: bar Time at start of test:

Pressure at end of test: bar Time at end of test:

A leak was detected during the test? Yes No

Was the max. pressure loss exceeded during the test? Yes No

PRESSURE TEST

Immediately done after the tightness test. Testing pressure: **3 bar** (± 0.2 bar) for pipes $\leq \text{Ø} 63$ mm - **1 bar** (± 0.1 bar) for pipes $> \text{Ø} 63$ mm Testing time after pressure stabilisation: **10 minutes**.

Max. accepted pressure loss after the complete tightness test is 0.5%. **0.015 bar** for pipes $\leq \text{Ø} 63$ mm.

Pressure at start of test: bar Time at start of test:

Pressure at end of test: bar Time at end of test:

Was the max. pressure loss exceeded during the test? Yes No

If the pressure difference at the end of a pressure test is more than allowed, there is a leak or influence of temperature. Check all connections for leakage and/or extend the press test until the pressure remains constant. In case of leakage, rectify leak and perform test again.

Signature of installer who conducted the test:

Signature of client (if applicable):

7.18.3

TEST PROCEDURE WITH DRINKING WATER - RADIATORS (HEATING)

TEST PROCEDURE FOR RADIATORS, ACCORDING TO DIN 18380

Information on the heating installation:

Project:

Installation site:

Name of person conducting the test:

Maximum working pressure of the installation (bar):

Maximum working temperature of the installation (°C):

PRESSURE TEST

Essential conditions and instructions:

1. Fill the heating system with drinking water and vent the system.
2. Connect the pressure measuring device to the system.
3. Put the system under pressure. The test pressure should correspond with the radiator pressure cap. The minimum test pressure should always be 1 bar.
4. The installed connections must be subjected to a visual inspection first.
5. Connections that need to be cast in concrete must be subjected to a pressure test before pouring the floors/walls.
6. Check the test pressure after 2 hours. The pressure might have dropped due to the influence of the temperature on the system. Increase the pressure again. Maintain the test pressure for at least 3 hours and observe the pressure drop does not exceed 0.2 bar.
7. If there is a risk of frost, measure must be taken. One can use glycol or heat up the building to avoid any damage to the system. If antifreeze products are used, they must be fully removed afterwards. The installation must be rinsed at least 3 times with fresh water.

TEST CONFIRMATION

Test pressure (bar): Test duration:

Pressure drop (bar) after 5 hours: Date:

If the pressure difference at the end of a pressure test exceeds 0.2 bar, there is a leak or temperature influence (water has warmed up). Check all connections for leaks and/or extend the pressure test until the pressure remains constant. If leakage, rectify leak and re-run the test.

Signature of installer who conducted the test:

Signature of client (if applicable):

8 Dimensions

8.1 Multilayer pipes

8.1.1 Pipes - B1

Straight lengths



Article Number	Specification	Bar (m)	Cylinder (m)
1100046875	16 x 2	5	125
1100046876	20 x 2	5	100
1100046877	26 x 3	5	45
1100046878	32 x 3	5	30
1100046862	40 x 4	5	25
1100046863	50 x 4.5	5	15
1100046864	63 x 6	5	15
1100046865	75 x 7.5	5	15

Coils



Article Number	Specification	Coil (m)
1100046874	16 x 2	100
1100046870	16 x 2	200
1100046991	16 x 2	500
1100046871	20 x 2	100
1100046872	26 x 3	50
1100046873	32 x 3	50

8.2 Fittings

8.1.2 Preinsulated pipes - B1

Preinsulated coils



Article Number	Specification	Coil (m)
1100046962	16 x 2 - 6 mm - RED	50
1100046963	16 x 2 - 6 mm - BLUE	50
1100046964	20 x 2 - 6 mm - RED	50
1100046965	20 x 2 - 6 mm - BLUE	50
1100055656	26 x 3 - 6 mm - RED	50
1100055657	26 x 3 - 6 mm - BLUE	50
1100058967	16 x 2 - 9 mm - RED	50
1100058966	16 x 2 - 9 mm - BLUE	50
1100058959	20 x 2 - 9 mm - RED	50
1100058968	20 x 2 - 9 mm - BLUE	50
1100046948	26 x 3 - 9 mm - RED	50
1100046949	26 x 3 - 9 mm - BLUE	50
1100046950	32 x 3 - 9 mm - RED	25
1100046982	32 x 3 - 9 mm - BLUE	25
1100058963	26 x 3 - 13 mm - RED	25
1100058962	26 x 3 - 13 mm - BLUE	25
1100058965	32 x 3 - 13 mm - RED	25
1100058964	32 x 3 - 13 mm - BLUE	25

8.1.3 Pipes with corrugated conduit - B1

Coils with corrugated conduit



Article Number	Specification	Coil (m)
1100046962	16 x 2 - RED	50
1100046964	16 x 2 - RED	100
1100046953	16 x 2 - BLUE	50
1100046955	16 x 2 - BLUE	100
1100046956	20 x 2 - RED	50
1100046957	20 x 2 - BLUE	50
1100046958	26 x 3 - RED	50
1100046959	26 x 3 - BLUE	50
1100046960	32 x 3 - RED	50
1100046961	32 x 3 - BLUE	50

8.2.1 Multiprofile press fittings - F18

Straight coupling

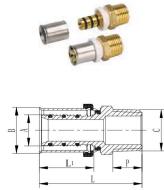


Reducing coupling



Article Number	Specification	A	B	L1	L
1100046393	16x16	11.75	20.2	26.1	59.4
1100046394	20x20	15.75	24.2	26.1	59.4
1100046405	26x26	19.75	30.4	33.3	74
1100046406	32x32	25.75	36.4	33.3	74
1100045768	40x40	31.75	43.5	43.2	96
1100045769	50x50	40.75	53.5	43.5	96.7
1100045770	63x63	50.7	67.4	66.2	143.4
1100045771	75x75	59.6	79.6	66.5	143.9

Male straight coupling



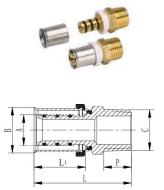
Article Number	Specification	A	B	C	L1	L	P
1100046432	16x3/8M	11.75	20.2	R3/8	26.1	46.2	11
1100046433	16x1/2M	11.75	20.2	R1/2	26.1	49.2	14
1100046434	16x3/4M	11.75	20.2	R3/4	26.1	50.2	15
1100046435	20x1/2M	15.75	24.2	R1/2	26.1	49.2	14
1100046436	20x3/4M	15.75	24.2	R3/4	26.1	50.2	15
1100046437	20x1M	15.75	24.2	R1	26.1	52.2	16
1100045808	26x3/4M	19.75	30.4	R3/4	33.3	57.5	15
1100045806	26x1M	19.75	30.4	R1	33.3	59.5	16
1100047058	32x1M	25.75	36.4	R1	33.3	58.5	16
1100045808	32x1 1/4M	25.75	36.4	R1 1/4	33.3	63	19.5
1100047059	40x1M	31.75	43.5	R1	43.2	77.5	16
1100045812	40x1 1/4M	31.75	43.5	R1 1/4	43.2	81	19.5
1100045809	40x1 1/2M	31.75	43.5	R1 1/2	43.2	81	19.5
1100045813	50x1 1/2M	40.75	53.5	R1 1/2	43.5	81.7	19.5
1100045810	50x2M	40.75	53.5	R2	43.5	86.7	24
1100045811	63x1 1/2M	50.7	67.4	R1 1/2	66.2	105.2	19.5
1100045814	63x2M	50.7	67.4	R2	66.2	109.7	24
1100045815	75x2 1/2M	59.6	79.6	R2	66.8	113.7	19.5

Male straight coupling with O-ring, cylindrical thread (G)



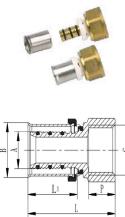
Article Number	Specification	A	B	C	L1	L	P
1100059170	16xG1/2M	11.75	20.2	G1/2	26.1	44.7	9
1100059171	20xG1/2M	15.75	24.2	G1/2	26.1	44.7	9

Male straight coupling, cylindrical thread (G)



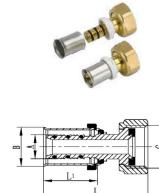
Article Number	Specification	A	B	C	L1	L	P
1100052146	16xG3/8M	11.75	20.2	G3/8	26.1	46.2	11
1100052147	16xG1/2M	11.75	20.2	G1/2	26.1	49.2	14
1100052148	20xG1/2M	15.75	24.2	G1/2	26.1	49.2	14
1100052149	20xG3/4M	15.75	24.2	G3/4	26.1	50.2	15
1100052150	26xG3/4M	19.75	30.4	G3/4	33.3	57.5	15
1100052151	26xG1M	19.75	30.4	G1	33.3	59.5	16

Female straight coupling



Article Number	Specification	A	B	C	L1	L	P
1100046424	16x1/2F	11.75	20.2	G1/2	26.1	46.2	14
1100046425	16x3/4F	11.75	20.2	G3/4	26.1	47.2	15
1100046426	20x1/2F	15.75	24.2	G1/2	26.1	46.2	14
1100046427	20x3/4F	15.75	24.2	G3/4	26.1	47.2	15
1100046428	20x1F	15.75	24.2	G1	26.1	48.7	15
1100045799	26x3/4F	19.75	30.4	G3/4	33.3	54.5	15
1100046431	32x1F	25.75	36.4	G1	33.3	56	16
1100045807	32x1 1/4F	25.75	36.4	G1 1/4	33.3	60	19.5
1100058083	40x1F	31.75	43.5	G1	43.2	65.5	16
1100045800	40x1 1/4F	31.75	43.5	G1 1/4	43.2	72	19.5
1100045804	40x1 1/2F	31.75	43.5	G1 1/2	43.2	72.2	19.5
1100045801	50x1 1/2F	40.75	53.5	G1 1/2	43.5	84.2	19.5
1100045802	63x2F	50.7	67.4	G2	66.2	99.7	23.5
1100045803	75x2 1/2F	59.6	79.6	G2 1/2	66.8	105.7	27

Female straight coupling, demountable with swivel nut and flat sealing



Article Number	Specification	A	B	C	L
1100045783	16x3/8F	11.75	20.2	26.1	G3/8 51.8
1100045784	16x1/2F	11.75	20.2	26.1	G1/2 50.7
1100045785	16x3/4F	11.75	20.2	26.1	G3/4 49.2
1100045786	20x1/2F	15.75	24.2	26.1	G1/2 50.7
1100045787	20x3/4F	15.75	24.2	26.1	G3/4 50.7
1100045788	26x3/4F	19.75	30.4	33.3	G3/4 60.5
1100045789	26x1F	19.75	30.4	33.3	G1 59
1100045790	32x1F	25.75	36.4	33.3	G1 59
1100045791	32x1 1/4F	25.75	36.4	33.3	G1 1/4 66.2
1100045793	40x1 1/4F	31.75	43.5	43.2	G1 1/4 80.2
1100045792	40x1 1/2F	31.75	43.5	43.2	G1 1/2 84.2
1100045794	50x1 1/2F	40.75	53.5	43.5	G1 1/2 86.5
1100045797	50x2F	40.75	53.5	43.5	G2 90.2
1100045795	63x2F	50.7	67.4	66.2	G2 112.2
1100045796	75x2 1/2F	59.6	79.6	66.8	G2 1/2 113.7

Press-fit adapter to eurocone



Article Number	Specification	A	B	L1	C	D	L
1100047344	16x3/4F EK	11.75	20.2	26.1	G3/4	18	51.2
1100047345	20x3/4F EK	15.75	24.2	26.1	G3/4	18	54.7

Press-fit adapter M24



Article Number	Specification	A	B	L1	C	D	L
1100059167	16xM24	11.75	20.2	26.1	M24	18	51.2
1100059168	20xM24	15.75	24.2	26.1	M24	18	64.7

Elbow 90° for connection of cistern, built-in toilet, 1/2

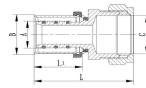


Article Number	Specification	A	B	L1	C	D	L	H
1100059073	16x1/2	11.75	20.2	26.1	G1/2	14.5	49.2	29.9

Press-fit adapter to copper compression



Article Number	Specification	A	B	C	L1	L
1100045780	16x15Cu	11.75	20.2	15.1	26.1	45.7
1100045781	20x22Cu	15.75	24.2	22.1	26.1	46.2
1100045782	26x22Cu	19.75	29.4	22.1	33.3	53.5



Press-fit adapter to copper press V/M/SA



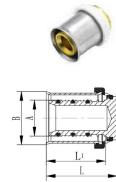
Article Number	Specification	A	B	C	L1	L	P
1100055638	16 x 12Cu V/M/SA	52.9	26.3	10.85	20.1	11.75	12.2
1100055639	16 x 15Cu V/M/SA	53.9	26.3	9.75	20.1	11.75	15.2
1100055640	20 x 15Cu V/M/SA	53.9	26.3	9.75	24.1	15.75	15.2
1100055641	20 x 22Cu V/M/SA	57.4	26.3	7.35	24.1	15.75	22.2
1100055642	26 x 22Cu V/M/SA	64.8	33.6	7.45	30.3	19.75	22.2
1100055643	32 x 28Cu V/M/SA	67.8	33.6	7.45	36.3	25.75	28.2

Press-fit adapter with copper pipe



Article Number	Specification	A	B	C	L1	L	P
1100052138	16x10Cu	11.75	20.2	10	26.1	81.2	50
1100052139	16x12Cu	11.75	20.2	12	26.1	81.2	50
1100052140	16x15Cu	11.75	20.2	15	26.1	81.2	50
1100052141	20x18Cu	15.75	24.2	18	26.1	81.2	50
1100059169	20x15Cu	15.75	24.2	15	26.1	81.2	50
1100052142	20x22Cu	15.75	24.2	22	26.1	81.2	50
1100052143	26x22Cu	19.75	29.4	22	33.3	88.5	50
1100052144	26x28Cu	19.75	29.4	28	33.3	88.5	50
1100052145	32x28Cu	25.75	36.4	28	33.3	88.5	50

End cap



Article Number	Specification	A	B	L1	L
1100045772	16	11.75	20.2	26.1	31.2
1100045773	20	15.75	24.2	26.1	31.2
1100045774	26	19.75	30.4	33.3	38.5
1100045775	32	25.75	36.4	33.3	38.5
1100045776	40	31.75	43.5	43.2	50
1100045777	50	40.75	53.5	43.5	50.7
1100045778	63	50.7	67.4	66.2	73.7
1100045779	75	59.6	79.6	66.8	72.2

Tee



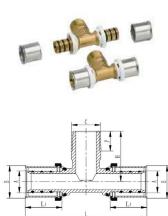
Article Number	Specification	A	B	L1	L	H
1100046412	16x16x16	11.75	20.2	26.1	80.4	40.2
1100046413	20x20x20	15.75	24.2	26.1	86.4	43.2
1100045902	26x26x26	19.75	30.4	33.3	107	53.5
1100046414	32x32x32	25.75	36.4	33.3	113	56.5
1100045903	40x40x40	31.75	43.5	43.2	144	72
1100045904	50x50x50	42.8	53.5	43.5	156.4	78.2
1100045905	63x63x63	50.7	67.4	66.2	215.4	107.7
1100045906	75x75x75	59.6	79.6	66.8	221.4	110.7

Reducing tee



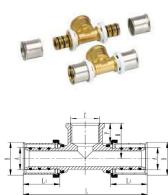
Article Number	Specification	A	B	L1	C	D	L2	E	F	L3	H	L
1100045876	16x20x16	11.75	20.2	26.1	15.75	24.2	26.1	11.75	20.2	26.1	41.2	86.4
1100046417	20x16x16	15.75	24.2	26.1	11.75	20.2	26.1	11.75	20.2	26.1	43.2	82.4
1100046418	20x16x20	15.75	24.2	26.1	11.75	20.2	26.1	15.75	24.2	26.1	43.2	82.4
1100046419	20x20x16	15.75	24.2	26.1	15.75	30.4	26.1	11.75	20.2	26.1	43.2	86.4
1100045880	20x26x20	15.75	24.2	26.1	19.75	30.4	33.3	15.75	24.2	26.1	50.5	92.4
1100045881	26x16x16	19.75	30.4	33.3	11.75	20.2	26.1	11.75	20.2	26.1	46.2	89.7
1100045882	26x16x20	19.75	30.4	33.3	11.75	20.2	26.1	15.75	24.2	26.1	45.2	89.7
1100045883	26x16x26	19.75	30.4	33.3	11.75	20.2	26.1	19.75	30.4	33.3	45.2	99
1100047051	26x20x16	19.75	30.4	33.3	15.75	24.2	26.1	11.75	20.2	26.1	45.2	95.7
1100045884	26x20x20	19.75	30.4	33.3	15.75	24.2	26.1	15.75	24.2	26.1	46.2	93.7
1100045885	26x20x26	19.75	30.4	33.3	15.75	24.2	26.1	19.75	30.4	33.3	46.2	101
1100047052	26x26x16	19.75	30.4	33.3	19.75	30.4	33.3	11.75	20.2	26.1	53.5	99.7
1100047053	26x26x20	19.75	30.4	33.3	19.75	30.4	33.3	15.75	24.2	26.1	53.5	99.7
1100047054	26x32x26	19.75	30.4	33.3	25.75	36.4	33.3	19.75	30.4	33.3	53.5	113
1100047055	32x16x32	25.75	36.4	33.3	25.75	36.4	33.3	25.75	36.4	33.3	48.2	99
1100052934	32x20x26	25.75	36.4	33.3	15.75	24.2	26.1	19.75	30.4	33.3	49.2	101
1100058970	32x20x32	25.75	36.4	33.3	15.75	24.2	26.1	25.75	36.4	33.3	49.2	101
1100058971	32x26x26	25.75	36.4	33.3	19.75	30.4	26.1	19.75	30.4	33.3	56.5	107
1100045888	32x26x32	25.75	36.4	33.3	19.75	30.4	26.1	25.75	36.4	33.3	56.5	107
1100058970	32x32x20	25.75	36.4	33.3	25.75	36.4	33.3	15.75	24.2	26.1	56.5	105.7
1100058971	32x32x26	25.75	36.4	33.3	25.75	36.4	33.3	19.75	30.4	26.1	56.5	107
1100047056	40x16x40	31.75	43.5	43.2	11.75	20.2	26.1	31.75	43.5	43.2	52.2	120
1100045889	40x20x40	31.75	43.5	43.2	15.75	24.2	26.1	31.75	43.5	43.2	52.2	124
1100045890	40x26x40	31.75	43.5	43.2	19.75	30.4	33.3	31.75	43.5	43.2	61.5	127
1100045891	40x32x32	31.75	43.5	43.2	25.75	36.4	33.3	25.75	36.4	33.3	61.5	123.5
1100045892	40x32x40	31.75	43.5	43.2	25.75	36.4	33.3	31.75	43.5	43.2	61.5	134
1100047057	50x20x50	40.75	53.5	43.5	15.75	24.2	26.1	43.8	53.5	43.5	58.2	129.4
1100045893	50x26x50	40.75	53.5	43.5	19.75	30.4	33.3	43.8	53.5	43.5	65.5	129.4
1100045894	50x32x50	40.75	53.5	43.5	25.75	36.4	36.4	43.8	53.5	43.5	65.5	138.4
1100045895	50x40x50	40.75	53.5	43.5	31.75	43.5	43.5	43.8	53.5	43.5	77.5	145.4
1100045896	63x26x63	50.7	67.4	66.2	19.75	30.4	33.3	50.7	67.4	66.2	73.5	178.4
1100045897	63x32x63	50.7	67.4	66.2	25.75	36.4	33.3	50.7	67.4	66.2	73.5	181.4
1100045898	63x40x63	50.7	67.4	66.2	31.75	43.5	43.2	50.7	67.4	66.2	84	191.4
1100045899	63x50x63	50.7	67.4	66.2	43.8	53.5	43.5	50.7	67.4	66.2	84	201.4
1100045900	75x40x75	59.6	79.6	66.8	31.75	43.5	43.2	59.6	79.6	66.8	88	194.4
1100045901	75x50x75	59.6	79.6	66.8	43.8	53.5	43.5	59.6	79.6	66.8	88.7	199.4
1100045879	75x63x75	59.6	79.6	66.8	50.7	67.4	66.2	59.6	79.6	66.8	110.7	211.4

Male tee



Article Number	Specification	A	B	L1	L	L2	C	H
1100045855	16x1/2Mx16	11.75	20.2	26.1	86.4	14	R1/2	34
1100045856	20x1/2Mx20	15.75	24.2	26.1	86.4	14	R1/2	36
1100047060	20x3/4Mx20	15.75	24.2	26.1	92.4	15	R3/4	37.5
1100047061	26x1/2Mx26	19.75	30.4	33.3	103	14	R1/2	40
1100045857	26x3/4Mx26	19.75	30.4	33.3	107	15	R3/4	41
1100047062	26x1Mx26	19.75	30.4	33.3	116	16	R1	42
1100045842	32x3/4Mx32	25.75	36.4	33.3	110	15	R3/4	40
1100045853	32x1Mx32	25.75	36.4	33.3	116	16	R1	45.5
1100045854	50x1/2Mx50	40.75	53.5	43.5	155.4	19.5	R1 1/2	50

Female tee



Article Number	Specification	A	B	L1	L	L2	C	H
1100046449	16x1/2Fx16	11.75	20.2	26.1	88.4	14	G1/2	24.5
1100046450	20x1/2Fx20	15.75	24.2	26.1	88.4	14	G1/2	25
1100046451	20x3/4Fx20	15.75	24.2	26.1	93.4	15	G3/4	26
1100045874	26x1/2Fx26	19.75	30.4	33.3	103	14	G1/2	26.5
1100045875	26x3/4Fx26	19.75	30.4	33.3	108	15	G3/4	27.5
1100046452	32x1/2Fx32	25.75	36.4	33.3	103	14	G1/2	29
1100046453	32x3/4Fx32	25.75	36.4	33.3	108	15	G3/4	30.5
1100046454	32x1Fx32	25.75	36.4	33.3	116	16	G1	32
1100045862	40x1Fx40	31.75	43.5	43.2	126	14	G1/2	31
1100045859	40x3/4Fx40	31.75	43.5	43.2	131	15	G3/4	31
1100045863	40x1Fx40	31.75	43.5	43.2	138	16	G1	36
1100045864	40x1/4Fx40	31.75	43.5	43.2	138	19.5	G1 1/4	48
1100045865	50x1/2Fx50	40.75	53.5	43.5	128.4	14	G1/2	36
1100045866	50x3/4Fx50	40.75	53.5	43.5	133.4	15	G3/4	36
1100045860	50x1Fx50	40.75	53.5	43.5	139.4	16	G1	40
1100045867	60x1 1/2Fx50	40.75	53.5	43.5	156.4	19.5	G1 1/2	42
1100045868	63x1/2Fx63	50.7	67.4	66.2	174.4	14	G1/2	42
1100045869	63x3/4Fx63	50.7	67.4	66.2	178.4	15	G3/4	43
1100045870	63x1Fx63	50.7	67.4	66.2	185.4	16	G1	45
1100045861	63x2Fx63	50.7	67.4	66.2	214.4	24	G2	51
1100045871	75x1Fx75	59.6	79.6	66.8	187.4	16	G1	48
1100045872	75x2Fx75	59.6	79.6	66.8	215.4	24	G2	56
1100045873	75x2 1/2Fx75	59.6	79.6	66.8	234.4	27	G2 1/2	60

Elbow 90°



Article Number	Specification	A	B	L1	L
1100046407	16x16	11.75	20.2	26.1	40.2
1100046408	20x20	15.75	24.2	26.1	43.2
1100047049	26x26	19.75	30.4	33.3	53.5
1100046409	32x32	25.75	36.4	33.3	56.5
1100045830	40x40	31.75	43.5	43.2	72
1100045832	50x50	40.75	53.5	43.5	78.3
1100045834	63x63	50.7	67.4	66.2	107.7
1100045836	75x75	59.6	79.6	66.8	110.7

Male elbow 90°



Article Number	Specification	A	B	C	L1	L	P	H
1100045816	16x3/8M	11.75	20.2	R3/8	26.1	41.7	11	30
1100046445	16x1/2M	11.75	20.2	R1/2	26.1	43.2	14	34
1100046446	20x1/2M	15.75	24.2	R1/2	26.1	43.2	14	36
1100046447	20x3/4M	15.75	24.2	R3/4	26.1	46.2	15	37.5
1100045817	26x3/4M	19.75	30.4	R3/4	33.3	53.5	15	40
1100045818	26x1M	19.75	30.4	R1	33.3	58	16	45.5
1100046448	32x1M	25.75	36.4	R1	33.3	58	16	45.5
1100045819	40x1 1/4M	31.75	43.5	R1 1/4	43.2	73	19.5	44.5
1100045820	50x1 1/2M	40.75	53.5	R1 1/2	43.5	78.2	19.5	50
1100045821	63x2M	50.7	67.4	R2	66.2	107.2	24	60

Male elbow 90°, cylindrical thread (G)



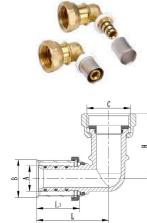
Article Number	Specification	A	B	C	L1	L	P	H
1100052153	16xG1/2M	11.75	20.2	G1/2	26.1	43.2	14	34
1100052152	20xG3/4M	19.75	24.2	G3/4	26.1	46.2	15	37.5
1100052154	26xG1M	15.75	30.4	G1	33.3	58	16	45.5

Female elbow 90°



Article Number	Specification	A	B	C	L1	L	P	H
1100046438	16x1/2F	11.75	20.2	G1/2	26.1	44.2	14	25
1100046439	20x1/2F	15.75	24.2	G1/2	26.1	44.2	14	24.5
1100046440	20x3/4F	15.75	24.2	G3/4	26.1	46.7	15	28
1100046428	26x3/4F	19.75	30.4	G3/4	33.3	54	15	27.5
1100045829	26x1F	19.75	30.4	G1	33.3	58	16	32
1100046441	32x1F	25.75	36.4	G1	33.3	57.5	16	32
1100045824	40x1 1/4F	31.75	43.5	G1 1/4	43.2	74.5	19.5	38
1100045825	40x1 1/2F	31.75	43.5	G1 1/2	43.2	77	19.5	38
1100045826	50x1 1/2F	40.75	53.5	G1 1/2	43.5	79.2	24	42
1100045827	63x2F	50.7	67.4	G2	66.2	107.7	24	48.5

Female elbow 90°, demountable with swivel nut and flat sealing



Article Number	Specification	A	B	C	L1	H	
1100045838	16x3/4F	11.75	20.2	26.1	G3/4	44.7	39
1100047043	20x3/4F	15.75	24.2	26.1	G3/4	43.7	39

Elbow 45°



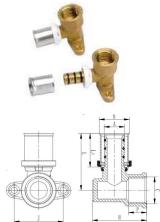
Article Number	Specification	A	B	C	L1	L
1100046410	26x26	19.75	30.4	33.3	48.5	
1100046411	32x32	25.75	36.4	33.3	51	
1100045831	40x40	31.75	43.5	43.2	67	
1100045833	50x50	40.75	53.5	43.5	70.7	
1100045835	63x63	50.7	67.4	66.2	96.7	
1100045837	75x75	59.6	79.6	66.8	96.7	

Elbow press-fit adapter to copper pipe, plated



Article Number	Specification	A	B	L1	C	L2
1100058983	16x12Cu - 200 mm	11.75	20.2	26.1	12	200
1100052131	16x15Cu - 200 mm	11.75	20.2	26.1	15	200

Female wall elbow



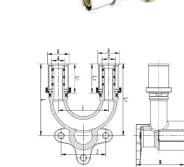
Article Number	Specification	A	B	C	L1	L	P	J	H
1100055644	16x3/8F- 38 mm-40 W	11.75	20.2	G3/8	26.1	43.2	11	40	38
1100046442	16x1/2F- 38 mm	11.75	20.2	G1/2	26.1	44.7	14	40	38
1100055646	16x1/2F- 52 mm	11.75	20.2	G1/2	26.1	44.7	14	40	52
1100055647	16x1/2F- 78 mm	11.75	20.2	G1/2	26.1	44.7	14	40	78
1100046443	20x1/2F- 42 mm	15.75	24.2	G1/2	26.1	44.7	14	40	42
1100055649	20x1/2F- 52 mm	15.75	24.2	G1/2	26.1	44.7	14	40	52
1100055650	20x1/2F- 78 mm	15.75	24.2	G1/2	26.1	44.7	14	40	78
1100046444	20x3/4F- 42 mm	15.75	24.2	G3/4	26.1	46.2	15	40	42
1100055652	20x3/4F- 52 mm	15.75	24.2	G3/4	26.1	46.2	15	40	52
1100055653	26x3/4F- 46.5 mm	19.75	30.4	G3/4	33.3	54.5	15	40	46.5

Elbow press fit adapter 90° to copper compression



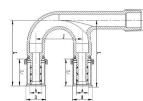
Article Number	Specification	A	B	L1	C	L	H
1100056318	16x15Cu	11.75	20.2	26.1	15.1	47.2	33.8
1100056319	20x22Cu	15.75	24.2	26.1	22.1	49.2	37.5
1100056320	26x22Cu	19.75	30.4	33.3	22.1	59.5	37.5

Female wall elbow, U-shape



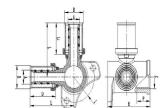
Article Number	Specification	A	B	L1	C	D	L2	L3	L	J	H	I
1100052162	16x1/2Fx16	11.75	20.2	26.1	11.75	20.2	26.1	64.2	64.2	40	43	45
1100052163	20x1/2Fx16	15.75	24.2	26.1	15.75	24.2	26.1	64.2	64.2	40	43	45
1100052164	20x1/2Fx20	15.75	24.2	26.1	15.75	24.2	26.1	64.2	64.2	40	43	45
1100052165	26x1/2Fx20	19.75	30.4	33.3	19.75	30.4	33.3	69.2	69.2	51	60	60
1100052166	26x1/2Fx26	19.75	30.4	33.3	19.75	30.4	33.3	76.5	76.5	40	51	60

Male tap elbow mixer, U-shape



Article Number	Specification	A	B	L1	C	L	J
1100050412	16x16xR1/2" M	11.75	20.2	26.1	R1/2	63.7	45
1100050413	16x16xR3/4" M	11.75	20.2	26.1	R3/4	63.7	45
1100050414	20x20xR1/2" M	15.75	24.2	26.1	R1/2	63.7	45
1100050415	20x20xR3/4" M	15.75	24.2	26.1	R3/4	63.7	45

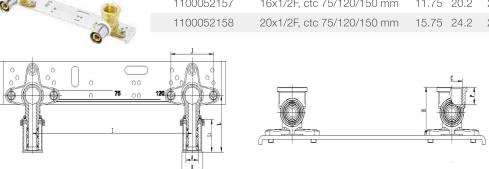
Female double wall elbow, 90°



Article Number	Specification	A	B	L1	C	P	H	I	J
1100045907	16x1/2Fx16	11.75	20.2	26.1	44.7	G1/2	16	43	R20.9 40
1100045908	20x1/2Fx20	15.75	24.2	26.1	44.7	G1/2	16	43	R20.9 40

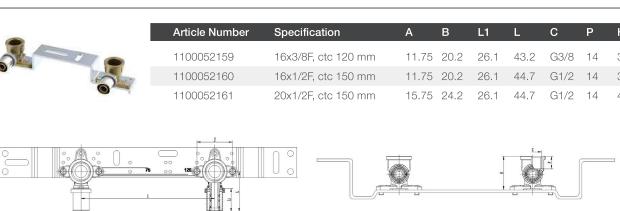
Galvanized straight backplate with two wall elbows

Article Number	Specification	A	B	L1	L	C	P	H	I	J
1100052157	16x1/2F, ctc 75/120/150 mm	11.75	20.2	26.1	44.7	G1/2	14	38	150	40
1100052158	20x1/2F, ctc 75/120/150 mm	15.75	24.2	26.1	44.7	G1/2	14	42	150	40



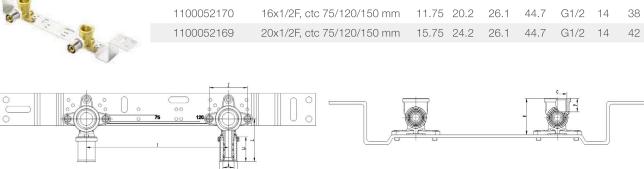
Galvanized backplate type "Gemini" with two wall elbows

Article Number	Specification	A	B	L1	L	C	P	H	I	J
1100052159	16x3/8F, ctc 120 mm	11.75	20.2	26.1	43.2	G3/8	14	38	120	40
1100052160	16x1/2F, ctc 150 mm	11.75	20.2	26.1	44.7	G1/2	14	38	150	40
1100052161	20x1/2F, ctc 150 mm	15.75	24.2	26.1	44.7	G1/2	14	42	150	40



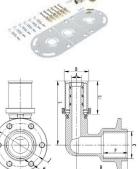
Galvanized bent backplate premounted with two wall elbows

Article Number	Specification	A	B	L1	L	C	P	H	I	J
1100052170	16x1/2F, ctc 75/120/150 mm	11.75	20.2	26.1	44.7	G1/2	14	38	150	40
1100052169	20x1/2F, ctc 75/120/150 mm	15.75	24.2	26.1	44.7	G1/2	14	42	150	40



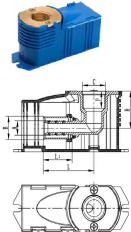
Galvanized backplate with two wall elbows and mounting plugs, for drywall construction

Article Number	Specification	A	B	L1	C	P	L	H	J	M	H
1100052167	16x1/2F	11.75	20.2	26.1	G1/2	19	50.2	40	34	M4	30
1100052168	20x1/2F	15.75	24.2	26.1	G1/2	19	50.2	40	34	M4	30

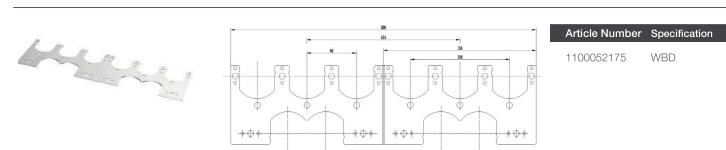


Wall box with press fitting

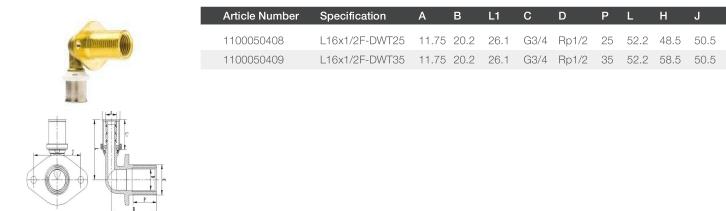
Article Number	Specification	A	B	L1	C	P	L	H
1100052155	16x1/2F	11.75	20.2	26.1	G1/2	14	45.7	30
1100052156	20x1/2F	15.75	24.2	26.1	G1/2	14	45.7	30



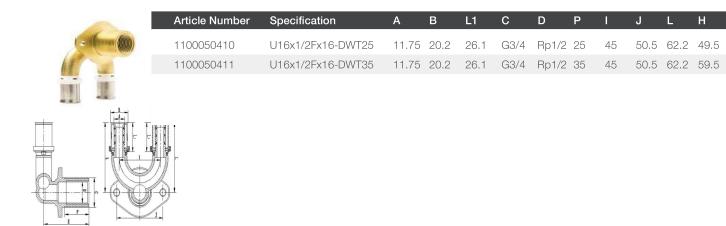
Mounting plate for wall box



Drywall tap elbow



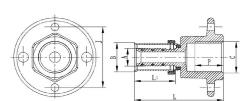
Drywall tap elbow, U



Press-fit adapter wall penetration

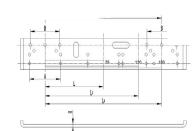


Article Number	Specification	A	B	L1	C	P	L	J
1100050376	S-G1/2F	11.75	20.2	26.1	G1/2	18	56.2	40



Straight mounting plate, galvanized steel

Article Number	Specification	A	B	L	L1	L2	L3	H
1100052172	MPS ctc 75/120/150 mm	40	38	75	120	150	150	3



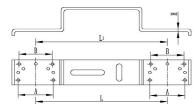
Galvanized bent backplate, galvanized steel

Article Number	Specification	A	B	L	L1	L2	L3	H
1100052171	MPS ctc 75/120/150 mm	40	38	75	120	150	150	3



Mounting plate type "Gemini", galvanized steel

Article Number	Specification	A	B	L	L1	H
1100052174	MPG ctc 150 mm	40	38	150	150	3



8.2.2 Push Fittings – F6

Straight coupling



Article Number	Specification	D	L
1100052218	16x16	25	64
1100052219	20x20	29	67
1100052220	26x26	36	77.5
1100052221	32x32	42	88.5

Reducing coupling



Article Number	Specification	C	D	L
1100052222	20x16	29	25	65.5
1100052223	26x16	25	36	71
1100052224	26x20	29	36	72.5
1100052225	32x16	42	25	76.5
1100052226	32x20	42	29	78
1100052227	32x26	42	36	83

Male straight coupling



Article Number	Specification	D	R	L
1100052228	16x1/2M	25	1/2	55
1100052229	16x3/4M	25	3/4	52
1100052230	20x1/2M	29	1/2	57
1100052231	20x3/4M	29	3/4	58
1100052232	26x3/4M	36	3/4	66
1100052233	26x1M	36	1	62
1100052234	32x1M	42	1	73.5

Female straight coupling



Article Number	Specification	D	G	L
1100052235	16x1/2F	25	1/2	48.5
1100052236	16x3/4F	25	3/4	49.5
1100052237	20x1/2F	29	1/2	50
1100052238	20x3/4F	29	3/4	51
1100052239	26x3/4F	36	3/4	56
1100052240	26x1F	36	1	57.5
1100052241	32x1F	42	1	63

Push-fit adapter to eurocone 3/4"



Article Number	Specification	D	G
1100052242	16x3/4F EK	25	3/4

End cap



Article Number	Specification	D	L
1100052244	16	25	34
1100052245	20	29	35.5
1100052246	26	35	40.5
1100052247	32	42	46

Tee



Article Number	Specification	D	L	H
1100052248	16x16x16	25	86	43
1100052249	20x20x20	29	93	47
1100052250	26x26x26	36	106	53
1100052251	32x32x32	42	125	63

Reducing tee



Article Number	Specification	B	C	D	L	H
1100052252	16x20x16	29	25	25	91	47
1100052253	20x16x16	25	29	25	88	45
1100052254	20x20x16	29	29	25	92	47
1100052255	20x26x20	36	29	29	98	51.5
1100052256	26x16x16	25	25	36	92	48.5
1100052257	26x16x20	25	29	36	93.5	48.5
1100052258	26x16x26	25	36	36	98	48.5
1100052259	26x20x16	29	25	36	96	49.5
1100052260	26x20x20	29	29	36	97	50
1100052261	26x20x26	29	36	36	102	50
1100052262	26x26x16	36	25	36	102.5	54.5
1100052263	26x26x20	36	29	36	104	54.5
1100052264	26x32x26	42	36	36	115	59.5
1100052265	32x16x32	25	42	42	110	50
1100052266	32x20x32	29	42	42	113	53
1100052267	32x26x32	29	42	42	114	53

Male tee



Article Number	Specification	D	R	L	H
1100052268	16x1/2Mx16	25	1/2	92	35
1100052269	16x3/4Mx16	25	3/4	97	36
1100052270	20x1/2Mx20	29	1/2	94	37
1100052271	20x3/4Mx20	29	3/4	100	38
1100052272	26x1/2Mx26	36	1/2	104	40
1100052273	26x3/4Mx26	36	3/4	108	41
1100052274	32x3/4Mx32	42	3/4	123	45
1100052275	32x1Mx32	42	1	130	46

Female tee



Article Number	Specification	D	G	L	H
1100052276	16x1/2Fx16	25	1/2	94	26
1100052277	16x3/4Fx16	25	3/4	99	27
1100052278	20x1/2Fx20	29	1/2	97	27
1100052279	20x3/4Fx20	29	3/4	102	28
1100052280	26x1/2Fx26	36	1/2	107	28
1100052281	26x3/4Fx26	36	3/4	113	30
1100052282	32x1/2Fx32	42	1/2	118	32
1100052283	32x3/4Fx32	42	3/4	123	33
1100052284	32x1Fx32	42	1	131	34

Elbow 90°



Article Number	Specification	D	L
1100052285	16x16	25	43
1100052286	20x20	29	47
1100052287	26x26	36	53
1100052288	32x32	42	63

Male elbow 90°



Article Number	Specification	D	R	L	H
1100052289	16x1/2M	25	1/2	46	35
1100052290	16x3/4M	25	3/4	48.5	36
1100052291	20x1/2M	29	1/2	47	37
1100052292	20x3/4M	29	3/4	50	38
1100052293	26x3/4M	36	3/4	54.5	36
1100052294	26x1M	36	1	58	37
1100052295	32x1M	42	1	65	46

Female elbow 90°



Article Number	Specification	D	G	L	H
1100052296	16x1/2F	25	1/2	47	26
1100052297	16x3/4F	25	3/4	50	27
1100052298	20x1/2F	29	1/2	49	27
1100052299	20x3/4F	29	3/4	51	28
1100052300	26x3/4F	36	3/4	56.5	32
1100052301	26x1F	36	1	60.5	33
1100052302	32x1F	42	1	66	34

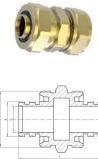
Female wall elbow



Article Number	Specification	D	G	L	H
1100052303	16x1/2F	25	1/2	47	43
1100052304	20x1/2F	29	1/2	48	43
1100052305	20x3/4F	29	3/4	51	43
1100052306	26x3/4F	36	3/4	56	48

8.2.3 Compression fittings - F1

Straight coupling



Article Number	Specification	A/A'	B/B'	C	L
1100045672	16x16	11.8	8	M22x1.5	47
1100045673	20x20	15.8	11.9	M26x1.5	48
1100052176	25x25	19.8	14.8	M32x1.5	49
1100045674	26x26	19.8	14.8	M32x1.5	49
1100052177	32x32	25.8	20.5	M39x1.5	50

Reducing coupling



Article Number	Specification	A	B	C	D	E	F	L
1100045675	20x16	11.8	8	11.9	15.8	M22x1.5	M26x1.5	48
1100052178	25x16	19.8	14.8	8	11.8	M32x1.5	M22x1.5	48.7
1100045676	26x16	19.8	14.8	8	11.8	M32x1.5	M22x1.5	48.5
1100045677	26x20	19.8	14.8	11.9	15.8	M32x1.5	M26x1.5	48.5
1100052179	32x16	25.8	20.5	8	11.8	M39x1.5	M22x1.5	49.5
1100052180	32x20	25.8	20.5	11.9	15.8	M39x1.5	M26x1.5	49.5
1100052181	32x25	25.8	20.5	14.8	19.8	M39x1.5	M32x1.5	50

Male straight coupling



Article Number	Specification	A	B	C	D	E	L
1100045686	16x1/2M	11.8	8	15	R1/2	M22x1.5	40
1100045687	16x3/4M	11.8	8	20	R3/4	M22x1.5	41
1100045689	20x1/2M	15.8	11.9	15	R1/2	M26x1.5	40
1100045690	20x3/4M	15.8	11.9	20	R3/4	M26x1.5	41
1100052182	25x3/4M	19.8	14.8	20	R3/4	M32x1.5	42.5
1100052183	25x1M	19.8	14.8	26	R1	M32x1.5	43.8
1100045691	26x3/4M	19.8	14.8	20	R3/4	M32x1.5	42.5
1100045692	26x1M	19.8	14.8	26	R1	M32x1.5	43.8
1100052184	32x1M	25.8	20.5	26	R1	M39x1.5	45.5

Female straight coupling



Article Number	Specification	A	B	C	D	E	L
1100045680	16x1/2F	11.8	8	G1/2	27	M22x1.5	37.2
1100045681	16x3/4F	11.8	8	G3/4	33	M22x1.5	38.7
1100045682	20x1/2F	15.8	11.9	G1/2	27.5	M26x1.5	36.7
1100045683	20x3/4F	15.8	11.9	G3/4	33	M26x1.5	38.5
1100052185	25x3/4F	19.8	14.8	G3/4	33	M32x1.5	39
1100045684	26x3/4F	19.8	14.8	G3/4	33	M32x1.5	39
1100052186	25x1F	19.8	14.8	G1	41	M32x1.5	40
1100045685	26x1F	19.8	14.8	G1	38	M32x1.5	43.8
1100052187	32x1F	25.8	20.5	G1	42	M39x1.5	39

Tee



Article Number	Specification	A/A/A"	B/B/B"	E	L1	L2
1100045700	16x16x16	11.8	8	M22x1.5	67	33.5
1100045701	20x20x20	15.8	11.9	M26x1.5	70.5	35.25
1100052188	25x25x25	19.8	14.8	M32x1.5	78	39
1100045702	26x26x26	19.8	14.8	M32x1.5	78	39
1100052189	32x32x32	25.8	20.5	M39x1.5	85	42.5

Reducing tee



Article Number	Specification	A	B	C	D	E	F	G	H	I	L1	L2
1100045703	16x20x16	11.8	8	11.8	11.9	15.8	M22x1.5	M22x1.5	M26x1.5	70	33	
1100045704	20x16x20	15.8	11.9	11.9	15.8	8	11.8	M26x1.5	M26x1.5	M22x1.5	66	35
1100052190	25x16x25	19.8	14.8	14.8	19.8	8	11.8	M32x1.5	M32x1.5	M22x1.5	68	38.2
1100052191	25x20x25	19.8	14.8	14.8	19.8	8	15.8	M32x1.5	M32x1.5	M26x1.5	72.5	38
1100045705	26x16x26	19.8	14.8	14.8	19.8	8	11.8	M32x1.5	M32x1.5	M22x1.5	68	38.2
1100052192	25x20x16	25.8	20.5	8	11.8	11.9	15.8	M32x1.5	M22x1.5	M26x1.5	69.5	37.5
1100052193	32x16x32	25.8	20.5	20.5	25.8	8	11.8	M39x1.5	M39x1.5	M22x1.5	70	45
1100052194	32x20x32	25.8	20.5	20.5	25.8	11.9	15.8	M39x1.5	M39x1.5	M26x1.5	73.5	41.5
1100052195	32x25x32	25.8	20.5	20.5	25.8	14.8	19.8	M39x1.5	M39x1.5	M32x1.5	78	42.5

Male tee



Article Number	Specification	A/A'	B/B'	C	D	E	L1	L2
1100045697	16x1/2Mx16	11.8	8	15	R1/2	M22x1.5	67	28.5
1100045698	20x1/2Mx20	15.8	11.9	15	R1/2	M26x1.5	70.5	30

Female tee



Article Number	Specification	A/A'	B/B'	C	D	E	L1	L2
1100052196	16x3/4Fx16	11.8	8	G3/4	33	M22x1.5	78	26
1100045694	20x1/2Fx20	15.8	11.9	G1/2	28	M26x1.5	72.5	25
1100045695	20x3/4Fx20	15.8	11.9	G3/4	33	M26x1.5	78	26
1100052197	25x3/4Fx25	19.8	14.8	G3/4	33	M32x1.5	79	27.5
1100045696	26x3/4Fx26	19.8	14.8	G3/4	33	M32x1.5	79	27.5
1100052198	32x1Fx32	25.8	20.5	G1	40	M39x1.5	86	32

Elbow 90°



Article Number	Specification	A/A'	B/B'	C	L1	L2
1100045707	16x16	11.8	8	M22x1.5	33.5	33.5
1100045708	20x20	15	11.9	M26x1.5	35.5	35.5
1100052199	25x25	19.8	14.8	M32x1.5	39	39
1100045709	26x26	19.8	14.8	M32x1.5	39	39
1100052200	32x32	25.8	20.5	M39x1.5	42.5	42.5

Male elbow 90°



Article Number	Specification	A	B	C	D	E	L1	L2
1100045710	16x1/2M	11.8	8	15	R1/2	M22x1.5	33.5	28.5
1100052201	16x3/4M	11.8	8	20	R3/4	M22x1.5	36	29.5
1100045711	20x1/2M	15.8	11.9	15	R1/2	M26x1.5	35	29.5
1100052202	20x3/4M	15.8	11.9	20	R3/4	M26x1.5	36	31.5
1100052203	25x3/4M	19.8	14.8	20	R3/4	M32x1.5	37.5	34
1100052204	25x1M	19.8	14.8	26	R1	M32x1.5	41	36
1100045712	26x3/4M	19.8	14.8	20	R3/4	M32x1.5	37.5	34
1100045713	26x1M	19.8	14.8	26	R1	M32x1.5	41	36
1100052205	32x3/4M	25.8	20.5	20.5	R3/4	M39x1.5	39	38

Female elbow 90°



Article Number	Specification	A	B	C	D	E	L1	L2
1100045714	16x1/2F	11.8	8	G1/2	28	M22x1.5	36	23.5
1100045715	20x1/2F	15.8	11.9	G1/2	28	M26x1.5	36	25
1100045716	20x3/4F	15.8	11.9	G3/4	33	M26x1.5	39	25
1100052206	25x3/4F	19.8	14.8	G3/4	33	M32x1.5	39.5	28.5
1100052207	25x1F	19.8	14.8	G1	40	M32x1.5	43	28.5
1100045717	26x3/4F	19.8	14.8	G3/4	33	M32x1.5	39.5	28.5
1100045718	26x1F	19.8	14.8	G1	40	M32x1.5	43	30.5
1100052208	32x1F	25.8	20.5	G1	40	M39x1.5	43	32
1100052205	32x3/4M	25.8	20.5	20.5	R3/4	M39x1.5	39	38

Female wall elbow



Article Number	Specification	A	B	C	D	E	L1	L2
1100045719	16x1/2F	11.8	8	G1/2	28	M22x1.5	36.5	24
1100045720	20x1/2F	15.8	11.9	G1/2	28	M26x1.5	36.5	25.5

Compression adapter M24 x 16



Article Number	Specification	A	B	C	D	E	L
1100052212	16xM24	11.8	8	16.6	18	M24	21.5

Coupling for conversion of compression fitting copper to compression fitting multilayer pipe



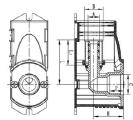
Article Number	Specification	A	B	C	D	E	L
1100045678	16x15Cu	11.8	8	16.6	15	44.3	19.8
1100045679	20x22Cu	15.8	11.9	20.6	22	45.6	20.1
1100052209	26x28Cu	19.8	14.8	26.5	28	49.5	22

Eurocone 3/4" F compression adapter



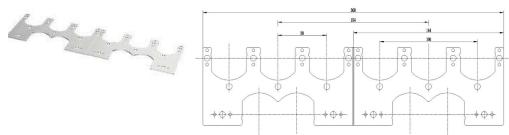
Article Number	Specification	A	B	C	D	E	L
1100052213	14x3/4F EK	9.8	6	14.6	18	G3/4	20.7
1100052214	16x3/4F EK	11.8	8	16.6	18	G3/4	21.5
1100052215	17x3/4F EK	12.8	9	17.6	18	G3/4	22
1100052216	18x3/4F EK	13.8	9.9	18.6	18	G3/4	24
1100052217	20x3/4F EK	15.8	11.9	20.6	18	G3/4	25

Wall box with compression fitting



Article Number	Specification	A	B	L1	C	P	L	H
1100052210	16x1/2F	11.75	20.2	26.1	G1/2	14	45.7	30
1100052211	20x1/2F	15.75	24.2	26.1	G1/2	14	45.7	30

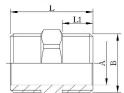
Mounting plate for wall box



Article Number	Specification
1100052175	WBD

8.2.4 Adapters

Eurocone 3/4" M straight coupling



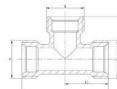
Article Number	Specification	A	B	L1	L
1100052133	3/4M EK x 3/4M EK	19.5	G3/4	13	35

Eurocone 3/4" M adapter to 1/2" M with O-ring



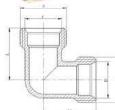
Article Number	Specification	A	B	C	D	L1	L2	L3	L
1100052134	3/4M EK x 1/2M O-ring	14.5	19.5	R3/4	R1/2	14	15	20	37

Eurocone 3/4" M tee



Article Number	Specification	A	B	C	L	L1	L2
1100052135	3/4M EK x 3/4M EK x 3/4M EK	G3/4	G3/4	G3/4	60	30	30

Eurocone 3/4" M elbow



Article Number	Specification	A	B	C	D	L	L1
1100052136	3/4M EK x 3/4M EK	G3/4	G3/4	21	21	30	30

Eurocone 3/4" M elbow to male 1/2" M adapter



Article Number	Specification	A	B	C	D	L	L1
1100052137	3/4M EK x 1/2M	G3/4	R1/2	17	17	29.5	30

8.2.5 Transition fittings

Press-fit adapter with copper pipe



Article Number	Specification	A	B	C	L1	L	P
1100052138	16x10Cu	11.75	20.2	10	26.1	81.2	50
1100052139	16x12Cu	11.75	20.2	12	26.1	81.2	50
1100052140	16x15Cu	11.75	20.2	15	26.1	81.2	50
1100052141	20x18Cu	15.75	24.2	18	26.1	81.2	50
1100059169	20x15Cu	15.75	24.2	15	26.1	81.2	50
1100052142	20x22Cu	15.75	24.2	22	26.1	81.2	50
1100052143	26x22Cu	19.75	29.4	22	33.3	88.5	50
1100052144	26x28Cu	19.75	29.4	28	33.3	88.5	50
1100052145	32x28Cu	25.75	36.4	28	33.3	88.5	50

Press-fit adapter to copper compression



Article Number	Specification	A	B	C	L1	L
1100045780	16x15Cu	11.75	20.2	15.1	26.1	45.7
1100045781	20x22Cu	15.75	24.2	22.1	26.1	46.2
1100045782	26x22Cu	19.75	29.4	22.1	33.3	53.5

Elbow press fit adapter 90° to copper compression



Article Number	Specification	A	B	L1	C	L	H
1100056318	16x15Cu	11.75	20.2	26.1	15.1	47.2	33.8
1100056319	20x22Cu	15.75	24.2	26.1	22.1	49.2	37.5
1100056320	26x22Cu	19.75	30.4	33.3	22.1	59.5	37.5

Elbow press-fit adapter to copper pipe, plated



Article Number	Specification	A	B	L1	C	L2
1100058983	16x12Cu - 200 mm	11.75	20.2	26.1	12	200
1100052131	16x15Cu - 200 mm	11.75	20.2	26.1	15	200

Press-fit adapter to copper press V/M/SA



Article Number	Specification	L	L1	Z	D	d	d1
1100055638	16 x 12Cu V/M/SA	52.9	26.3	10.85	20.1	11.75	12.2
1100055639	16 x 15Cu V/M/SA	53.9	26.3	9.75	20.1	11.75	15.2
1100055640	20 x 15Cu V/M/SA	53.9	26.3	9.75	24.1	15.75	15.2
1100055641	20 x 22Cu V/M/SA	57.4	26.3	7.35	24.1	15.75	22.2
1100055642	26 x 22Cu V/M/SA	64.8	33.6	7.45	30.3	19.75	22.2
1100055643	32 x 28Cu V/M/SA	67.8	33.6	7.45	36.3	25.75	28.2