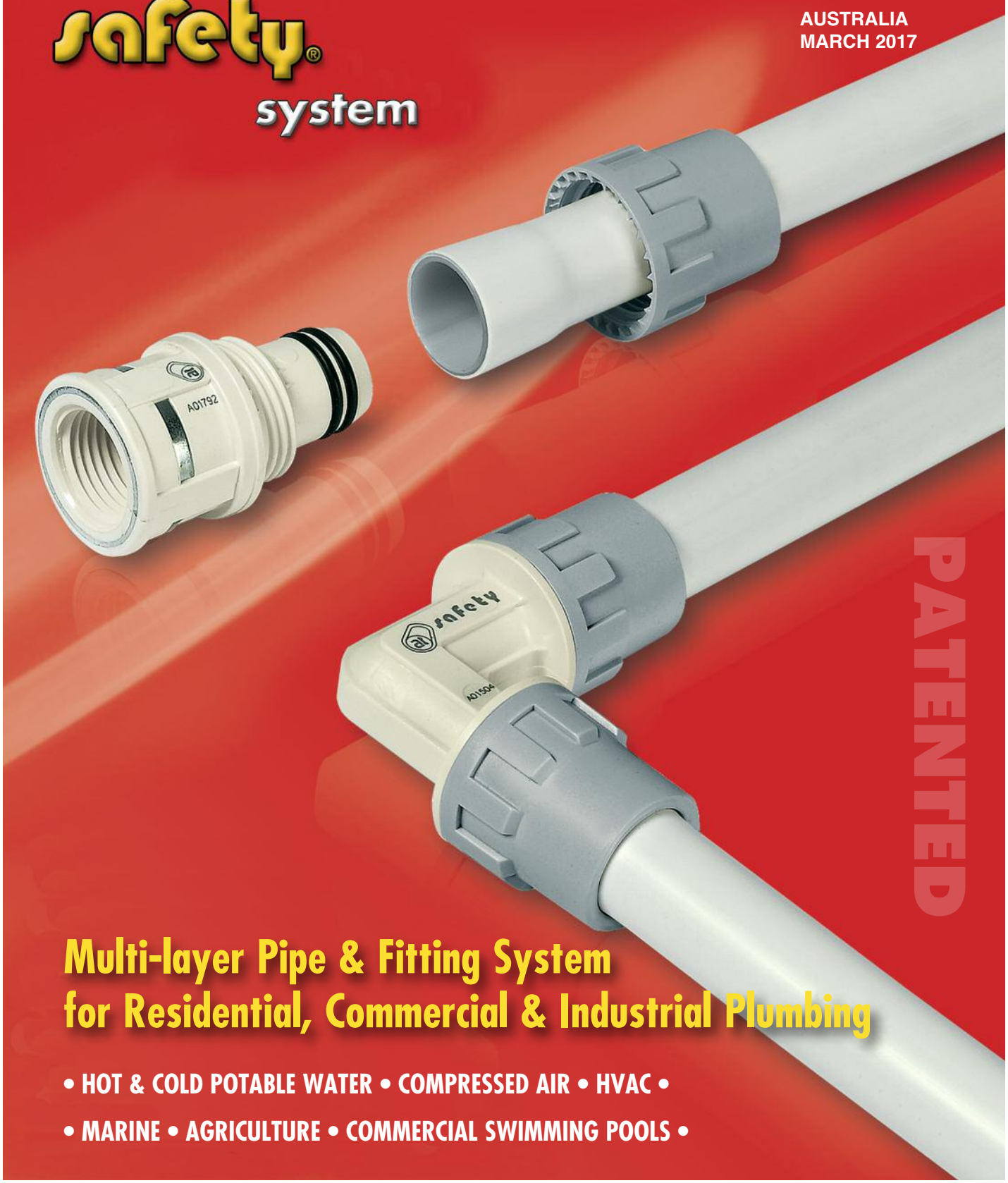
safety® system

AUSTRALIA
MARCH 2017



PATENTED

Multi-layer Pipe & Fitting System for Residential, Commercial & Industrial Plumbing

• HOT & COLD POTABLE WATER • COMPRESSED AIR • HVAC •

• MARINE • AGRICULTURE • COMMERCIAL SWIMMING POOLS •

WaterMark IIP www.iip.it CISQ IQNet

aquatechnik®

TRAINING DEMONSTRATIVE CENTRE IN BUSTO ARSIZIO
via Bonsignora, 53 - 21052 Busto Arsizio (Va) - Italy

AQUATECHNIK AUSTRALIA
1600 Canterbury Road, Punchbowl NSW 2196
tel. +61 2 9793 9233 - fax +61 2 9793 9544
E-mail:admin@aquatechnik-australia.com.au
www.aquatechnik-australia.com.au

✆ **1800 AQUATECHNIK**
(1800 278 283)

INTERNATIONAL HEAD OFFICE - PRODUCTION
via P.F. Calvi, 40 - 20020 Magnago (MI) Italy
E-mail:aquatechnikexp@aquatechnik.it
www.aquatechnik.it

aquatechnik®

Introduction	5
PIPES	**6**
MULTI-CALOR PIPES	**7**
Pipe specifications	8
Dimensions and tolerances	9
Regression lines	10
System advantages	**11**
MULTI-ECO PIPES	12
Pipe specifications	13
Dimensions and uses	**14**
POLIPERT PIPES	15
Pipe specifications	16
Dimensions and uses	**17**
PIPE PRESSURE DROPS	**18**
LINEAR EXPANSION AND CLAMPING	**21**
Installation example	25
Thermal insulation	26
SAFETY SYSTEM	**28**
Fittings	29
Technical features	30
PRESSURE DROPS THROUGH FITTINGS	**32**
Comparison of pressure drops through fitting	33
Fitting pressure drops	35
APPLICATION FOR THE SAFETY SYSTEM	**37**
TOOLS AND PROCESSING	**41**
Extraordinary works and repairs	45
Precautions on processing	47
Protection against UV-rays	51
MODULAR MANIFOLDS	**52**
Description and hydro-sanitary manifolds	53
Manifolds for traditional heating	54
Plant testing and protocol	55
COMPONENT IDENTIFICATION AND DIMENSIONS	**57**
IMPORTANT NOTES	**97**
COMPETENCE AND RESPONSIBILITY	**98**
PPSU CHEMICAL RESISTANCE	**99**
CERTIFICATION	**106**
WARRANTY CERTIFICATE	**108**
PROJECTS AND INSTALLATIONS	**110**
CONTACT DETAILS	**Back Cover**

aquatechnik®

In the last few years, the field of water, thermal and sanitary installations has distinguished itself for the increasing use of plastic materials in application for domestic, and commercial construction along with industrial and plant engineering. Nowadays, the use metal-plastic composite materials is well-established in many countries, thus becoming the main alternative to common metals. **aquatechnik** notably contributed to the research of technically advanced plastic materials, such as in the series of fittings for multi-layer pipes, called **safety**, which is available in diameters up to 63 mm.

The success of the **safety** system drove **aquatechnik** to design and expand its range of products with new pipe systems that have a more favourable quality/price ratio and a larger range of applications.

Subsequently, the **multi-eco** (PE-X/AL/PE-HD) and **polipert** (PE-RT with EVOH barrier) pipe series were designed. Even if their performances are different from the **multi-calor** pipe, they share the same type of processing and the same system for connection to **safety** fittings.

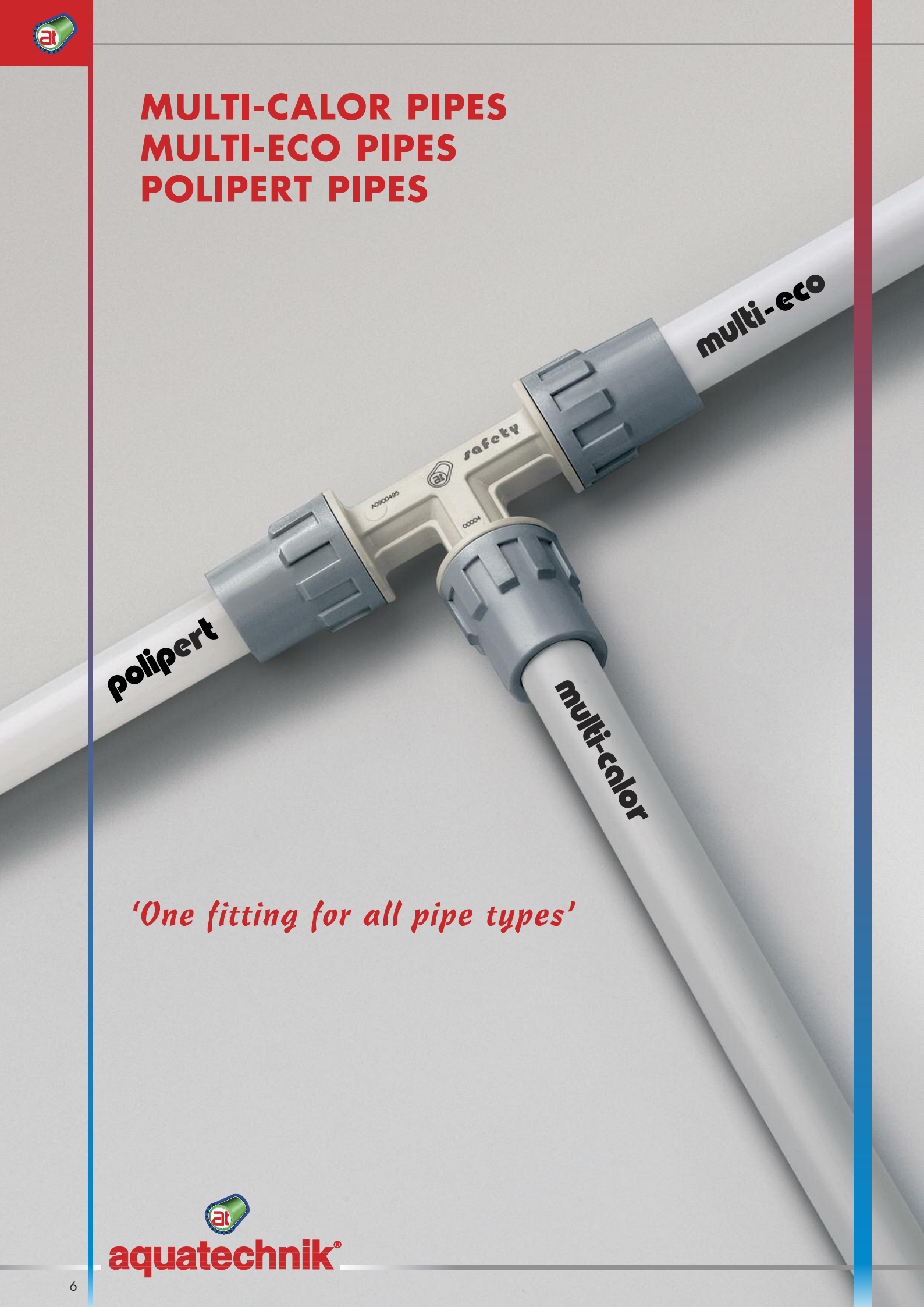
aquatechnik has been expanding its markets in Italy and abroad for several years, and being a leader in the sector of plastic materials for pipes – strengthened its own production capacity thanks to new plastics moulding departments, processing equipment and testing laboratories, which in their turn were upgraded with new equipment and high precision instruments, in order to continue controlling the entire production in a strict and rigorous way.

This updated technical guide aims at documenting, as best as possible, the correct use of the systems and methods of connecting pipes to the fittings, as well as showing all features and performance characteristics of **aquatechnik** materials. We hope that this guide is easy to use and we invite you to read it carefully. For additional assistance, please contact the **aquatechnik** distributor in your region.

WaterMark®

aquatechnik®

MULTI-CALOR PIPES
MULTI-ECO PIPES
POLIPERT PIPES



'One fitting for all pipe types'

aquatechnik®

multi-calor

The pipe used in the **multi-calor** system is made by integrating different materials, resulting in the terminology "multi-layer".
The polymer of the internal/external layer is cross-linked polyethylene (PE-X, see table of values and features). This produces pipe with very good performance with high temperature fluids under pressure and leaves the characteristics of potable water unchanged.

During the production process, the external cover of the pipe (PE-X) is combined with thin aluminium alloy layers, welded lenghtwise - by laser beam plasma - and then combined with a special adhesive to make the materials bond perfectly. The result is that the metal (Al) is covered by a PE-X layer, protecting it from corrosion.
All the process stages are checked by computerised quality control ensuring every batch meets the appropriate standards.

The whole **multi-calor** pipe range is certified by regulatory authorities and complies with the laws in force for the conveyance of potable fluids for human consumption in countries including Italy, Germany, Spain, the Netherlands, Norway, Polland, USA, France , Russia and Australia.

aquatechnik®

PIPE SPECIFICATIONS	multi-color		
Name	PE-X + Al + PE-X Cross-linked polyethylene + aluminium + cross-linked polyethylene		
Reference standards	UNI EN 21003; DIN 4726; DVGW W542; KIWA BRL-5610; AENOR RP01.54: AS 4176.2		
Aluminium welding	butt with TIG method (with control camera)		
Colour	white		
Chemical reticulation inner layer	PE-Xb silans, minimum value 65%		
Chemical reticulation outer layer	PE-Xb silans, minimum value 65%		
Aluminium alloy	Treatment: annealing Yield: minimum value 50 MPa Elongation at fracture: minimum value 30% Ductility/malleability: can be folded to 180° Expansion after welding: increaded by 20%		
Adhesive between layers	Adhesion value: always higher than 80 N/cm^2		
Oxygen permeability	(According to DIN 4726 Standard) % mg/l 0.00		
Max. temperature	in continuous working conditions 95°C peak 100°C		
Hot working conditions (for heating)	a + 95°C	10 bar/1000kPa	min. life 50 years
Cold working conditions (for conditioning)	a + 5°C	20 bar/2000kPa	min. life 50 years
Thermal conductivity at 20°C	W/mK	0.43	
Expansion coefficient	mm/mK	0.026	
Internal roughness	mm	0.007	
Bending radius	pipe Ø x 6 times		
Potability and organoleptic features	Watermark Certification – Evaluated to AS 4176.2 2010 – Multilayer pipes for pressure applications – Multilayer piping systems for hot and cold water plumbing applications – Pipes (ISO 21003-2:2008, MOD) Certificate No: WMK26042		
Quality control and sale authorization	According to UNI EN ISO 9001:2000 Supervision by the Test and Laboratory Manager		
	The **multi-color** pipes satisfy all the requirements of UNI EN 21003, on the conveyance of potable warm and cold fluids, for human consumption, for radiator heating, low temperature conditioning, floor panel system and other systems possible with the basic material.		

aquatechnik®

multi-color SYSTEM PN 10 by 95°C UNI 10954/1 - WHITE COLOUR

Ext. Ø mm	Thick. mm	Alu mm	Int. Ø mm	Content H_2O l/m	Packages		Weight kg/m	Pack. weight no insul. kg
					Roll no insul. m	Pipes m 4 m		
16	2	0.30	12.0	0.113	100	*40*	0.120	12.00 *4.80*
16	2	0.30	12.0	0.113	250	–	0.120	30.00
20	2	0.40	16.0	0.201	100	*40*	0.150	15.00 *6.00*
20	2	0.40	16.0	0.201	150	–	0.150	22.50
26	3	0.58	20.0	0.314	50	*40*	0.300	15.00 *12.00*
32	3	0.75	26.0	0.531	50	*40*	0.410	20.50 *16.40*
40	3.5	0.80	33.0	0.960	–	*20*	0.590	*11.80*
50	4	1.00	42.0	1.385	–	*20*	0.835	*16.70*
63	4.5	1.20	54.0	2.289	–	*12*	1.325	*15.90*

Pipes

Rolls

WORKING CONDITIONS

Temperature	Pressure - bar/kPa	Life - years
20°C	20/2000	50
95°C	10/1000	50

APPLICATIONS

The **multi-color** pipe can be used in all the plant-engineering systems and particularly:

HOUSING : hot and cold potable water; heating systems; conditioning and cooling systems; garden irrigation; distribution networks; sanitary systems.

INDUSTRIAL: hot and cold potable water; conditioning and heating systems; compressed air; supply to machinery pneumatic and hydraulic circuits; marine; agriculture; green houses; sanitary systems and other applications compatible with the basic material.

SERVICE INDUSTRY: hot and cold potable water; shops; laboratories; surgeries; schools; gym and swim centres; restaurants, public premises; religious buildings; animal care and breeding centres; etc.

aquatechnik®

Reference regression lines for multilayer piping: **multi-color**

internal pressure (bar)

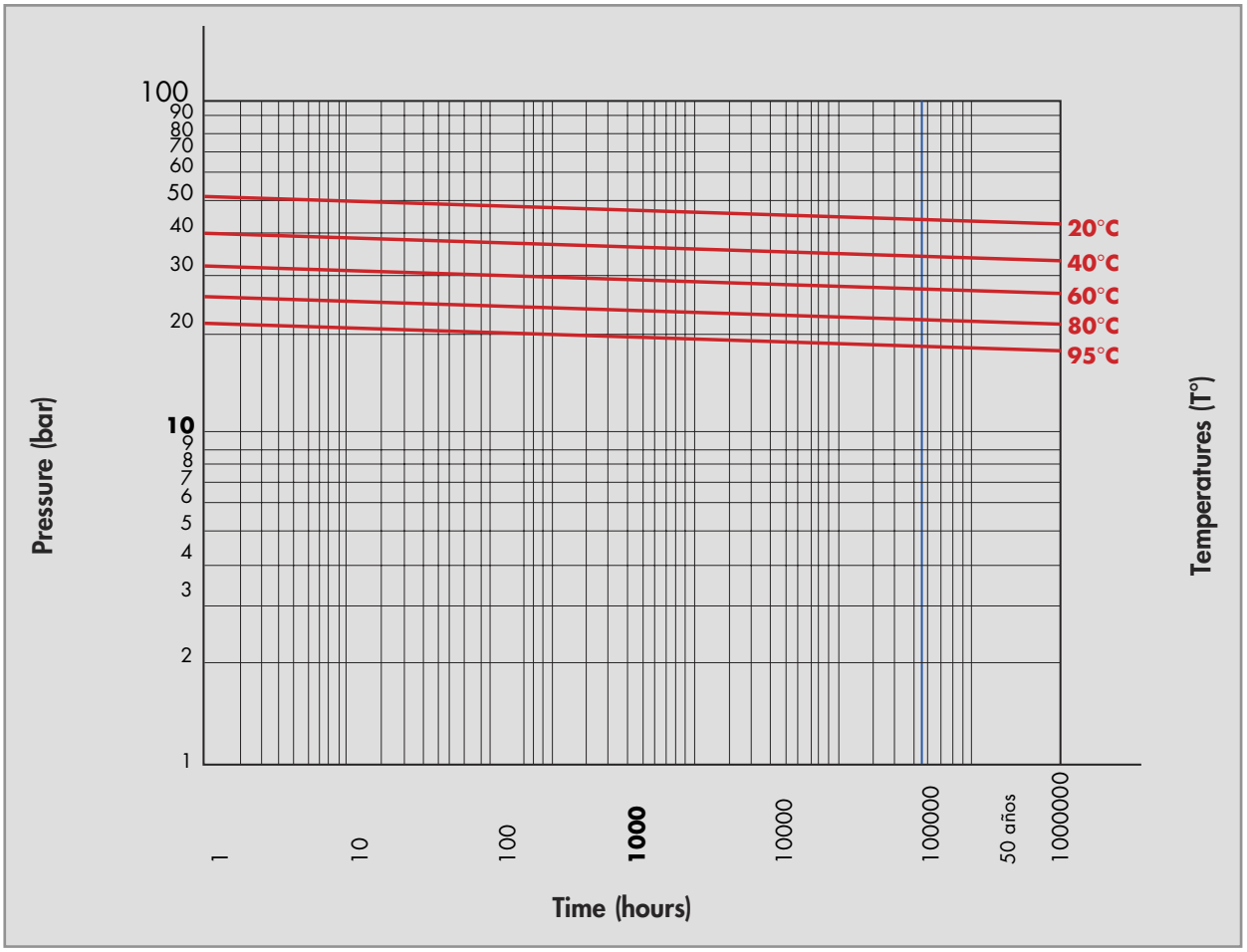


Table obtained by the reference regression lines for multilayer piping according to indirect evaluation method used to issue the UNI EN 21003 standard.

Temperature	Stress duration 10 years bar/kPa	Stress duration 20 years bar/kPa	Stress duration 50 years bar/kPa
20°C	43.3/4330	42.9/4290	42.5/4250
40°C	34.2/3420	33.9/3390	33.5/3350
60°C	27.2/2720	26.9/2690	26.7/2670
80°C	21.8/2180	21.6/2160	21.4/2140
95°C	18.4/1840	18.4/1840	18.2/1820

aquatechnik®

SYSTEM ADVANTAGES

Installing the **multi-calor** pipes can considerably improve plant performances, making any processing easier and providing the following advantages:

- Great resistance to high working temperatures and pressures
- Chemically stable ensuring the safety of fluids for human consumption
- Zero corrosion
- Reliability and low maintenance
- Malleable and ductile to ensure ease of manual processing
- No change to internal bore dimensions at fitting junction ensuring optimum flow rates and less pressure drop
- Lower thermal conductivity
- Low cost installation and ease of transport
- Impermeability to oxygenated fluids
- Simple to install, unparalleled reliability under the harshest working conditions

multi-eco

The pipe of the **multi-eco** system is characterised by 5 layers, which are united one to the other and enhance the value of the metal-plastic couple. The internal layer that carries the fluid is made of cross-linked polyethylene, a polymer whose resistance to high temperatures and hydrostatic pressures has been confirmed over more than thirty years of use in the plant engineering sector with excellent results. On the contrary, the external layer is made with high-density polyethylene.
From the organoleptic point of view, the material is generally acknowledged to be one of the best solutions for the conveyance of drinkable water and liquids for human consumption. In the last few years, **aquatechnik** has substantially contributed to the improvement of the multi-layer technology. The improvement concerned all construction phases, starting from the application of new adhesives that are more resistant to mechanical stresses, aluminium alloy plates with higher performances and easier to weld, up to the synchronisation of the entire process to assure maximum quality standards.
The entire European range of diameters UNI EN 21003, class 1.

aquatechnik®

PIPE SPECIFICATIONS	multi-eco		
Name	PE-X + Al + HDPE (cross-linked polyethylene + aluminium + high-density polyethylene)		
Reference standards	UNI EN 21003		
Aluminium welding	butt with TIG method (with control camera)		
Colour	grey		
Chemical reticulation, inner layer	PE-Xb with silanes, minimum value: 65% according to the standard		
Aluminium alloy	Treatment: annealing Yield: minimum value 50 MPa Elongation at fracture: minimum value 25% Ductility/malleability: can be folded to 180° Expansion after welding: increased by 18%		
Adhesive between layers	Adhesion value always higher than 80 N/cm²		
Oxygen permeability	(according to DIN 4726 standard) % mg/l 0.00		
Max. temperature	in continuous working conditions 95°C with 100°C peaks		
Hot working conditions (for heating)	a + 95°C	10 bar/1000 kPa	min. duration: 45 years
Cold working conditions (for conditioning)	a + 5°C	20 bar/2000 kPa	min. duration: 45 years
Thermal conductivity at 20°C	W/mK	0.43	
Expansion coefficient	mm/mK	0.026	
Internal roughness	mm	0.007	
Bend radius	Ø of the pipe x 6 times		
Potability and organoleptic features	Compliant with European Union Directives; as for the National territory, cp. Decree no. 1 74 dated April 6th, 2004		
Quality Control and sale authorisation	According to UNI EN ISO 9001:2000 Supervision by the Test and Laboratory Manager		
	aquatechnik multi-eco pipes comply with all requirements established by the European UNI EN 21003 Standard for the conveyance of hot and cold drinkable fluids for human consumption, heating systems equipped with radiators, conditioning at low temperatures, floor radiant panels and other systems that are compatible with the basic material. The manufacturer is certified and its production complies with the UNI EN ISO 9001:2000 quality management system (certified IIP no. 640 - IQNET IT-16323), and works under the supervision of the Test and Laboratory Manager, by means of a control system that includes an internal test laboratory.		

PRODUCT SPECIFICATIONS

multi-eco PIPES PN 10 at 95°C UNI EN 21003 Standard - GREY COLOUR

Ext. Ø mm	Thick. mm	Alu mm	Int. Ø mm	Content H_2O l/m	Rolls packages m	Weight kg/m	Pack. weight kg
16	2	0.20	12.0	0.113	100	0.120	12.00
16	2	0.20	12.0	0.113	250	0.120	30.00
20	2	0.20	16.0	0.201	100	0.150	15.00
20	2	0.20	16.0	0.201	150	0.150	22.50

WORKING CONDITIONS

Temperature	Pressure - bar/kPa	Life - years
20°C	20/2000	45
95°C	10/1000	45

APPLICATIONS

The **multi-eco** pipe was designed to be used in traditional heating systems (radiators), conditioning systems (fan-coil), as well as cooling and heating systems equipped with radiant panels.
The technical-construction features of the product allow to use it also for sanitary systems; however, in these cases, the reduced thickness of the aluminium layer and the absence of PE-X on the external layer assure product performances that are slightly reduced compared with the performances of the **multi-color** pipe range (product being type approved in more than 20 countries).

Applications include the following sectors:

HOUSING : hot and cold potable water; heating systems; conditioning and cooling systems; garden irrigation; distribution networks; sanitary systems.

INDUSTRIAL: hot and cold potable water; conditioning and heating systems; compressed air; supply to machinery pneumatic and hydraulic circuits; marine; agriculture; green houses; sanitary systems and other applications compatible with the basic material.

SERVICE INDUSTRY: hot and cold potable water; shops; laboratories; surgeries; schools; gym and swim centres; restaurants, public premises; religious buildings; animal care and breeding centres; etc.

polipert

The pipe of the **polipert** system is characterised by 5 layers, which are united one to the other.
Polyethylene (with increased resistance to temperature) is used for internal/external layers of the pipe; an EVOH layer is extruded between them and it has the function of anti-oxygen barrier (in compliance with DIN 16837 and DIN 4726 standards). The adhesion of the layers is assured by two adhesive extruded layers. The features of this product make it particularly suitable for the creation of cooling and heating systems. In detail, the high flexibility of the **polipert** pipes facilitates pipe laying operations and make it particularly suitable for the creation of systems with radiant panels.
The excellent resistance to electro-chemical phenomena assures long term durability of the material.

Thanks to the BBS 32 Coupling Tool and the support of specific expanders, **polipert** pipes are compatible with the entire range of **safety** fittings.

Coming Soon

aquatechnik®

PIPE SPECIFICATIONS	polipert		
Name	PE-RT (polyethylene with increased resistance to temperature)		
Reference standards	DIN 16833, DIN 16837 and DIN 4726		
Colour	semitransparent		
Adhesive between the layers	Adhesion value always higher than 80 N/cm^2		
Density	0.934 g/cm^3		
Oxygen permeability	(according to DIN 4726 standard) % mg/l-24h <0.1		
Max. temperature	in working conditions: 70°C		
Max. pressure	6 bar/600 kPa		
Hot working conditions (for heating)	classes 4 and 5		min. duration: 50 years
Cold working conditions (for conditioning)	a + 20°C	10 bar/1000 kPa	min. duration: 50 years
Thermal conductivity at 20°C	W/mK	0.40	
Linear expansion coefficient	mm/mK	0.190	
Elongation at fracture	800 %		
Internal roughness	mm	0.007	
Bend radius	Ø of the pipe x 6 times		
Quality Control and sale authorisation	According to UNI EN ISO 9001:2000 Supervision by the Test and Laboratory Manager		
	aquatechnik **polipert** pipes meet all requirements established by DIN 16833, 16837 and 4726 standards. The manufacturer is certified and its production complies with the UNI EN ISO 9001:2000 quality management system (certified IIP no. 640 - IQNET IT-16323), and works under the supervision of the Test and Laboratory Manager, by means of a control system that includes an internal test laboratory.		

polipert PIPES with EVOH anti-oxygen barrier – SEMITRANSPARENT COLOUR

Ext. Ø mm	Thick. mm	Int. Ø mm	Content H_2O l/m	Rolls packages m	Weight kg/m	Pack. weight kg
16	2	12.0	0.113	100	0.080	8.00
16	2	12.0	0.113	250	0.080	20.00
20	2	16.0	0.201	100	0.110	11.00
20	2	16.0	0.201	150	0.110	16.50

WORKING CONDITIONS

Temperature	Pressure - bar/kPa	Duration - years
20°C	10/1000	50
70°C	6/600	50

APPLICATIONS

The use of **polipert** pipes is the ideal solution for the creation of heating systems with radiators, conditioning systems and floor heating/cooling systems for industrial and civil buildings.
The entire range of diameters complies with the requirements established in the DIN 4726 Standard, classes 4 and 5.

MULTI-CALOR, MULTI-ECO, POLIPERT AT 20°C - 80°C

Roughness: 0.007 mm Specific weight 998.00 kg/m³ 971.90 kg/m³ Temp : 20°C 80°C Viscosity : 1.02 E-06 m²/s 3.70 E-07 m²/s

Q = flowing l/s R = pressure loss mbar/m V = speed m/s

De = external diameter Di = internal diameter

Q = l/s	De Di	16x2 12 mm	20x2 16 mm	26x3 20 mm	32x3 26 mm	40x3.5 33 mm	50x4 42 mm	63x4.5 54 mm
0.01	R	0.18 0.14	0.02 0.04	0.00 0.01	0.00 0.00	0.00 0.00	0.00 0.00	
	V	0.09	0.05	0.03	0.02	0.01	0.01	
0.02	R	0.62 0.47	0.16 0.12	0.05 0.04	0.02 0.01	0.01 0.00	0.00 0.00	
	V	0.18	0.10	0.06	0.04	0.02	0.01	
0.03	R	1.26 0.95	0.32 0.24	0.11 0.08	0.03 0.02	0.01 0.01	0.00 0.00	0.00 0.00
	V	0.27	0.15	0.10	0.06	0.03	0.02	0.01
0.04	R	2.08 1.58	0.53 0.40	0.18 0.14	0.05 0.04	0.01 0.01	0.01 0.01	0.00 0.00
	V	0.35	0.20	0.13	0.08	0.05	0.03	0.02
0.05	R	3.08 2.33	0.79 0.59	0.27 0.21	0.08 0.06	0.02 0.02	0.01 0.01	0.00 0.00
	V	0.44	0.25	0.16	0.09	0.06	0.04	0.02
0.06	R	4.24 3.20	1.08 0.82	0.37 0.28	0.11 0.08	0.02 0.02	0.01 0.01	0.00 0.00
	V	0.53	0.30	0.19	0.11	0.07	0.04	0.03
0.07	R	5.55 4.20	1.42 1.07	0.49 0.37	0.14 0.11	0.04 0.03	0.01 0.01	0.00 0.00
	V	0.62	0.35	0.22	0.13	0.08	0.05	0.03
0.08	R	7.01 5.30	1.79 1.35	0.62 0.47	0.18 0.13	0.06 0.04	0.02 0.01	0.00 0.00
	V	0.71	0.40	0.25	0.15	0.09	0.06	0.03
0.09	R	8.62 6.51	2.20 1.66	0.76 0.58	0.22 0.17	0.07 0.05	0.02 0.02	0.00 0.00
	V	0.80	0.45	0.29	0.17	0.10	0.06	0.04
0.10	R	10.3 7.83	2.64 2.00	0.92 0.69	0.26 0.20	0.08 0.06	0.03 0.02	0.01 0.00
	V	0.88	0.50	0.32	0.19	0.12	0.07	0.04
0.12	R	14.2 10.8	3.64 2.75	1.26 0.95	0.36 0.27	0.11 0.08	0.04 0.03	0.01 0.01
	V	1.06	0.60	0.38	0.23	0.14	0.09	0.05
0.14	R	18.7 14.1	4.76 3.60	1.65 1.25	0.47 0.26	0.15 0.11	0.05 0.04	0.01 0.01
	V	1.24	0.70	0.45	0.26	0.16	0.10	0.06
0.16	R	23.6 17.8	6.01 4.55	2.08 1.57	0.60 0.45	0.18 0.14	0.06 0.04	0.02 0.01
	V	1.41	0.80	0.51	0.30	0.18	0.12	0.07
0.18	R	29.9 21.9	7.39 5.59	2.56 1.94	0.74 0.56	0.22 0.17	0.07 0.06	0.02 0.02
	V	1.59	0.90	0.57	0.34	0.21	0.13	0.08
0.20	R	34.8 26.3	8.89 6.72	3.08 2.33	0.89 0.67	0.27 0.20	0.09 0.07	0.03 0.02
	V	1.77	0.99	0.64	0.38	0.23	0.14	0.09
0.30	R	70.8 53.5	18.1 13.6	6.26 4.73	1.80 1.36	0.55 0.42	0.18 0.14	0.05 0.04
	V	2.65	1.49	0.95	0.57	0.35	0.22	0.13
0.40	R	117 88.6	29.9 22.6	10.3 .83	2.98 .25	0.90 0.70	0.29 0.23	0.09 0.07
	V	3.54	1.99	1.27	0.75	0.46	0.29	0.17
0.50	R	173.23 ----	44.2 33.4	15.3 11.6	4.4 3.33	1.34 1.05	0.44 0.34	0.13 0.11
	V	4.42	2.49	1.59	0.94	0.58	0.36	0.22
0.60	R		60.8 45.9	21.1 15.9	6.06 .58	1.85 1.46	0.60 0.47	0.18 0.15
	V		2.98	1.91	1.13	0.69	0.43	0.26
0.70	R		79.6 60.1	27.5 21.8	7.93 5.99	2.43 1.93	0.79 0.62	0.23 0.19
	V		3.48	2.23	1.32	0.81	0.51	0.30
0.80	R		100 76.2	34.8 26.3	10.1 7.57	3.08 2.46	1.00 0.78	0.29 0.24
	V		3.98	2.55	1.51	0.92	0.58	0.35
0.90	R		93.39 ----	42.8 32.3	12.3 .31	3.80 3.05	1.23 0.97	0.36 0.30
	V		4.48	2.86	1.70	1.04	0.65	0.39
1.00	R		148 112	51.5 38.9	14.8 11.2	4.59 3.70	1.48 1.18	0.44 0.36
	V		4.97	3.18	1.88	1.16	0.72	0.43
1.20	R			70.8 53.5	20.4 15.4	6.37 5.17	2.05 1.64	0.60 0.50
	V			3.82	2.26	1.39	0.87	0.52
1.40	R			92.7 70.1	26.7 20.1	8.41 6.87	2.70 2.17	0.79 0.67
	V			4.46	2.64	1.62	1.01	0.61
1.60	R			117.2 -----	33.7 25.5	10.7 8.80	3.43 2.78	1.01 0.85
	V			5.09	3.01	1.66	1.15	0.69
1.80	R				41.4 31.3	13.2 10.9	4.24 3.45	1.24 1.05
	V				3.39	2.08	1.30	0.78
2.00	R				49.8 37.6	16.1 13.4	5.13 4.19	1.50 1.27
	V				3.77	2.31	1.44	0.87
2.20	R				58.8 44.4	19.1 15.9	6.10 5.00	1.78 1.51
	V				4.14	2.54	1.59	0.98
2.40	R				68.5 51.8	22.4 18.7	7.14 5.87	2.08 1.77
	V				4.52	2.77	1.73	1.04
2.60	R				78.8 59.6	25.9 21.8	8.25 6.81	2.40 2.05
	V				4.90	3.00	1.88	1.13
2.80	R					29.7 25.2	9.44 7.82	2.75 2.35
	V					3.23	2.02	1.21
3.00	R					33.7 ---	10.7 8.89	3.11 2.67
	V					3.47	2.17	1.30

aquatechnik®

The maximum suggested speed is:
H_2O by 20 °C = 5 m/s
H_2O by 80 °C = 3 m/s

MULTI-CALOR, MULTI-ECO, POLIPERT AT 20°C - 80°C

Roughness: 0.007 mm Specific weight 998.00 kg/m³ 971.90 kg/m³ Temp : 20°C 80°C Viscosity : 1.02 E-06 m²/s 3.70 E-07 m²/s

Q = flowing l/s R = pressure loss mbar/m V = speed m/s

De = external diameter Di = internal diameter

Q = l/s	De Di	16x2 12 mm	20x2 16 mm	26x3 20 mm	32x3 26 mm	40x3.5 33 mm	50x4 42 mm	63x4.5 54 mm
3.20	R V						12.1 10.1 2.31	3.50 3.00 1.39
3.40	R V						13.4 11.2 2.45	3.90 3.35 1.47
3.60	R V						14.9 12.5 2.60	4.33 3.73 1.56
3.80	R V						16.5 13.8 2.74	4.77 4.12 1.68
4.00	R V						18.1 15.3 2.89	5.24 4.53 1.73
4.20	R V						18.8 16.8 3.03	5.72 4.96 1.82
4.40	R V							6.23 5.40 1.91
4.60	R V							6.75 5.86 1.99
4.80	R V							7.30 6.35 2.08
5.00	R V							7.86 6.85 2.17
5.20	R V							8.44 7.36 2.25
5.40	R V							9.05 7.90 2.34
5.60	R V							9.67 8.45 2.43
5.80	R V							10.3 9.03 2.51
6.00	R V							10.9 9.61 2.60
6.20	R V							11.6 10.2 2.69
6.40	R V							12.3 10.8 2.77
6.60	R V							13.0 11.4 2.86
6.80	R V							13.8 12.1 2.95
7.00	R V							14.5 12.8 3.03
8.00	R V							
9.00	R V							

The maximum suggested speed is:
H_2O by 20 °C = 5 m/s
H_2O by 80 °C = 3 m/s

aquatechnik®

Example:
Collector supply (module) **multi-color** Ø 16 mm for warm-cold water
Water need of wash basin = l/s 0.10 (l/h 360)
Pressure drop = .783 kPa/m
Speed = 0.88 m/s

Comparison of pipes for sanitary plants

Pipes	Q = flow l/s	l/h	R= pressure drop kPa/m	v = speed m/s
multi-color Ø 20mm x 2 mm	0.16	576	.455	0.80
Zinc-plated pipe 1/2"	0.16	576	.650	0.86
Copper Ø 18 mm x 1 mm	0.16	576	.500	0.85

Example:
Heating radiator system with collector conveyance.
multi-color pipe Ø 16 mm
Radiator supply = l/s 0.09 that is l/h 324
Pressure drop R = .6513 kPa/m
Speed = 0.80 m/s

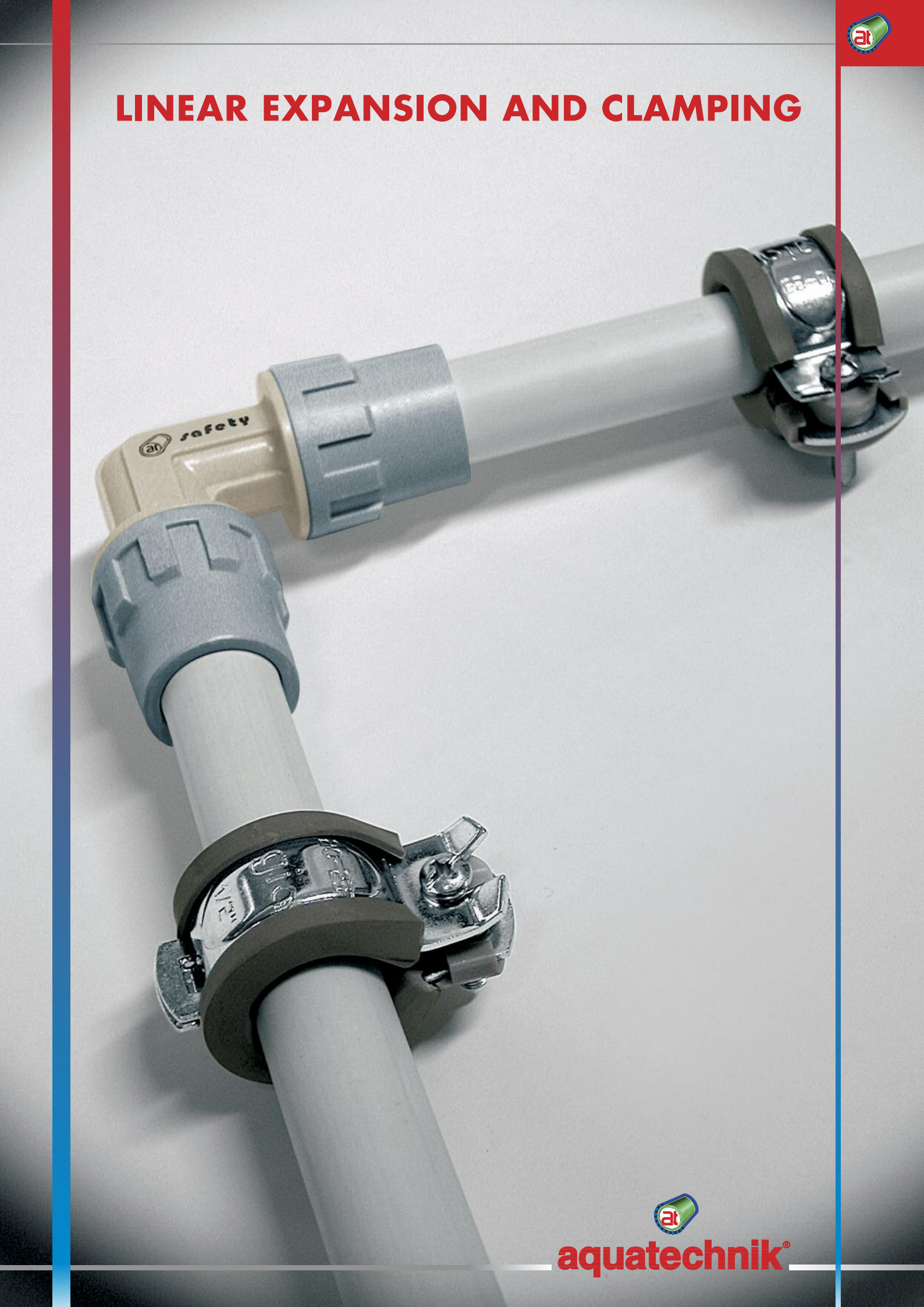
Comparison of pipes for heating systems with H^2O by 80°C:

Pipes	Q = flow l/s	R = pressure drop kPa/m	v = speed m/s
multi-color Ø 32mm x 3 mm	l/h 2880	R = .75 kPa/m	1.51 m/s
Copper Ø 28 mm x 1.5 mm	l/h 2560	R = .80 kPa/m	1.49 m/s
Zinc-plated steel Ø 1" mm x 2.9 mm	l/h 2680	R = .80 kPa/m	1.31 m/s

From this table, you can easily note the superior performance of **multi-color** pipes.

aquatechnik®

LINEAR EXPANSION AND CLAMPING



aquatechnik®

When pipes are heated, they become longer. This phenomenon is common for all the materials and it should be carefully considerd during installation.

NOTE 1 - Walled-up piping does not require any special indication, as even the smallest expansion is absorbed by the insulation layers covering the pipes.

NOTE 2 - For cold water and conditioning piping, the influence of linear expansion is quite negligible, except for very high temperatures (for example, 10°C).

NOTE 3 - In case of compressed air piping systems installed out of the wall, you should consider the surrounding temperatures.

Linear expansion of multi-calor and multi-eco pipes (en mm)

Pipe length m	Δ t 10	Δ t 20	Δ t 30	Δ t 40	Δ t 50	Δ t 60	Δ t 70	Δ t 80
0.5	0.12	0.25	0.37	0.50	0.62	0.75	0.87	1.00
1.0	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00
2.0	0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00
3.0	0.75	1.50	2.25	3.00	3.75	4.50	5.25	6.00
4.0	1.00	2.00	3.00	4.00	5.00	6.00	7.00	8.00
5.0	1.25	2.50	3.75	5.00	6.25	7.50	8.75	10.00
6.0	1.50	3.00	4.50	6.00	7.50	9.00	10.50	12.00
7.0	1.75	3.50	5.25	7.00	8.75	10.50	12.50	14.00
8.0	2.00	4.00	6.00	8.00	10.00	12.00	14.00	16.00
9.0	2.25	4.50	6.75	9.00	11.25	13.50	15.75	18.00
10.0	2.50	5.00	7.50	10.00	12.50	15.00	17.50	20.00

Example of calculation of Δt
Fluid temp. = 70°C
Room temp. = 20°C
Δt = 70° - 20° = 50°C

Clamping distance of multi-calor and multi-eco (en mm)

Δ t	Ø 16 mm	Ø 20 mm	Ø 26 mm	Ø 32 mm	Ø 40 mm	Ø 50 mm	Ø 63 mm
0°C	1300	1550	1700	1900	2300	2550	3000
10°C	1150	1400	1500	1550	1850	2350	2900
20°C	1000	1200	1300	1550	1850	2350	2900
30°C	1000	1200	1300	1500	1750	2250	2800
40°C	1000	1100	1200	1450	1750	2100	2800
50°C	900	1100	1200	1450	1700	2100	2700
60°C	800	1000	1100	1400	1600	1900	2500
70°C	700	900	1000	1300	1500	1800	2300

Linear expansion of polipert pipes (en mm)

Pipe length m	Δ t 10	Δ t 20	Δ t 30	Δ t 40	Δ t 50	Δ t 60	Δ t 70	Δ t 80
0.5	0.95	1.90	2.85	3.80	4.75	5.70	6.65	7.60
1.0	1.90	3.80	5.70	7.60	9.50	11.40	13.30	15.20
2.0	3.80	7.60	11.40	15.20	19.00	22.80	26.60	30.40
3.0	5.70	11.40	17.10	22.80	28.50	34.20	39.90	45.60
4.0	7.60	15.20	22.80	30.40	38.00	45.60	53.20	60.80
5.0	9.50	19.00	28.50	38.00	47.50	57.00	66.50	76.00
6.0	11.40	22.80	34.20	45.60	57.00	68.40	79.80	91.20
7.0	13.30	26.60	39.90	53.20	66.50	79.80	93.10	106.40
8.0	15.20	30.40	45.60	60.80	76.00	91.20	106.40	121.60
9.0	17.10	34.20	51.30	68.40	85.50	102.60	119.70	136.80
10.0	19.00	38.00	57.00	76.00	95.00	114.00	133.00	152.00

Example of calculation of ΔΔt
Fluid temp. = 70°C
Room temp. = 20°C
ΔΔt = 70° - 20° = 50°C

Clamping distance of polipert pipe (en cm)

Temperature	Max. possible distance between clamping	
	Ø 16 mm	Ø 20 mm
T = 13°C	78.50	83.50
Δ t = max 50°C	48.50	58.50

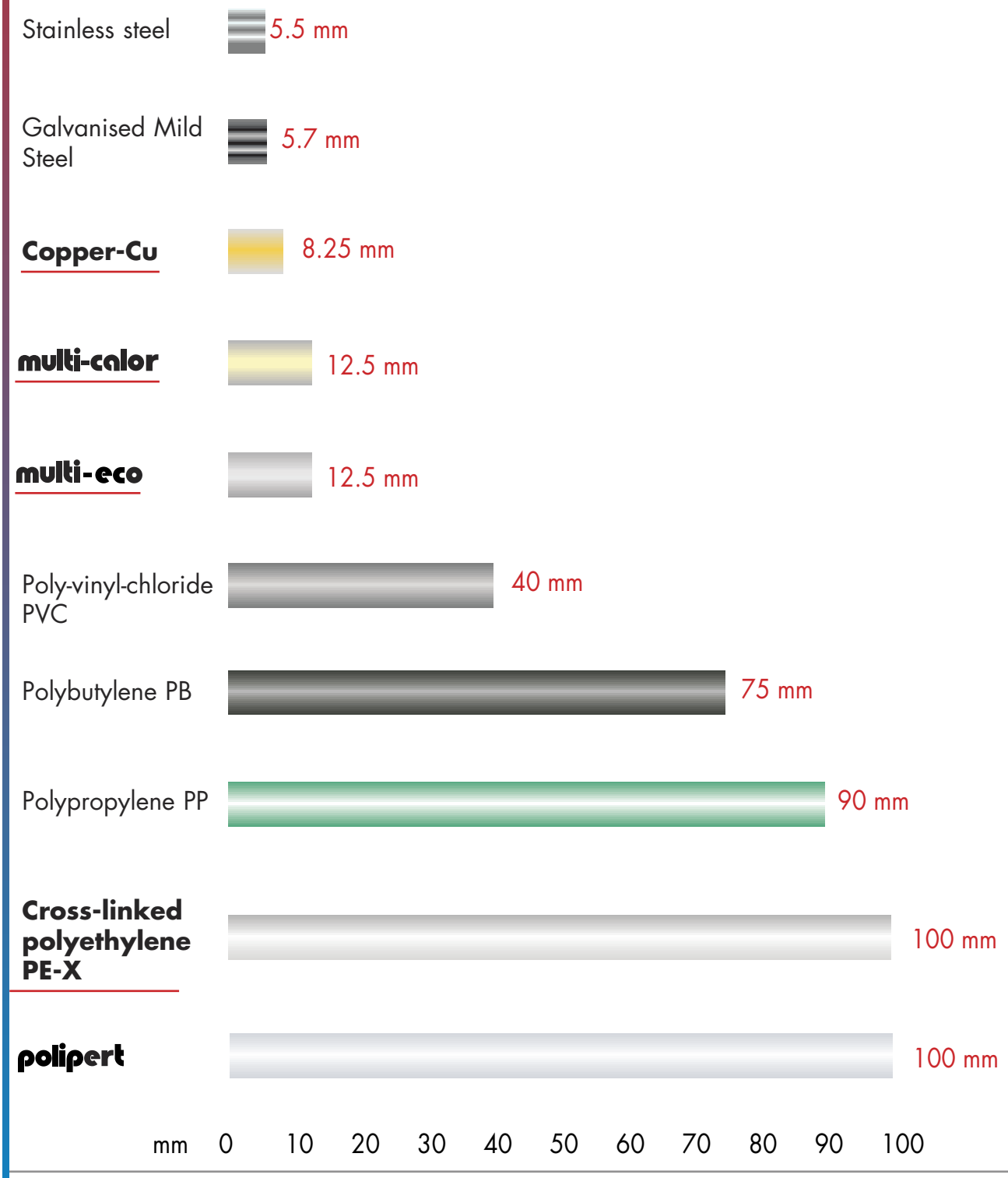
NOTE 1: Pipe clamping must be done through metal rings and elastic protections. At fixed points, the ring must completely lock any movement.

NOTE 2: The pipe clamping values that are indicated above don't guarantee a good aesthetic result. Using PE-RT pipe, because of its elastic features, we always recommend the installation with shells.

It is very interesting that the **multi-color** pipes are much more stable in axial elongation than other thermo-plastic materials.

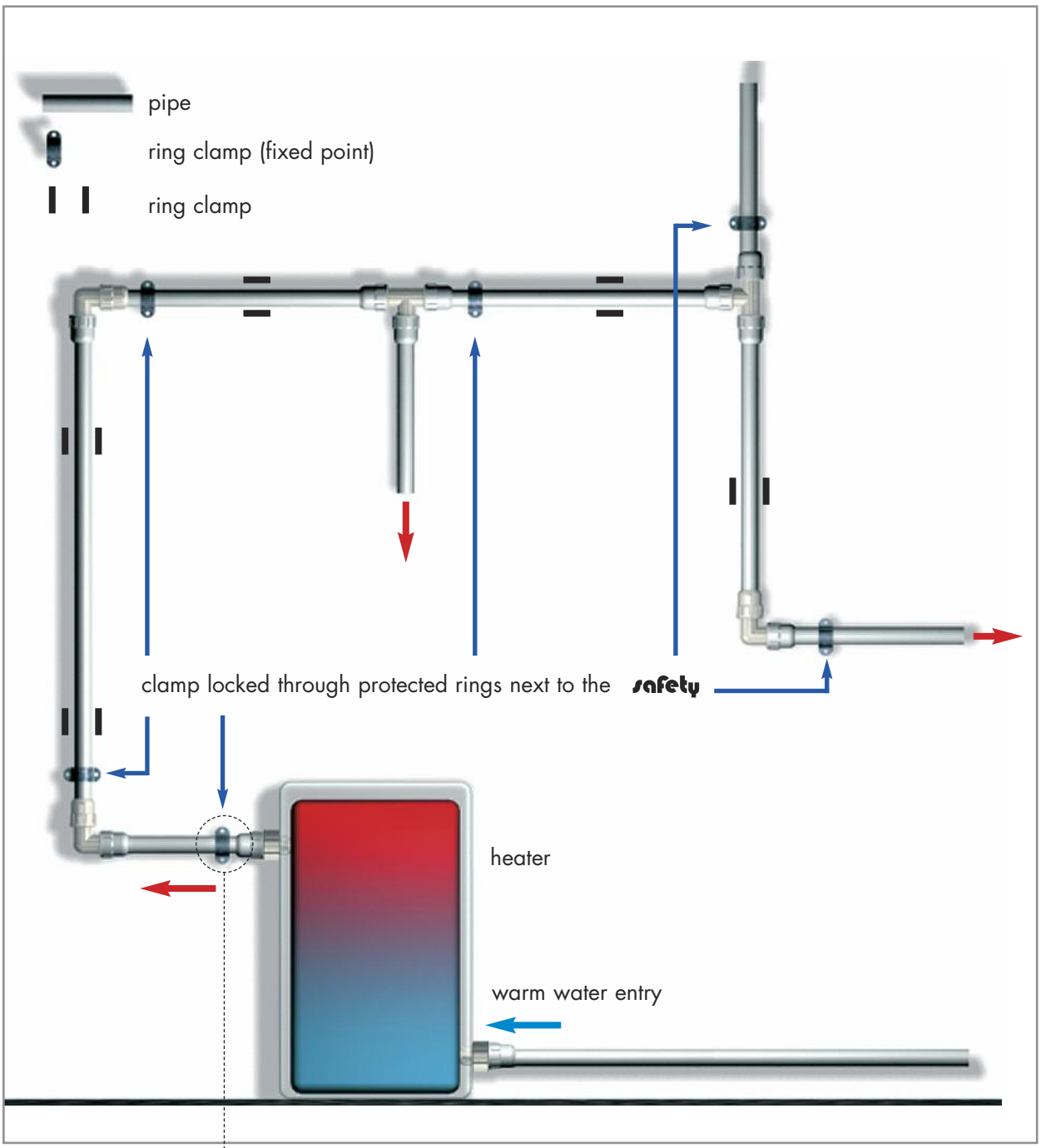
They can actually be compared to the usual metallic pipes used in thermal-sanitary plant-engineering.

Comparison table for elongation in mm: Δt 50°C for 10 linear m of pipe

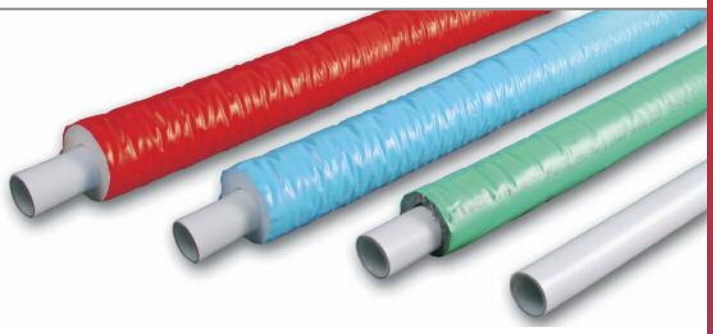


When installing the **safety** fittings with multilayer pipes, the linear expansion coefficient is negligable. Pipe supports and locking clamps should follow the table on page 22.
When free laying on walls, locking clamps should be placed next to the fittings.

Example: warm water piping with **multi-color** system and **safety** fittings.



Clamp through the rings next to the threaded fittings in free laying



PRE-INSULATED PIPES OF THE ISOLINE SERIES

The **multi-calor** pipe rolls of between 16 mm and 32 mm diameter are supplied in pre-insulated versions, as well:

- with **green** sheath for high-temperature water-sanitary and heating systems (energy containment);
- with **light blue** sheath for heating, conditioning and water-sanitary systems (energy containment and anti-condensation)

Also **multi-eco** pipes in rolls of 16 mm and 20 mm diameters are available in pre-insulated version:

- with **grey** sheath for high-temperature water-sanitary and heating systems (energy containment).

The insulating material that forms the pipe coating is manufactured with closed-cell expanded polyethylene, having a water vapour permeability equalling 3500 μ and a thermal conductivity equalling λ = 0.040 W/mK at 40°C. The external layer is a coloured low-density polyethylene film.

PRE-INSULATED PIPES OF THE ISOLINE-PLUS SERIES

The **multi-calor** pipes of 16 mm and 20 mm diameter are supplied in rolls and pre-insulated :

- with **red** sheath for high-temperature water-sanitary and heating systems (energy containment);

The insulating material that forms pipe coating is manufactured with closed-cell expanded polyethylene, having a water vapour permeability equalling 6500 μ and a thermal conductivity very low (0.035 W/mK at 40°C). Also in this case, the external layer is a coloured low-density polyethylene film (red colour).

The **multi-calor** and the **multi-eco** pipes of the ISOLINE and ISOLINE-PLUS series, have a thermal conductivity coefficient equalling 0.43 W/mK at 20°C inside the insulating sheaths and must be installed by following the same procedures that are used in building yards or in case of free-laying, both with **safety** and other types of fittings.

It is well-known that metallic pipes are characterised by a very high thermal conductivity: this factor favours the creation of condensation. The risk caused by the aforesaid phenomenon is reduced significantly thanks to the use of **multi-calor** and **multi-eco** pipes, whose thermal conductivity value is very low.

For example, if we compare a copper pipe whose thermal conductivity equals λ = 390 W/mK with a **multi-calor** or **multi-eco** pipe equalling λ = 0.43 W/mK, it is easy to understand that **multi-calor** and **multi-eco** pipes reduce the risks of condensation thanks to thermal conductivity values that are about 900 times lower than copper.

Technical specification

Item	Description	nom. Ø mm	int. Ø mm	est. Ø mm	Insulation thickness	Package m	Weight kg/m	Package weight kg
74034	multi-calor pipe ISOLINE in rolls	16	12.0	28.0	6 ± 0.8	50	0.140	7.000
74038	multi-calor pipe ISOLINE in rolls	20	16.0	32.0	6 ± 0.8	50	0.190	9.500
74040	multi-calor pipe ISOLINE in rolls	26	20.0	46.0	10 ± 0.8	25	0.340	8.500
74042	multi-calor pipe ISOLINE in rolls	32	26.0	52.0	10 ± 0.8	25	0.472	12.800
74064	multi-calor pipe ISOLINE in rolls	16	12.0	36.0	10 ± 0.8	50	0.146	7.300
74068	multi-calor pipe ISOLINE in rolls	20	14.0	40.0	10 ± 0.8	50	0.194	9.700
74070	multi-calor pipe ISOLINE in rolls	26	20.0	52.0	13 ± 0.8	25	0.352	8.800
74072	multi-calor pipe ISOLINE in rolls	32	26.0	58.0	13 ± 0.8	25	0.480	12.000
74084	multi-calor pipe ISOLINE- PLUS in rolls	16	12.0	28.0	6 ± 0.8	50	0.140	5.400
74088	multi-calor pipe ISOLINE- PLUS in rolls	20	16.0	32.0	6 ± 0.8	50	0.190	6.250
74534	multi-eco pipe ISOLINE in rolls	16	12.0	28.0	6 ± 0.8	50	0.125	6.500
74538	multi-eco pipe ISOLINE in rolls	20	16.0	30.0	6 ± 0.8	50	0.170	8.500
74540	multi-eco pipe ISOLINE in rolls	26	20.0	46.0	10 ± 0.8	25	0.336	8.400
74542	multi-eco pipe ISOLINE in rolls	32	26.0	52.0	10 ± 0.8	25	0.460	11.500

Technical data-sheet for reel insulation

FEATURES	ISOLINE SERIES	ISOLINE-PLUS SERIES
Material	Closed-cell expanded polyethylene	Closed-cell expanded polyethylene
Colour	green (minimum thicknesses) for **multi-color** pipe light blue (increased thicknesses) for **multi-color** pipe grey (minimum thicknesses) for **multi-eco** pipe	red (minimum thicknesses) for **multi-color** pipe
Working temperatures	from -45°C to + 100°C	from -45°C to + 100°C
Water vapour permeability	(according to DIN 52615 standard) 3500μ	(according to DIN 52615 standard) 6500μ
Thermal conductivity at 40°C	W/mK 0.040	W/mK 0.035
Dripping	none	none
Resistance to ozone	excellent	excellent
Resistance to moulds and insects	excellent	excellent
Resistance to deformations	excellent	excellent
Resistance to chemicals	good	good
Toxicity	the product obtained the certification about toxicity and opacity of fumes: No. 100/CF/T/97 16/01/98 No. 101/CF/T/97 16/01/08	the product obtained the certification about toxicity and opacity of fumes: No. 100/CF/T/97 16/01/98 No. 101/CF/T/97 16/01/08
Fire behaviour	self-extinguishing, class 1 (type-approval dated 20/03/06 no. DCPST/A5/2209/3807/1157)	self-extinguishing, class 1 (type-approval dated 20/03/06 no. DCPST/A5/2209/3807/1157)
In compliance with law no. 549 dated 28/12/93, it does **not contain** CFCs (FREON)		

CONDITIONING SYSTEMS (and condensation factor)

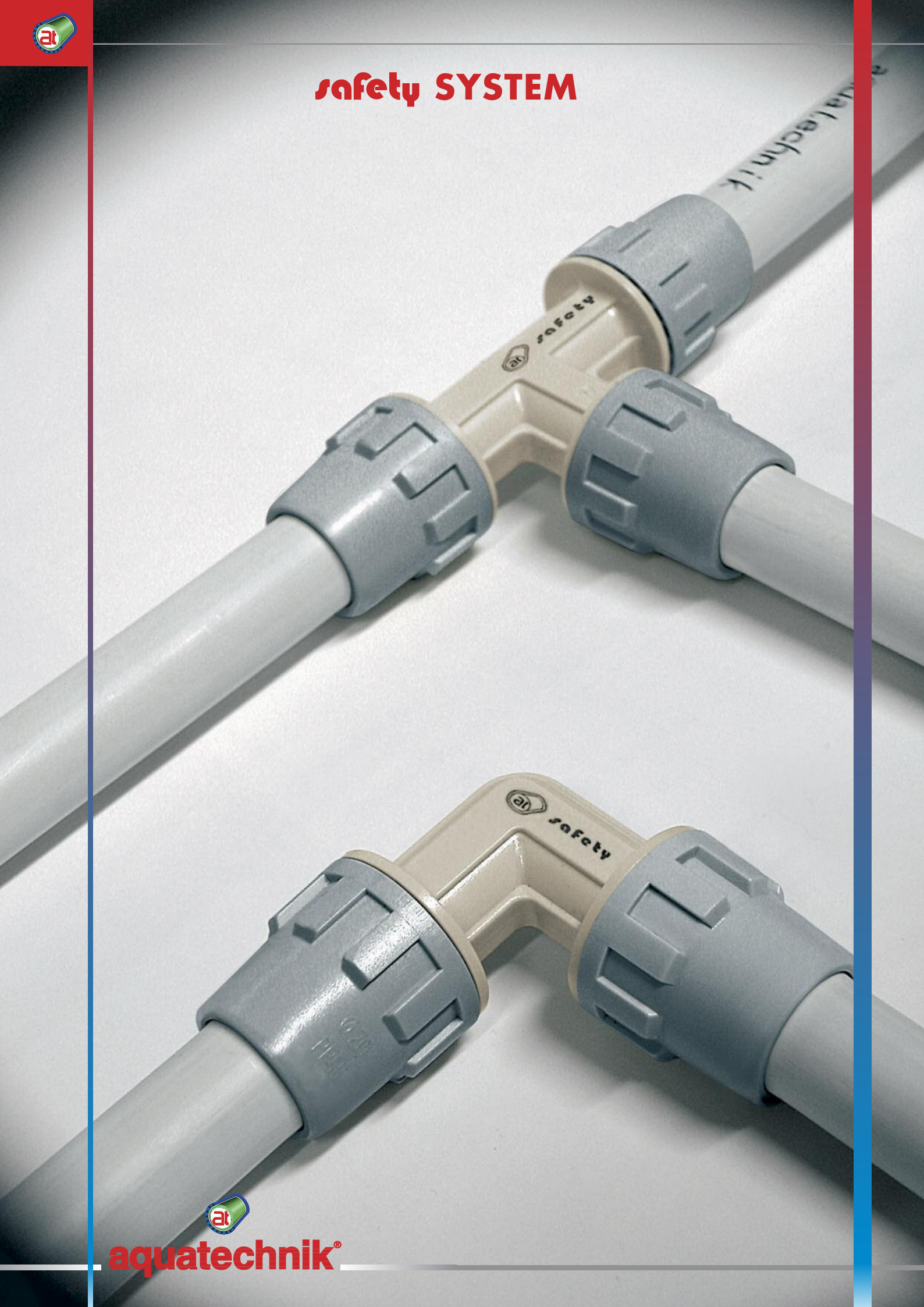
As far as the conditioning systems (fan-coils, dehumidifiers, etc.) are concerned, it is advisable to always check the suitability of insulation sheath thicknesses with respect to system operation and working conditions (relative humidity %, positioning, etc.).

For these types of system, it is advisable to use the **multi-color** pipe with increased insulation (light blue colour).

NOTES

Pre-insulated pipes of the Isoline Series and Isoline Plus Series comply with the regulatory requirements of ASNZS 3500.4:2015:
Note that the designer must check the suitability of the thicknesses:
- Condensation effect: as far as the conditioning systems are concerned, it is advisable to check that the thicknesses of the insulating sheath are suitable.
Note that:
• the insulating material of the ISOLINE series has a thermal conductivity equalling λ = 0.040 W/mK at 40°C and a water vapour permeability equalling 3500 μ
• the insulating material of the ISOLINE-PLUS serie has a thermal conductivity equalling λ = 0.035 W/mK at 40°C and a water vapour permeability equalling 6500 μ
For further information, call aquatechnik Technical Department. As for cold water pipes that follow the same paths of the lines with hot fluids or in case they are very close, it is advisable to suitably insulate both water supply lines.

safety SYSTEM



aquatechnik®

The **safety** system is a range of patented fittings designed to ensure the highest safety when connecting multilayer pipes and to improve the technical and working performance of installations. The long development on prototypes in different materials allowed a carefull choice of materials for the final product. These fittings have been tested to verify their reliability under the harshest working conditions.

safety has gained highly positive results, confirmed by Quality Certification institutes, resulting in highly successful introduction into the market.
The range of fittings is extensive to cater for any kind of sanitary system.
The **safety** fittings have obtained the following certifications:

- WMK26042, Australia;
- WRAS (Nr. 0807073, United Kingdom);
- IIP (Nr. 380/2012, Italy);
- RINA (Nr. MAC257610CS, Italy);
- DVGW (Nr. DW-8501BP5634, Germany);
- SKZ (Nr. 372410/11/92490, Germany);
- HY (Nr. C-134677-05-Sf, Germany);
- AENOR (Nr. 001/004899, Spain);
- CSTBat (Nr. 105-1308, France);
- KIWA-KOMO (Nr. K40532/02, The Netherlands);
- BYGGFORKS (Nr. 1192, Norway);
- ITB (Nr. AT-15-7359/2007, Polland);
- NSF (Nr. 3B050, USA);
- GOST-R (Nr. POCC IT.TH02.B00373, Russia);
- VUPS (Nr. 227/C5/2012/0095, (Czech Republic);

NB: The entire **safety** range, processing tools included, is an exclusive property of **aquatechnik** and is regularly protected by a licence.

aquatechnik®

The idea to develop the safety fittings arose from the desire to match the internal diameter of the fitting to the internal bore of the pipe – consequently decreasing pressure drops and friction. This is achieved by expanding the pipe to allow a fitting of the same nominal bore size to be inserted.
By searching for the best solution, the technical details of the pipe/fitting junction has attained the highest reliability and safety for pipes placed in walls. After all the necessary tests, approvals and patents were obtained for the whole range and the tools from appropriate authorities. Following this, the distribution to the individual markets began.
The expanded socket on the pipe head is made using aquatechnik patented tooling, ensuring a fast and safe connection every time.

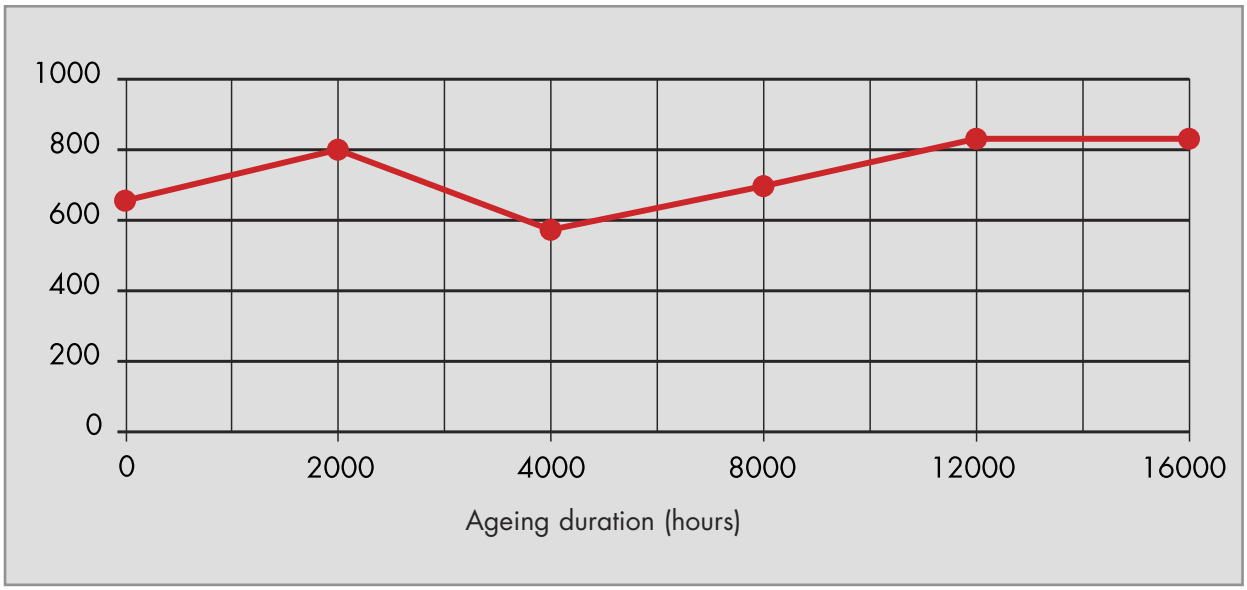
The fitting body
aquatechnik safety fittings are produced in DZR brass alloy or in PPSU by injection moulding. They have a ribbed structure to withstand the thermal-mechanical stressing from the fluids and a special device for locking the conical cap. The fitting body has a conical thread at its end and hollow seats for the peroxidic EPDM o-ring. The synthetic washer keeps the pipe insulated at the junction and avoids potential corrosion or electro-chemical action.

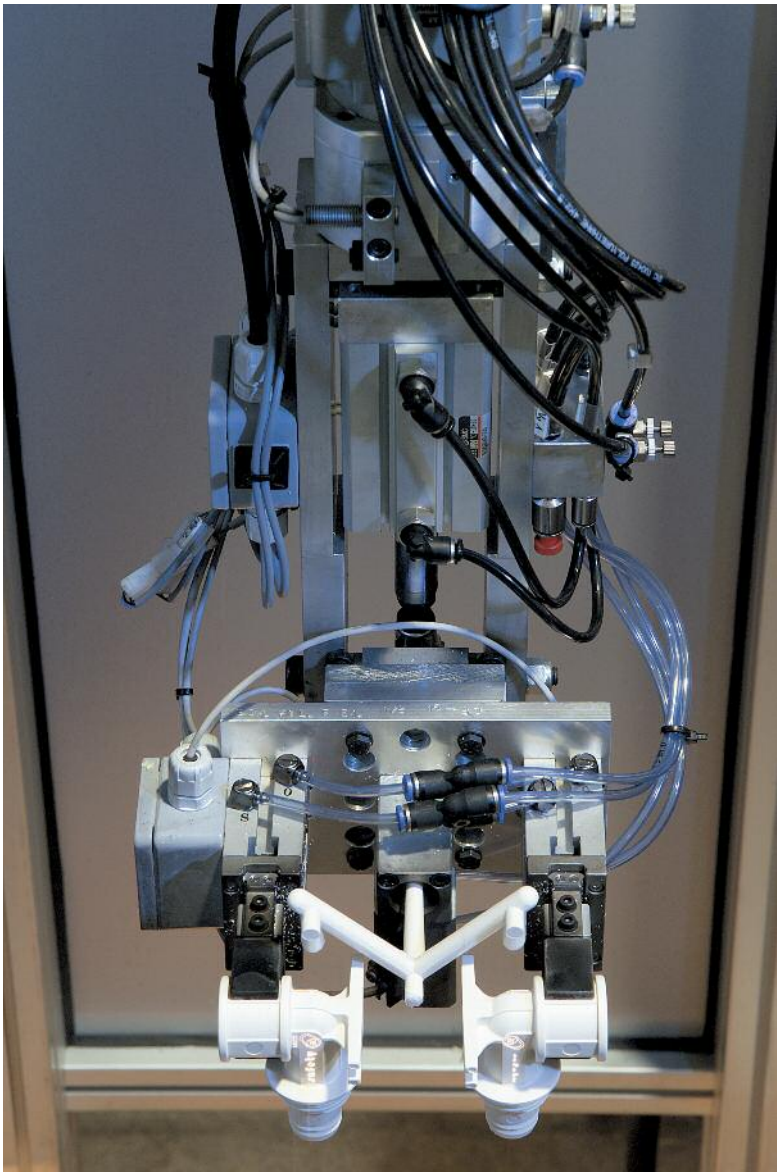
The cap
The fitting cap is moulded at high temperature. The cap should be screwed on the thread untill the locking device engages with the fitting body. The conical shape allows the cap to lock securely without excessive tightening.

Technical specification of PPSU

Conditions	U.M.	Values
Working temperature	°C	from -100 till +207
Life time (working pressure 8bar)	years	50
Resistence against traction	N/mm^2	70
Bending test	N/mm^2	2400
Impact resistance	J/m	694
Resistance against chemical and oxidant agents	-	Stable
Elongation by breaking	%	from 60 till 120

Resistance of PPSU Polyphenylsulfone to IZOD impact after ageing in water at 95°C



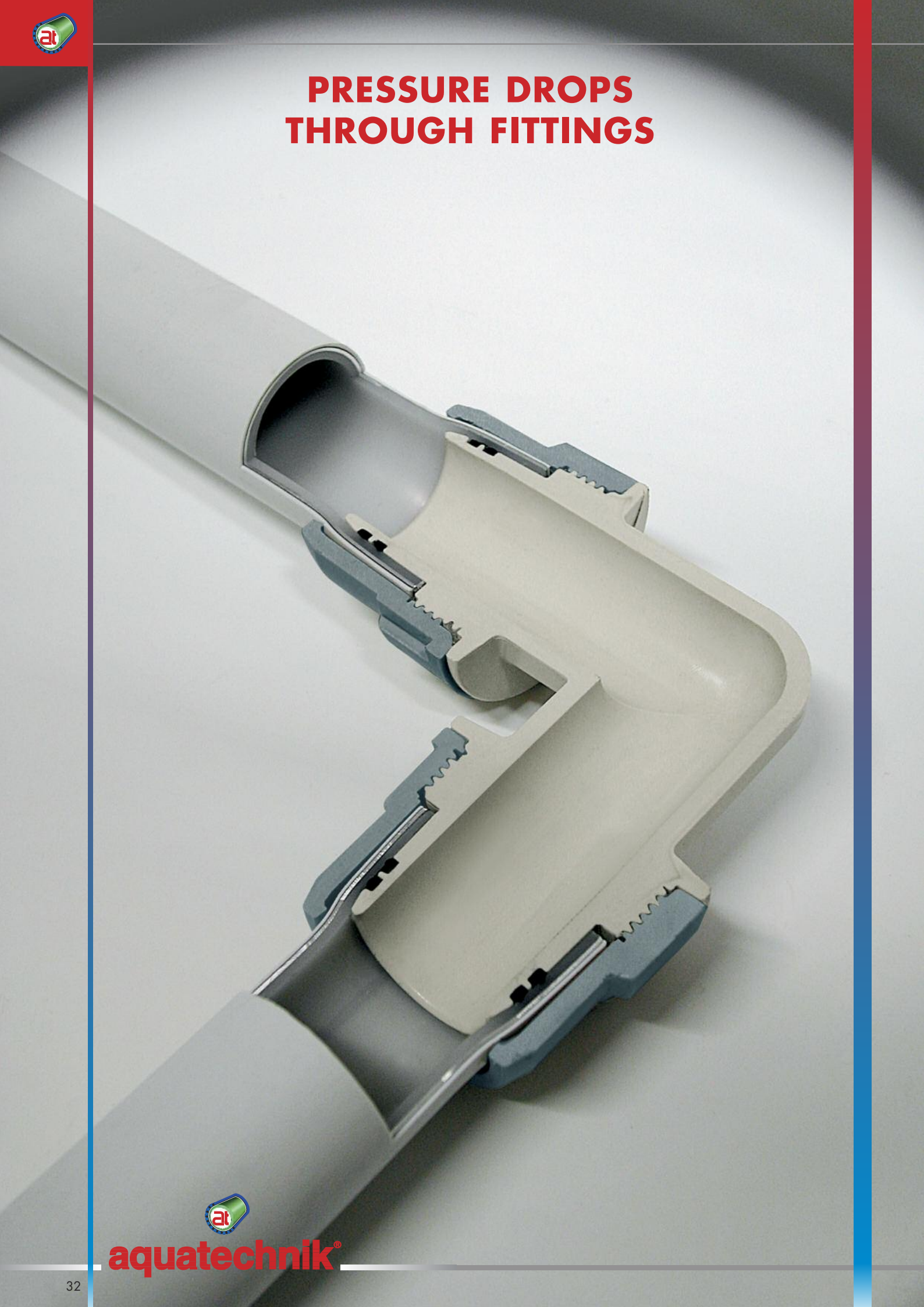


This material has a very good thermal and mechanical stability and it is universally certified about its organoleptic features by:

- FCN (Food Contact Subtance Notification 000083 - U.S.A.)
- FDA - U.S.A. NSF (National Sanitation Foundation - Standard 51 - U.S.A.)
- WRc - (UK)
  UE - (European Community).

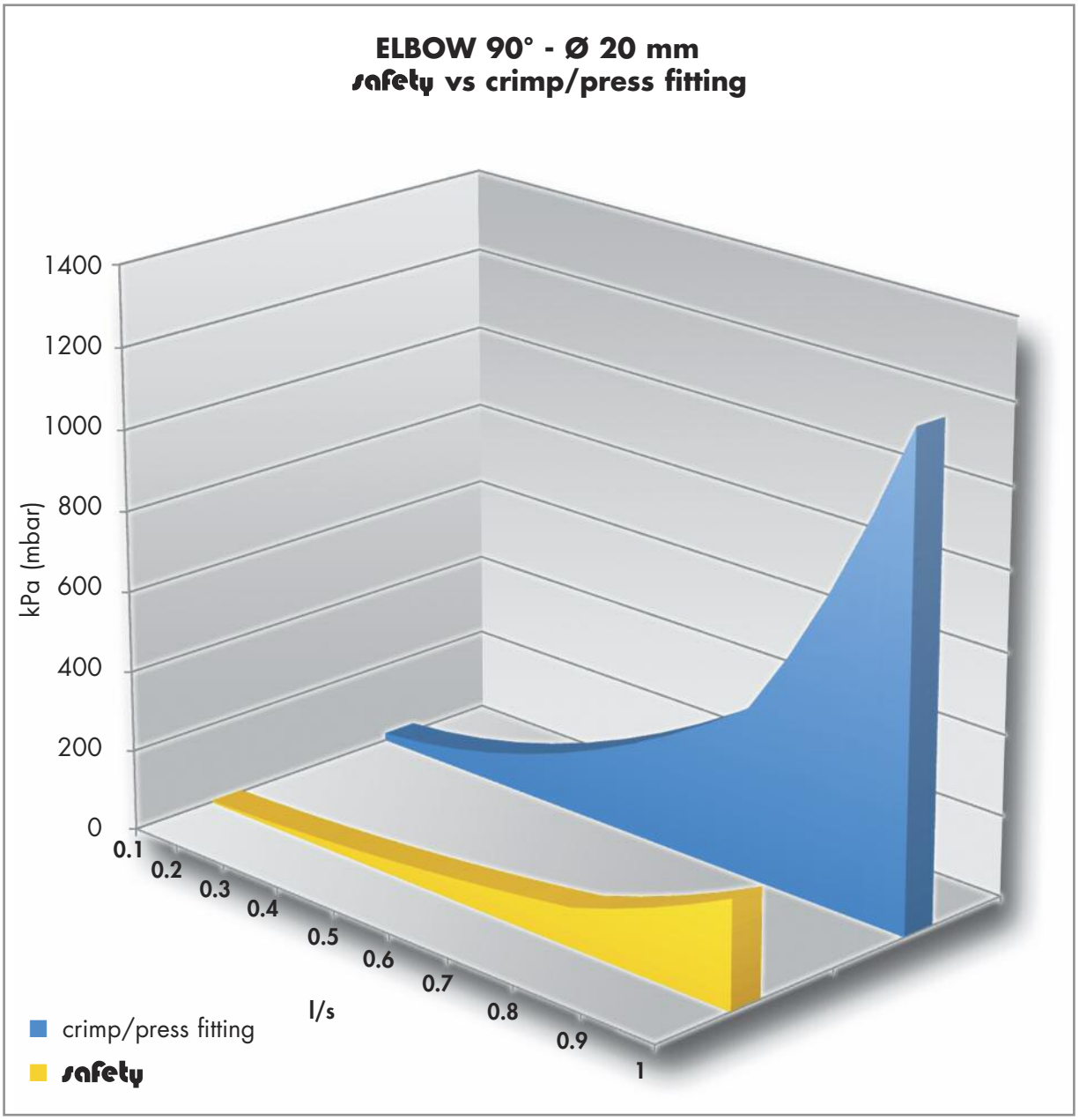
aquatechnik®

PRESSURE DROPS THROUGH FITTINGS

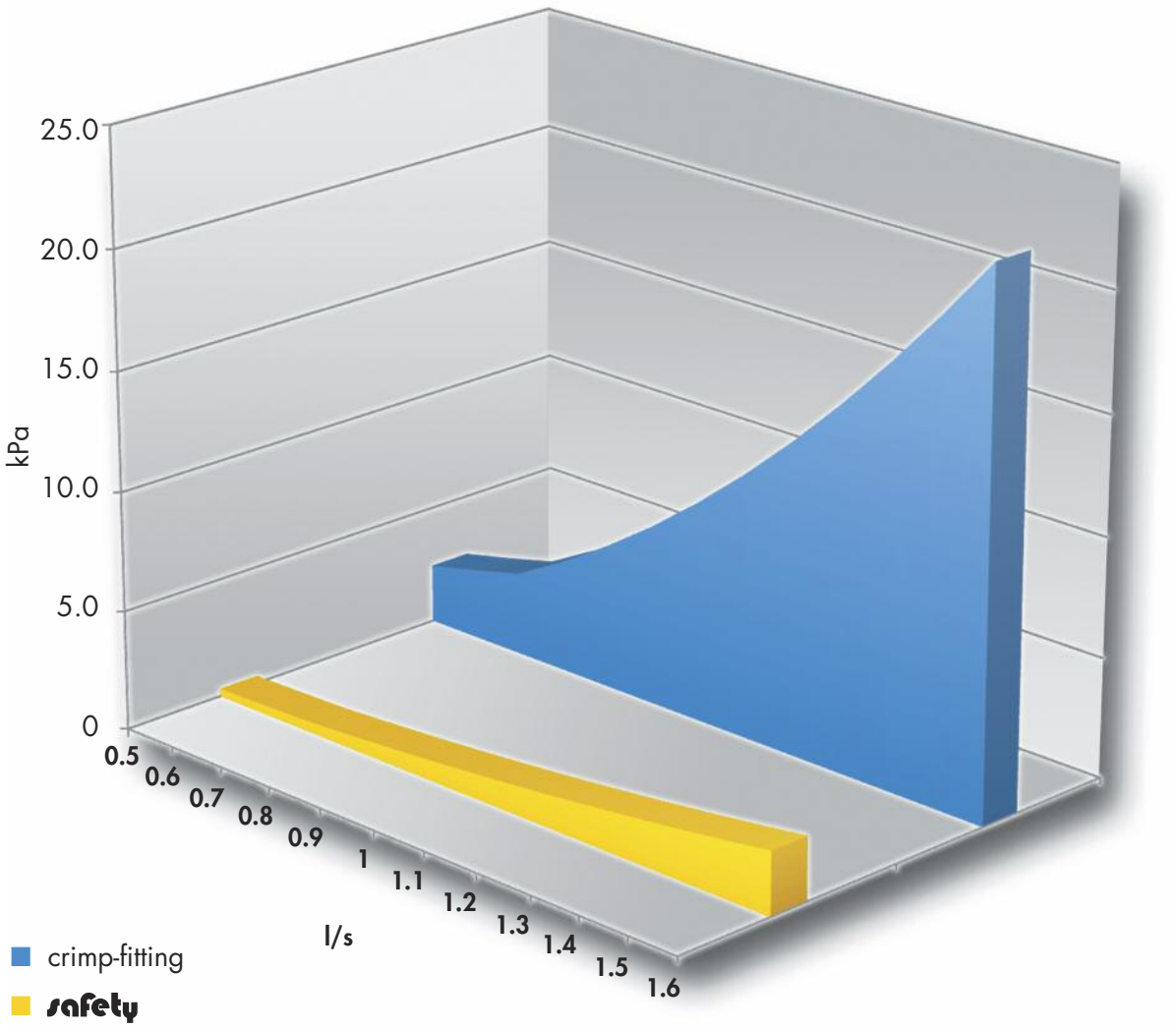


When designing a potable water or heating supply system, the pressure drops occuring along the piping are one of the most important factors to consider.
Unlike the safety system, most multi-layer pipe systems use crimp fittings that reduce the internal bore of the pipe. This can cause internal erosive forces, reduced flow rate and pressure decreases.

Pressure drop comparison table between safety fittings and crimp/press fittings

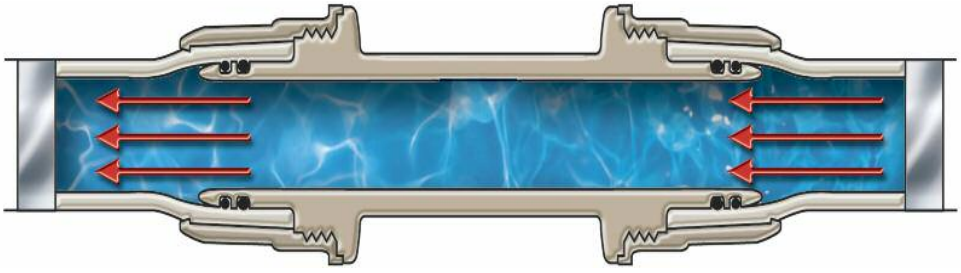


PIPE-COUPLING Ø 26 mm
safety vs crimp-fitting

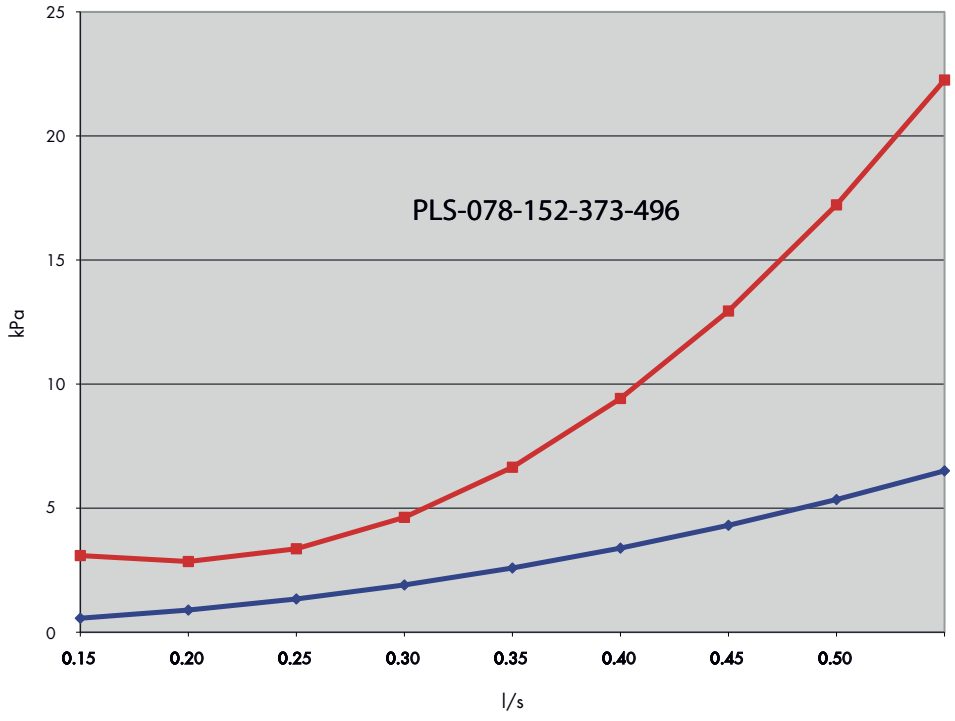


crimp-fitting section

safety fitting section



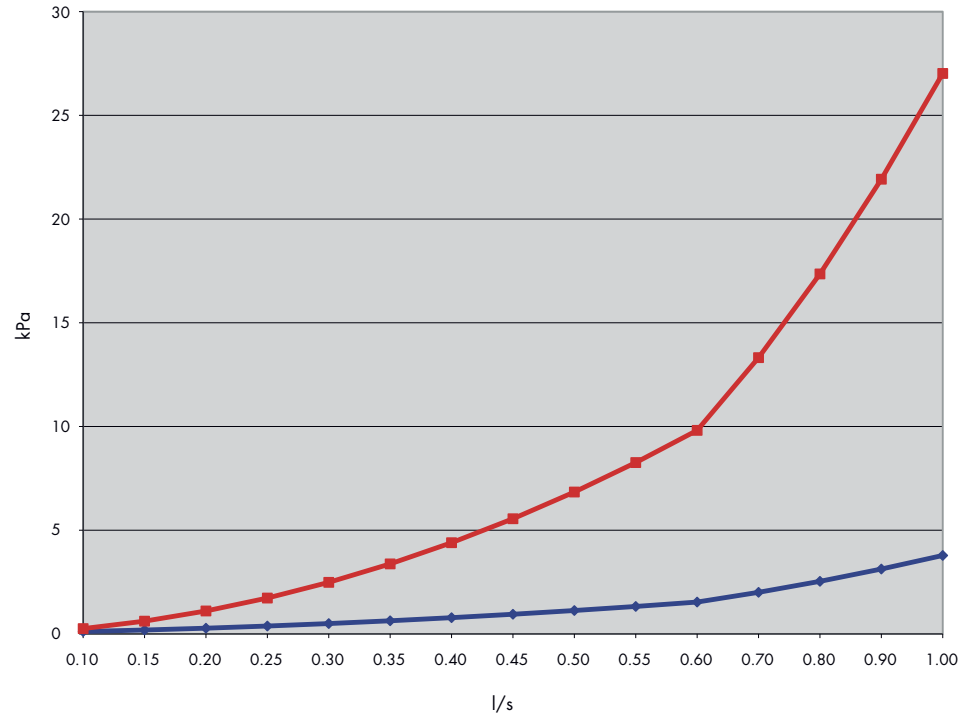
safety fittings Ø 16 x 2 mm



- Pipe coupling
- Tee
- Threaded tee F

- Elbow 90°
- Tee
- Threaded tee F

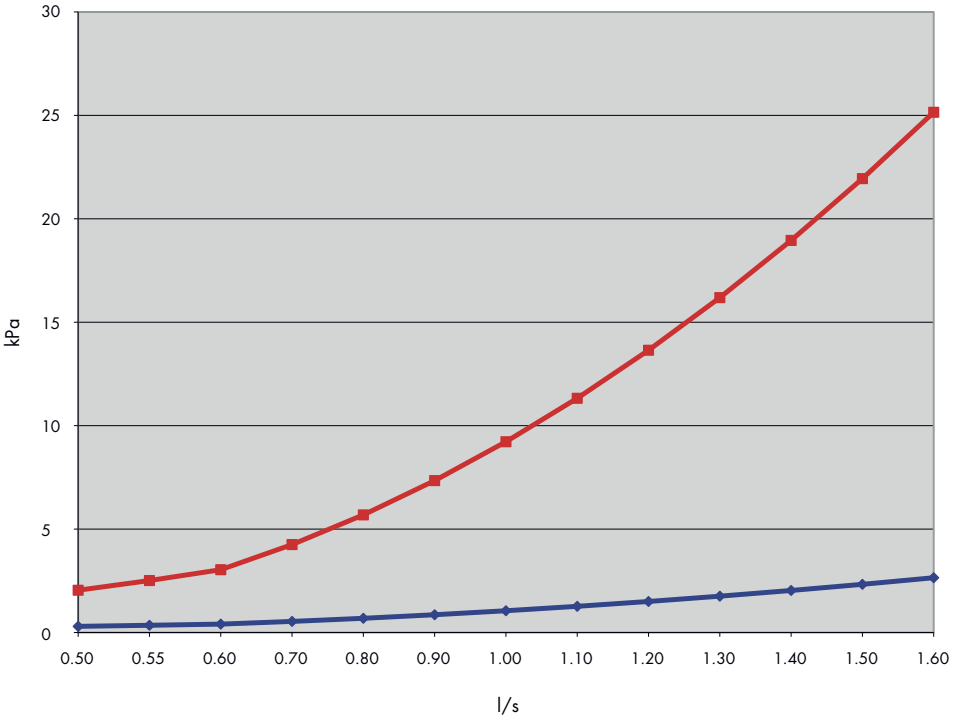
safety fittings Ø 20 x 2 mm



- Pipe coupling
- Tee
- Threaded tee F

- Elbow 90°
- Tee
- Threaded tee F

safety fittings Ø 26 x 3 mm



Pipe coupling

Tee

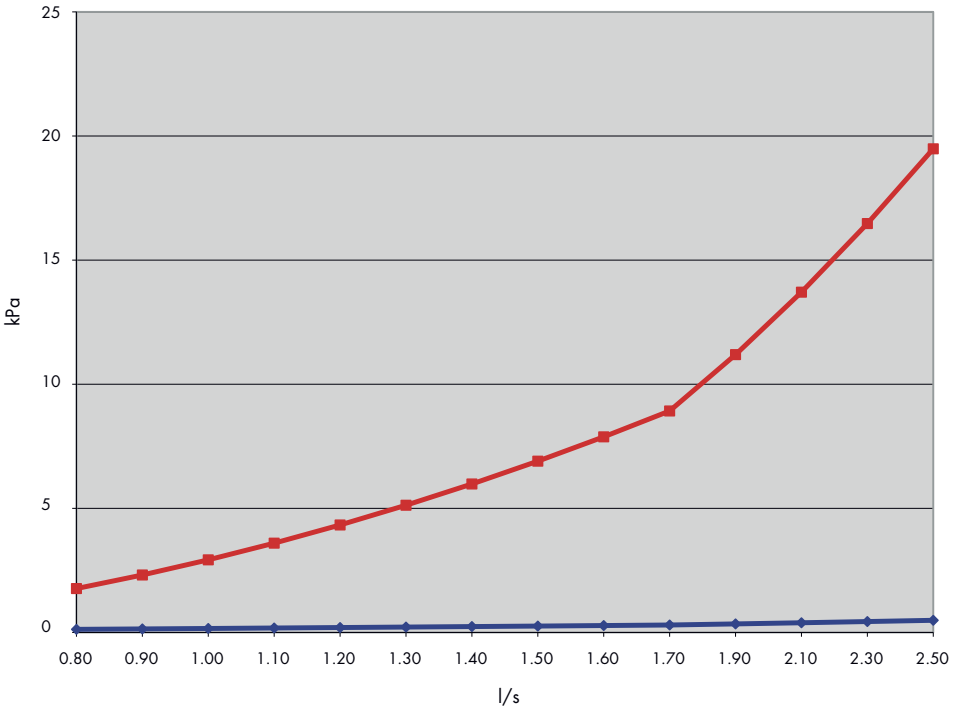
Threaded tee F

Elbow 90°

Tee

Threaded tee F

safety fittings Ø 32 x 3 mm



Pipe coupling

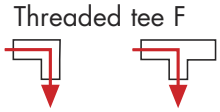
Tee

Threaded tee F

Elbow 90°

Tee

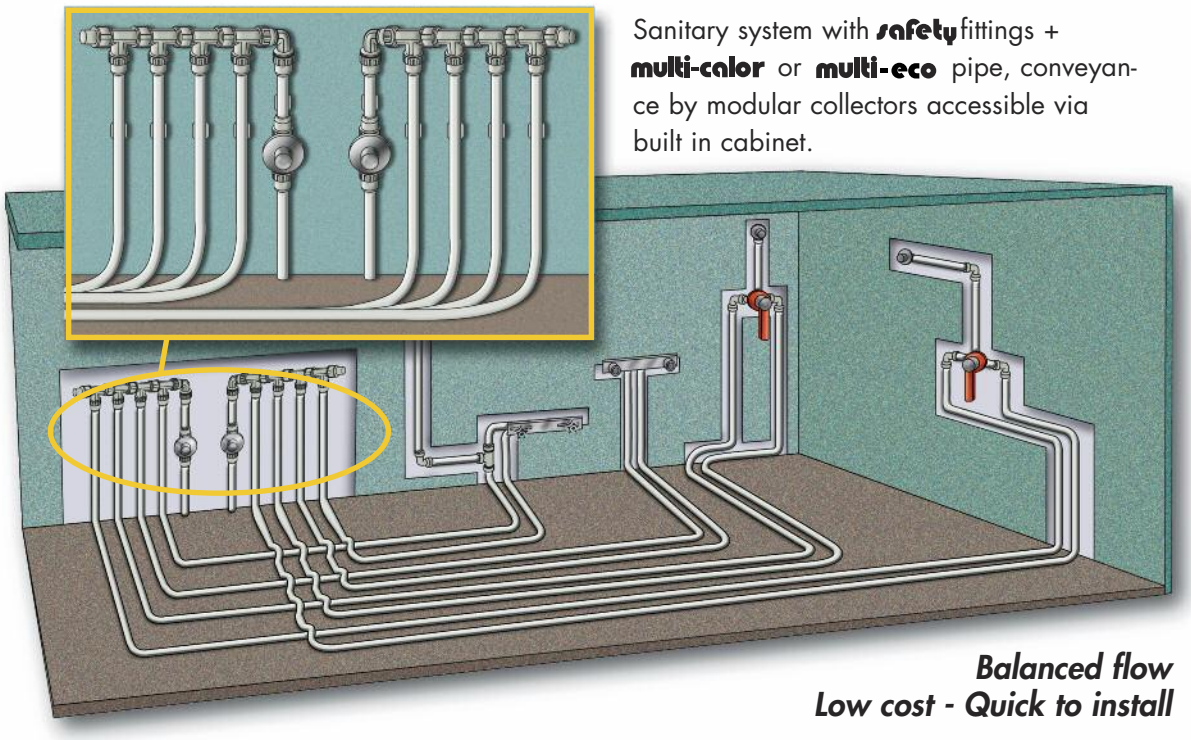
Threaded tee F



APPLICATIONS FOR THE safety SYSTEM

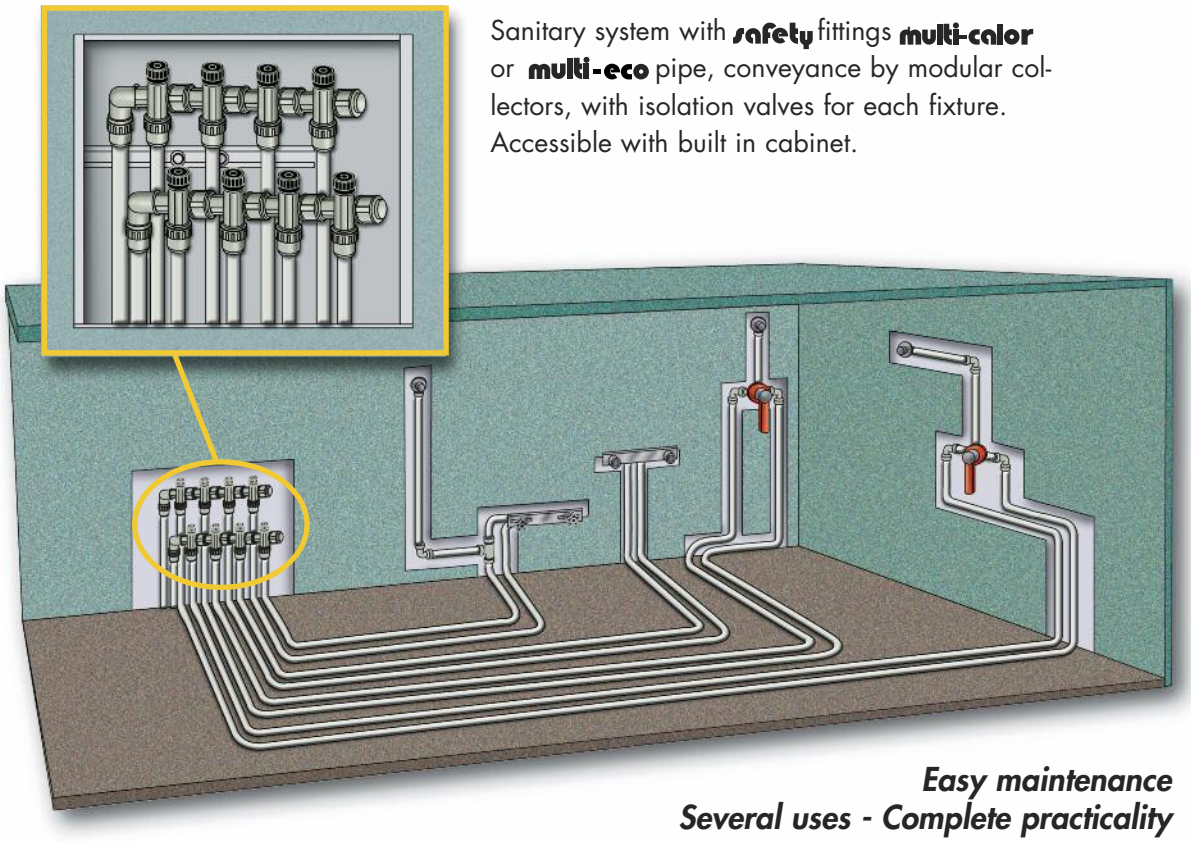
aquatechnik®

Conveyance system with modular collectors



Sanitary system with **safety** fittings + **multi-color** or **multi-eco** pipe, conveyance by modular collectors accessible via built in cabinet.

Balanced flow
Low cost - Quick to install

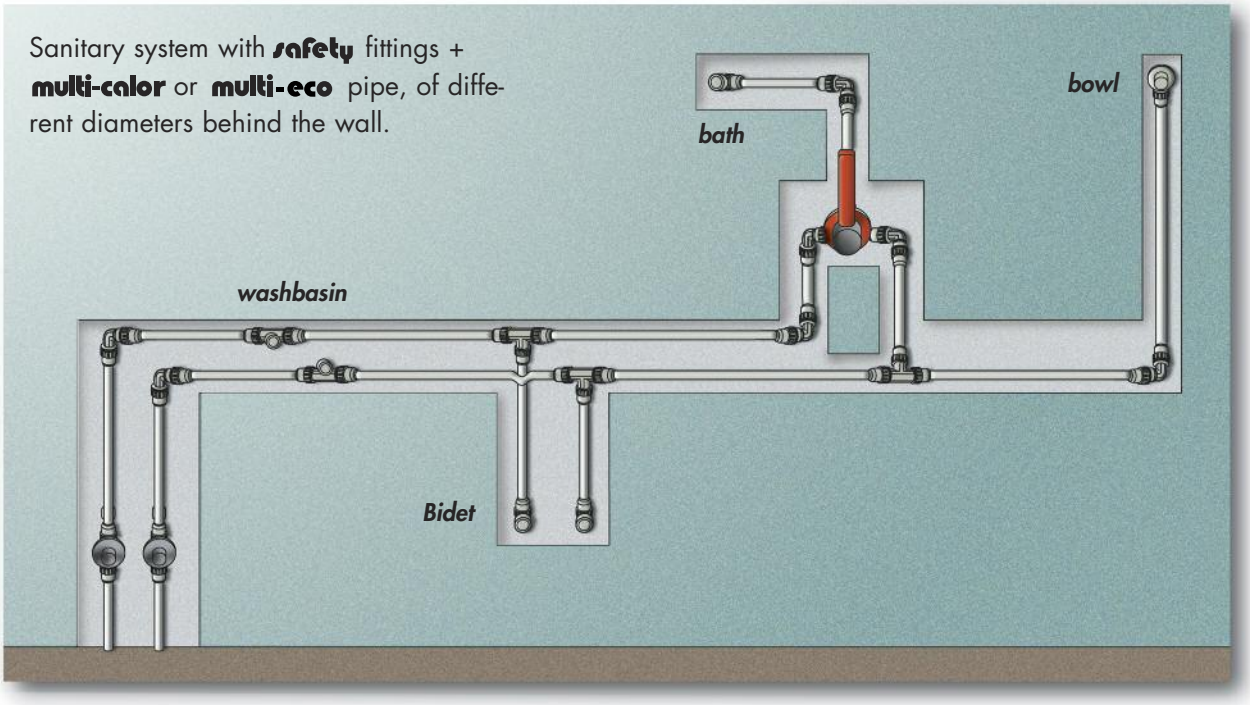


Sanitary system with **safety** fittings **multi-color** or **multi-eco** pipe, conveyance by modular collectors, with isolation valves for each fixture. Accessible with built in cabinet.

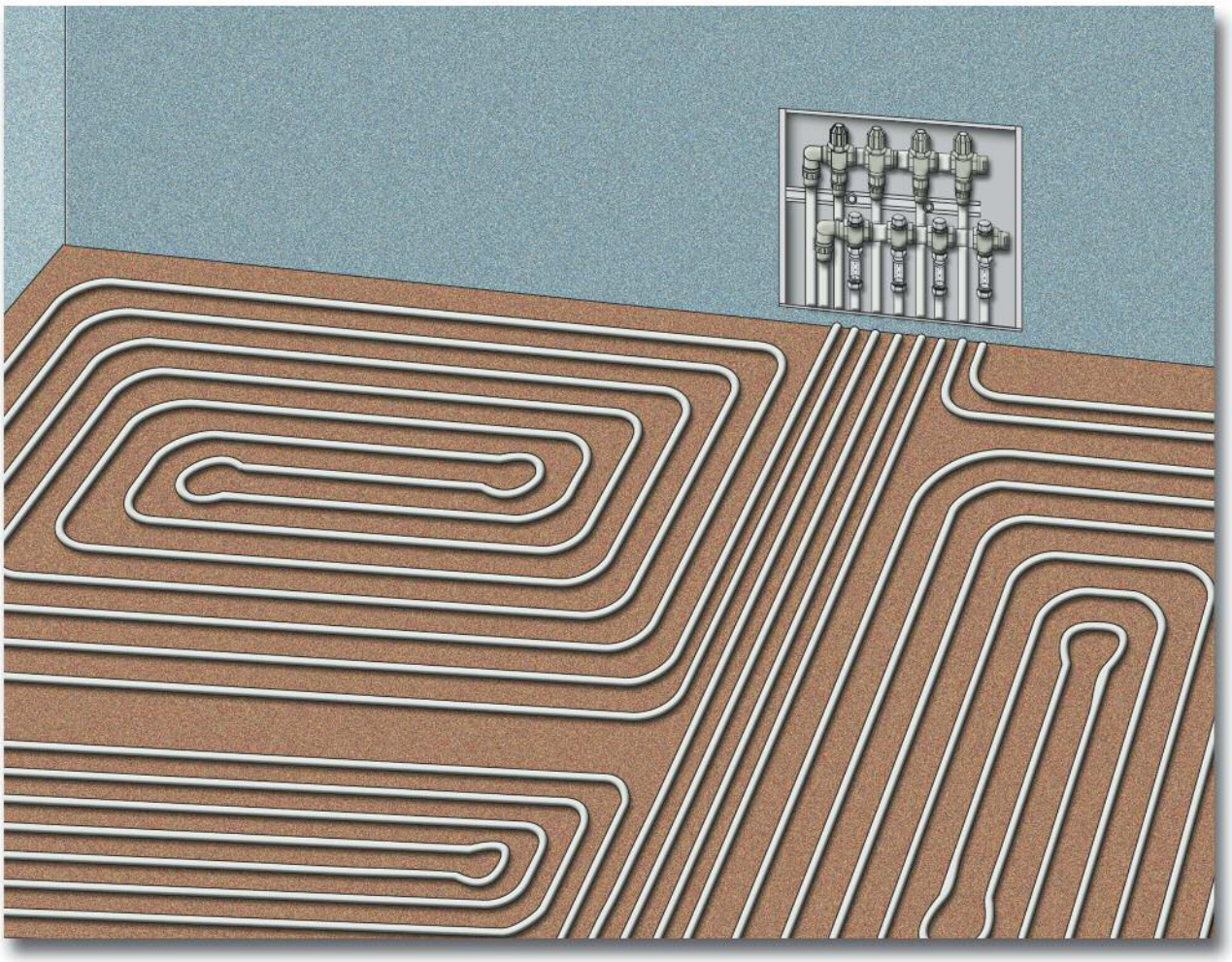
Easy maintenance
Several uses - Complete practicality

Traditional conveyance dead-leg system

Sanitary system with **safety** fittings + **multi-color** or **multi-eco** pipe, of different diameters behind the wall.



Definitive safety - Extraordinary life - Super performances



safety modular collectors with double regulation for the conveyance by radiant panels, with heating, cooling and dehumidifying functions.

safety + multi-calor pipes
multi-eco pipes
polipert pipes
=
the pratical, safe and patented system for all the applications

aquatechnik®

TOOLS AND PROCESSING

aquatechnik®

Processing with power tools:

BBS 32 - battery operated 18V: for pipes from Ø 16 mm up to 32 mm.
It can be connected with electrical supply 230V by a suitable transformer (art. 50447)

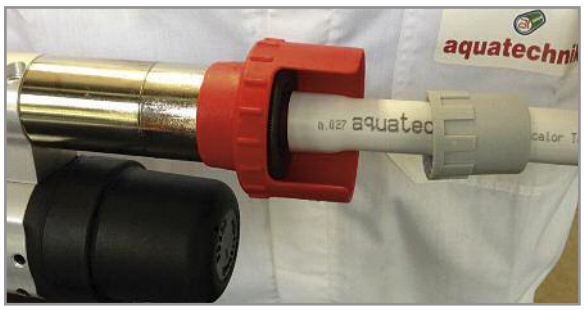
BBR 90 - for electrical supply 18V: for pipes from Ø 40 mm up to 63 mm.

NB: technical features and servicing of the machines are available in their packages.

To install the **safety** fittings with the **multi-color** and **multi-eco** pipes, the installer should use the patented Aquatechnik tools.
The following illustrates the correct procedure for assembling the **safety** system .

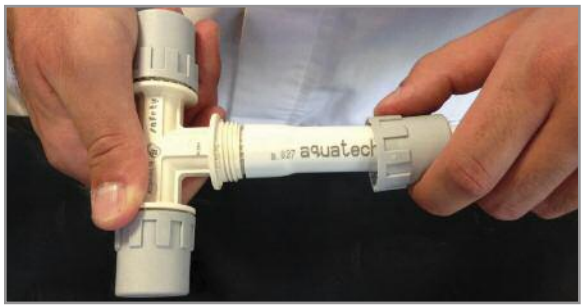
1 - Cut the pipe square using the Safety® system pipe cutter or other suitable tool.

2 - Slip the compression cap over the pipe.

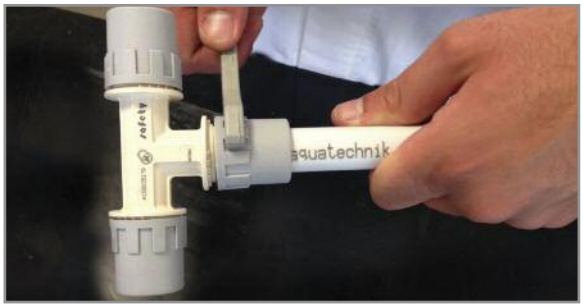


3 - Push the pipe up to the stop of the mechanical expander. Hold the trigger until the pipe is expanded (the pipe will be automatically released from the tool once the operation is completed).

4 - **safety** fittings are factory lubricated using a robotic application process and should not require the application of any lubricant.



5 - Insert the **safety** fitting into the expanded pipe, pushing it up to the stop.



6 - Screw the compression cap up and lock the cap into position using the Safety® system pipe wrench tool.

Coupling tool BBR 90

Battery operated tool for pipe end expansion. Supplied with 18V battery, charger, grease and carry case.

Processing diameters: from 16 to 63 mm.

NB: For operating instructions and servicing information, refer to the guide that is supplied with the machine.

Battery Charger & Battery for BBR 90

230/240V input
18V output

NB: For operating instructions and servicing information, refer to the guide that is supplied with the machine.

Mechanical Expanders for BBR 90

NB: For operating instructions and servicing information, refer to the guide that is supplied with the machine.

There are several aquatechnik patented tools available for preparing the safety system in all available dimensions. Designed and produced by the mechanical section of **aquatechnik**, they are protected by patents.

Coupling tool BBS 32

Battery operated 18V.
Automatic tool to prepare pipe expansion for fittings.
Processing diameters: from mm. 16 up to mm. 32.

NB: For operating instructions and servicing information, refer to the guide that is supplied with the machine.

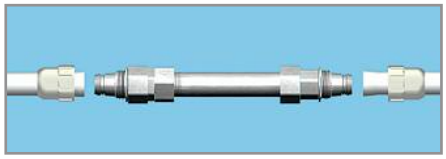
Pipe bending tool HTS 32
(for Ø 16-32 mm)

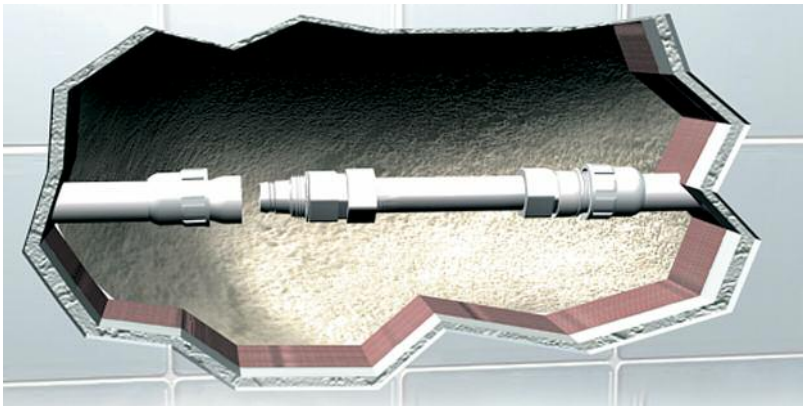
Swan-neck tool CPS 26
(for Ø 20-26 mm)

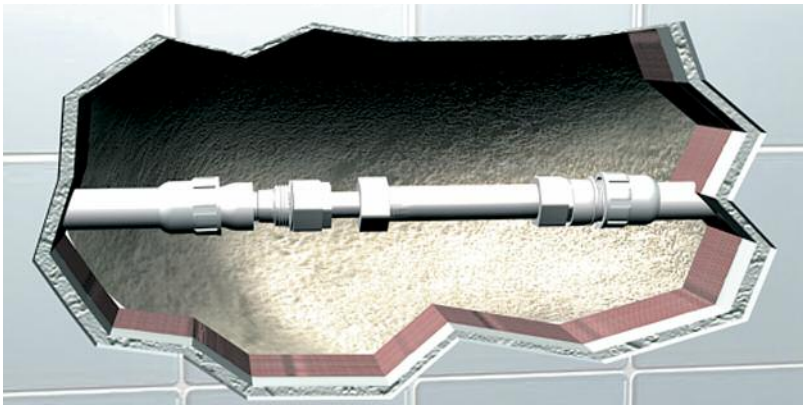
To allow simple processing of the safety systems, some useful accessories are available as detailed in the current price list. We describe briefly the most important ones:

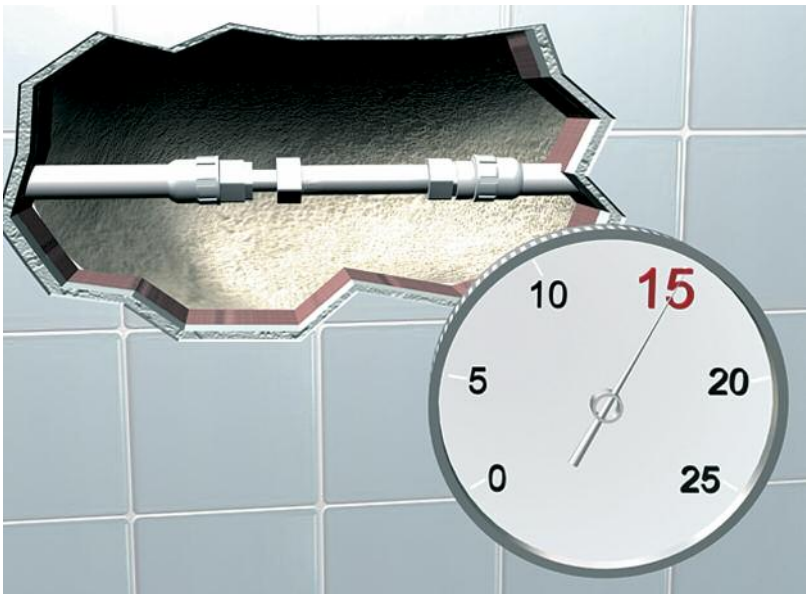
- Fixed wrench to lock/unlock the caps.
- Mechanical expanders for the different diameters of the range.
- Pipe cutting shears.
- Jack wrench and adaptor for manual machines.
- Pipe bending machine with templates and counter-templates.
- Outer and inter pipe-bending spring.
- Extensible support tripod.
- Elastomeric adaptors.
- Transformer for BBS 32.
- Spare-part

All the accidental breaks and holes in the pipes can be repaired using the special sliding joint (code 31050), which can be inserted very easily into the damaged area.
Proceed as explained below:









1 Uncover the holed or damaged part.

2 Cut the damaged piece using a shear or pipe cutter.

3 Install the **safety** caps and prepare both the pipe heads.

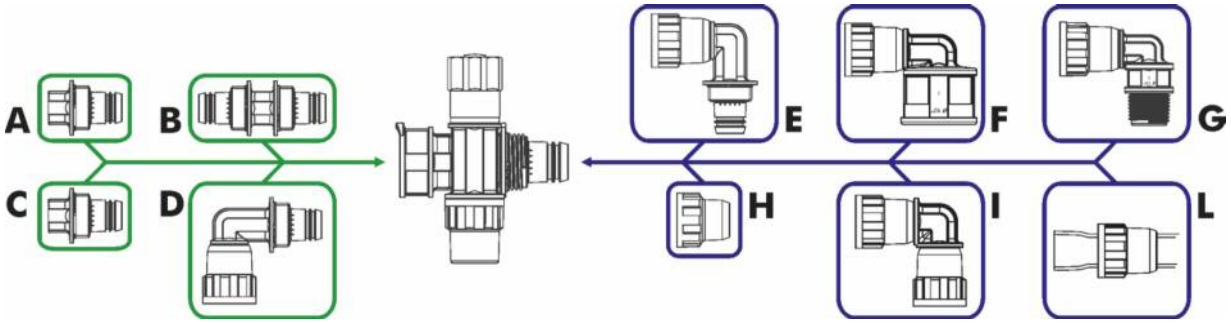
4 Install the sliding joint.

5 Extend the sliding joint to meet the pipe spigot. Complete the joint and lock accordingly.

6 Test the work before finally repairing the wall.

ACCESSORIES AND CUSTOMISING OF SPECIAL
SAFETY FITTING MODULES

The full range of accessories for **safety** multirapid manifolds makes it possible to customise them according to the specific needs of each system.



A - male cap,
B - sleeve,
C - ½" male thread reducer cap,
D/E - male/female elbow,
F - female/female threaded elbow,
G - male/female threaded elbow,
H - female cap,
I - 90° female/female elbow,
L - multi-calor/multi-eco/polipert/PE-X tube.*

Note: the use of PE-X and PE-RT tubes with **safety fittings is permitted only with a thickness equal to that of the multi-calor tubes. For more information consult the **aquatechnik** technical service.*

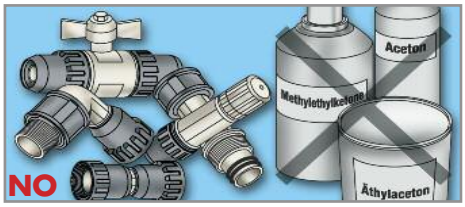
Important

IMPORTANT!!

The whole **safety** range **cannot be compared** to other mechanical compression fittings ("screwed" method), and even less to the crimp systems. The connection between pipe and fitting is not made by crimping or press screwing, but through the perfect junction of the seat. Also, the safety cap prevents any movement of the joint parts, ensuring - more than any other method - long-term reliability for both walled up or free layed installations.

To coat the PPSU threads, use only:
- hemp with **aquatechnik** compound (code 71370)
- the suitable sealant by **aquatechnik** (code 71380)
- teflon.

NB: absolutely avoid the use of sealants for metal threads.



Absolutely avoid contamination of the **safety** fittings (PPSU) with sealing compounds or paints with:

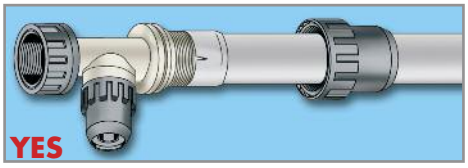
- Ethyl-methylketone (MEK)
- Acetone
- Ethyl-acetate
- For full material compatibility, see the table on page 99)

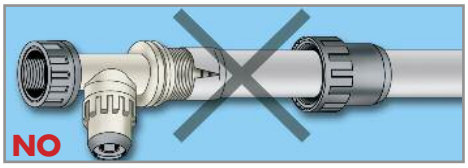
Always protect pipes and fittings by:

– Building-in

– Adhesive foil (code 71397)
WARNING: only use the adhesive suggested by **aquatechnik**

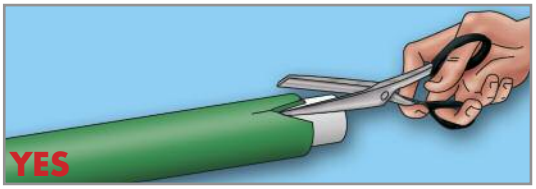
– Suitable paint PR 094G/01 (code 71400)



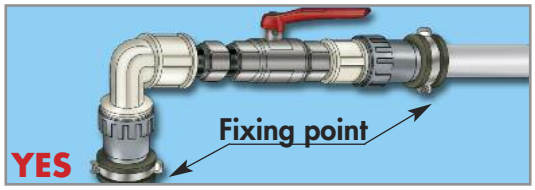


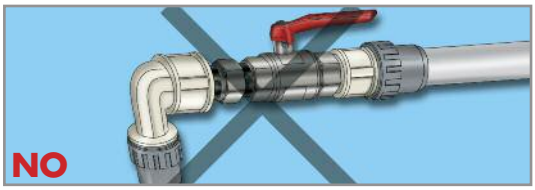
Sometimes during the expansion operation, the aluminium layer could slightly tear. Such defect does not change the technical performances of the pipe. If you can put the fitting into the pipe, you can normally continue. However, if the aluminium or pipe is torn, split or damaged excessively, you should cut the defective section out and repeat the operation.

All **safety** connections are prelubricated. If lubricant is lacking or the connection is re-used, usie of **aquatechnik** grease is recommended (Code 71391).

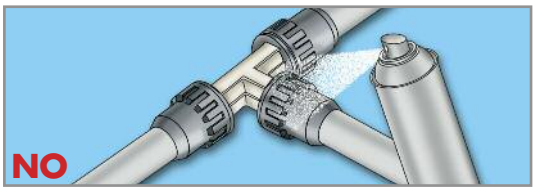


Avoid the internal and/or external incision of the pipe.
Do not use a knife or blade to cut the insulation as this may damage the pipe

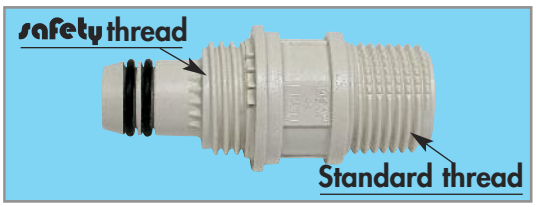




For installations out of walls, absolutely avoid the expansion stress on the threaded fittings. Arrange clamping points through special locking brackets, as shown here.



Absolutely avoid the use of spray-foam and spray in general to detect any pressure drop on the safety fittings. To detect pressure drops, use only the **aquatechnik** spray (Code 71393).



The safety range has a special thread with a locking device, to lock PPSU caps and/or fittings of the same range (collectors, reducers, caps, etc.). Do not connect other thread types to these special threads (e.g. gas, DIN, etc).

Useful hint

- Before finally locking the fitting, you can turn it for final positioning. Once the fitting is locked, it can be slightly adjusted.
- To take the fitting apart and use it again, undo the cap using the special wrench to unlock it. We always suggest to replacing the cap, if it is damaged.

IMPORTANT NOTES

The safety system has been designed and produced to cater for any kind of hydrothermic installation, both in chased situations and free laid applications. Certificates have been issued by international authorities based on long-term testing carried out in our laboratory which showed the safety system offers excellent reliability and durability.
The whole range of fittings, processing tools and accessories are exclusive to aquatechnik, and covered by patents from appropriate authorities.
Our company has the right to prosecute anyone for plagiarism or illegal use or reproduction of any material . aquatechnik has the right to modify any technical detail which is necessary to improve the system, without notice.

INSTALLATION TESTING

Each installation should be tested according to the appropriate standard (or at least 15 bar (1500kPa) for 30 minutes for pre-test, and at 15 bar (1500kPa) for 2 hours for final test) before the final walling-up, after a positive test result. See Page 55 for full testing requirements.
Should the hydraulic test be omitted, then aquatechnik is released from any responsibility for accidents and/or damages to structures, products or personel.
The installing company is legally responsible for the works completed and should guarantee their workmanship.
For the testing instructions, refer to the final part of our technical guide.

aquatechnik®

YES	NO
Use only the correct cutting tool for cutting the pipe, ensuring the tool is free of defect .	Do not use damaged tooling.
Ensure the cap is in place before expanding the pipe.	Do not expand the pipe without the cap in place.
Check that no tears or breaks are evident on the elastomeric adaptor.	Do not use damaged elastomeric adaptor.
All **safety** connection are prelubricated. If lubrication is required or connection is re-used, use **aquatechnik** grease (code 71391).	Do not insert the fitting onto a pipe before checking for appropriate O-ring lubrication.
Slightly adjust the axial position.	Do not force locked fittings more than allowed.
Lock the cap on the safety notch with suitable wrench.	Do not forget final locking of the cap.
When connecting PPSU and metal threads, check the threads are aligned correctly. To repair PPSU threads, use the suitable tool "Threading machine" (code 51240).	Do not assemble PPSU and metal threads if laying is not correct.
To coat the PPSU threads, use only: - hemp with **aquatechnik** compound (code 71370) - suitable **aquatechnik** sealant (code 71380) - teflon	Do not use compounds, glues or sealants different than the given ones. Do not seal too much. Absolutely avoid the use of sealants for metal threads.
Use cylindrical and undamaged threads with female joints.	Do not use conical or damaged threads with female joints.
With **safety** threads, connect only caps and fittings of the same system (collectors, reducers, caps, etc.).	Do not connect common standard threads (gas, DIN, etc.) to the **safety** threads.
Use only undamaged caps/fittings.	Do not use damaged caps or fittings.
Transport and store products with care and protect from damage.	Do not use products damaged during transport or storage.
Work carefully and cleanly.	Do not use dirty and foreign materials damaging fittings.
When free laying, ensure the use of suitable clamps.	Do not exert pressure from expansion/contraction on the fittings.
Protect form U.V.A. rays, using the suitable paint (code 71400), adhesive foil (code 71397) or immediately wall-up.	Avoid installations exposed to long-term U.V. rays, to avoid PPSU yellowing and damage to the pipes. Absolutely avoid the contact of PPSU with ethyl-methylketone (MEK), acetone, ethyl-acetate and derivates. (See Compatibility table on Page 99 for a full list of PPSU material compatibility.
Use the correct installation tools and equipment.	Do not use mal-functionning, damaged or incorrect tools.

YES	NO
In case of unburied pipe laying, fasten with suitable supports and anchor with protected brackets (or walling) next to terminals, threads or compensation breaks.	Where possible, avoid the use of male or female threaded junctions in-ground.
When processing of PE-RT and PEX pipes, use only the specified mechanical expanders from the 50800 series.	Do not use the mechanical expanders with **multi-eco**, **multi-color** (50700 series), PE-RT and PE-X pipes.
Comply with the bend radiuses recommendations for each pipe diameter, when bending manually or when using a pipe bending machine.	Do not heat the pipes and/or the fittings by using open flames.
Insulate hot water lines by means of sheaths with a suitable thickness.	Prevent energy from being wasted, as well as external aggressive environments, etc.
Test the systems in compliance with the Regulations before the final walling.	Do not build any walls or other structures without having performed the hydraulic testing in compliance with the Regulations.

NB: the equipment and the accessories for processing operations can be subject to operation and/or construction modifications on the discretion of the Manufacturer; for this purpose, see the user instructions that are attached to the relevant packaging. Remember **that the product warranty will be valid only for manifest or structural defects**; installation operations and any other function concerning the systems are entrusted to the installing companies and are not ascribable to **aquatechnik.**

To protect the pipes exposed to U.V. rays, you can use a suitable paint (PR 094G/01) and the related thinner (2001). These products have been researched and produced by **aquatechnik**, in cooperation with a industry leader in paint.
Features and usage methods are described below:

Paint PR 094G/01

General features

Composition: xylene, mixture of isometers.
Description: one-pack primer.
Application: this product has been studied to paint plastics pipes and fittings.
Binder: modified alkyd.
Main features:
- well bonding on PP-R, PPSU and PE-X;
- high resistance to the atmospheric agents and to UV-rays;
- repaintable by any building paint or enamel.

Technical features

Dry waste 44% ±3
Density 1200 g/l ±30
Color grey
Brightness 3 ÷ 6 gloss a 60°

Mixture preparation

Component	Mixing ratio (%)
Paint	100
Thinner	20 ÷ 30
Catalyst	the product does not require catalysis

Instructions for correct use

- The product should be applied with a brush, a roller or a spray, **after careful cleaning** of the surfaces to be covered with the recommended thinner 2001.
- The product should be thinned in a ratio of 20 – 30% with the recommended thinner 2001.
- The thinned product should be applied at least twice. Wait at least 4 hours between the first coat and subsequent coat.
- The product dries slowly, to adhere perfectly to the surface.
- **Periodic re-application is necessary.**

Precautions

Inflammable product, harmful if inhaled or on contact with skin, irritant to eyes and skin.
Repeated exposure may cause dryness and skin fissures.
Keep the product in a well-ventilated place, away from foods, eating utensiles and beverages.
Keep away from fire and sparks, do not smoke, avoid electrostatic charge.
Wear suitable protective clothing.

Thinner 2001

General features

Composition: xylene, mixture of isometers.
Description: polyurethane-synthetic thinner.
Application: thinning of painting products for critical plastics supports.

Technical features

Dry waste 0%
Density 895 g/l ±15
Color transparent

Product application

- The product is used to thin paints.
- **The thinner 2001 is suggested to clean the surface before painting it.**

Precautions

Inflammable product, harmful if inhaled or on contact with skin, irritant to eyes and skin.
Repeated exposure may cause dryness and skin fissures.
Keep the product in a well-ventilated place, away from foods, eating utensiles and beverages.
Keep away from fire and sparks, do not smoke, avoid electrostatic charge.
Wear suitable protective clothing.

aquatechnik®

MODULAR MANIFOLDS

DESCRIPTION

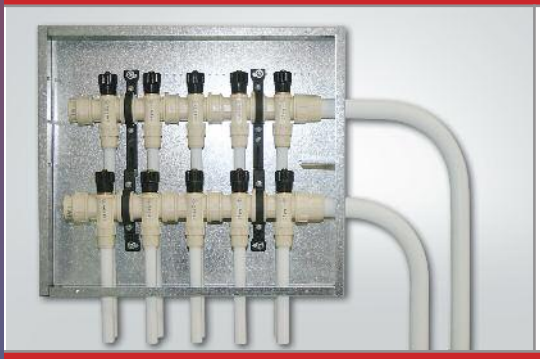
Using extensive **aquatechnik** experience, a series of modular manifolds was created. These are available individually or in the pre-assembled units, complete with the micrometric holder, valves and locking brackets. Each manifold is modular and allows the installer to match the number of the connection to the number of zones.

The **aquatechnik** modular manifolds are available in :
- **PPSU** (white colour)

They are completely compatible with the **safety** range. The manifold input can be on the right or on the left of the inspection case.

HYDRO-SANITARY MANIFOLDS

Modular manifold to be placed in the control cabinet with isolating shut-off valves for any fixture.



With:
multirapid manifold with shut-off valve
control cabinet
locking brackets
closing cap M

It can be assembled with the following manifold diameters: 20-16, 26-16, 26-20.

Manifolds to be placed walled-in with isolating shut-off valves.

With:
modular manifold for free-laying and walled-in
shut-off valve
nipples F/F
closing cap M

It can be assembled with the following manifold diameters: 20-16, 26-16, 26-20.

Swan-neck manifold to be placed walled-in with isolating shut-off valves.

With:
swan-neck manifold
shut-off valve
nipples F/F
closing cap M
elbow 90°
elbow 90° M/F

It can be assembled with the following manifold diameters: 26-16.

Multirapid manifold for water conveyance to be placed in a plant room.

With:
multirapid manifold with shut-off valve
elbow 90° M/F
closing cap M

It can be assembled with the following manifold diameters: 32-16, 32-20, 40-20, 40-26.

Multirapid manifold for water conveyance with horizontal shut-off valves to be placed in a plant room.

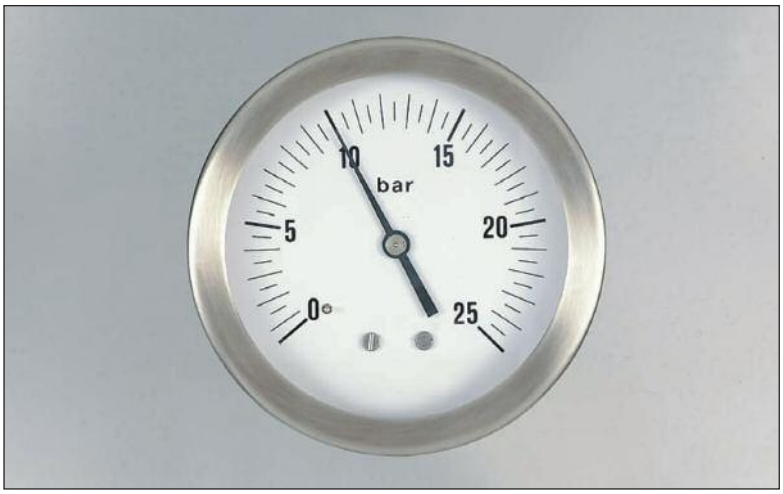
With:
multirapid manifold with shut-off valve
elbow 45°
elbow 90° F/F
threaded tee F
closing cap M
drain valve with cap

It can be assembled with the following manifold diameters: 32-16, 32-20, 40-20, 40-26.

Multirapid manifold for water conveyance with water-meters to be placed in the inspection cabinets or in the meter room.

With:
multirapid manifold with shut-off valve
threaded joint F/F of metal
elbow 90° M/F
closing cap M
threaded joint F

It can be assembled with the following manifold diameters: 32-16, 32-20, 40-20, 40-26.



Each plant – water-sanitary, heating or of other type – should be tested according to AS3500 before final walling-up is completed.
The installing company is legally responsible for the works completed and should guarantee their workmanship accordingly.

The testing according to regulations requires the following steps:

1 – **PRE-TEST**: stress duration 30 minutes.

- The installation must be filled, venting the air from the highest points of the piping.
- Connect the variable pressure pump to a suitable terminal, loading the installation to 15 bar (1500 kPa).
- Once the assembled parts have been checked, the installation should be drained. In this stage, the max. allowed drop is 0.3 bar (30 kPa).

2 – **FINAL TEST**: minimum duration 2 hours.

- The final test must be completed by applying a pressure of 15 bar (1500 kPa) for the duration, with no pressure drops greater than 0.3 bar (30 kPa) are allowed. If there are no fluid losses, we suggest to walling up the pipes and fittings while leaving the test pressure applied.

3 – **TESTING PROTOCOL**

- The installing company should attest and certify the testing and materials, by completing a certification form.

IMPORTANT NOTES:

a) Should the hydraulic test be partially or totally omitted, then the warranty on **aquatechnik** products is to be considered void and our company is released from any responsibility of accidents and/or damage to structures, components personel.

b) Thermoplastic materials are sensitive to room temperature changes; large temperature drops or increases can cause drops or increases of the testing pressures. As an example, a change of 10°C can increase or decrease the testing pressure by 0.5/1 bar (50/100 kPa).

c) The test pump should be located at the lowest point of the installation and should have a manometer able to check any variation of 0.1 bar (10 kpa).

d) We suggest testing piping up to 100 m in length. In cases where piping is longer, we suggest testing in sections.

e) We recommend that walling up or chasing in the pipework be completed while the system is still under test. This will assist in confirming that the pipework is damage free during and following this operation.

f) In case of freezing danger or during winter times, we recommend completely draining the piping.

aquatechnik®

TESTING REPORT

Installed plant: ☐ water-sanitary ☐ heating ☐ other _____

Work done at	Name _____ Address _____ Number _____ Post code _____ City _____ Country _____ Phone _____ E-mail _____
Customer	Name _____ Address _____ Number _____ Post code _____ City _____ Country _____ Phone _____ E-mail _____
Installer	Name _____ Address _____ Number _____ Post code _____ City _____ Country _____ Phone _____ E-mail _____

INSTALLED PIPES

Tipo Type	Ø da from	Ø a to	Pipe length (m.)	Type	Ø da from	Ø a to	Pipe length (m.)
☐ multi-calor			about	☐			about
☐ multi-eco			about	☐			about
☐ polipert			about	☐			about
☐			about	☐			about
☐			about	☐			about

TESTING SYSTEM

PRE-TESTING tolerated pressure drop: maximum 0,6 bar		FINAL TEST tolerated pressure drop: maximum 0,2 bar	
Duration	60 minutes	Duration	120 minutes
Starting pressure (normally 15 bar)	bar	Starting pressure	bar
Pressure after 30 minutes	bar	**NB:** the starting pressure is the same of the pre-testing after 60 minutes	
Pressure after 60 minutes	bar	Pressure after 120 minutes	bar
Pressure drop	bar	Pressure drop	bar
Test result		Test result	

Starting test _____ Final test _____

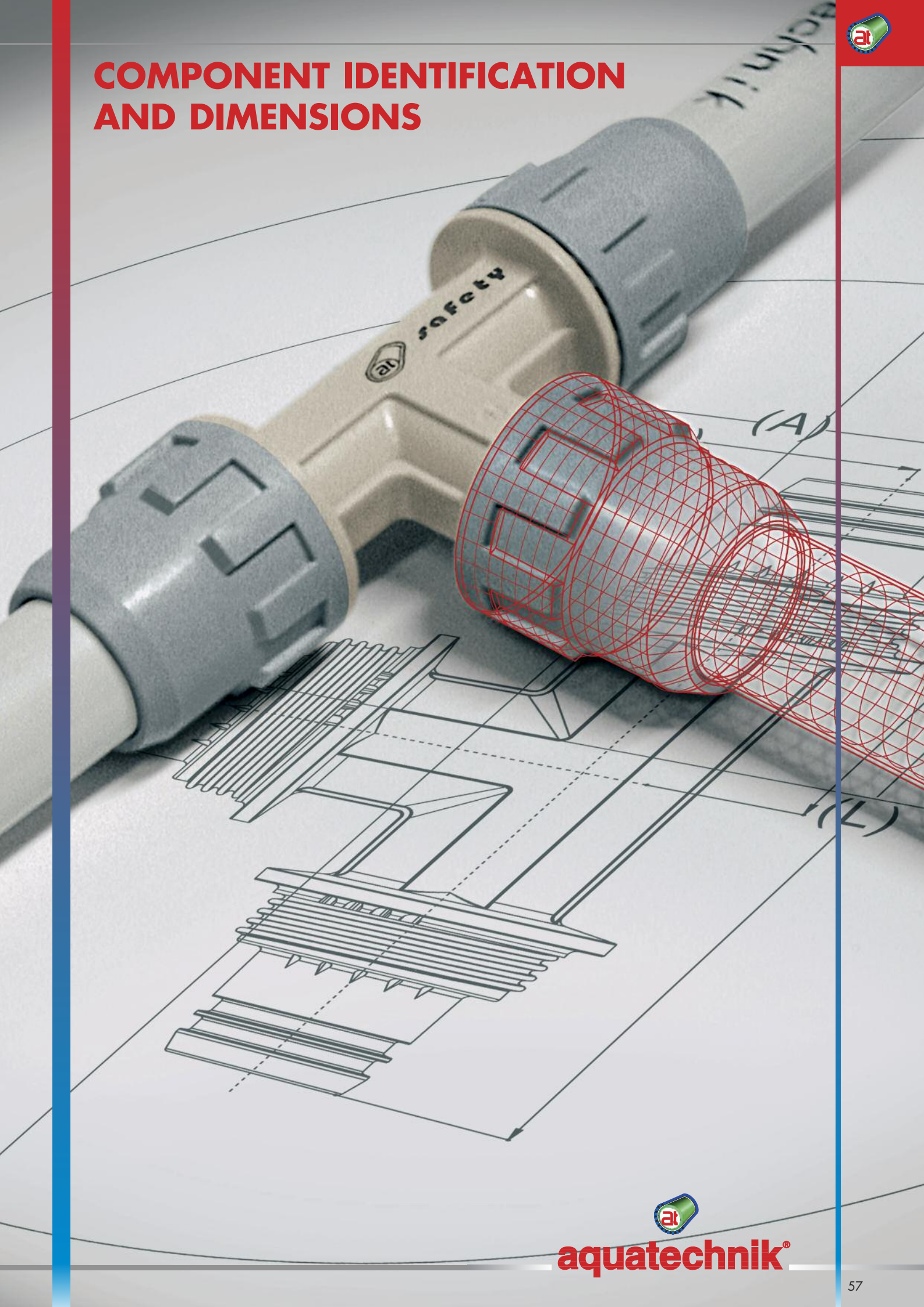
Place _____ Date _____

Signature (customer) _____ Signature (The installing company) _____

aquatechnik®

aquatechnik®

COMPONENT IDENTIFICATION AND DIMENSIONS



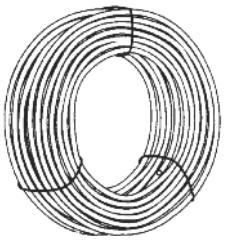
multi-calor pipes

multilayer pipes in white colour

WaterMark

IIP www.iip.it
HYGIENE INSTITUTE
VUPS
RINA
SKZ
BYGGFORSK
ITB
KIWA
CSTB
DVGW
AENOR
WRAS

Figure	Item no.	Nom. Dimensions	Dimensions mm. ext.	Dimensions mm. thick.	Alu. thick. mm
MULTI-CALOR PIPE	74154	16	16	2	0.30
	74156	20	20	2	0.40
	74158	26	26	3	0.58
	74160	32	32	3	0.75
	74162	40	40	3.5	0.80
	74164	50	50	4	1.00
	74166	63	63	4.5	1.20

Figure	Item no.	Nom. Dimensions	Dimensions mm. ext.	Dimensions mm. thick.	Alu. thick. mm
MULTI-CALOR PIPE 	74004	16	16	2	0.30
	74008	20	20	2	0.40
	74010	26	26	3	0.58
	74012	32	32	3	0.75

MULTI-CALOR PIPE ISOLINE

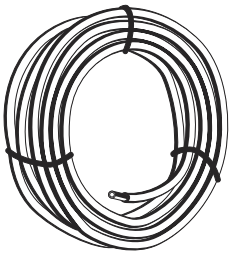
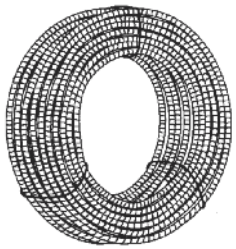
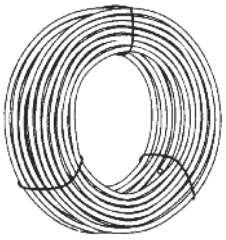


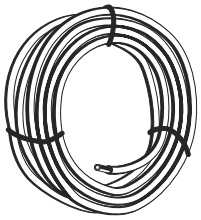
Figure	Item no.	Nom. Dimensions	Dimensions mm. ext.	Dimensions mm. thick.	Isdl. mm	Alu. thick. mm
	74034	16	16	2	λ 0.040 mm 6	0.30
	74038	20	20	2	λ 0.040 mm 6	0.40
	74040	26	26	3	λ 0.040 mm 10	0.58
	74042	32	32	3	λ 0.040 mm 10	0.75
	74064	16	16	2	λ 0.040 mm 10	0.30
	74068	20	20	2	λ 0.040 mm 10	0.40
	74070	26	26	3	λ 0.040 mm 13	0.58
	74072	32	32	3	λ 0.040 mm 13	0.75
	74084	16	16	2	λ 0.035 mm 6	0.30
	74088	20	20	2	λ 0.035 mm 6	0.40

Figure	Item no.	Nom. Dimensions	Dimensions mm. ext.	Dimensions mm. thick.	Alu. thick. mm
MULTI-CALOR PIPE BLUE CORRUGATED 	74204	16	16	2	0.30
	74206	20	20	2	0.40
MULTI-CALOR PIPE RED CORRUGATED	74224	16	16	2	0.30
	74226	20	20	2	0.40

multi-eco pipes
multilayer pipes in white colour

Figure	Item no.	Nom. Dimensions	Dimensions mm. ext.	Dimensions mm. thick.	Alu. thick. mm
MULTI-ECO PIPE 	74504	16	16	2	0.20
	74508	20	20	2	0.20

aquatechnik®

Figure	Item no.	Nom. Dimensions	Dimensions mm. ext.	Dimensions mm. thick.	Isdl. mm	Alu. thick.
MULTI-ECO PIPE ISOLINE 	74534	16	16	2	λ 0.040 mm 6	0.20
	74538	20	20	2	λ 0.040 mm 6	0.20

polipert pipes

pipes in PE-RT with antioxigen barrier in natural colour

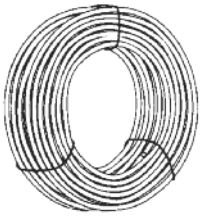
Figure	Item no.	Nom. Dimensions	Dimensions mm. ext.	Dimensions mm. thick.
POLIPERT PIPE 	75004	16	16	2
	75008	20	20	2

Figure	Item no.	Nom. Dimensions	Dimensions mm. in inches	Dimensions mm. in mm
SHELL	61508	20	1/2	20
	61510	26	3/4	26
	61512	32	1	32
	61514	40	1 1/4	40
	61516	50	1 1/2	50
	61518	63	2	63

System

safety

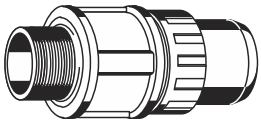
with pipes

FITTINGS AND CAPS IN PPSU FOR SANITARY, HEATING, COOLING AND COMPRESSED AIR SYSTEMS, FOR PLANT ROOMS IN-WALL AND OUT OF WALLS.

WaterMark

IIP www.iip.it · DVGW · WRAS · RINA · HYGIENE INSTITUTE · AENOR · BYGGFORSK · NSF · SKZ · CSTB · ITB · KIWA · VUPS

THREADED JOINT M.



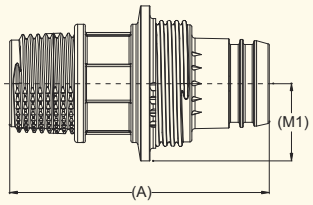
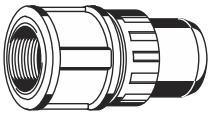


Figure	Item no.	Dimension mm			
		nominal	for pipe	A	M1
	20001	M 3/8" - 16	16 - 2	59.00	13.77
	20002	M 1/2" - 16	16 - 2	61.50	13.75
	20006	M 1/2" - 20	20 - 2	62.70	16.25
	20010	M 3/4" - 20	20 - 2	65.20	16.25
	20012	M 3/4" - 26	26 - 3	68.50	20.50
	20013	M 1" - 26	26 - 3	75.0	20.5
	20016	M 1" - 32	32 - 3	74.00	25.00
	20018	M1 1/4" - 40	40 - 3.5	90.60	29.90
	20028	M1 1/2" - 50	50 - 4	90.00	36.50
	20033	M2" - 63	63 - 4.5	118.50	47.50
	20022*	M 1/2" - 16	16 - 2	69.50	16.50
	20026*	M 1/2" - 20	20 - 2	70.50	16.50

* With alloy insert

aquatechnik®

THREADED JOINT F.



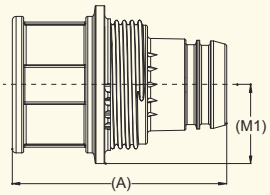
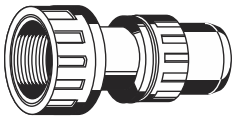


Figure	Item no.	Dimension mm			
		nominal	for pipe	A	M1
	20062	F 1/2" - 16	16 - 2	53.50	16.00
	20066	F 1/2" - 20	20 - 2	54.70	16.25
	20070	F 3/4" - 20	20 - 2	52.20	19.50
	20072	F 3/4" - 26	26 - 3	55.50	20.50
	20073	F 1" - 26	26 - 3	61.00	20.75
	20076	F 1" - 32	32 - 3	61.00	25.00
	20078	F 1 1/4" - 40	40 - 3.5	70.50	31.50
	20088	F 1 1/2" - 50	50 - 4	75.50	36.50
	20093	F 2" - 63	63 - 4.5	94.50	47.50
	20082*	F 1/2" - 16	16 - 2	53.50	17.50
	20086*	F 1/2" - 20	20 - 2	54.50	17.50

REDUCER



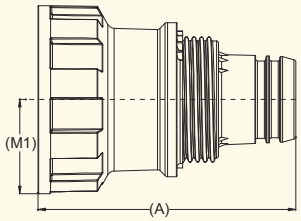
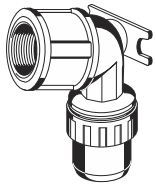
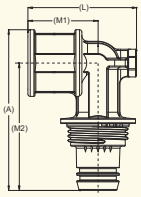


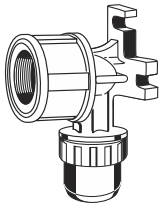
Figure	Item no.	Dimension mm			
		nominal	for pipe	A	M1
	20122	20 - 16	16 - 2	57.80	16.25
	20126	26 - 16	16 - 2	62.50	20.50
	20130	26 - 20	20 - 2	63.70	20.50
	20132	32 - 16	16 - 2	65.00	25.00
	20136	32 - 20	20 - 2	66.30	25.00
	20138	32 - 26	26 - 3	68.60	25.00
	20142	40 - 16	16 - 2	71.50	30.00
	20144	40 - 20	20 - 2	72.70	30.00
	20146	40 - 26	26 - 3	75.00	30.00
	20148	40 - 32	32 - 3	77.50	30.00
	20156	50 - 32	32 - 3	86.00	36.50
	20158	50 - 40	40 - 3.5	87.50	36.50
	20168	63 - 40	40 - 3.5	99.50	47.55
	20170	63 - 50	50 - 4	107.50	47.55

* With alloy insert

THREADED ELBOW F. WITH BRACKET







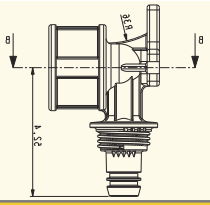
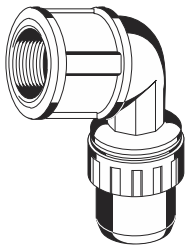


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	20212	F 1/2" - 16	16 - 2	67.75	45.00	30.50	52.50
	20216	F 1/2" - 20	20 - 2	70.75	47.30	30.50	55.50
	20202*	F 1/2" - 16	16 - 2	70.00	45.00	30.50	52.50
	20206*	F 1/2" - 20	20 - 2	73.00	47.00	30.50	55.50

THREADED ELBOW F.



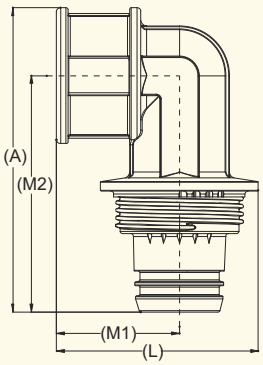
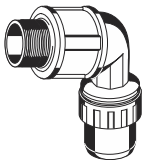


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	20222	F 1/2" - 16	16 - 2	67.75	44.25	30.50	52.50
	20226	F 1/2" - 20	20 - 2	70.75	46.80	30.50	55.50
	20230	F 3/4" - 20	20 - 2	77.65	44.80	28.50	58.20
	20232	F 3/4" - 26	26 - 3	80.95	52.50	32.00	61.50
	20238	F 1" - 32	32 - 3	93.50	63.00	38.00	69.00
	20262*	F 1/2" - 16	16 - 2	70.00	44.25	30.50	52.50
	20266*	F 1/2" - 20	20 - 2	73.00	46.80	30.50	55.50

* With insert alloy

aquatechnik®

THREADED ELBOW M.



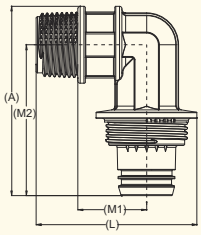


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	20282	M 1/2" - 16	16 - 2	65.00	53.00	22.50	52.50
	20286	M 1/2" - 20	20 - 2	68.00	55.00	22.50	55.50
	20288	M 3/4" - 20	20 - 2	74.00	58.00	24.50	58.00
	20290	M 3/4" - 26	26 - 3	77.00	65.50	28.00	61.50
	20296	M 1" - 32	32 - 3	88.50	76.00	31.00	69.00
	20322*	M 1/2" - 16	16 - 2	69.00	60.00	30.50	52.50
	20326*	M 1/2" - 20	20 - 2	72.00	62.50	30.50	55.50

N°19BP BACKPLATED ELBOW M

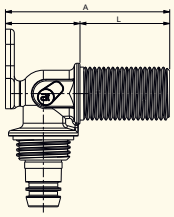
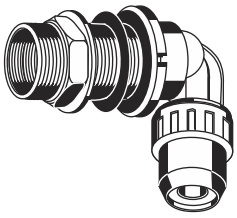


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L		
	30352	M 1/2" - 16	16 - 2	65.0	35.5		
	30354	M 1/2" - 16	16 - 2	90.0	60.5		
	30356	M 1/2" - 20	20 - 2	90.0	54.0		

ELBOW WITH EXTENDED THREAD M/F



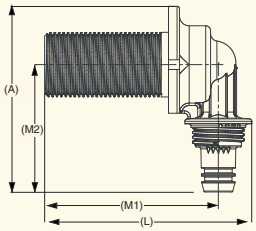
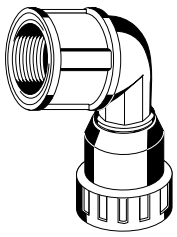


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	20330*	F 1/2" - 16	16 - 2	76.40	82.275	71.50	52.40
		total length thread 51 mm					

* With insert alloy

THREADED ELBOW F/F



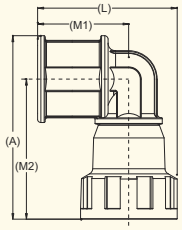
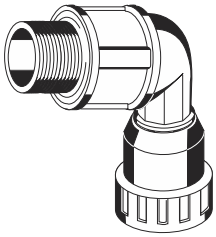


Figure	Item no.	Dimension mm					
		nominal	for fitting	A	L	M1	M2
	20332	F 1/2" - 16	16	60.75	44.00	30.50	45.50
	20336	F 1/2" - 20	20	62.05	46.50	30.50	47.00
	20337	F 3/4" - 26	26	75.00	52.75	32.00	55.50
	20338	F 1" - 32	32	86.55	63.00	38.00	62.30

THREADED ELBOW M/F



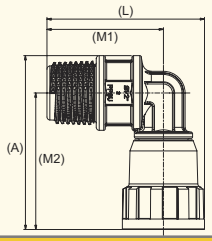
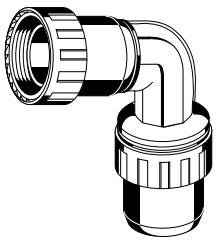


Figure	Item no.	Dimension mm					
		nominal	for fitting	A	L	M1	M2
	20342	M1/2" - 16	16	58.20	52.75	39.00	45.70
	20344	M1/2" - 20	20	59.50	55.15	39.00	47.00
	20346	M3/4" - 26	26	67.20	65.75	45.00	51.50
	20348	M1" - 32	32	76.60	76.00	51.00	57.10

ELBOW 90° M/F



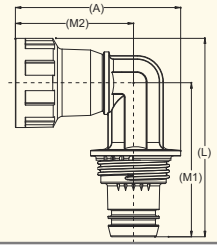
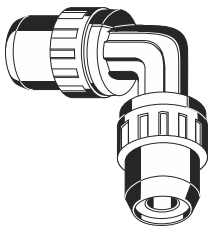


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	20352	16 - 16	16 - 2	53.30	66.00	52.50	40.00
	20356	20 - 20	20 - 2	59.50	71.50	55.50	43.00
	20358	26 - 26	26 - 3	71.45	82.25	61.50	51.00
	20360	32 - 32	32 - 3	81.35	94.00	69.00	56.40
	20362	40 - 40	40 - 3.5	97.40	107.50	77.50	67.50

aquatechnik®

ELBOW 90°



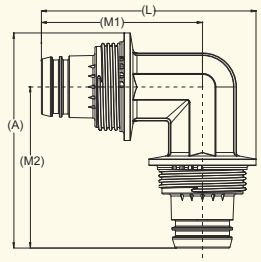
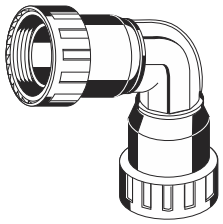


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	20382	16 - 16	16 - 2	66.00	66.00	52.50	52.50
	20386	20 - 20	20 - 2	71.50	71.50	55.50	55.50
	20388	26 - 26	26 - 3	82.00	82.00	61.50	61.50
	20390	32 - 32	32 - 3	94.00	94.00	69.00	69.00
	20392	40 - 40	40 - 3.5	107.50	107.50	77.50	77.50
	20394	50 - 50	50 - 4	127.50	127.50	91.00	91.00
	20396	63 - 63	63 - 4.5	150.50	150.50	112.00	112.00

ELBOW 90° F/F



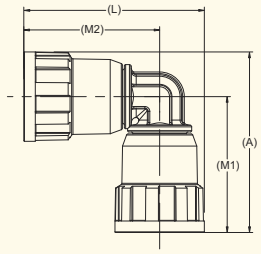


Figure	Item no.	Dimension mm					
		nominal	for fitting	A	L	M1	M2
	20402	16 - 16	16	54.95	54.95	41.35	41.35
	20406	20 - 20	20	59.95	59.95	43.80	43.80
	20408	26 - 26	26	74.25	74.25	53.50	53.50
	20410	32 - 32	32	85.00	85.00	60.00	60.00

ELBOW 45°

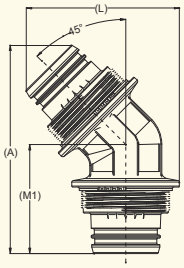
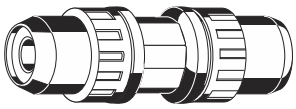


Figure	Item no.	Dimension mm				
		nominal	for pipe	A	L	M1
	20416	20 - 20	20 - 2	80.60	52.60	41.00
	20418	26 - 26	26 - 3	90.24	62.00	48.65
	20420	32 - 32	32 - 3	100.30	72.25	53.00
	20422	40 - 40	40 - 3.5	113.50	84.40	59.00
	20424	50 - 50	50 - 4	135.50	102.00	70.00
	20426	63 - 63	63 - 4.5	165.60	128.30	85.00

PIPE COUPLING



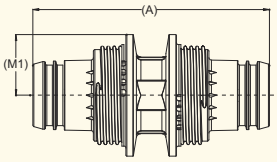
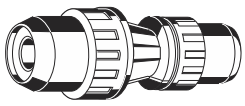


Figure	Item no.	Dimension mm			
		nominal	for pipe	A	M1
	20442	16 - 16	16 - 2	72.00	13.75
	20446	20 - 20	20 - 2	76.50	16.25
	20448	26 - 26	26 - 3	80.00	20.50
	20450	32 - 32	32 - 3	85.00	25.00
	20452	40 - 40	40 - 3.5	95.00	30.00
	20454	50 - 50	50 - 4	115.00	36.50
	20456	63 - 63	63 - 4.5	140.00	47.50

REDUCED PIPE COUPLING



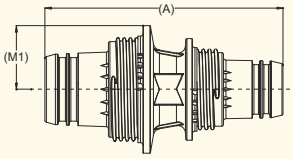
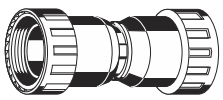


Figure	Item no.	Dimension mm			
		nominal	for pipe	A	M1
	20472	20 - 16	20-2 - 16-2	72.00	16.25
	20480	26 - 20	26-3 - 20-2	76.50	20.50

NIPPLES F/F



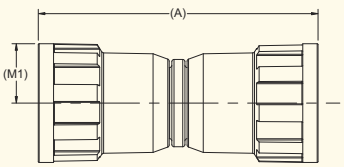
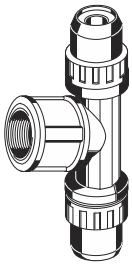


Figure	Item no.	Dimension mm			
		nominal	for fitting	A	M1
	20522	16 - 16	16	64.10	13.75
	20526	20 - 20	20	66.60	16.25
	20528	26 - 26	26	77.00	20.75
	20530	32 - 32	32	81.00	25.00
	50532	40 - 40	40	97.3	30.0
	50534	50 - 50	50	126.4	36.5

THREADED TEE F.



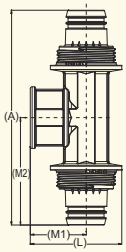
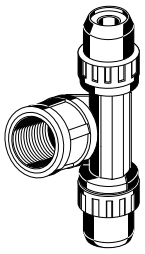


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	20542	16 - F 1/2" - 16	16 - 2	105.00	44.25	30.50	52.50
	20546	20 - F 1/2" - 20	20 - 2	111.00	46.80	30.50	55.50
	20550	26 - F 3/4" - 26	26 - 3	123.00	52.50	32.00	61.50
	20556	32 - F 1" - 32	32 - 3	138.00	63.00	38.00	69.00
	20582*	16 - F 1/2" - 16	16 - 2	105.00	44.25	30.50	52.50
	20586*	20 - F 1/2" - 20	20 - 2	111.00	46.80	30.50	55.50

ECCENTRIC THREADED TEE F.



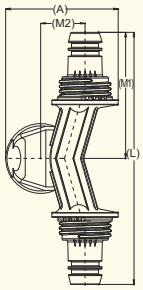
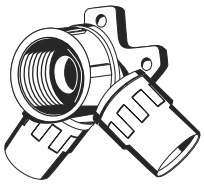


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	20592	16 - F 1/2" - 16	16 - 2	46.80	105.00	52.50	18.50
	20596	20 - F 1/2" - 20	20 - 2	49.50	111.00	55.50	18.50
	20606*	20 - F 1/2" - 20	20 - 2	36.00	111.00	55.50	18.50

THREADED T FEMALE ANGLE 90°



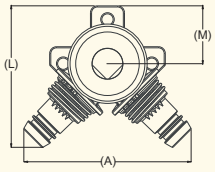
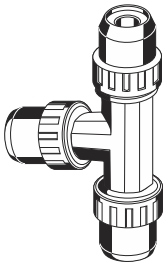


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	20632	sf16 - F 1/2" - sf16	16 - 2	74.00	62.50	30.50	46.50

TEE



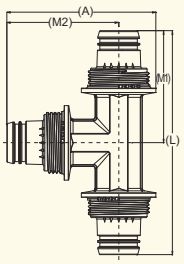
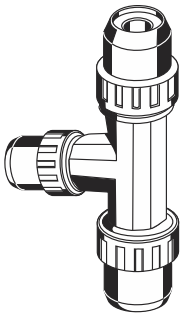


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	20662	16 - 16 - 16	16 - 2	66.00	105.00	52.50	52.50
	20666	20 - 20 - 20	20 - 2	71.50	111.00	55.50	55.50
	20668	26 - 26 - 26	26 - 3	82.00	123.00	61.50	61.50
	20670	32 - 32 - 32	32 - 3	94.00	138.00	69.00	69.00
	20672	40 - 40 - 40	40 - 3.5	107.50	155.00	77.50	77.50
	20674	50 - 50 - 50	50 - 4	127.50	182.00	91.00	91.00
	20676	63 - 63 - 63	63 - 4.5	159.50	224.00	112.00	112.00

REDUCED TEE



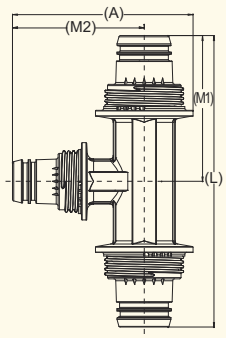


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	20717	20 - 16 - 16	20-2 - 16-2	68.50	107.90	55.50	52.50
	20720	20 - 16 - 20	20-2 - 16-2	68.50	111.00	55.50	52.50
	20725	26 - 16 - 26	26-3 - 16-2	75.15	123.00	61.50	54.40
	20728	26 - 20 - 26	26-3 - 20-2	76.00	123.00	61.50	55.50
	20732	32 - 16 - 32	32-3 - 16-2	77.50	138.00	69.00	52.40
	20735	32 - 20 - 32	32-3 - 20-2	80.50	138.00	69.00	55.50
	20736	32 - 26 - 32	32-3 - 26-3	86.50	138.00	69.00	61.50
	20740	40 - 16 - 40	40-3.5 - 16-2	79.00	155.00	77.50	49.00
	20742	40 - 20 - 40	40-3.5 - 20-2	80.00	155.00	77.50	50.00
	20744	40 - 26 - 40	40-3.5 - 26-3	82.00	155.00	77.50	52.50
	20746	40 - 32 - 40	40-3.5 - 32-3	99.00	155.00	77.50	69.00
	20750	50 - 16 - 50	50-4 - 16-2	90.50	182.00	91.00	54.00
	20754	50 - 20 - 50	50-4 - 20-2	91.70	182.00	91.00	55.20
	20756	50 - 26 - 50	50-4 - 26-3	94.50	182.00	91.00	58.00
	20758	50 - 32 - 50	50-4 - 32-3	97.00	182.00	91.00	60.50
	20760	50 - 40 - 50	50-4 - 40-3.5	114.00	182.00	91.00	77.50
	20762	63 - 16 - 63	63-4.5 - 16-2	108.50	224.00	112.00	61.00
	20766	63 - 20 - 63	63-4.5 - 20-2	110.00	224.00	112.00	62.50
	20768	63 - 26 - 63	63-4.5 - 26-3	112.80	224.00	112.00	65.30
	20770	63 - 32 - 63	63-4.5 - 32-3	115.00	224.00	112.00	67.50
	20772	63 - 40 - 63	63-4.5 - 40-3.5	119.00	224.00	112.00	71.50
	20774	63 - 50 - 63	63-4.5 - 50-4	138.50	224.00	112.00	91.00

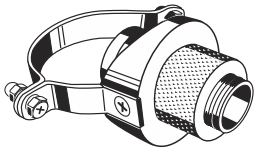
Figure	Item no.	Dimension mm
DIRECT JUNCTION FOR MULTILAYER PIPES 	22812	M 1/2" for pipe Ø 63 mm
	22814	M 3/4" for pipe Ø 63 mm

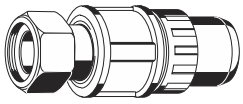
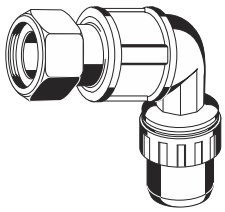
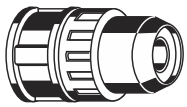
Figure	Item no.	Dimension mm	
		nominal	for pipe
PIPE UNION 	20832	3/4" - 16	16 - 2
	20836	3/4" - 20	20 - 2
	20840	1" - 26	26 - 3
	20844	1 1/4" - 32	32 - 3

Figure	Item no.	Dimension mm	
		nominal	for pipe
BENT PIPE UNION 	20862	3/4" - 16	16 - 2
	20866	3/4" - 20	20 - 2
	20870	1" - 26	26 - 3
	20874	1 1/4" - 32	32 - 3

SAFETY PIPE UNION



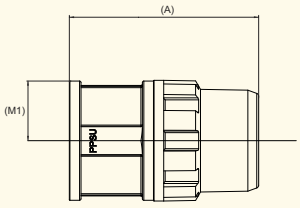
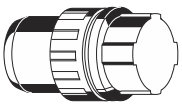


Figure	Item no.	Dimension mm			
		nominal	for pipe	A	M1
	20882	16 - 16	16 - 2	54.00	13.75
	20884	20 - 20	20 - 2	58.50	16.30
	20888	26 - 26	26 - 3	64.00	20.50
	20890	32 - 32	32 - 3	68.00	25.00

CLOSING CAP M.



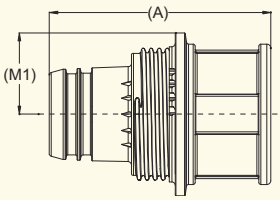
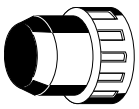


Figure	Item no.	Dimension mm			
		nominal	for pipe	A	M1
	20902	16	16 - 2	41.50	13.75
	20906	20	20 - 2	44.20	16.25
	20908	26	26 - 3	55.50	20.50
	20910	32	32 - 3	61.00	25.00
	20912	40	40 - 3.5	64.00	30.00
	20914	50	50 - 4	77.50	36.50
	20916	63	63 - 4.5	92.50	41.00

CLOSING CAP F.



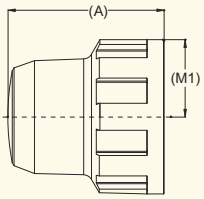


Figure	Item no.	Dimension mm			
		nominal	for fitting	A	M1
	20952	16	16	31.50	13.75
	20956	20	20	32.50	16.25
	20958	26	26	36.50	20.50
	20960	32	32	39.00	25.00
	20962	40	40	43.50	30.00
	20964	50	50	53.85	36.50
	20966	63	63	73.50	41.00

REDUCING CAP

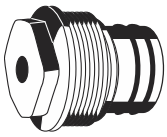


Figure	Item no.	Dimension
	21064	safety 26 mm - F 1/2"
	21066	safety 32 mm - F 1/2"

SHUT-OFF VALVE

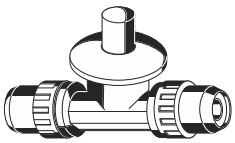


Figure	Item no.	Dimension mm	
		nominal	for pipe
	21202	16 - 16	16 - 2
	21206	20 - 20	20 - 2
	21208	26 - 26	26 - 3

SHUT-OFF VALVE

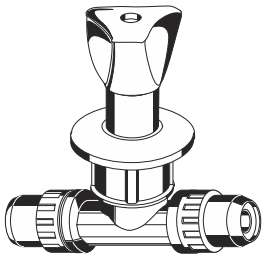
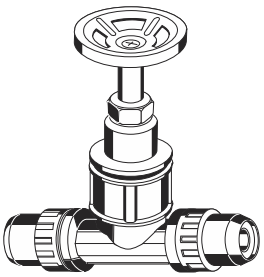


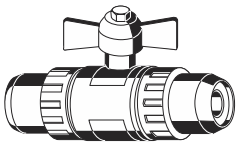
Figure	Item no.	Dimension mm	
		nominal	for pipe
	21232	16 - 16	16 - 2
	21236	20 - 20	20 - 2
	21238	26 - 26	26 - 3

SHUT-OFF VALVE



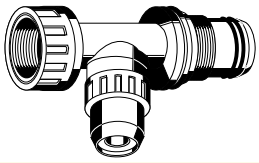
Item no.	Dimension mm	
	nominal	for pipe
21262	16 - 16	16 - 2
21266	20 - 20	20 - 2
21268	26 - 26	26 - 3

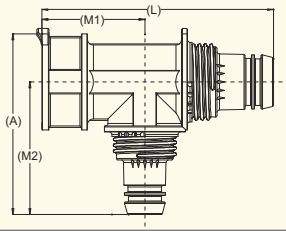
BALL VALVE WITH BUTTERFLY HANDLE



Item no.	Dimension mm	
	nominal	for pipe
21282	16 - 16	16 - 2
21286	20 - 20	20 - 2
21288	26 - 26	26 - 3
21290	32 - 32	32 - 3

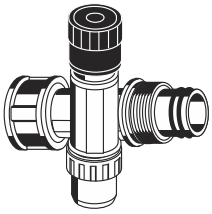
MODULAR MANIFOLD

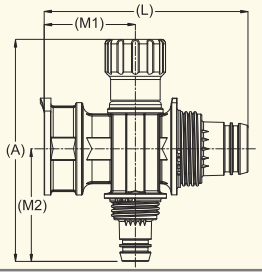




Item no.	Dimension mm					
	nominal	for pipe	A	L	M1	M2
21302	20 - 16	20-2 - 16-2	61.50	79.00	35.00	45.00
21304	26 - 16	26-3 - 16-2	71.00	90.50	40.50	50.50
21307	26 - 20	26-3 - 20-2	71.70	90.50	40.50	51.20

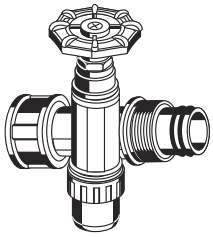
MULTIRAPID MANIFOLD WITH SHUT-OFF VALVE





Item no.	Dimension mm					
	nominal	for pipe	A	L	M1	M2
21312	20 - 16	20-2 - 16-2	92.00	79.00	35.00	45.00
21316	26 - 16	26-3 - 16-2	98.50	90.50	40.50	50.00
21322	32 - 16	32-3 - 16-2	106.00	96.50	43.00	52.20
21326	32 - 20	32-3 - 20-2	106.00	96.50	43.00	52.20

MULTIRAPID MANIFOLD WITH SHUT-OFF VALVE



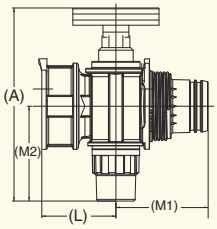
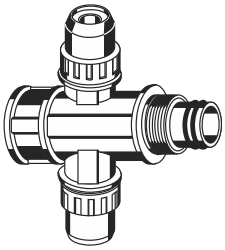


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	21342	32 - 16	32-3 - 16-2	115.90	96.50	43.00	52.20
	21346	32 - 20	32-3 - 20-2	115.10	96.50	43.00	52.20
	21348	40 - 20	40-3.5 - 20-2	126.90	120.50	55.00	53.70
	21350	40 - 26	40-3.5 - 26-3	132.40	120.50	55.00	58.25

CROSS MANIFOLD



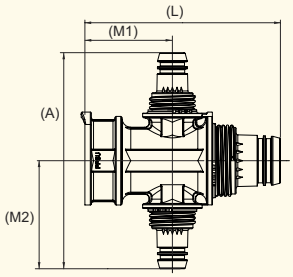
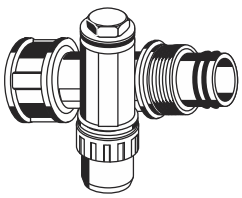


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	21402	20 - 16	20-2 - 16-2	90.00	79.00	35.00	45.00
	21406	26 - 16	26-3 - 16-2	101.00	90.50	40.50	50.50

MODULAR MANIFOLD



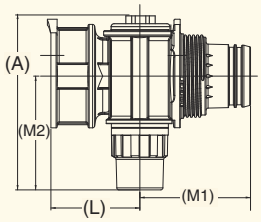
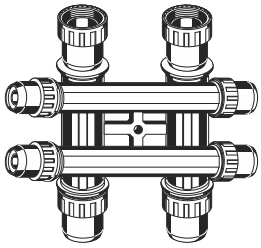


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	21602	26 - 16	26-3 - 16-2	77.25	90.50	40.50	50.00
	21608	32 - 16	32-3 - 16-2	84.75	96.50	43.00	52.20
	21612	32 - 20	32-3 - 20-2	83.95	96.50	43.00	52.20
	21620	40 - 20	40-3.5 - 20-2	83.45	120.50	55.00	53.70

aquatechnik®

COPLANAR MANIFOLD



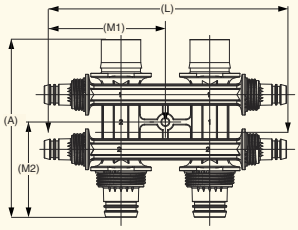
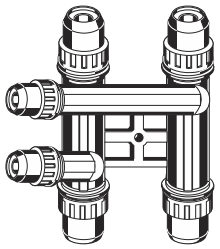


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	21658	26 - 16	26-3 - 16-2	135.00	164.00	64.50	82.00

DERIVATION MANIFOLD



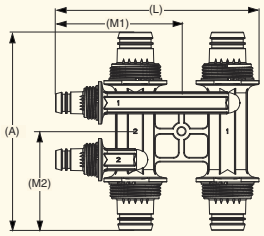
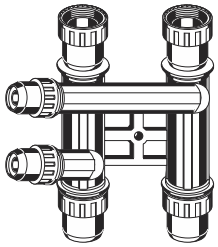


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	21685	20 - 16	20-2 - 16-2	122.40	128.27	82.00	61.20
	21689	26 - 16	26-3 - 16-2	129.00	132.45	82.00	64.50

Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
DERIVATION MANIFOLD M/F	21745	20 - 16	20-2 - 16-2	116.10	128.27	82.00	61.20



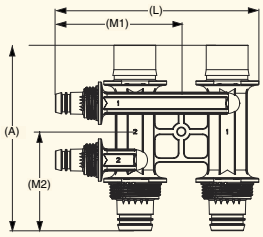
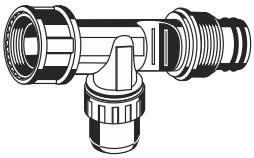
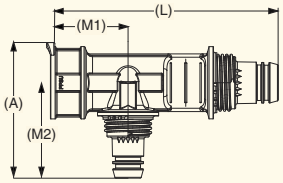
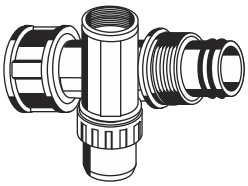


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
SWAN-NECK MANIFOLD	21782	20 - 16	20-2 - 16-2	59.30	102.70	43.00	35.00





MANIFOLD BODY



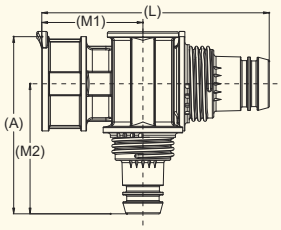
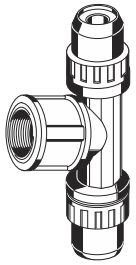


Figure	Item no.	Dimension mm					
		nominal	for pipe	A	L	M1	M2
	22312	20 - 16	20-2–16-2	63.00	78.70	35.00	45.00
	22316	26 - 16	26-3–16-2	70.50	90.50	40.50	50.00
	22322	32 - 16	32-3–16-2	78.00	96.50	43.00	52.20
	22326	32 - 20	32-3–20-2	77.20	96.50	43.00	52.20
	22334	40 - 20	40-3.5–20-2	76.70	120.50	55.00	53.70
	22336	40 - 26	40-3.5–26-3	82.50	120.50	55.00	59.50

VALVE CASING



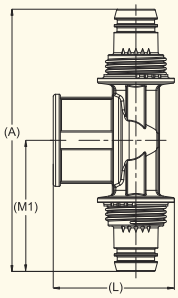
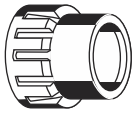


Figure	Item no.	Dimension mm				
		nominal	for pipe	A	L	M1
	22802	16 - 16	16 - 2	105.00	48.80	52.50
	22806	20 - 20	20 - 2	111.00	51.30	55.50
	22808	26 - 26	26 - 3	123.00	60.45	61.50

CAP



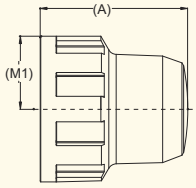


Figure	Item no.	Dimension mm			
		nominal	for fitting	A	M1
	39102	16	16	31.00	13.75
	39106	20	20	32.00	16.25
	39108	26	26	36.20	20.50
	39110	32	32	38.40	25.00
	39112	40	40	43.50	30.00
	39114	50	50	54.00	36.50
	39116	63	63	68.00	42.50

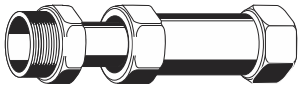
Figure	Item no.	Dimension
SHOWER MIXER	30282DR	Safety exit 16 x 150 mm right angle
LAUNDRY/BATH MIXER	30292DR	Safety entry 16 x M 300 mm right angle
THREADED ELBOW M WITH BRACKET – N°19 BP	30352DR	16 x 1/2" x 65 mm
	30354DR	16 x 1/2" x 90 mm
	30356DR	20 x 1/2" x 90 mm
BRASS CONNECTOR BARB M	39312DR	16 mm
	39314DR	20 mm
BRASS CAP	22876	M 3/8" for code 22312, 22314, 22316, 22318
	22902	M 1/2" for code 22322, 22326, 22334
	22904	M 1" for code 22336
BRASS REDUCER CAP	22910	M 1" - F 1/2" for art. 22336
AUTOMATIC VENT VALVE	92320	M 3/8"
	92322	M 1/2"
MANUAL VENT VALVE	92330	M 3/8"
	92332	M 1/2"
SLIDING JOINT 	31050	F 1/2" - M 1/2" length closed mm112 - length open mm158

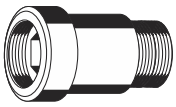
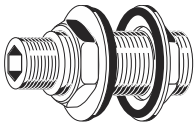
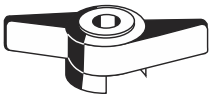
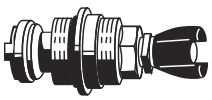
Figure	Item no.	Dimension
BRASS EXTENSION 	20984	Thread M 1/2" - F 1/2" total length mm. 48
METAL FIXING JOINT 	22868	1/2" - 1/2" - 3/4" length mm. 51
	22872	1/2" - 1/2" - 3/4" length mm. 71
BUTTERFLY HANDLE 	22850	for code 21282, 21286
	22852	for code 21288, 21290
VALVE FOR MANIFOLD AND SHUT-OFF VALVE	22880	for code 21312 for code 21316
	22882	for code 21322 for code 21326
HANDWEEL	22854	for code 22850, 22852
AUGER 	22890	for code 21202 for code 21206
	22892	for code 21208
HANDWHEEL	40990	for code 22890 for code 22892

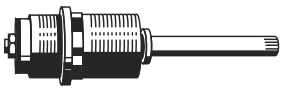
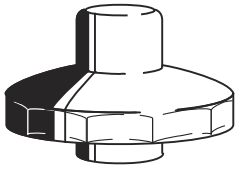
Figure	Item no.	Dimension
BRASS AUGER	22886	for code 21342 for code 21346 for code 21348
	22888	for code 21350
	22940	for code 21262 for code 21266
	22942	for code 21268
HANDLE	40992	for code 22886 for code 22940
	40994	for code 22888 for code 22942
HANDLE	22920	for code 21232 for code 21236 for code 21238
AUGER FOR SHUT-OFF VALVE 	22930	for code 21232 for code 21236
	22932	for code 21238
CAP 	40927	for code 21202 for code 21206 for code 21208

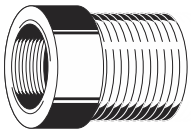
Figure	Item no.	Dimension
EXTENSION 	40931	tot. length 36 mm for code 21202 for code 21206 for code 21208 for code 21232 for code 21236 for code 21238
EXTENSION	40934	tot. length 40,5 mm for code 21202 for code 21206 for code 21208 for code 21232 for code 21236 for code 21238

Figure	Item no.	Dimension mm	
		nominal	for fitting
O RING	39252	16	16
	39256	20	20
	39258	26	26
	39260	32	32
	39262	40	40
	39264	50	50
	39266	63	63

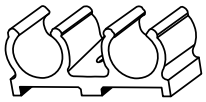
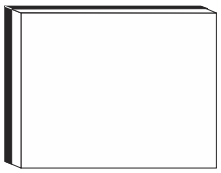
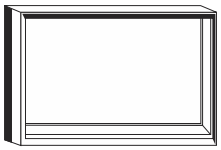
Figure	Item no.	Dimension
PIPE SPACER 	39296	16 - 2
	39300	20 - 2
INSPECTION CABINET Ø 20 AND 26 	71458	max. 5 connec. mm. 350 x 400 x 90
	71460	max. 9 connec. mm. 400 x 700 x 90
INSPECTION CABINET Ø 26 AND 32 	71462	max. 4 connec. mm. 450 x 500 x 110
	71464	max. 8 connec. mm. 450 x 750 x 110
	71466	max. 12 connec. mm. 450 x 1000 x 110

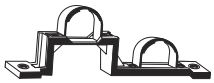
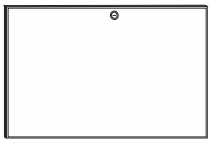
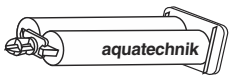
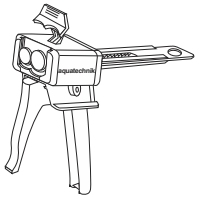
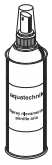
Figure	Item no.	Dimension
LOCKING BRACKET 	73580	for safety collector Ø 20 and case 71458 - 460
	73582	for safety collector Ø 26 and case 71458 - 460
	73584	for safety collector Ø 26 and case 71462 - 464 - 466
	73584	for safety collector Ø 32 and case 71462 - 464 - 466
LOCKING BRACKET	73586	for code 21658 for code 21689
CABINET COVER 	73552	for code 71462
	73554	for code 71464
	73556	for code 71466
	73558	for code 71458
	73560	for code 71460
HEMP COMPOUND	71370	g 400
SEALANT 	71380	ml 50
MIXING NOOZLE	71382	for code 71380
DOSING PISTOL 	71384	for code 71380
LEAK TESTER 	71393	250 ml

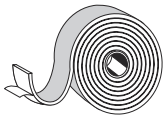
Figure	Item no.	Dimension	
GREASE	71391	g 50 for O-ring	
ADHESIVE FOIL 	71397	length m. 22 H mm. 3 thickness mm. 50	
Figure	**Item no.**	**Dimension**	
		in inches	**in mm**
CLIPS	27042	3/8"	16 - 18
	27044	1/2"	20 - 22
	27046	1/4"	25 - 27
Figure	**Item no.**	**Dimension**	
PAINT PR 094G/01	71400	1 Kg.	
Figure	**Item no.**	**Dimension**	
THINNER 2001	71405	1 l.	
Figure	**Item no.**	**Dimension**	
CLOSING CAP	27048	1/2"	
	27050	3/4"	

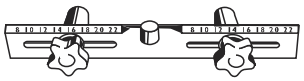
Figure	Item no.	Dimension
COMPASS LEVEL 	27054	extension from mm. 80 to 240

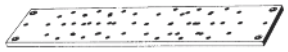
Figure	Item no.	Dimension
FIXED PRE-DRILLED BRACKET 	27058	for code 20202 for code 20206 for code 20632

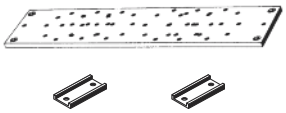
Figure	Item no.	Dimension
FIXED PRE-DRILLED BRACKET WITH SUPPORT 	27060	for code 20212 for code 20216

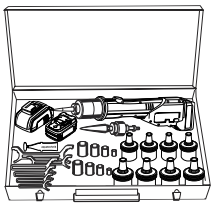
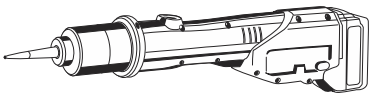
Figure	Item no.	Dimension
COUPLING TOOL BBR 90 KIT WITH ACCESSORIES 	51195	BBR 90 18V battery operated power tool with battery, battery charger, grease, carry case wrenches, elastomeric adaptor, mechanical expanders Ø 16-20-26-32 mm and head-adaptor
	51198	BBR 90 18V battery operated power tool with battery, battery charger, grease, carry case wrenches, elastomeric adaptor, mechanical expanders Ø 16-20-26-32-40-50-63 mm and head-adaptor
COUPLING TOOL BBR 90 (NO ACCESSORIES) 	51136	BBR 90 18V battery operated power tool only
BATTERY & BATTERY CHARGER BBR 90	50424	18V Li-ion battery – 1.5 Ah
	50662	18V Li-ion battery – 3.0 Ah
	50441	Battery charger – 230V input – 18V output
240V POWER SUPPLY FOR BBR 90	50665	Power supply to operate BBR 90 directly from 230/240V mains supply.

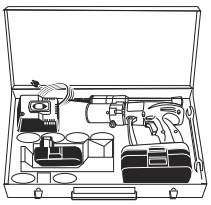
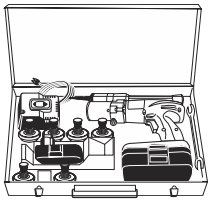
Figure	Item no.	Dimension
COUPLING TOOL BBS 32 	51142	battery operated 18V from 16 to 32 mm capacity
COUPLING TOOL BBS 32 	51144	battery operated 18V from 16 to 32 mm capacity complete with mechanical expanders Ø 16, 20, 26, 32

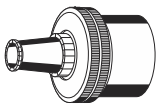
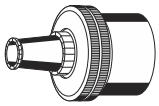
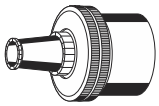
Figure	Item no.	Dimension mm	
		nominal	for pipe
BBR 90 - BBS 32 - BMC 011 MECHANICAL EXPANDER FOR MULTI-CALOR AND MULTI-ECO PIPE 	50702	16	16 - 2
	50704	20	20 - 2
	50705	26	26 - 3
	50706	32	32 - 3
BBR 90 MECHANICAL EXPANDER FOR MULTI-CALOR AND MULTI-ECO PIPE 	50707	40	40 - 3.5
	50708	50	50 - 4
	50709	63	63 - 4.5
BBS 32 - MECHANICAL EXPANDER FOR PE-RT AND PE-X PIPE 	50801	16	16 - 2
	50804	20	20 - 2

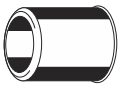
Figure	Item no.	Dimension mm	
		nominal	for pipe
ELASTOMERIC ADAPTOR FOR BBS 32 	50752	16	16 - 2
	50754	20	20 - 2
	50755	26	26 - 3
	50756	32	32 - 3
	50757	40	40 - 3.5
	50758	50	50 - 4
	50759	63	63 - 4.5
ELASTOMERIC ADAPTOR FOR BBR 90	50760	75	

Figure	Item no.	Dimension mm
GREASE FOR CONICAL PIN	50825	for BBS 32 - BMC 011 - BBR 90
PROTECTION FOR CONICAL PIN	50770	for BBS 32 - BMC 011
PROTECTION FOR MECHANICAL EXPANDER	50772	for BBS 32 - BMC 011

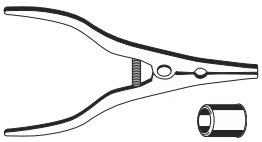
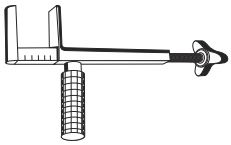
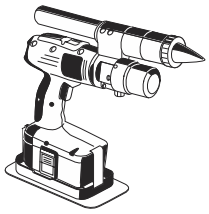
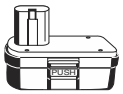
Figure	Item no.	Dimension
SPLITTING WRENCH 	50830	**to insert the elastomeric adaptor from Ø 16 to 32 mm** for code 50752 for code 50754 for code 50755
SPLITTING WRENCH 	50832	**to insert the elastomeric adaptor from Ø 40 to 63 mm** for code 50757 for code 50758 for code 50759
COUPLING TOOL BBS 32 	50426	battery working 18V from 16 to 32 mm capacity
BATTERY 	50426	for BBS 32

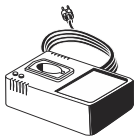
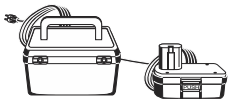
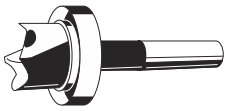
Figure	Item no.	Dimension mm
BATTERY RECHARGER 	50430	for BBS 32
TRANSFORMER 	50447	230 - 18V for BBS 32
MILLER FOR MULTI-CALOR PIPES 	50340	Ø 31 mm - 1/2"
	50342	Ø 37 mm - 3/4"

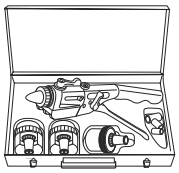
Figure	Item no.	Dimension mm
COUPLING TOOL BMC 011	50451	manual from 16 to 32
COUPLING TOOL BMC 011 	50452	manual from 16 to 32 with mechanical expanders ∅ 16 and 20
COUPLING TOOL BMC 011	50454	manual from 16 to 32
SUPPORT	50246	for BBS 32

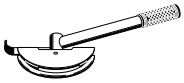
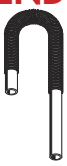
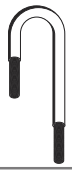
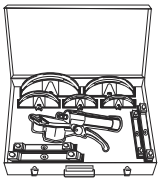
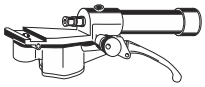
Figure	Item no.	Dimension mm
CLAMP	50127	BMM 094
WRENCH	50600	16 - 20 (of plastics)
	50602	26 - 32 (of plastics)
	50604	40 (of aluminium)
	50606	50 (of aluminium)
	50608	63 (of aluminium)
MANUAL BENDING MACHINE 	51082	16
	51086	20
OUTER PIPE-BENDING SPRING 	51094	16 (length cm. 50)
	51098	20 (length cm. 50)
	51100	26 (length cm. 50)
INTER PIPE-BENDING SPRING 	51304	16(length cm. 100)
	51308	20(length cm. 100)
BENDING MACHINE HTS 32 	51150	from 16 to 32
BENDING MACHINE HTS 32 	51155	from 16 to 32
TEMPLATE	51165	16
	51175	20
	51180	26
	51185	32

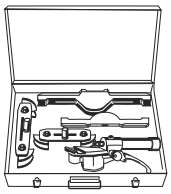
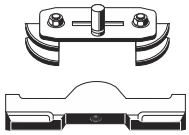
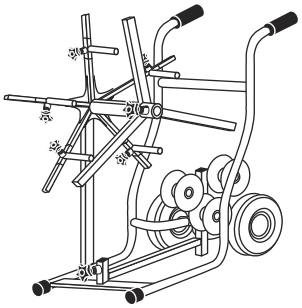
Figure	Item no.	Dimension mm
COUNTER-TEMPLATE	51200	16
	51205	20
	51210	26
	51215	32
SWAN NECK MACHINE CPS 26 	51218	20 - 26
TEMPLATE AND COUNTER-TEMPLATE 	51225	20
	51230	26
THREADING MACHINE	51240	for thread da 1/2"

Figure	Item no.	Dimension mm
PIPE LAYER TR 20 	50205	from 16 to 20 (coated pipe included)
CUTTER CM 26	50275	from 16 to 20
MEDIUM CUTTER	50280	from 16 to 40
PIPE CUTTER	50288	from 20 to 32
	50289	from 40 to 60
	50292	from 50 to 120
ROLLER	50293	for code 50288
	50294	for code 50289
	50295	for code 50292
BLADE	50298	for code 50280
	50302	for code 50275
	50304	for code 50277

Important

Information detailed in the following pages describe necessary actions to avoid accidents or problems during processing the multilayer systems.

- Thermoplastic materials are very sensitive to low room temperatures (from 5° C lower); this can cause additional product stress and vulnerability. Impact or other accidents at the jobsite can cause damage which is not the responibility of **aquatechnik**.
- During winter in areas where fluids may freeze, piping should be completely drained.
- Storage of pipes and fittings should be done in covered areas, protected from direct sun rays. Long-term exposure to sun light can damage the products.
- The materials detailed in our technical information are compatible with any kind of water used in water-sanitary, heating and conditioning systems. If used with **by aggressive fluids, we suggest to refer to table about PPSU chemical resistance at page 99, and/or to our technical department.**
- The materials and tools in this information can be replaced, or modified at the discretion of **aquatechnik** to meet its production requirements.
- All the processing tools are guaranteed in good working order when supplied to the customer, and we suggest to verify their correct operation before starting work, and to check them periodically (at least, once a year).
- Any repair or modification of the processing tools is permitted only if made by the producer.
- In case of repair or replacement of mechanical parts or or other components, the customer must return the tool to the **authorised reseller**, with details describing the malfunction. **aquatechnik** only accepts material or tools sent to it by its resellers.
- Any repair or replacement of the tools will be determined by **aquatechnik**.
- **aquatechnik** does not assume any responsibility for:
  - use of its tools with products of other companies or competitors;
  - careless use of materials and tools ;
  - accidents;
  - incorrect calculation of piping system requirements.

Regulation for plant installation with multi-calor , multi-eco , polipert and safety

Purpose of this regulation is to clarify capabilities and responsibilities concerning heating, cooling and sanitary systems completed with products manufactured by **aquatechnik**.

Materials and services	Competencies and responsibilities
Quotation, calculation and dimensioning of the system, in compliance with the existing standards.	Professional office capable of thermo-technical engineering and/or a consultant.
Installation of the necessary materials, such as: pipes and fittings in thermoplastic materials, insulation (in accordance with regulations) for the transfer of water to heating equipment, distribution collectors, control devices, central heating station, various testing, system commisioning, and any further work on the system	Qualified company for thermo-sanitary installations and technical servicing centres for heating stations.
Electrical connections to the working and control devices, to the service and safety thermostat, and any further work related to the electrical or electronic components.	Qualified electrical installation company
Pipes and fittings in thermoplastic material for hydraulic circuits, accessories and components.	**aquatechnik® group s.p.a.**

1. The liability and responsibilities of **aquatechnik** are related exclusively to its own products and supply of materials, which are covered by a warranty for material flaws or production defects.
2. Our company is released from any possible claim regarding:
   a) Any kind of system failing.
   b) Pipes and/or fittings breakage due to transportation to the jobsite; absence of hydraulic testing as per the technical guide; conveyance of aggressive fluids; other companies materials installed in the system, which can cause collateral damage or wear to the original piping.
   c) Errors in the electrical or electronic connection completed by the installers.
   d) Any system faults, not related to the original products.
3. Services of any technician (installer, user, wholesaler, etc.) in relation to any problem not related to point 1 above, will be charged to the applicant.

ORGANIC AGENTS

Name	Resistance
TRICHLOROETHANE	NO
ACETONE	NO
BENZENE	NO
BUTANOL	YES
BUTYL ACETATE	YES
CARBITOL	YES
CYCLOHEXANE	NO
ETHANOL	YES
ETHYL ACETATE	NO
ETHYLENE GLYCOL	YES
FORMALDEHYDE	YES
GLYCEROL	YES
METHANOL	YES
TOLUENE	NO
N-BUTANE	NO
ISO-OCTANE	NO
ETHYL-METHYLKETONE	NO
CARBON TETRACHLORIDE	YES
ACETIC ACID (MAX 20%)	YES
ACETIC ANHYDRIDE	NO
CITRIC ACID	YES
FORMIC ACID	YES

INORGANIC AGENTS

Name	Resistance
HYDROCHLORIC ACID (20%)	YES
NITRIC ACID	NO
OLEIC ACID	YES
POTASSIUM HYDROXIDE	YES
SODIUM HYDROXIDE	YES
SULPHURIC ACID (20%)	YES

CUTTING FLUID

Name	Producer	Resistance
Castrol nonol cutting oil	Castrol	NO

DETERGENTS

Name	Concentration	Producer	Resistance
ANTIKAL	100%	P&G	NO
BREF - Bath	100%	Henkel	YES
BREF - Fresh Shower	100%	Henkel	YES
CAROLIN - gloss cleaner	1.8%	Boltom Belgium	YES
CAROLIN - Active Fresh	1.9%	Boltom Belgium	YES
CAROLIN - with lineseed oil	1.9%	Boltom Belgium	YES
CAROLIN - Marseille soap	1.8%	Boltom Belgium	YES
Mr. Propre - citroen	3.4%	P&G	NO
Mr. Propre - extra hygiene	3.5%	P&G	YES
Mr. Propre - delicate surfaces	2.4%	P&G	NO
Mr. Propre - orange peel	3.4%	P&G	NO
Mr. Propre - winter fresh	3.4%	P&G	NO
TERRA - stone floors	12%	Henkel	YES
TERRA - parket	3.2%	Henkel	YES
TERRA - glossy floors	1.6%	Henkel	NO

DESINFECTION

Name	Concentration	Producer	Resistance
FINKTEC FT-99 CIP	6%	Finktec GmbH	NO
Mikro Quat 1	100%	Ecolab	NO
Mikrobac forte	1%, 23°C	Bode Chemie	YES
Hydrogen peroxide	35%, 23°C		YES
Potassium Permanganate KMnO4	15 mg/l, 23°C		YES
Sodium Hypochlorite NaOCl	>6%, 23°C		YES
Calciumhypochlorit Ca(ClO)2	50 mg/l, 23°C		YES
Chorodioxide ClO2	6 mg/l, 23°C		YES

GASKETS

Name	Concentration	Producer	Resistance
HEMP COMPOUND		aquatechnik	YES
5366 silicomet AS-310	100%	Loctite	YES
Cimberio Loxeal 58-11 (ptfe thead sealing)	100%		NO
Dreibond 5331	100%	Dreibond	NO
EPDM. rubber O-Ring	100%	Join de France	YES
EverSeal Thread sealant	100%	Federal Process Corp.	NO

GASKET

Name	Concentration	Producer	Resistance
FACOT PTFE SEAL (Ptfe seal)	100%		NO
Griffon fitting-kit	100%	Verhagen-Herlitzius BV.	YES
Kolmat jointpaste (-30 to 135°C)	100%	Denso	YES
Locher Paste Spezial	100%	Locher & Co ag	YES
Loctite 5061	100%	Loctite	YES
Loctite 518 Gasket Eliminator	100%	Loctite	NO
Loctite 5331	100%	Loctite	YES
Loctite 542	100%	Loctite	NO
Loctite 55	100%	Loctite	YES
Loctite 577	100%	Loctite	NO
Loctite Dryseal	100%	Loctite	YES
Multipak	100%		YES
Neo-Fermit	100%	Nissen & Volk	YES
Neo-Fermit Universal 2000	100%	Nissen & Volk	YES
Plastic Fermit gasket	100%	Nissen & Volk GmbH	YES
Precote 4	100%	Omnifit	NO
Precote 80	100%	Omnifit	NO
RectorSeal # 5	100%	RectorSeal Corp.	NO
Red Silicone Sealant (-65 to 315°C)	100%	Loctite	YES
Rite-Lok	100%	Chemence	NO
Scotch-Grip Rubber & Gasket Adhesive # 1300	100%	3M	NO
Scotch-Grip Rubber & Gasket Adhesive # 2141	100%	3M	NO
Scotch-Grip Rubber & Gasket Adhesive # 847	100%	3M	NO
Selet Unyte	100%	Whitman	NO
Tangit metalock	100%	Henkel	NO
Tangit Unilock	100%	Henkel	NO
TWINEFLO (ptfe tape) + Processing aid	100%	Resitape / Ulith	YES
Unipack Packsalve	100%		YES
Viscotex Locher Paste 2000	100%		YES

GLUE AND FOAM

Name	Concentration	Producer	Resistance
ARMAFLEX 520 KLEBER ADHESIVE	100%		NO
BISON SILIKONENKIT SANITAIR	100%		YES
Bison-Tix contact glue	100%	Perfecta International	NO
CFS SILICONE SEALANT S-200	100%		YES
GENKEM CONTACT ADHESIVE	100%		NO

GLUE AND FOAM

Name	Concentration	Producer	Resistance
GOLD CIRCLE SILICONEKIT BOUW TRANSPARENT	100%		YES
Knauf sanitair silicone kit	100%		YES
Knauf silicone kit for acrylic bads	100%		YES
PEKAY GB480 (Vidoglue)	100%		NO
PEKAY GB685 (Insulglue)	100%		YES
PUR foam (contains diphenylmethane-4,4-diisocyanate)	100%	Wickes	NO
Repa R 200	100%		YES
RUBSON SILICONE SANITAIR TRANSPARENT KIT	100%	Rubson	YES
RUBSON SILICONE SANITAIR TRANSPARENT KIT SPECIAL	100%	Rubson	YES
Türmontageschaum 2-K Klima plus	100%		YES
Schacht-und Brunnenschaum Klima plus	100%		NO
O.K. - 1 K PUR	100%		NO
PURATEC - 1 K PUR	100%		NO
PURATEC - 2 K PUR	100%		NO
water resistant wood glue	100%		YES

GREASE

Name	Concentration	Producer	Resistance
GREASE		aquatechnik	YES
BAYSILONE ÖL M 1000	100%		YES
BECHEM BERUSOFT 30	100%	bechem	YES
Dansoll Silec Blue Silicone Spray	100%	dansoll	YES
Dansoll Super Silec Plumbing Mounting Paste	100%	dansoll	YES
Huile de chenevis	100%		YES
Kluber Proba 270	100%	Kluber	YES
KLÜBERSYNTH VR 69-252	100%	Kluber	YES
Kluber Unislikikone L641	100%	Kluber	YES
OKS 462 / 0956409	100%	Kluber	YES
OKS 477 HAHNFETT	100%	Kluber	YES
Laureat Zloty Installator	100%		YES
Luga Srpay (Leif Koch)	100%	Leif Koch	YES
Silicon Spray (Motip)	100%	Motip	YES
silicona lubricante SDP ref S-255	100%		YES
silicone oil M 10 - M 100000	100%		YES
silicone oil M 5	100%		YES
Turmisilon GL 320 1-2	100%		YES
Wacker silicon	50%	Wacker	NO

METAL IONS AND RELATED ITEMS

Name	Concentration	Producer	Resistance
Copper Ions (Cu^{2+})	50 ppm		YES

METAL IONS AND RELATED ITEMS

Name	Concentration	Producer	Resistance
YORKSHIRE FLUX	100%		NO
Degussa Degufit 3000	100%	Degussa	YES
Aluminum Ions (Al^{3+})	50 ppm		YES

PAINTS

Name	Concentration	Producer	Resistance
Paint PR 094G/01		aquatechnik	YES
Sigma Superprimer TI	100%	Sigma Coatings	YES
Sigma Amarol	100%	Sigma Coatings	YES
Decalux	100%	De Keyn Paint	YES
Permaline	100%	ITI-Trimetal	YES
Silvatane	100%	ITI-Trimetal	YES
DULUX waterbased high gloss	100%	ICI	NO
DULUX waterbased silk gloss satin	100%	ICI	NO
DULUX for wood micorporous silk gloss	100%	ICI	YES
DULUX floor paint, very resistant, silk gloss	100%	ICI	YES
DULUX metal paint, anti corrosion, high gloss	100%	ICI	YES
Hammerite White silk gloss	100%	ICI	YES
Hammerrite White high gloss based on xyleen	100%	ICI	NO
Hammerite silvergrey high gloss based on xyleen	100%	ICI	YES
Boss Satin	100%	BOSSPAINTS	YES
Hydrosatin Interior	100%	BOSSPAINTS	YES
Carat	100%	BOSSPAINTS	YES
Bolatex	100%	BOSSPAINTS	YES
Optiprim	100%	BOSSPAINTS	YES
Elastoprim	100%	BOSSPAINTS	YES
Plastiprop	100%	BOSSPAINTS	NO
Formule MC	100%	BOSSPAINTS	NO

WALL FILLERS

Name	Concentration	Producer	Resistance
bitumen based water protection coating (Isolier anstrich)	100%		YES
Cold working adhesive for bitumen paper (Kaltkleber)	100%		YES
Climacoll glue for pipe insulation foam	100%		NO
Compactuna	6%		YES
FT-extra	100%		YES

WALL FILLERS

Name	Concentration	Producer	Resistance
Giso Grund Primer	100%		NO
Mellerud Schimmel Vernichter	100%		YES
Nivoperl (insulating filler)	100%		YES
PE pipe insulation foam	100%		YES
Polyfilla interior wall filler	100%	Polyfilla	YES
Porion instant filler	100%	Henkel	YES
Porion Reparation mortar	100%	Henkel	NO
Portland Cement	100%	CBR	YES
Self-adhering insulation PE foam ('Wickelband)	100%		YES
Stucal plaster	100%	Gyproc	YES
Tile adhesive paste (Fliesenkleber)	100%		YES
UniversanGrundierung	100%		YES
Wood Concrete Multiplex Bruynzeel (fumes of..)	100%		YES
Wood Pinewood (fumes of..)	100%		YES
Wood MDF Medium Density Fibreboard (fumes of..)	100%		YES
Wood Multiplex water tight glued (fumes of..)	100%		YES

SPRAY

Name	Concentration	Producer	Resistance
Leak tester		aquatechnik	YES
LIQUI MOLY Leck-such-spray	100%, 23°C		YES
Multitek Gas Leakage spray	100%		NO
Sherlock gas leakage indicator	100%		YES

- All the products are tested at 95°C for 168 hours.
- For more information about the use of product which don't appear in the present list, please contact **aquatechnik** technical dept.

CERTIFICATE OF CONFORMITY

SAI Global hereby grants:

Aquatechnik Group SpA

via P.F. CALVI 40, Magnago (MI), Italy

Watermark Certificate of Conformity - Level 1

Evaluated to:

AS 4176.2-2010 - Multilayer pipes for pressure applications - Multilayer piping systems for hot and cold water plumbing applications - Pipes (ISO 21003-2:2008, MOD)
& AS 4176.3-2010 - Multilayer pipes for pressure applications - Multilayer piping systems for hot and cold water plumbing applications - Fittings (ISO 21003-3:2008, MOD)

"the WaterMark Licensee" the right to use or arrange the use of the WATERMARK as shown below only in respect of the goods described and detailed on the product schedule identified on www.saiglobal.com which are produced by the WaterMark Licensee or on behalf of the WaterMark Licensee* and which comply with the appropriate Standard referred to above as from time to time amended. The Licence is granted subject to the rules governing the use of the WATERMARK and the Terms and Conditions for certification. The WaterMark Licensee covenants to comply with all the Rules and Terms and Conditions

Certificate No:WMK26042

Issued: 16 August 2016
Expires: 24 September 2020

Originally Certified: 25 September 2015
Current Certification: 25 July 2016

Paul Simpson
Global Policy Risk and Certification Manager

WaterMark™

JAS-ANZ
WWW.JAS-ANZ.ORG/REGISTER

*** For details of manufacture, refer to the licensee**

The WATERMARK is a registered certification trademark of Australian Building Codes Board ABN 74 599 608 295 and is issued under licence by SAI Global Certification Services Pty Limited (ACN 108 716 669) ("SAI Global") 680 George Street, Sydney NSW 2000, GPO Box 5420 Sydney NSW 2001. This certificate remains the property of SAI Global and must be returned to SAI Global upon its request. Refer to www.saiglobal.com for the list of product models.

SAI GLOBAL
INFORM. INSPIRE. IMPROVE.

CERTIFICATO DI CONFORMITÀ
Certificate of conformity
DVGW-Baumusterprüfzertifikat
DVGW type examination certificate
Certificate
CSTB
SKZ
A 391
DVGW
BYGGFORSK
Produktsertifikat
kiwa
ATEST HIGIENICZNY
PAŃSTWOWY ZAKŁAD HIGIENY
NATIONAL INSTITUTE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
HYGIENIC CERTIFICATE

aquatechnik® s.p.a.
group
Capitale Sociale € 6.000.000 i.v. - R.E.A. Varese n. 319261
C.F / P.IVA / Cam. Com. Varese Reg. Imprese n. 03069000127
SEDE AMMINISTRATIVA - PRODUZIONE - MAGAZZINI
20020 Magnago (MI) - Via P.F. Calvi, 40
Tel. 0039 0331 307015 (R.A.) - Fax 0039 0331 306923
www.aquatechnik.it - E-mail: info@aquatechnik.it

AQUATECHNIK AUSTRALIA
1600 Canterbury Road
Punchbowl NSW 2196
Sydney
Australia

Aquatechnik warranty: *safety* system

This Warranty is provided by aquatechnik group s.p.a., as set out below.
Aquatechnik group s.p.a. warrants that the product supplied is free from manufacturing defects. Aquatechnik group s.p.a. agrees to replace or repair faulty product free of charge.
Warranty Period: 25 years from the date of delivery or sale, whichever is later.

Warranty conditions:
1. The defect must be shown to have occurred during manufacture and prior to delivery or sale (whichever is later).
2. Warranty does not extend to any failure or defect caused by normal wear and tear, mechanical overload, abrasion, corrosion, mishandling or incorrect installation or any other cause beyond the control of aquatechnik group s.p.a.
3. No liability will be accepted by aquatechnik group s.p.a. if:
(a) the design, use and installation is not in accordance with the appropriate Australian standards:
(i) AS/NZS 3500 Part 1 Plumbing and drainage water services,
(ii) AS/NZS 3500 Part 4 Plumbing and drainage heated water services,
(iii) AS/NZS 3500 Part 5 Plumbing and drainage domestic installations,
(iv) AS 4176.2-2010 Multilayer pipes for pressure applications- Multilayer piping systems for hot and cold water plumbing applications- Pipes (ISO 21003-2:2008, MOD)
(v) AS 4176.3-2010 Multilayer pipes for pressure applications- Multilayer piping systems for hot and cold water applications- Fittings (ISO 21003-3:2008, MOD)
(b) the product has been interfered with, or other action has been taken to remedy any defect, prior to aquatechnik group s.p.a. being notified of the alleged defect and aquatechnik group s.p.a. being given reasonable time to inspect the product. Interference with the product prior to inspection by aquatechnik group s.p.a. will void any claim under this Warranty;
(c) the product has been subjected to positive pressure greater than 2000kPa at a temperature of 20 degrees Celsius
(d) the product has been subjected to temperature greater than 95 degrees Celsius at any pressure,
(e) the product has been subjected to negative pressure at any temperature.
4. No liability will be accepted by aquatechnik group s.p.a. for property damage, loss of profits, loss of revenue, loss of use, loss of contracts, loss of production or any indirect or consequential loss or damage. The sole remedy for a breach of this warranty is repair or replacement of the faulty product and to the extent permitted by law, no other warranty express or implied shall apply.

Making a claim: A Warranty claim by a customer can be made by forwarding a letter containing details of the defect to the address referred to below within 30 days of the defect becoming known to the customer, together with proof of purchase documents evidencing the date and place of purchase and the date of delivery or sale.

aquatechnik® s.p.a.
group
Capitale Sociale € 6.000.000 i.v. - R.E.A. Varese n. 319261
C.F / P.IVA / Cam. Com. Varese Reg. Imprese n. 03069000127
SEDE AMMINISTRATIVA - PRODUZIONE - MAGAZZINI
20020 Magnago (MI) - Via P.F. Calvi, 40
Tel. 0039 0331 307015 (R.A.) - Fax 0039 0331 306923
www.aquatechnik.it - E-mail: info@aquatechnik.it

AQUATECHNIK AUSTRALIA
1600 Canterbury Road
Punchbowl NSW 2196
Sydney
Australia

Expenses: If the Warranty claim is accepted by aquatechnik group s.p.a., expenses associated with the claim shall be paid by aquatechnik group s.p.a.. If the customer has incurred such expenses (with the consent of aquatechnik group s.p.a.) it shall supply evidence of those expenses (and payment) to aquatechnik group s.p.a. who may accept such evidence and reimburse the customer. Expenses do not include claims for damages or loss, but only claims associated with investigation of the Warranty claim and repair or replacement of the product.

Additional consumer terms: If the product was purchased by a Consumer (as that term is defined under the Australian Consumer law) then, in addition to the above, the following provisions also apply to this Warranty:
(a) This Warranty is in addition to other rights and remedies of the Consumer under any law in relation to the goods or services to which the Warranty relates.
(b) Notwithstanding the above, the products come with guarantees that cannot be excluded under the Australian Consumer law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonable foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Magnago, 15.12.2016

In witness thereof
aquatechnik group s.p.a.
Marco Petenà

aquatechnik®

aquatechnik® australia

AQUATECHNIK AUSTRALIA
1600 Canterbury Road, Punchbowl NSW, 2196
Fax +61 (0)2 9793 9544

E-mail: admin@aquatechnik-australia.com.au

✆ 1800 AQUATECHNIK
(1800 278 283)

www.aquatechnik-australia.com.au

INTERNATIONAL HEAD OFFICE - PRODUCTION - WAREHOUSE
20020 Magnago (MI) - ITALY - Via P.F. Calvi, 40
E-mail: aquatechnikexp@aquatechnik.it

TRAINING CENTER IN BUSTO ARSIZIO:
21052 Busto Arsizio (VA) - ITALY - Via Bonsignora,53

www.aquatechnik.it