



# aquatherm blue pipe

## **Pipe system made of polypropylene**

For heating and cooling and various industrial applications



**aquatherm**

state of the pipe



## NEW SINCE THE LAST VERSION

Page	Change
22	Revision Fire Protection
60	Push-fit fitting
89	Planning & design of compressed air applications
102	Explanatory comments on the aquatherm GmbH warranty
from 122	Updated product list

The application pictures in this catalogue show the aquatherm blue pipe pipes as they were produced until March 2020. With the material change to fusiofen® PP-RCT, the pipes are now single-coloured blue.

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# SERVICE

## TECHNICAL HOTLINE

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#### Technical sales

Whether briefing on site, system briefing in your workshop or counter events and tool days at the specialized trade: In addition to the regular training in Attendorf, the aquatherm application engineers are every day and everywhere in Germany on the way.

A list of our partners worldwide can be found on our website [www.aquatherm.de](http://www.aquatherm.de) in the category „contact“.



#### Training

In addition to the proven lectures and counter events in the specialized trade and the training at the guild associations, aquatherm regularly offers specialist seminars and information events at the training center in Attendorf.

#### Trade shows

aquatherm is represented with its own booth at all important sanitary and HVAC trade shows in Germany and abroad. Information on trade fair dates in your area are available at [www.aquatherm.de](http://www.aquatherm.de) in the „service“ area.



## Certifications in accordance with ISO 9001, 14001 & 50001

Since 1996 aquatherm fulfills the requirements of the quality management system according to DIN ISO 9001. The 2012 TÜV certificate was extended by the environmental management system according to ISO 14001 and currently by the energy management system according to ISO 50001.

This success is another step towards strengthening our competitive position and to meet the high requirements and the responsibility for our customers, partners and the environment.



Management  
System  
ISO 9001:2015  
ISO 14001:2015  
ISO 50001:2011  
www.tuv.com  
ID 0091005348



### Laboratory

From testing of granulate properties to permanent process monitoring: Only perfect goods have the chance to leave aquatherm.



### Software service

The aquatherm software service provides Datanorm files, BIM-compatible files, an independent graphical configuration program (liNear) as well as the appropriate training on site.



### Brochures and more

No matter if brochures, catalogues or product lists: everything is developed by our in-house marketing department. All documents can be downloaded as PDF from our website [www.aquatherm.de](http://www.aquatherm.de). For printed copies just send an e-mail to [infoservice@aquatherm.de](mailto:infoservice@aquatherm.de).

# SERVICE

# PRODUCTS

aquatherm is the leading manufacturer of polypropylene pipe systems for plant engineering and building services. The numerous product lines provide superior solutions in potable water applications, heating systems, fire sprinkler systems, air-conditioning and refrigeration technology, as well as in surface heating and cooling systems. The product range comprises almost 17,000 articles in six product lines.

		Dimension [mm]																	
		16	17	20	25	32	40	50	63	75	90	110	125	160	200	250	315	355	400
aquatherm green pipe	SDR 6 S	●		●	●	●	●	●	●	●	●	●							
aquatherm green pipe	SDR 7.4 S	●		●	●	●	●	●	●										
aquatherm green pipe	SDR 7.4 MF			●	●	●	●	●	●	●	●	●	●	●	●	●			
aquatherm green pipe	SDR 7.4 MF UV			●	●	●	●	●	●	●	●	●	●	●	●	●			
aquatherm green pipe	SDR 9 MF RP					●	●	●	●	●	●	●	●	●	●	●	●	●	
aquatherm green pipe	SDR 9 MF RP UV					●	●	●	●	●	●	●	●	●	●	●	●	●	
aquatherm green pipe	SDR 9 MF RP TI					●	●	●	●	●	●	●	●	●	●	●	●	●	
aquatherm green pipe	SDR 11 S			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
aquatherm green pipe	SDR 11 MF																		●
aquatherm blue pipe	SDR 7.4 MF			●	●														
aquatherm blue pipe	SDR 7.4 MF UV			●	●														
aquatherm blue pipe	SDR 7.4 MF OT			●	●														
aquatherm blue pipe	SDR 9 MF RP					●													
aquatherm blue pipe	SDR 9 MF RP UV					●													
aquatherm blue pipe	SDR 9 MF RP OT					●													
aquatherm blue pipe	SDR 9 MF RP TI					●													
aquatherm blue pipe	SDR 9 MF RP OT TI					●													
aquatherm blue pipe	SDR 11 S			●	●														
aquatherm blue pipe	SDR 11 MF RP						●	●	●	●	●	●	●	●	●	●	●	●	●
aquatherm blue pipe	SDR 11 MF RP UV						●	●	●	●	●	●	●	●	●	●	●	●	●
aquatherm blue pipe	SDR 11 MF RP OT						●	●	●	●	●	●	●	●	●	●			
aquatherm blue pipe	SDR 11 MF RP TI						●	●	●	●	●	●	●	●	●	●	●	●	
aquatherm blue pipe	SDR 11 MF RP OT TI						●	●	●	●	●	●	●	●	●	●			
aquatherm blue pipe	SDR 17.6 MF RP												●	●	●	●	●	●	●
aquatherm blue pipe	SDR 17.6 MF RP UV												●	●	●	●	●	●	●
aquatherm blue pipe	SDR 17.6 MF RP TI												●	●	●	●	●	●	●
aquatherm red pipe	SDR 7.4 MF HI					●	●	●	●	●	●	●	●						
aquatherm black system	M OT																		
aquatherm orange system	M OT	●	●	●	●														
aquatherm grey pipe	M OT	●		●	●														

ABBREVIATIONS			
<b>S</b>	single-layer	<b>UV</b>	UV-resistant
<b>M</b>	multi-layer	<b>OT</b>	oxygen-tight
<b>MF</b>	multi-layer, fibre-reinforced	<b>TI</b>	thermally isolated
<b>RP</b>	raised pressure resistance	<b>HI</b>	hardly inflammable

			Application areas										
450	500	630	potable water	building services	swimming pool	chemical fluids	recycled & reclaimed water	fire protection	com-pressed air	district heating	geo-thermal	ship-building	refrigeration & air conditioning
			●	○	○	●	○		○	○	○	●	○
			●	○	○	●	○		○	○	○	●	○
			●	○	○	●	○		○	○	○	●	○
			●	○	○	●	○		○	○	○	●	○
			●	○	○	●	○		○	○	○	●	○
			●	○	○	●	○		○	○	○	●	○
			●	○	○	●	○		○	○	○	●	○
			●	○	○	●	○		○	○	○	●	○
●			●	○	○	●	○		○	○	○	●	○
				●	●	●	○		●	●	●	●	●
				●	●	●	○		●	●	●	●	●
				●	●	●	○		●	●	●	●	●
				●	●	●	○		●	●	●	●	●
				●	●	●	○		●	●	●	●	●
				●	●	●	○		●	●	●	●	●
				●	●	●	○		●	●	●	●	●
●				●	●	●	○		●	●	●	●	●
●				●	●	●	○		●	●	●	●	●
				●	●	●	○		●	●	●	●	●
				●	●	●	○		●	●	●	●	●
●	●	●		●	●	●	○		●	●	●	●	●
●	●	●		●	●	●	○		●	●	●	●	●
				●	●	●	○		●	●	●	●	●
								●					
				●									
				●									
			●	○	●	●	○		○	●	●	●	

System recommended due to its technical advantages: ●  
Application of the system is suitable: ○

## SHORT CUTS & SYMBOLS

Abbreviations pipe structure	
S	single-layer
M	multi-layer
MF	multi-layer, fibre-reinforced
RP	raised pressure resistance
UV	UV-resistant
OT	oxygen-tight
TI	thermally isolated

Abbreviations material	
PP	polypropylene
PP-R	polypropylene random copolymer
PP-RCT	polypropylen random copolymer with raised pressure resistance
PE-RT	polyethylene with raised temperature resistance

◆ = Only available on request.

## APPLICATION AREAS



potable water application



heating system construction



heating and cooling connection



underfloor heating



wall heating



ceiling heating and cooling



industrial floor cooling



industrial floor heating



chilled water technology



agriculture



sports floor heating and cooling



swimming pool technology



chemical transport



rainwater application



irrigation



fire protection sprinkler-systems



shipbuilding



district heating



geothermal



**Dear readers,**

We are always making decisions – in every minute of every hour of every day. At this moment, you have decided to open our catalogue to consciously find out more about our company aquatherm.

Without knowing the reason behind your decision, we can promise you one thing, namely that the insight into our colourful, yet always slightly green tinged, aquatherm world is sure to impress you!

As a family business which is passionate about all it does we, together with our employees, confidently meet all challenges and, in doing so, are able to trustfully call upon values which have defined our company for already more than four successful decades.

We know where we want to go without forgetting where we came from. Hereby we like to live with the role of not being a “normal” business. The characteristics “being different” and “special” represent our motivation in all that we do to be the best.

We are “state of the pipe” because we act independently and decisively and are hereby always reliable which makes us the leading manufacturer of polypropylene pipes.

We were, are and will remain as this – promise!

But see for yourself and decide upon aquatherm not only in the next few moments but also in the long term.

Best wishes

**Christof Rosenberg**  
Managing Director

**Dirk Rosenberg**  
Managing Director

**Maik Rosenberg**  
Managing Director

**Gerhard Rosenberg**  
President of the Advisory Board

- 1973 aquatherm founded by Gerhard Rosenberg
- 1981 development of the first pipe system made of polypropylene; the colour green becomes a characteristic feature of aquatherm
- 1991 subsidiary Radeberg was founded
- 1996 first certification of the quality management system in accordance with ISO 9001
- 1997 foundation of the sales company in Italy
- 1999 development of fusiotherm® fasar composite pipe
- 2001 aquatherm operates in more than 50 export markets
- 2002 market launch of the aquatherm blue pipe
- 2005 market launch of the aquatherm red pipe and aquatherm black system
- 2010 system expansion of the pipe size to max. ø630 mm
- 2010 Christof, Dirk and Maik Rosenberg assume company management
- 2012 first certification of the environment management system in accordance with ISO 14001
- 2012 market launch of the material fusiotherm® PP-RP
- 2013 first certification of the energy management system in accordance with ISO 50001
- 2015 foundation of the sales company in North America
- 2017 opening of the new pipe extrusion plant
- 2018 opening of the new injection moulding facility
- 2018 foundation of the sales company in England
- 2019 expansion of the industrial prefabrication operation

# aquatherm pipe systems



## AQUATHERM POLYPROPYLENE PIPE SYSTEMS

The history of the aquatherm pipe systems began in 1973 when Gerhard Rosenberg founded a company for warm water underfloor heating systems. Initially, the owner's garage and basement served as the company's headquarters and production facility. A lot has happened since then.

In the past more than 40 years, aquatherm has developed into the world's leading manufacturer of plastic pipe systems made of polypropylene for plant engineering and building services. The numerous product lines provide superior solutions in potable water applications, heating systems, fire sprinkler systems, air conditioning and refrigeration technology, as well as in surface heating and cooling systems. The product range comprises of almost 17,000 articles in six product lines.

Due to their special material properties, the aquatherm pipe systems convince by their diverse application possibilities.

The aquatherm pipe systems can be used in all areas of new installation, repair and renovation.

## AQUATHERM PIPE SYSTEMS

### Characteristics

aquatherm polypropylene pipe systems stop corrosion damages. All materials are corrosion-resistant and have reduced flow noise compared to metallic pipes. aquatherm pipes are opaque. There is therefore no risk of algae formation.

### Installation

aquatherm pipes and fittings are connected by heat fusion, which creates a homogeneous, cohesive unit with no leak paths. Heat fusion connections are stronger than the pipe itself, providing lasting safety at these critical points of a piping system. A properly executed aquatherm fusion creates a permanent leakproof connection.

An aquatherm pipe with an outside diameter of 20 mm can be heat fused in only 5 seconds.

aquatherm pipe connections can be hydraulic pressure tested or put into operation directly after their fusion. There are no waiting times.

### Quality

Quality is very important to aquatherm. This is not only reflected in the national and international certification marks, but also in the high satisfaction level of aquatherm customers, installers and engineers. For more details regarding quality and certificates see page 30.

### Warranty

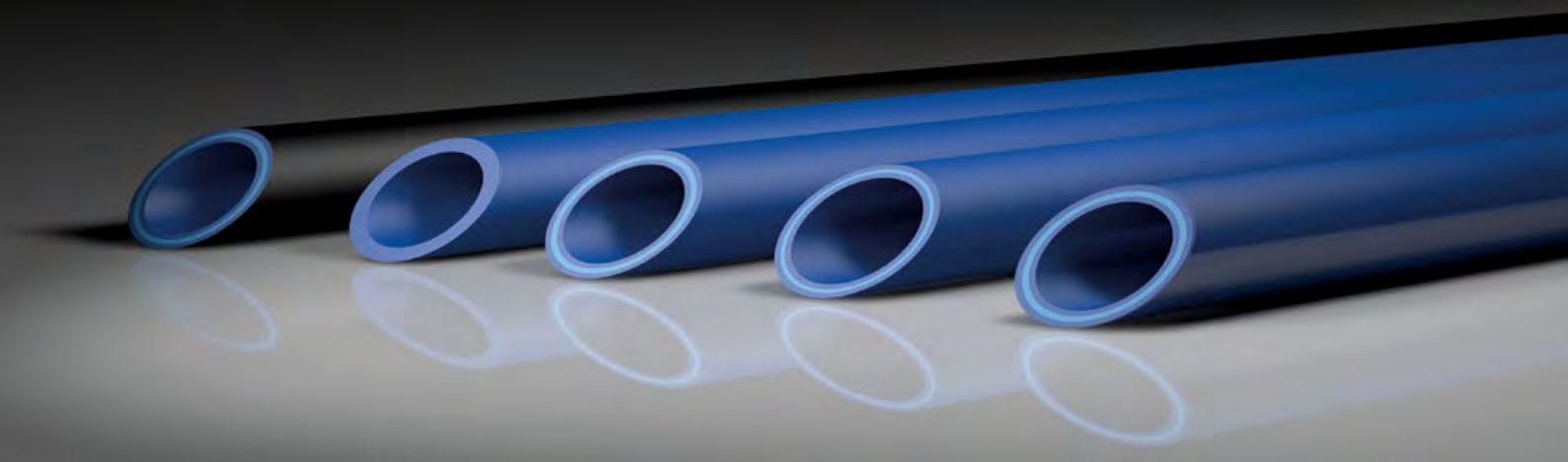
Due to the high product quality, aquatherm offers a 10-years warranty on all pipes and fittings instead of the 2 years applicable under German law. The extended warranty period is covered by a comprehensive insurance policy from a leading insurance company in our industry. For details, see the Warranty section of this catalogue.

### Price advantage

aquatherm offers you high quality, durable piping systems at an optimal price / performance ratio.



# aquatherm blue pipe



## aquatherm blue pipe

Made of corrosion-resistant polypropylene, aquatherm blue pipe is ideal for the transport of cooling and heating media in closed systems. It is particularly well suited for a wide variety of industrial applications. The physical properties of the plastic, such as its high temperature capacity and pressure resistance, are tailored to the specific needs of the heating and cooling sector. aquatherm blue pipe is joined via reliable heat fusion, which produces a virtually leak-free and cohesive unit with excellent safety and durability.

### APPLICATION AREAS

- Air conditioning
- Refrigeration
- Chemical transport
- Compressed air
- Building services
- Swimming pool technology
- Shipbuilding
- District heating
- Geothermal
- Irrigation

### SYSTEM COMPONENTS

In combination aquatherm the green pipe fittings, the system provides all components required for the piping installation of air conditioning, refrigeration, heating systems and industrial applications. The dimensions range from 20 mm to 630 mm outside diameter.

- Pipes in straight lengths and/or coils
- Fittings
- Flanged joints
- Water point connections and accessories
- Welding devices and machines
- Weld-in and weld-on saddles
- Manifolds
- Shut-off devices
- Cutting and peeling tools
- Installation guide and fastenings
- Transition joints from polypropylene to metal or from metal to polypropylene

### aquatherm blue pipe stopps corrosion damages!

Steel pipes used in air conditioning systems are particularly susceptible to corrosion on the outside of the pipe. Condensed water that forms between the insulation and the pipe attacks the pipe surface and causes it to corrode.

aquatherm blue pipe is made from 100% corrosion-resistant fusiolen® PP-RCT, which considerably extends the life of the air conditioning system.

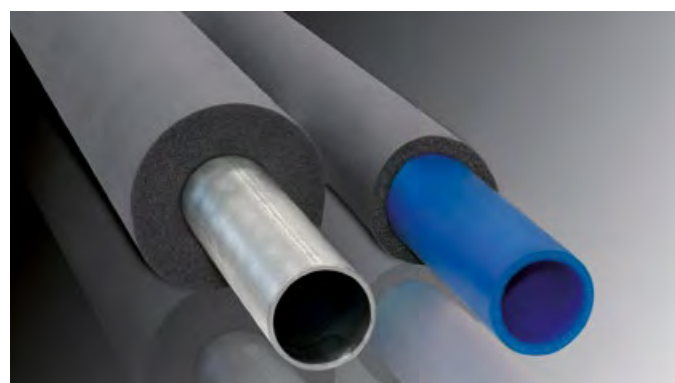


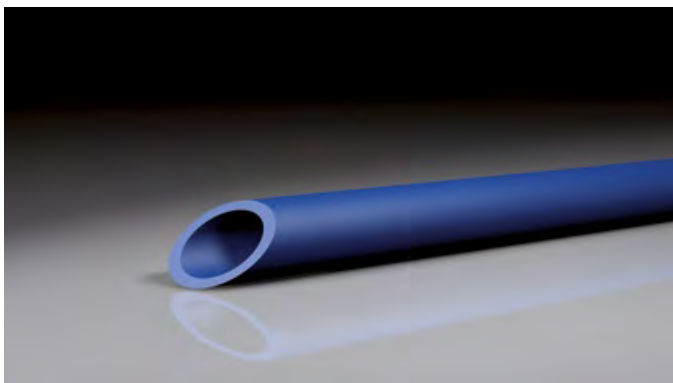
corroded steel pipes

### Insulation against energy loss

Due to their excellent thermal insulation properties aquatherm blue pipes compared to metal pipes require a considerably thinner insulation.

For detailed information see table on page 81.





**SDR:** 11      **ø:** 20–25 mm

**Type of pipe:** aquatherm blue pipe S



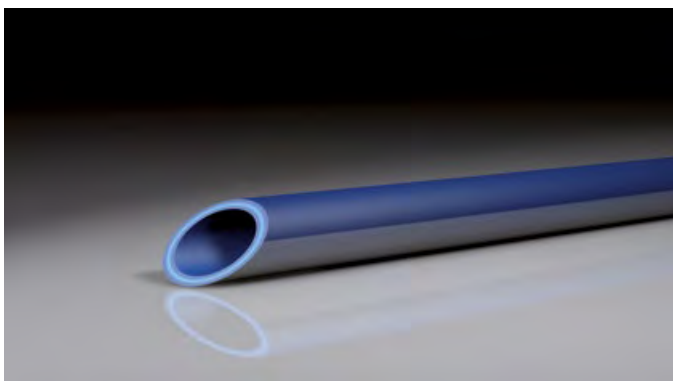
**SDR:** 7,4      **ø:** 20–25 mm

**SDR:** 9      **ø:** 32 mm

**SDR:** 11      **ø:** 40–450 mm

**SDR:** 17,6      **ø:** 125–630 mm

**Type of pipe:** aquatherm blue pipe MF (RP) UV



**SDR:** 7,4      **ø:** 20–25 mm

**SDR:** 9      **ø:** 32 mm

**SDR:** 11      **ø:** 40–250 mm

**Type of pipe:** aquatherm blue pipe MF (RP) OT



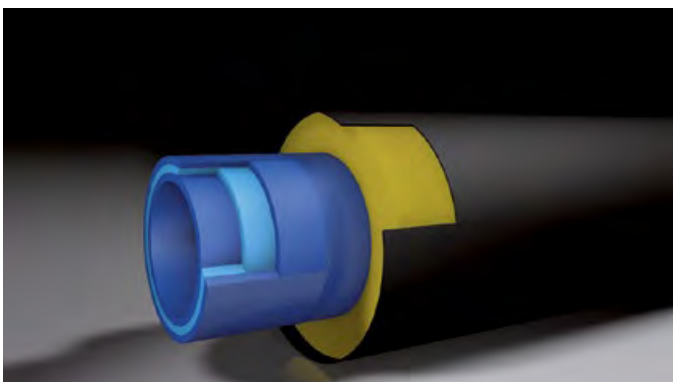
**SDR:** 7,4      **ø:** 20–25 mm

**SDR:** 9      **ø:** 32 mm

**SDR:** 11      **ø:** 32–450 mm

**SDR:** 17,6      **ø:** 125–630 mm

**Type of pipe:** aquatherm blue pipe MF (RP)



**SDR:** 9      **ø:** 32 mm

**SDR:** 11      **ø:** 40–355 mm

**SDR:** 17,6      **ø:** 125–315 mm

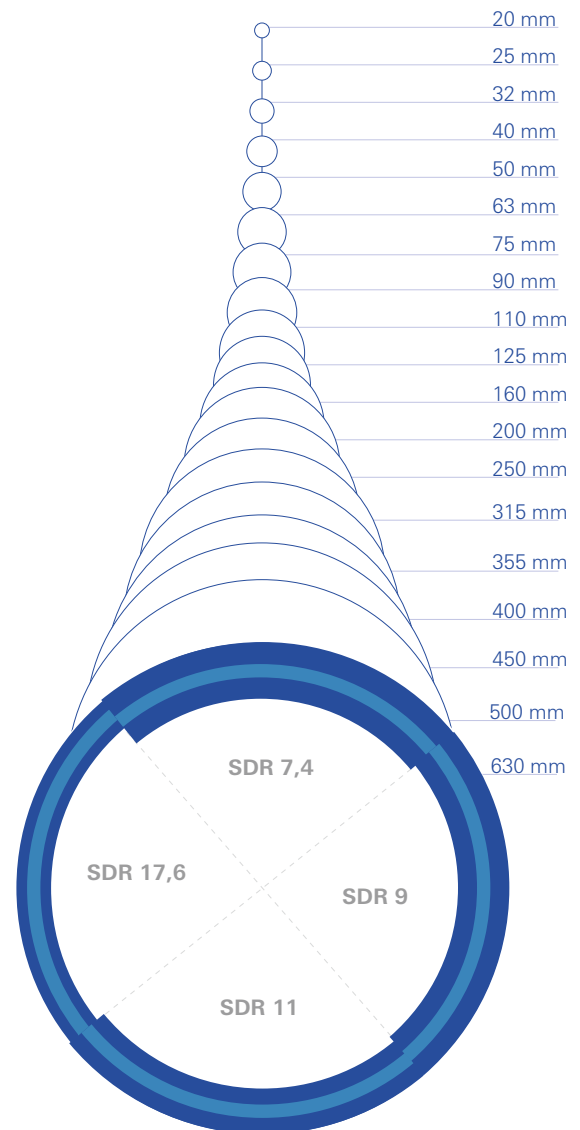
**Type of pipe:** aquatherm blue pipe MF RP TI

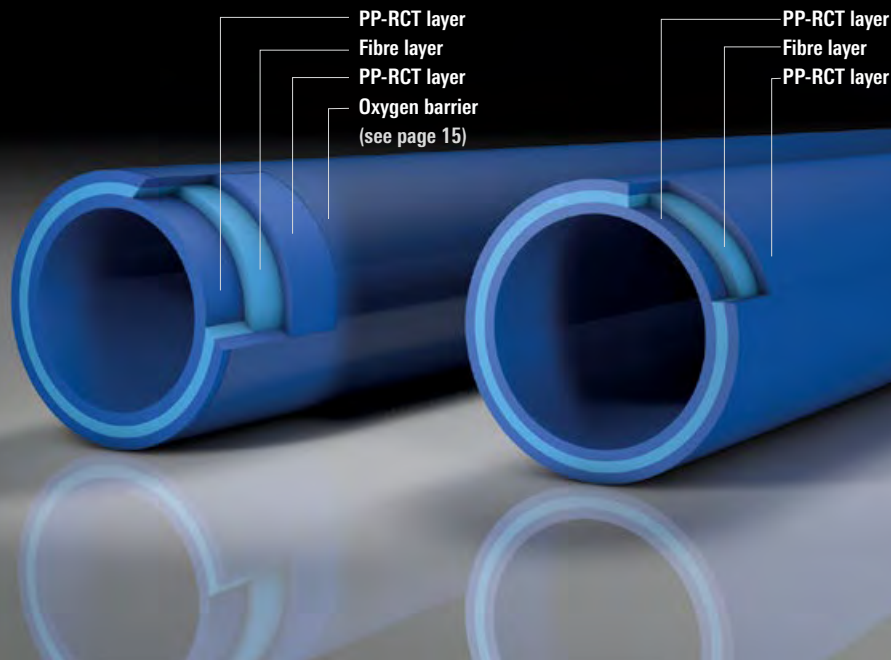


# aquatherm blue pipe

## COMPARISON OF THE WATER CONTENT PER METER [L]

ø Dimension mm	aquatherm blue pipe SDR 7,4 MF SDR 7,4 MF OT	aquatherm blue pipe SDR 11 MF RP SDR 11 MF RP OT SDR 11 S	aquatherm blue pipe SDR 17,6 MF RP
ø 20	0,163	0,206	-
ø 25	0,254	0,327	-
ø 32	0,423	0,539	-
ø 40	-	0,834	-
ø 50	-	1,307	-
ø 63	-	2,074	-
ø 75	-	2,959	-
ø 90	-	4,252	-
ø 110	-	6,359	-
ø 125	-	8,199	9,637
ø 160	-	13,430	15,792
ø 200	-	21,010	24,661
ø 250	-	32,861	38,568
ø 315	-	52,172	61,223
ø 355	-	66,325	77,832
ø 400	-	84,290	98,756
ø 450	-	106,477	125,036
ø 500	-	-	154,272
ø 630	-	-	245,070





## aquatherm blue pipe MF

### FIBRE COMPOSITE TECHNOLOGY

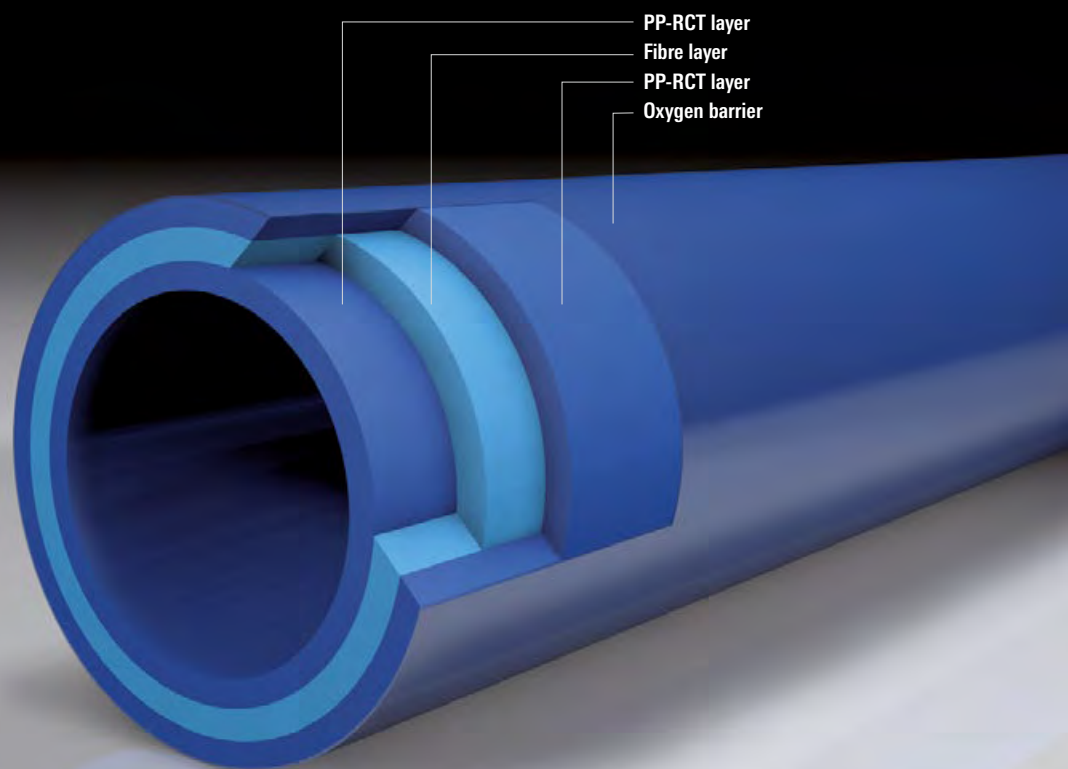
aquatherm blue pipe MF is a multi-layer fiber-composite pipe. The pipe is made in a multi-layer extrusion process. The manufacturing process developed by aquatherm enables the integration of glass fibres within the material polypropylene in the middle layer of the pipe. This reinforces the pipe and restricts expansion and contraction.

#### Advantages of aquatherm blue pipe MF:

- The linear expansion is reduced by at least 75 % compared with standard PP pipes
- The flow rate is increased by 20% at the same pressure conditions due to smaller wall thicknesses.
- High stability
- The coefficient of linear expansion is nearly identical to that of metal pipes, so that compared with common plastic pipes the support intervals can be extended and the number of clamps can be reduced.
- Optimum cost-performance ratio
- Lower weight
- High impact rate
- Simply cut and weld

A diagram for the easy and quick determination of the linear expansion and the expansion compensation can be found on page 72.

## aquatherm blue pipe ot SPECIAL TECHNICAL FEATURES



## aquatherm blue pipe ot

### WITH OXYGEN BARRIER

aquatherm blue pipe ot is an fibre reinforced, oxygen-tight pipe that is equipped with an oxygen barrier and thus meets the requirements of DIN 4726.

In combination with the green pipe fittings, the aquatherm blue pipe OT system provides all components required for the piping installation of air conditioning, refrigeration, heating systems and industrial applications.

#### Advantages of aquatherm blue pipe OT:

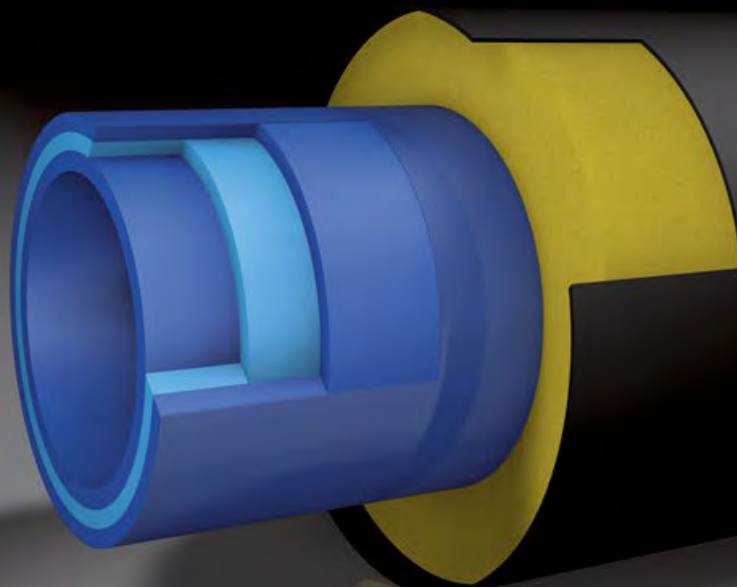
- Oxygen-tight by diffusion barrier
- Certified according to DIN 4726
- Absolutely corrosion resistant
- Less pipe friction
- High stability
- High heat-stability
- High environmental compatibility
- High impact rate
- Resistant against chemicals
- Heat- and sound insulating characteristics
- Very good welding properties
- Considerably thinner insulation

#### Easy and quick installation technology

aquatherm blue pipe OT also convinces by its easy but effective installation and connection technology. The pipe end and the connecting part are heated up. After joining, the two elements create a permanent bond. aquatherm blue pipe OT has to be peeled with peeling tools (art. no. 50506–50526) before processing.

## aquatherm blue pipe ti

### SPECIAL TECHNICAL FEATURES



## aquatherm blue pipe ti

### PRE-INSULATED PIPE SYSTEMS FOR DISTRICT HEATING AND COOLING

For the transport of district heating and cooling energy over long distances a complex, mostly underground pipe system is required. High demands are made on both the medium pipe and the pipe insulation.

With the factory-insulated aquatherm blue pipe ti fiber composite pipes, aquatherm offers the ideal district heating pipes for heating networks that are operated at operating pressures up to 20 bar and operating temperatures up to 90 °C.

The insulated aquatherm blue pipe fiber composite pipes are also used as cooling- and refrigerant agent pipes. The pipe insulation is factory-made with PUR rigid foam that surrounds the medium pipe all over. To protect the insulation layer outward against mechanical or weather-related influences, the outside coating consists of a PEHD-protection pipe.

Fittings such as elbows, bends or tees are insulated at the factory in the same design. The joints between pipe and fitting are manufactured locally at the site in the pipe dimension 32 up to 125 mm by socket welding and in the dimension 160 up to 355 mm by butt-welding process.

The insulation of these joints is done by insulation sockets that enable a continuous insulation of the district heating and cooling pipeline.

aquatherm blue pipe ti pipes are available in length of 5.8 m and 11.6 m. We offer fittings with leg lengths of 0.5 m and 1.0.

The pipe system is optionally also available with trace heating and mains monitoring. Special designs on request.

#### Medium pipes

##### aquatherm blue pipe ti

faser composite pipe system SDR 9 in dimension 32 mm  
faser composite pipe system SDR 11 in dimensions 40 – 355 mm and faser composite pipe system SDR 17.6 in dimensions 125 – 355 mm  
for heating, cooling and waste water

##### aquatherm blue pipe ot ti

oxygen-tight pipe system for heating- and industrial water  
faser composite pipe system SDR 9 in dimension 32 mm  
faser composite pipe system SDR 11 in dimensions 40 – 250 mm

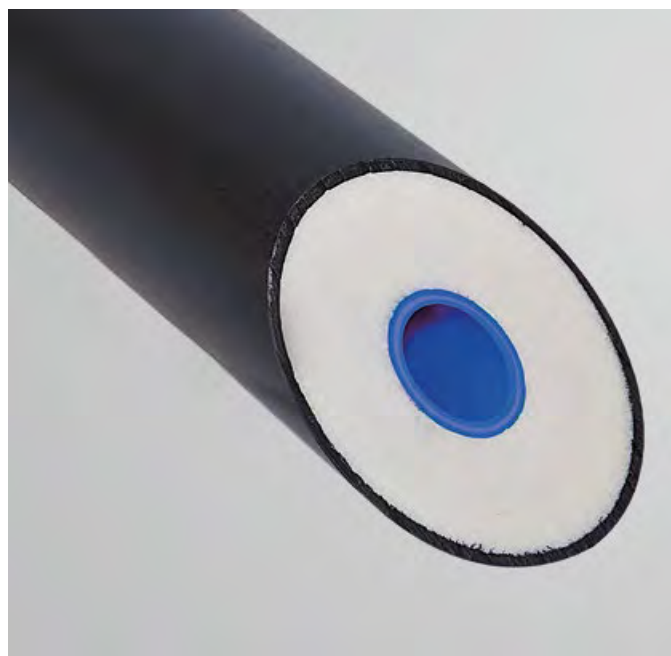
aquatherm ti Application areas	aquatherm blue pipe ti	aquatherm blue pipe ot ti
Heating system construction	●	●
Air conditioning	●	●
Refrigeration	●	●
Swimming pool	●	
Rainwater application	●	
Irrigation	●	
Compressed air systems	●	
Geothermal	●	○
Chemical fluids considering the material resistance	●	●

- System recommended due to its technical advantages
- Application of the system is suitable

## aquatherm ti SYSTEM PROPERTIES

### aquatherm blue pipe (ot) ti

Low expansion	●
Resistance to corrosion	●
Very good welding properties	●
Less pipe friction	●
High impact resistance	●
Heat-stability	●
Metal deactivation	●
Recyclable	○
Sound- and heat insulation	●
Low weight	●
Self-compensating	●



## DIMENSIONS

medium pipe	aquatherm blue pipe ti fibre composite pipe SDR 9 (32 mm)/SDR 11	aquatherm blue pipe ot ti fibre composite pipe SDR 9 (32 mm) / SDR 11 (40-250 mm)	aquatherm blue pipe ti fibre composite pipe SDR 17,6	casing pipe
external diameter	dimension	dimension	dimension	external diameter
32 mm	DN 25	DN 25	-	90 mm
40 mm	DN 32	DN 32	-	110 mm
50 mm	DN 40	DN 40	-	110 mm
63 mm	DN 50	DN 50	-	125 mm
75 mm	DN 65	DN 65	-	140 mm
90 mm	DN 80	DN 80	-	160 mm
110 mm	DN 80/100	DN 80/100	-	200 mm
125 mm	DN 100	DN 100	DN 100	225 mm
160 mm	DN 125	DN 125	DN 150	250 mm
200 mm	DN 150	DN 150	DN 200	315 mm
250 mm	DN 200	DN 200	DN 250	400 mm
315 mm	DN 250	-	DN 300	450 mm

\* larger dimensions on request

## aquatherm ti INSULATION

### Material

The aquatherm ti pipe systems are insulated with PUR-rigid foam. This polyurethane foam is made of Polyol and Isocyanate and meets the functional requirements of the EN 253. The foam is homogene with an average cell size of max. 0,5 mm.

For the professional insulation of the pipe and fitting connections, insulation jackets made of PUR-rigid foam are available for the aquatherm ti pipe system, coated with shrink sockets resulting in a permanent connection with the casing pipes.

### Material parameters

Technical data	PUR
Cell gas Cyclopentane	> 8 %
Core density	> 60 kg/m <sup>3</sup>
Closed cell	> 88 %
Water absorption	< 10 % (Vol)
Compression strength 10 % deformation	> 0.3 N/mm <sup>2</sup>
Shearing resistance	> 0.12 N/mm <sup>2</sup>
Tangent shearing resistance	> 0.20 N/mm <sup>2</sup>
Thermal conductivity at 50 °C	< 0.03 W/mK

## aquatherm ti LOSS OF HEAT AND COOLING ENGERGY

Type of pipe	Heat loss at average temperature 40 °C in W/m	Heat loss at average temperature 50 °C in W/m	Heat loss at average temperature 65 °C in W/m
<b>aquatherm blue pipe ot SDR 9 MF RP OT TI</b>			
32 mm	6.86	8.57	11.14
<b>aquatherm blue pipe SDR 11 MF RP TI &amp; MF RP OT TI</b>			
40 mm	6.92	8.65	11.24
50 mm	8.87	11.08	14.41
63 mm	10.10	12.62	16.41
75 mm	10.99	13.74	17.86
90 mm	11.80	14.75	19.17
110 mm	11.27	14.08	13.81
125 mm	11.43	14.29	18.57
160 mm	14.83	18.54	24.10
200 mm	14.60	15.25	23.73
250 mm	14.15	17.69	23.00
315 mm	18.30	22.88	29.74
355 mm	19.34	24.18	31.43

Type of pipe	Cooling engergy loss at F: -12 °C R: -6 °C AT: 26 °C in W/m	Cooling engergy loss at F: 6 °C R: 12 °C AT: 26 °C in W/m	Cooling engergy loss at F: 15 °C R: 18 °C AT: 26 °C in W/m
<b>aquatherm blue pipe SDR 9 MF RP OT TI</b>			
32 mm	5.88	2.86	1.60
<b>aquatherm blue pipe SDR 11 MF RP TI &amp; MF RP OT TI</b>			
40 mm	5.94	2.89	1.61
50 mm	7.65	3.72	2.08
63 mm	8.75	4.25	2.37
75 mm	9.54	4.64	2.59
90 mm	10.26	4.98	2.79
110 mm	9.80	4.76	2.66
125 mm	9.94	4.83	2.70
160 mm	13.03	6.33	3.54
200 mm	12.81	6.22	3.48
250 mm	12.40	6.02	3.37
315 mm	16.23	7.88	4.41
355 mm	16.92	8.22	4.59
<b>aquatherm blue pipe SDR 17,6 MF RP TI</b>			
125 mm	9.94	4.83	2.70
160 mm	13.46	6.54	3.65
200 mm	13.22	6.42	3.59
250 mm	12.79	6.21	3.47
315 mm	16.89	8.21	4.59
355 mm	17.65	8.57	4.79

F = flow, R = return, AT = ambient temperature

## aquatherm ti CASING PIPES MATERIAL

The casing pipes of the aquatherm ti pipe system are made of the material PE according to DIN EN 8075. Like insulated steel pipes correspond to the EN 253, aquatherm applies casing pipes, which correspond to the technical requirements of this standard.

The material is characterized by the following mechanical and thermal features.

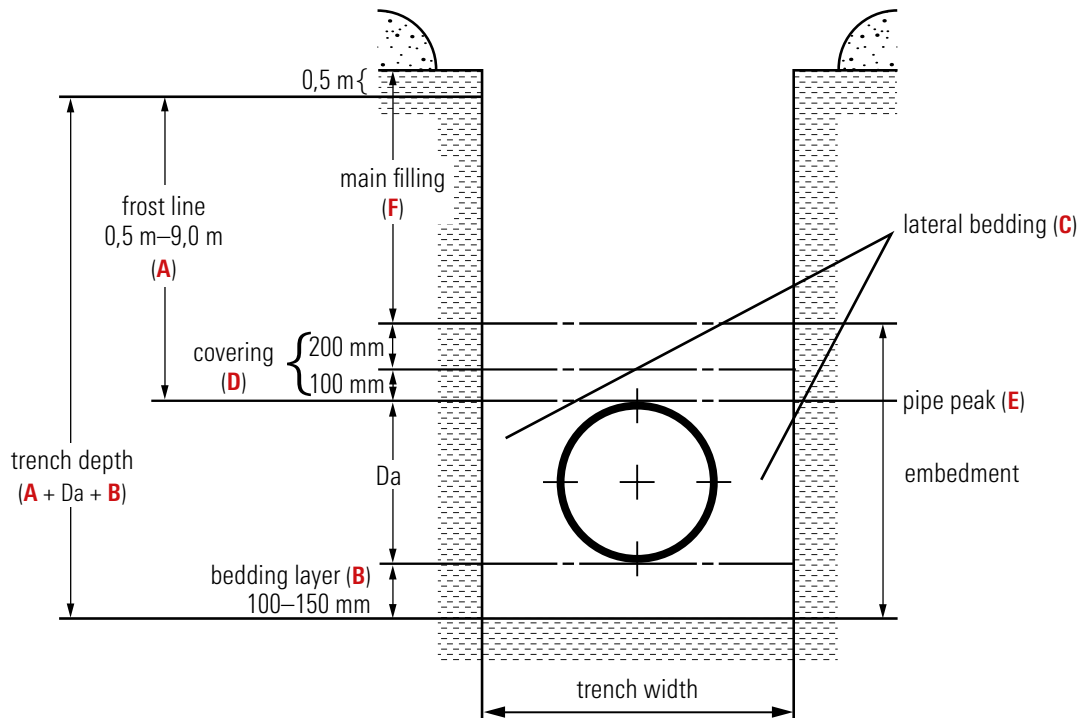
## Material parameters

Technical data	PE 80
Density, g/cm <sup>3</sup> , ISO 1183	0.950
Yield stress, MPa, DIN EN ISO 527	22
Elongation at yield stress, %, DIN EN ISO 527	9
Elongation at break, %, DIN EN ISO 527	300
Tension-E-module, MPa, DIN EN ISO 527	800
Impact strength, kJ/m <sup>2</sup> , DIN EN ISO 179	without break
Impact strength, kJ/m <sup>2</sup> , DIN EN ISO 179	12
Ball impression hardness, MPa, DIN EN ISO 2039-1	40
Shore hardness, D, ISO 868	63
Medium thermal expansion coeff., K-1, DIN 53752	1.8 · 10 <sup>-4</sup>
Thermal conductivity, W/m · K, DIN 52612	0.38
Electric strength, kV/mm, VDE 0303-21	47
Surface resistance, Ohm, DIN IEC 167	10 <sup>14</sup>
Inflammability, DIN 4102	B2
Physiological harmlessness acc. to BgVV	yes
Chemical resistance acc. to DIN 8075 supplement	complied with
Thermal operating conditions	°C -40 to +80

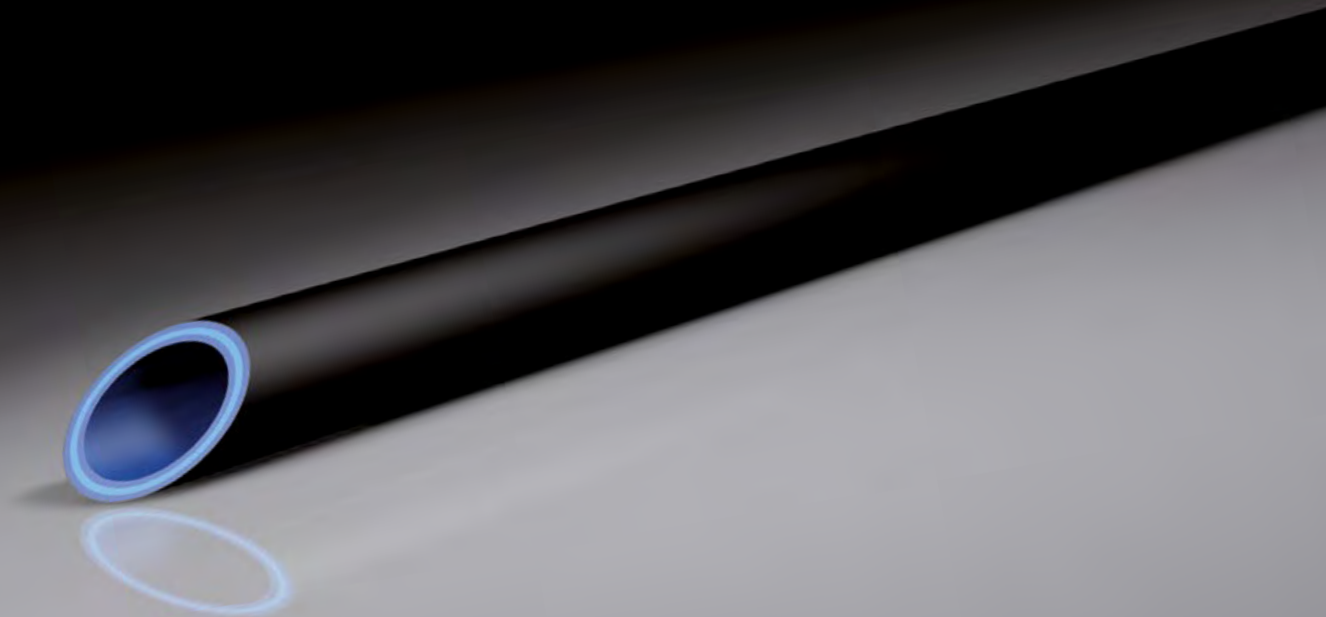
## RING STIFFNESS OF aquatherm blue pipe

All aquatherm polypropylene pipes have a ring stiffness of  $\geq 16 \text{ kN/m}^2$  (according to DIN EN ISO 9969) and therefore can be classified in the ring stiffness class SN16.

- Underground installation:** The depth of the trench adds up from the depth of the frost line, the outer diameter of the pipe and the height of the bedding ( $A+D_a+B$ ). The frost line must be observed: 0.5–9.0 m above the pipe peak (E). If the pipes are installed outside the specified laying depth, a load distribution by steel or concrete slabs must be installed.
- Traffic load:** SLW 60, heavy forklift (60 tons maximum load).
- Trench design:** Recommended calculation according to ATV A 127 (basis for calculation).
- Laying conditions:** We recommend laying the pipes in a narrow trench in which nevertheless sufficient space for working is available.
- Bedding layer (B):** In normal soil 100 mm sand with round graining size 0–8 mm.  
When rock or rocky soils 150 mm sand with round graining size 0–8 mm.  
This layer is equally compressed ( $\geq 97\%$  Proctor) with gaps in the socket area. Non sustainable soils are made stable by the choice of the bedding layer. Note planning requirements.
- Backfilling:** The building material 4/8 mm graining is filled in layers in order to construct the lateral bedding (C) and the covering (D). Thereby the peak of the pipe (E) is covered with minimum 100 mm. Then the main filling (F) with the excavation can be carried out. Note that the grain size does not exceed 300 mm respectively sharp and rough stones are removed. Planning requirements of the filling levels are always to be considered.  
Each filling is compressed separately.
- Compaction:** The compression ( $\geq 97\%$  Proctor) of the lateral bedding (C) and the covering (D) is done by hand or with light equipment. If the main filling is made with minimum 20 cm, the trench can be compressed 95 % Proctor upwards from this layer with heavy equipment. The last 50 cm of the trench are compressed with 97–100 % Proctor.







### UV-RESISTANCE

Pipes made from fusiolen® polypropylene are normally not exposed to UV-radiation during installation.

To bridge the transport and assembly time, aquatherm polypropylene pipes and fittings are packed in UV-protected packaging. The maximum permissible storage time outdoors is 6 months.

For outdoor pipe laying, aquatherm offers polypropylene composite pipes with a UV protective layer made of polyethylene. The special protection layer prevents damages from sunlight. The pipes are available under the name aquatherm blue pipe MF RP UV.

### UV ADHESIVE TAPE

As an alternative to our polypropylene pipes with UV protection layer, wrapping with UV-resistant adhesive tape is possible, if moulded parts or short pipe sections are to be protected.

For this purpose, the adhesive tape recommended by aquatherm (art. no. 10871) should be selected, which shows good resistance to abrasion, moisture, oils, light acids and alkalis as well as weather influences outdoors.

The tape should always be applied to a dry, clean and grease-free surface. The winding should be done with a slight pull and at least 50% overlap.

Further information on page 119.

### INTEGRATION OF OTHER SYSTEMS OR COMPONENTS WITH AQUATHERM PIPING FOR PRESSURE PIPE APPLICATIONS

When integrating aquatherm piping systems with other systems or components not made of polypropylene (e.g. valves, pumps, other piping, check valves, strainers, etc), care must be taken to ensure the operating parameters for polypropylene won't damage the other materials or vice versa.

Be aware that even if the aquatherm pipe is compatible with the fluid being transported, other materials in the system may not be. All parts of the system must be verified as compatible with the medium being carried before installing them. And, while aquatherm pipe does not require treatment to protect it from corrosion, metals (ferrous and non-ferrous) in the system may be susceptible to corrosion.

Do not mix aquatherm pipe with other piping systems in conditions that will cause the other system or components to fail.



## PERMISSIBLE WORKING PRESSURE

for general pressure pipe applications in permanent operation

Temperature	Years of service	aquatherm blue pipe SDR 17,6 MF RP		aquatherm blue pipe SDR 11 MF RP		aquatherm blue pipe SDR 11 S		aquatherm blue pipe SDR 9 MF RP	
		Permissible working pressure in bar and (psi)							
		bar	(psi)	bar	(psi)	bar	(psi)	bar	(psi)
10 °C 50 °F	10	13,1	(190,0)	25,3	(366,9)	19,3	(279,9)	27,5	(399)
	25	12,9	(187,1)	24,7	(358,2)	18,7	(271,2)	27,1	(393)
	50	12,7	(184,2)	24,1	(349,5)	18,2	(264,0)	26,7	(387)
	100	12,6	(182,7)	23,5	(340,8)	17,8	(258,2)	26,3	(381)
15 °C 59 °F	10	12,3	(178,4)	23,4	(338,7)	17,8	(258,2)	25,7	(373)
	25	12,1	(175,5)	22,8	(330,7)	17,2	(249,5)	25,2	(366)
	50	11,9	(172,6)	22,2	(322,0)	16,8	(243,7)	24,9	(361)
	100	11,7	(169,7)	21,6	(313,3)	16,3	(236,4)	24,5	(355)
20 °C 68 °F	10	11,4	(165,3)	21,4	(310,4)	16,4	(237,9)	23,9	(347)
	25	11,2	(162,4)	21,0	(304,6)	15,9	(230,6)	23,5	(341)
	50	11,0	(159,5)	20,4	(295,9)	15,4	(223,4)	23,1	(335)
	100	10,9	(158,1)	19,9	(288,6)	15,0	(217,6)	22,8	(331)
30 °C 86 °F	10	9,8	(142,1)	18,3	(265,4)	13,9	(201,6)	20,6	(299)
	25	9,6	(139,2)	17,8	(258,2)	13,4	(194,4)	20,2	(293)
	50	9,5	(137,8)	17,3	(250,9)	13,0	(188,5)	19,9	(289)
	100	9,4	(136,3)	16,8	(243,7)	12,7	(184,2)	19,7	(286)
40 °C 104 °F	10	8,4	(121,8)	15,5	(224,8)	11,8	(171,1)	17,7	(257)
	25	8,3	(120,4)	15,0	(217,6)	11,3	(163,9)	17,3	(251)
	50	8,1	(117,5)	14,6	(211,8)	11,0	(159,5)	17,1	(248)
	100	8,0	(116,0)	14,1	(204,5)	10,7	(155,2)	16,8	(244)
50 °C 122 °F	10	7,2	(104,4)	13,0	(188,5)	9,9	(143,6)	15,1	(219)
	25	7,0	(101,5)	12,6	(182,7)	9,5	(137,8)	14,7	(213)
	50	6,9	(100,1)	12,2	(176,9)	9,2	(133,4)	14,5	(210)
	100	6,8	(98,6)	11,9	(172,6)	9,0	(130,5)	14,3	(207)
60 °C 140 °F	10	6,1	(88,5)	10,9	(158,1)	8,3	(120,4)	12,7	(184)
	25	5,9	(85,6)	10,6	(153,7)	8,0	(116,0)	12,4	(180)
	50	5,8	(84,1)	10,3	(149,4)	7,7	(111,7)	12,2	(177)
70 °C 158 °F	10	5,1	(74,0)	8,5	(123,3)	7,0	(101,5)	10,7	(155)
	25	5,0	(72,5)	8,3	(120,4)	6,0	(87,0)	10,4	(151)
	50	4,9	(71,1)	8,1	(117,5)	5,1	(74,0)	10,2	(148)
75 °C 167 °F	10	4,6	(66,7)	7,7	(111,7)	6,0	(87,0)	9,7	(141)
	25	4,5	(65,3)	7,6	(110,2)	4,8	(69,6)	9,5	(138)
	50	4,4	(63,8)	7,3	(105,9)	4,0	(58,0)	9,3	(135)
80 °C 176 °F	5	4,3	(62,4)	7,2	(104,4)	5,7	(82,7)	9,0	(131)
	10	4,2	(60,9)	7,0	(101,5)	4,8	(69,6)	8,9	(129)
	25	4,1	(59,5)	6,8	(98,6)	3,9	(56,6)	8,6	(125)
90 °C 194 °F	5	3,5	(50,8)	5,9	(85,6)	3,7	(53,7)	7,4	(107)
	10	3,4	(49,3)	5,8	(84,1)	3,2	(46,4)	7,3	(106)

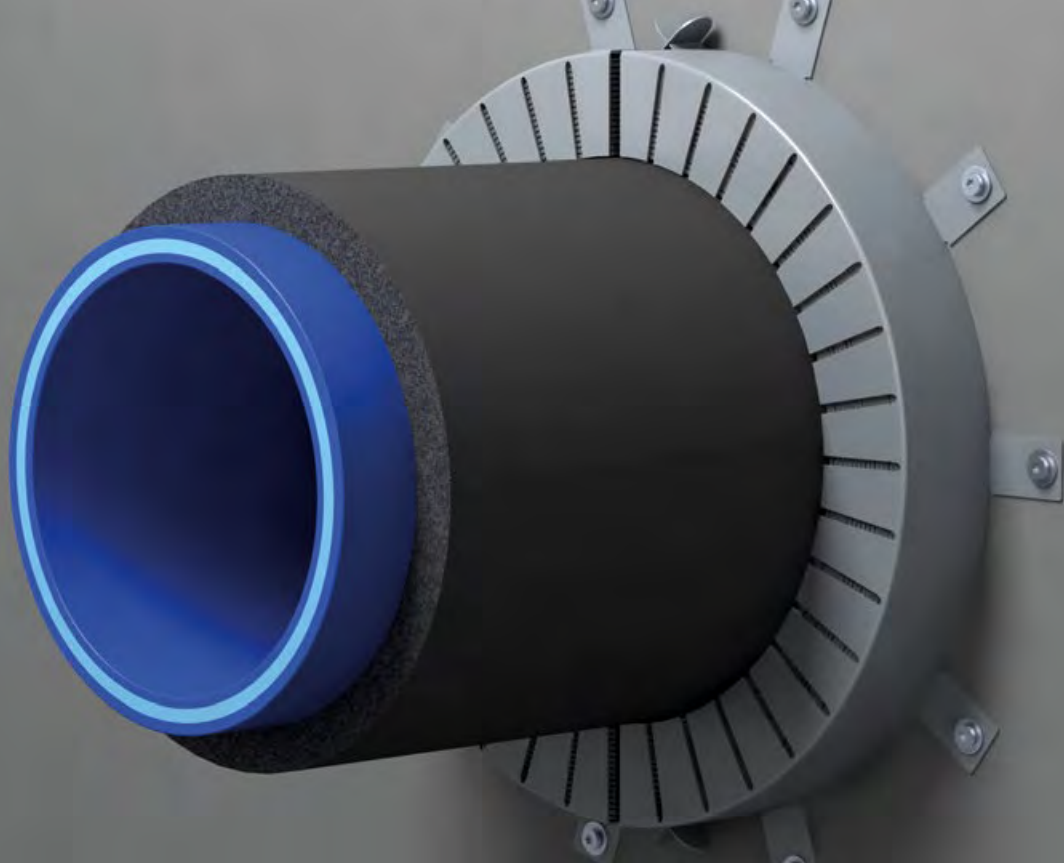
**SDR** = Standard Dimension Ratio (diameter/wall thickness ratio)

**S** = single-layer

**MF** = multi-layer faser

**MF RP** = multi-layer faser – raised pressure resistance

For fittings of butt-welded pipe segments a reduction factor of 0.75 (reduction of the table values by 25 %) is effective.



## FIRE PROTECTION

The aquatherm polypropylene pipe systems comply with the requirements of the fire classification B2 DIN 4102 (normal inflammable). Compared to natural products like wood, cork or wool, aquatherm PP-R pipes do not produce any gas toxicity. In case of fire, there is no risk of dioxin emissions.

To avoid fire and smoke transmission aquatherm advises the use of fire retardant seals. The fire resistance period is the minimum period in minutes.

The extent of the preventive measures depends on the type of installation. The determination of fire areas and fire classification has to be made in accordance with the law of the country. Information is given by the Planning Department and Building Control Office or the Fire Protection Representative.

Basically, fire walls and ceilings with pipe passages have to be installed to the same fire resistance classification. All fire protection systems with a corresponding classification are suitable for aquatherm polypropylene pipes.

**The following companies offer suitable fire protection solutions:**

### **Fire protection pipe shell Conlit 150 U:**

#### **DEUTSCHE ROCKWOOL GmbH & Co. KG**

Rockwool Straße 37-41  
45966 Gladbeck, Germany  
Phone: +49 2043 408 0 · Fax: +49 2043 408 444  
[www.rockwool.de](http://www.rockwool.de)

### **Fire protection sleeve AWM II:**

#### **b.i.o. BRANDSCHUTZ GmbH**

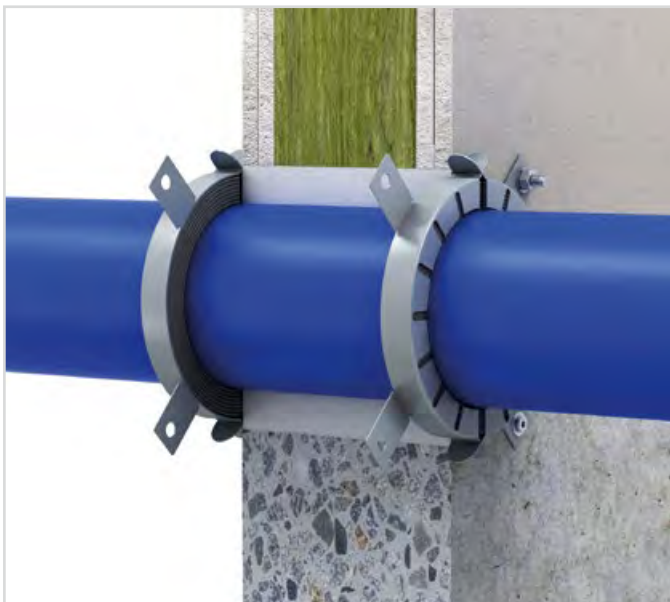
Oberwaldstraße 3a  
64859 Eppertshausen, Germany  
Phone: +49 6071 390070  
[ZT-support@bio-brandschutz.de](mailto:ZT-support@bio-brandschutz.de)  
[www.bio-brandschutz.de](http://www.bio-brandschutz.de)

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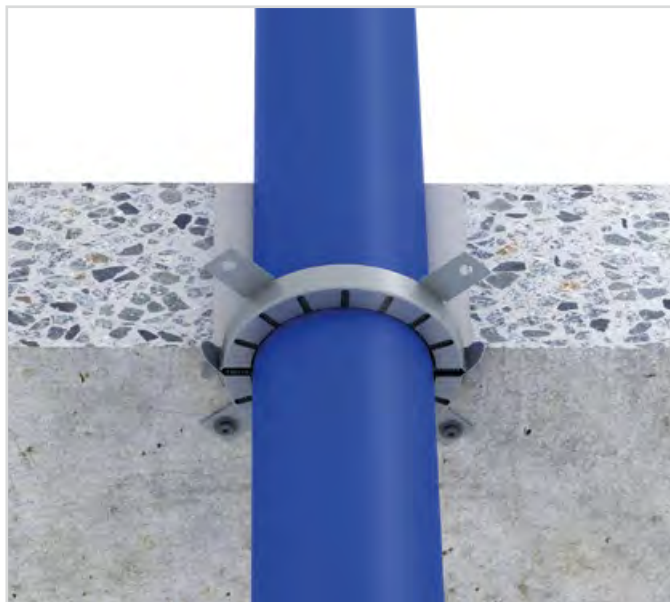
#### **Hilti Deutschland AG**

Hiltistrasse 2  
86916 Kaufering, Germany  
Phone: +49 800 888 55 22  
[www.hilti.de](http://www.hilti.de)

Roku System AWM II in the wall



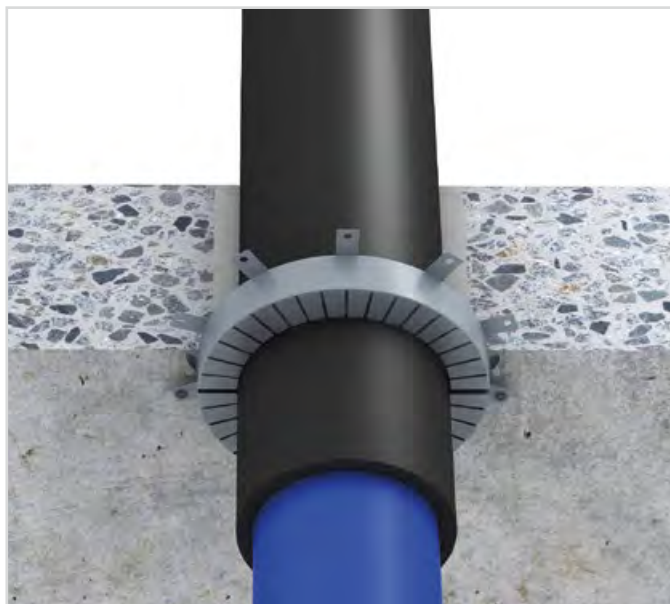
Roku System AWM II in the ceiling



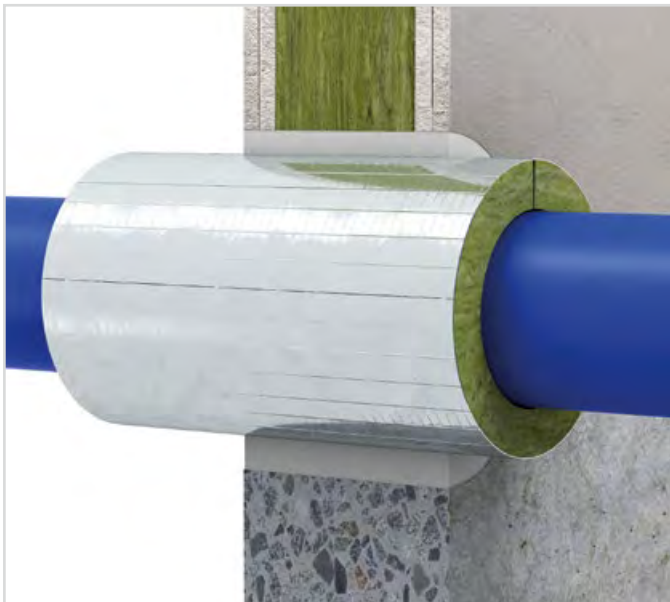
Roku System AWM II with synthesis rubber in the wall



Roku System AWM II with synthesis rubber in the ceiling



Rockwool Conlit 150 U in the wall



Rockwool Conlit 150 U in the ceiling



## EXCERPT FROM THE ROCKWOOL PLANNING AND INSTALLATION AID

R 30- to R 90 pipe penetrations for the aquatherm installation systems with non-combustible media, such as drinking water, heating, cooling

## Product name / Material

## aquatherm green pipe

## PP-R

SDR 6 S,  
SDR 7.4 S,  
SDR 7.4 MF,  
SDR 7.4 MF UV,  
SDR 11 S

## aquatherm green pipe

## PP-RCT

SDR 9 MF RP,  
SDR 9 MF RP UV

## aquatherm blue pipe

## PP-R

SDR 7.4 MF,  
SDR 7.4 MF OT,  
SDR 7.4 MF UV  
SDR 11 S

## aquatherm blue pipe

## PP-RCT

SDR 9 MF RP,  
SDR 9 MF RP OT,  
SDR 9 MF RP UV,  
SDR 11 MF RP,  
SDR 11 MF RP OT,  
SDR 11 MF RP UV

## aquatherm red pipe

## PP-R (B1)

SDR 7.4, MF HI

## aquatherm grey pipe

## PE-Xc/Al/PE-X

SDR 7.4

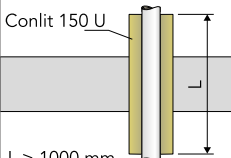
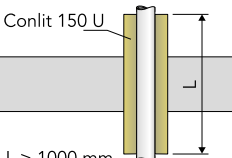

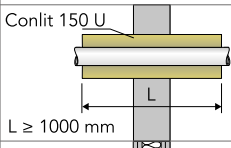
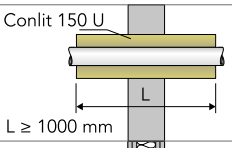
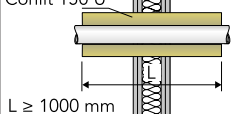
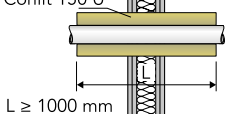
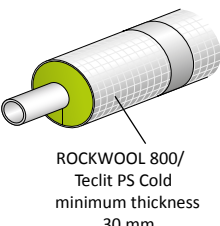
## aquatherm black system

## PP-grid connection pipe

## aquatherm orange

## system

## PE-RT

Components F 30 to F 90	F 30	F 60 F 90	
Solid ceiling Thickness minimum 150 mm			
Solid wall Thickness minimum 100 mm			
Light partition Thickness minimum 100 mm			

Variant according to Variant according to ROCKWOOL abP P3726/4140MPA BS.

System	Pipe dimension	Conclit 150 U			ROCKWOOL 800 <sup>1), 2), 3)</sup> TECLIT PS Cold <sup>1), 2), 3)</sup>		
	Outer diameter Da [mm]	Type <sup>3)</sup>	Insulation thickness <sup>4)</sup> s [mm]	Core drilling DK [mm]	EnEV 100 % hot, type	EnEV 50 % hot, type	DIN 1988 cold, type <sup>3)</sup>
pipes without OT or UV layer	14,0	12/24	24,0	60	15/20	15/20	15/20
	16,0	16/22	22,0	60	18/20	18/20	18/20
	17,0	17/21,5	21,5	60	18/20	18/20	18/20
	20,0	20/20	20,0	60	22/20	22/20	22/20
	25,0	25/17,5	17,5	60	28/20	28/20	28/20
	26,0	26/17	17,0	60	28/20	28/20	28/20
	32,0	32/24	24,0	80	35/30	35/20	35/30
	40,0	40/20	20,0	80	42/40	42/20	42/40
	50,0	50/25	25,0	100	54/40	54/30	54/40
	63,0	63/33,5	33,5	130	64/50	64/30	64/50
pipes with OT or UV layer	75,0	75/52,5	52,5	180	76/70	76/40	76/70
	90,0	90/65	65,0	220	102/80	102/40	102/80
	110,0	110/70	70,0	250	114/100	114/50	114/100
	16,0	18/21	21,0	60	18/20	18/20	18/20
	20,0	22/19	19,0	60	22/20	22/20	22/20
	25,0	27/16,5	16,5	60	28/20	28/20	28/20
	32,0	34/23	23,0	80	35/30	35/20	35/30
	40,0	42/19	19,0	80	42/40	42/20	42/40
	50,0	52/24	24,0	100	54/40	54/30	54/40
	63,0	65/57,5	57,5	180	76/50	76/30	76/50
aquatherm green pipe UV	75,0	77/51,5	51,5	180	89/70	89/40	89/70
	90,0	90/65	65,0	220	102/80	102/40	102/80
	110,0	113/53,5	53,5	220	114/100	114/50	114/100

## Notes/special installation conditions

<sup>1)</sup> In some cases, the available minimum insulation thickness is specified.

<sup>2)</sup> For further insulation, the insulation ROCKWOOL 800 or TECLIT PS Cold can be used.

<sup>3)</sup> For cold pipes, a vapor barrier must be available according to DIN 1988-200, therefore only use fire protection pipe shell Conclit 150U/ Insulating shell ROCKWOOL 800 or TECLIT PS Cold.

<sup>4)</sup> Insulation thickness according to EnEV 50% and according to DIN 1988 - 200 suitable for the core bore diameter DK.

All basic conditions of the specified general building inspectorate test certificates must be considered.

## FIRE LOAD

The values required for determining the fire load within a fire section are calculated from the total of all flammable materials located within this area.

The calculation for establishing the combustion heat  $V$  [kWh/m] for a fire section in the event of an outbreak is dependent on dimensions and materials.

The basis used for the calculation of pipe systems made of polypropylene is the lower calorific value  $H_u = 12.2$  kWh/kg (as per DIN V 18230 T1) in conjunction with the mass of material  $m_{\text{pipe}}$  [kg/m].

The integrated layers of fibres in the aquatherm fibre composite pipes are also considered.

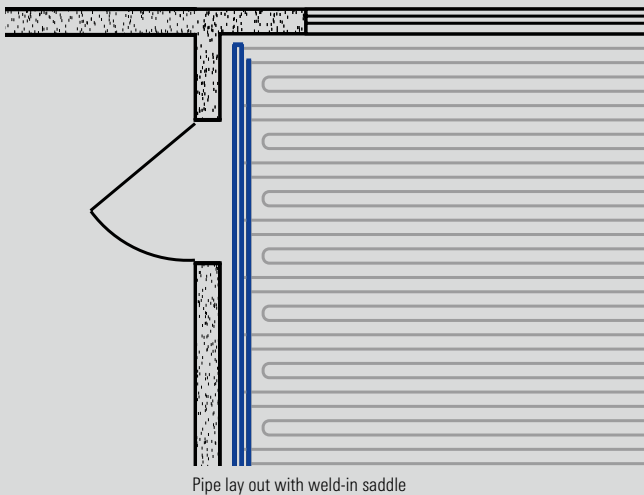
Depending on the calculation procedure, the fire load is worked out with reference to the burn-up factor. This value is designated as  $m_{\text{factor}}$  and is taken as 0.8 for polypropylene.

### Combustion values $V$ [kWh/m] for aquatherm blue pipe

Dimension mm	aquatherm blue pipe SDR 7,4 MF/OT	aquatherm blue pipe SDR 9 MF/OT	aquatherm blue pipe SDR 11 MF/OT	aquatherm blue pipe SDR 17,6 MF
20	1,76	-	-	-
25	2,74	-	-	-
32		4,39	3,14	-
40	-	-	4,83	-
50	-	-	7,48	-
63	-	-	11,82	-
75	-	-	16,48	-
90	-	-	23,86	-
110	-	-	35,33	-
125	-	-	45,83	30,03
160	-	-	74,88	48,53
200	-	-	116,64	75,68
250	-	-	181,42	117,64
315	-	-	285,82	186,32
355	-	-	362,93	236,07
400	-	-	460,78	299,73
450	-	-	583,21	378,64
500	-	-	-	468,24
630	-	-	-	740,59



## CONNECTION



Pipe lay out with weld-in saddle



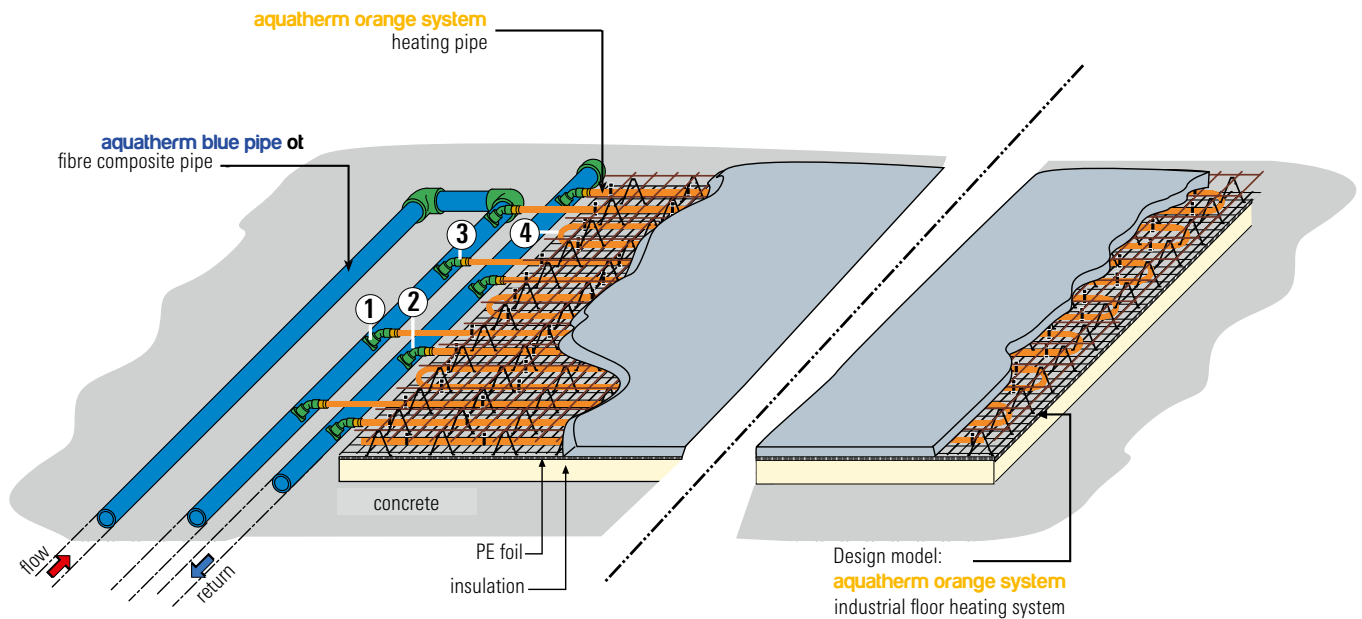
## REVERSE RETURN TECHNIQUE (Tichelmann-principle)

The weld-in saddle technique, developed by aquatherm orange system provides the connection of the heating pipes to a continuous manifold pipe according to reverse return. This technique is applied for the double swing floor design a+b and industrial floor heating.

On applying the reverse return technique all heating circuits have the same length. Thus the pipe lay out ensures the same pressure loss for all heating circuits. A hydraulic balancing of the heating circuits is not required.

### Installation

For this connection technique the manifold pipes are made from aquatherm blue pipe or fibre composite pipes and weld-in saddles. The spacing of saddles is determined by the pipe spacing of the heating pipes. aquatherm grey pipe transition adapter are applied for the connection of the oxygen-tight heating pipes. They provide an optimum connection between the aquatherm blue pipe or fibre composite pipes and the aquatherm orange system.



1. aquatherm green pipe weld-in saddle

2. aquatherm green pipe elbow 45°

3. aquatherm grey pipe transition adapter

4. heating pipe

## The advantages

of aquatherm pipes and fusiolen® polypropylene

- Corrosion resistant
- Resistant against many chemicals
- High environmental compatibility
- Less pipe roughness
- Heat and soundinsulating characteristics
- Very good welding properties
- High heat-stabilized
- High mechanical stability
- Lighter in weight than steel and copper
- Easy processing
- Well-priced
- Installation aids and fixings

# fusiolen®

## OUR MATERIAL FUSIOLEN POLYPROPYLENE

Decades of experience in the manufacture and use of PP-R/PP-RCT piping systems and the simultaneous striving for continuous further development have led to numerous improvements in aquatherm system technology.

Newly opened markets place ever increasing demands on the pipe material. Versatile applications require the greatest possible independence of the processed materials. Raw materials with novel properties that could not be achieved until then are required. For this reason, aquatherm has been developing and producing its own innovative polypropylene materials for several years, which meet the global challenges in sanitary and heating technology, in air-conditioning and refrigeration technology, in industrial applications and agriculture, in shipbuilding and in fire protection. Successful results of this research are fusiolen® PP-R, fusiolen® PP-RCT and fusiolen® PP-R FS.

Special heat and extraction stability are only two of the features of this material. Its physical and chemical properties are tailored to the special needs of potable water and heating applications. Above all, the good welding properties and the fusion into a homogeneous unit, resulting in a permanent connection, have made the aquatherm systems and the raw material fusiolen® polypropylene well known worldwide.

### Environment

The environmentally friendly material polypropylen fusiolen® PP-R/PP-RCT is recyclable and can be ground, melted and reutilised for various applications e.g. motor-protections, wheel linings, laundry baskets and other kinds of transport boxes. There are no polluting substances with PP-R/PP-RCT either in its processing or in its disposal.

**fusiolen® PP-R/PP-RCT – for the benefit of our environment!**

### Use of metal deactivators

By adding suitable food-approved additives the risk of material damage caused by metal ions under extreme operating conditions is reduced.

### Higher long-term heat stabilization

The long-term heat stabilization has been increased to resist to the potential effects of peak temperatures within higher safety parameters.

## MATERIAL PROPERTIES

The extrapolated service life of aquatherm PP-RCT pipes is more than 50 years. Peak temperatures of 100 °C arising from short disruptions are unproblematic. Permanent temperatures from 70 °C up to 90 °C reduce the service life of the pipe (see table "Permissible Working Pressure", page 21). When using aquatherm PP-R/PP-RCT pipes, the pressure and temperature conditions according to the table "Permissible working pressure" apply. With regard to pressure and temperature, the operating conditions in the following table are to be used for pipes and pipe connections





## TECHNICAL DATA SHEET

Technical properties	fusiolen® PP-R	fusiolen® PP-R/PP-RCT fibrepipe
Melt-flow index 190 °C/5 kg	0.5 g/10 min	0.5 g/10 min.
Melt-flow index 230 °C/2.16 kg	0.3 g/10 min	0.3 g/10 min.
Modulus of elasticity	800 N/mm <sup>2</sup>	1200 N/mm <sup>2</sup>
Yield stress	25 N/mm <sup>2</sup>	30 N/mm <sup>2</sup>
Density	0.9 g/cm <sup>3</sup>	1.0 g/cm <sup>3</sup>
Tensile strength	25 MPa	35 MPa
Inflammation temperature	430 °C–450 °C	490 °C–500 °C
Thermal expansion coefficient	1.5 *10 <sup>-4</sup> K <sup>-1</sup>	0.35 *10 <sup>-4</sup> K <sup>-1</sup>
Coefficient of thermal conduction	0,15 W/mK (measured at pipe)	0,15 W/mK (measured at pipe)
Coefficient of friction in pipes	0.007	0.007
Bending radius	6 x d	
Water absorption	< 0.02 %	< 0.02 %
Electrical properties	fusiolen® PP-R	fusiolen® PP-R/PP-RCT fibrepipe
Relative permittivity	2,3 (in case of 1 MHz)	2,3 (in case of 1 MHz)
Puncture voltage	500 kV/cm	500 kV/cm
Specific resistance	> 10 <sup>17</sup> Ω cm	> 10 <sup>17</sup> Ω cm
Surface resistance	10 <sup>14</sup> Ω	10 <sup>14</sup> Ω
Dissipation coefficient	0.0002 (in case of 50 Hertz)	0.0002 (in case of 50 Hertz)

## AQUATHERM & ECOLOGY

Environmental protection is very important to aquatherm.

The aquatherm pipe systems and fittings are not only characterized by their long service life, but also by their excellent environmental compatibility. Since its foundation, aquatherm attaches great importance to the fact that its products and manufacturing processes do not pollute our sensitive ecosystems. Through the development of recyclable materials, it is possible that these can easily be fed into new productions.

Long before environmental protection was regarded as a global issue, the aquatherm green pipe system met the ecological standards that are required today. For more than 45 years, the aquatherm philosophy has emphasized that ecological and economical interests in production, distribution and application of a product are not contradictory.

The environmentally friendly raw material fusiolen® is used for the production of the aquatherm pipe systems. To ensure its environmental compatibility the basic material polypropylene, as well as all contained additives (colour pigments and stabilizers) were extensively tested, not only by aquatherm's own laboratory, but also by independent laboratories.

Their results show that the polypropylene granules fusiolen® and the pipe systems from which it is manufactured, comply with the highest ecological standards.



## ENVIRONMENTAL PRODUCT DECLARATION AND LEED CERTIFICATION

As the world's first pipe system manufacturer, aquatherm has developed an Environmental Product Declaration (EPD) for its products. Thus the aquatherm products contribute to the attainment of points in the LEED system. Learn more about the importance of life cycle assessments, environmental product declarations and LEED for planners, engineers and builders.

### Life-Cycle Assessments (LCAs)

LCAs provide a comprehensive evaluation of the upstream and downstream energy and environmental impacts associated with a product. They are comprised of five parts: Goal, Scope, Life-Cycle Inventory Analysis, Results, and Interpretation. aquatherm has chosen the cradle-to-gate approach for its LCA „Life Cycle of Polypropylene Pressure Piping Systems“ encompassing the product life cycle from the extraction of raw materials through manufacturing and product distribution.

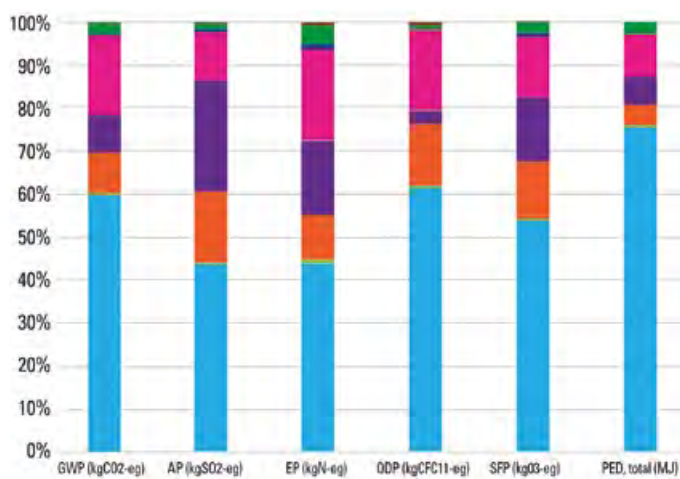
### Environmental Product Declarations (EPDs)

The EPD is the document used to convey the LCA's results to the products' users and specifiers. It focuses on information about a product's environmental impact such as global warming, ozone depletion, water pollution, ozone creation, and greenhouse gas emissions.

EPDs typically are verified following the processes described in ISO 14025, EN 15804, and ISO 21930 for construction products. These steps include: 1) Finding or developing a Product Category Rule (PCR); 2) Generating the input data and performing an LCA according to a specific PCR; 3) Compiling information in the EPD; 4) Verification of the EPD and LCA; and 5) Registration and publication.

aquatherm utilized ThinkStep as independent third party to conduct an ISO-conformant LCA for its following product lines: aquatherm had an ISO-compliant life cycle assessment carried out by ThinkStep as an independent third party for the following product lines: aquatherm green pipe, aquatherm blue pipe, aquatherm red pipe, aquatherm lilac pipe (no longer available) and the aquatherm black system for surface heating and cooling. In the study, one meter (3.2 ft) length of pipe was selected as functional unit per the requirements of the respective PCR "Piping Systems for Use for Sewage and Storm Water (Under Gravity)". The declared product was defined as a representative average of the five aquatherm product offerings.

Two different test methodologies were chosen to analyze the products in the LCA: Tool for Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI) 2.1 and CML 2001, a method developed by the Institute of Environmental Sciences at the University of Leiden in the Netherlands. The TRACI 2.1 method utilized impact categories, including Global Warming Potential (GWP), Acidification Potential (AP), Eutrophication Potential (EP), Ozone Depletion Potential (ODP), and Smog Formation Potential (SFP). The results of the findings are summarized in the following table.



### Environmental impacts and Primary Energy Demand of aquatherm PP-R piping systems according to TRACI 2.1

Upon completion of the aquatherm product-specific LCA, aquatherm submitted its products, the LCA, and supporting documentation for independent verification by NSF International. The verification process included a review by an independent panel of experts, an audit of the manufacturing facilities and records, and a confirmation of material formulations. aquatherm's Product-Specific Type III third-party verified EPD was published Dec. 18, 2015: <http://info.nsf.org/Certified/Sustain/ProdCert/EPD10069.pdf>

Within the EPD, you will find information on aquatherm, its product descriptions, data quality requirements, raw-materials origins, a manufacturing diagram, a declaration of parameters per the PCR, and the lifecycle-impact conclusion for aquatherm pipe.

### Advantages of PP-R piping systems and radiant panels compared to metal systems

The analysis has shown that polypropylene comprises nearly 50% or more of the impact contribution depending on the impact category. Also Primary Energy Demand (PED) is mainly driven by polypropylene. However, this is because of the embodied energy content of the resin rather than fuel consumption upstream. In other words, aquatherm polypropylene has available energy within the material that can be recovered later in the product's life cycle during recycling. This differs greatly compared with metals. With metal systems, all of the energy is used in the original processing of the raw material. Metals do not provide energy to the recycling process.

Thus aquatherm PP-R piping systems and radiant panels can provide a more sustainable, lower environmental impact option to designers, engineers, and building owners when compared with other piping and radiant panel systems.

### How is aquatherm's EPD relevant to LEED v4 points?

LEED stands for „Leadership in Energy and Environmental Design“ and is one of the most popular green building certification programs used worldwide. It was developed by the U.S. Green Building Council (USGBC) in 1998 and has defined various standards for environmentally friendly, resource-saving and sustainable construction.

LEED v4 incorporates point structures to encourage the use of products/ materials that environmentally, economically, and socially support preferable life-cycle impacts. Point structures were developed to reward the selection of products from manufacturers who have verified improved environmental life-cycle impacts.

aquatherm's green pipe, blue pipe, red pipe and black system products have attained Type III EPD status through independent verification by NSF International. They now can be utilized as a portion of the 20 permanent products engineers must have throughout their LEED-certified buildings. aquatherm's EPD also carries double the weight of the Industry-Wide (Generic) EPD in terms of LEED product value and four times the weight of a self-certified Product-Specific Declaration by a manufacturer. aquatherm has continued its industry leadership position by becoming the first piping manufacturer to have an independently verified, Product-Specific Type III EPD and by supporting building owner to achieve LEED certification.

For further information please see our White Paper:

<https://www.aquatherm.de/company/sustainability/?lang=en>

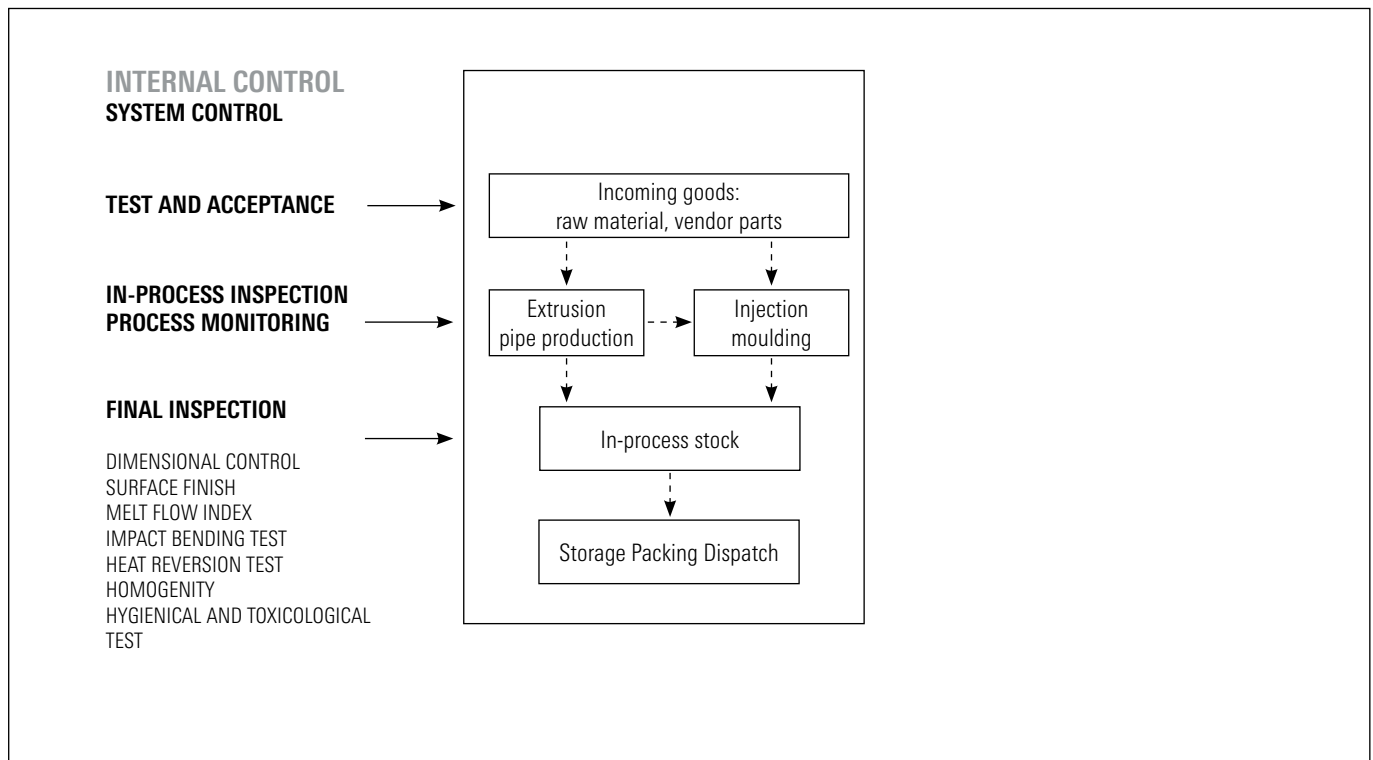
- 1. PP-R
- 2. Other Plastics
- 3. Brass Fittings
- 4. Additives
- 5. Auxiliary Materials
- 6. Energy
- 7. Inbound Transport
- 8. Packaging
- 9. Waste Treatment



## COMPLIANCE WITH THE SYSTEM STANDARD

Various national and international independent authorities and institutions confirm aquatherm's quality standard. You can see our certificates on our website at [www.aquatherm.de/products/certificates](http://www.aquatherm.de/products/certificates)

## AQUATHERM QUALITY MANAGEMENT SYSTEM



In addition to the permanent internal quality control, an external control is conducted by i.e. SKZ, SAI, TGM, Hygieneinstitut.



## SYSTEM CONTROL

The production of a quality controlled pipe system demands the supervision, regulation and control of all work operations. All results and processes have to be documented.

This requires

**test and acceptance of incoming goods**  
**process control**  
**in-process inspection and test**  
**final inspection and test**

The minimum requirements for self-monitoring are derived from the monitoring regulations of the South German Plastic Center (SKZ), DIN guidelines and DVGW-worksheets, compliance with which is checked by neutral test institutes as part of external monitoring.

Conformance to the standards is verified by independent institutes in form of internal audits and laboratory tests.

aquatherm has many years of experience in extrusion and injection moulding and is the market leader and pioneer in the manufacture of polypropylene pipe systems.

This experience is reflected in internal quality standards and laid down procedures, which are taken strongest note of and are documented by the constant quality of our products.

## INTERNAL CONTROL

Trained and qualified employees and a modern equipped laboratory ensure that all tests are carried out and regulations are complied with in accordance with the quality control policy, which includes

**control of inspection, measuring and test equipment process and**  
**production control**  
**receiving inspection test**  
**in-process inspection**  
**final inspection**

All internal quality controls are documented and recorded in accordance with the quality control policy.





## QUALITY ASSURANCE

### Test and acceptance of incoming goods

All incoming goods are subject to a test. This ensures that incoming products conform to specified requirements. Goods, which have not been tested are not released for production.

### In-process inspection and test

The quality plan requires that tests and inspections are carried out before and during production. At the start of production all quality relevant data are checked by the quality assurance department. Preproduction samples are tested by the laboratory technicians for

- Surface finish
- Dimensional accuracy of the test samples
- Data from extrusion and injection moulding machines

and whether they meet the specifications. Only if this is ensured, it will be released for production. The tests are carried out at the beginning of each series production in order to guarantee impeccable quality.

### Process control

Ultrasonic measurement and process data recording in the field of extrusion are only two examples of the extensive quality control process.

This equipment enables constant observation and control of production.

Ultrasonics automatically measure and report any deviations in tolerance to the cutting device on the extrusion machine so that the sizing plant automatically isolates a substandard product. This ensures that only perfect quality products are packed and stored.

All data received during production is analyzed in detail.

### Final inspection and test

After completion of the products, all final inspections specified in the test plan are conducted. Only if it has been proven that all the required tests are fully documented and the results correspond to the optimum system quality, the products are sent to the finished goods warehouse.

The final inspection and test covers the following test procedures:

- Dimensional control
- Surface finish
- Measurement of the melt flow index
- Impact bending test
- Heat reversion test
- Homogeneity of the material
- Internal pressure test

In addition to the tests mentioned above, daily hygiene tests in accordance with KTW/DVGW guidelines are carried out regularly in the company's own sensory analysis laboratory.



## EXTERNAL CONTROL

External supervision consists of tests of a defined scope and in defined intervals. The respective supervising institutions appoint authorized test organizations to carry out these tests.

The external supervision includes external tests of the products and

- internal audit of aquatherm's quality assurance system and test procedures,
- calibration of the test equipment and
- hygienic and toxicity tests.

The results of the supervisory visits as well as external tests made on pipe and fitting samples are confirmed to aquatherm in test certificates.

In Germany, the external supervision of the aquatherm pipe system is carried out by the

- SKZ (Süddeutsches Kunststoffzentrum in Würzburg)
- Institute for Hygiene, Gelsenkirchen (Hygieneinstitut in Gelsenkirchen)

who are authorized by the DVGW (German Institute for Gas and Water) as controlling organization. The external supervision for certificates from abroad is carried out in a similar way.

## Storage/packing/dispatch

Upon successful release the products are stored in suitable warehouses.

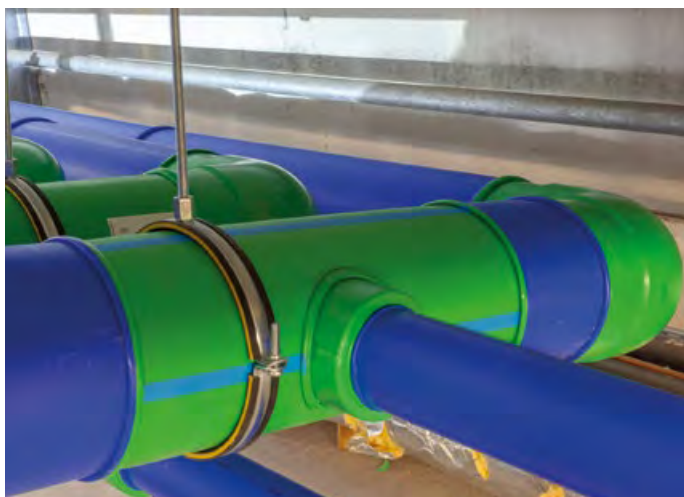
Internal instructions control the method of packing, storage and dispatch of the products. The warehouse staff is responsible for control of the stored product.





### HEATING AND AIR-CONDITIONING

aquatherm blue pipe includes all pipe installation components for chilled water, hot water and various industrial applications. The reduced wall thickness offers higher flow rates and the products feature high heat-stabilized properties.





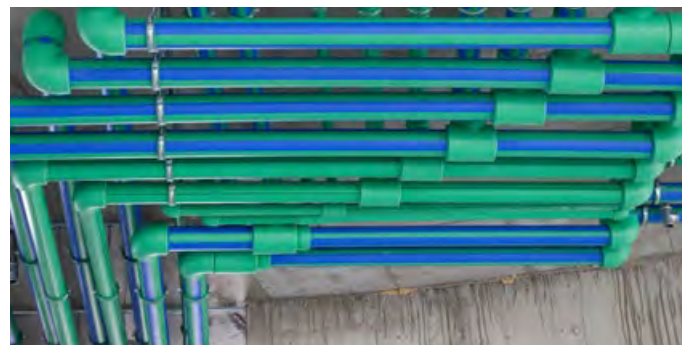


## BUILDING SERVICES

Flange connections and transition joints enable the connection of all components to the central heating system and on the floor.



Risers and distribution piping for heating supply should be planned and installed with aquatherm blue pipe fibre composite pipes.



The connection of floor heating systems or the installation of radiator pipes up to the manifold can also be carried out with aquatherm blue pipe.







## INDUSTRIAL FLOOR HEATING

### Application areas

- Production halls
- Workshops
- Warehouses
- Logistics centers
- Maintenance hangars
- Exhibition halls
- Market halls
- Showrooms
- Cold storage warehouses with sub-freezing protection heater

Industrial buildings are planned by builders and architects in a way that preferably the entire volume of space is utilized.

TGA-installation must not impede the working processes. With component integrated surface heating systems the entire surface area is available to the user. That creates absolute space freedom and optimal utilization of the halls. Industrial surface heating offers a uniform temperature profile, low air speeds and low maintenance costs. It works at low temperatures and is characterized by rapid amortization.

The lifetime of the pipes corresponds to the life of the building!

### Energy efficiency

Systems near to room temperature have the highest energy efficiency. Large transfer surfaces are required for the operation of heat pumps and the use of waste heat. Only industrial surface heating is suitable for these requirements.

### Thermal insulation

Thermal insulation in industrial surface heating is usually placed under the concrete slab as perimeter insulation (adjacent to ground).

Depending on the static load it is chosen between extruder foam and foam glass plates. The insulation material for the perimeter insulation must be impervious to moisture and suitable for the loads occurring.

In calculating the U-value, according to DIN 4108, only layers up to the building sealing have to be included. Only when presenting a building approval for the selected building material the insulation value of the perimeter insulation can be included in the calculation of the U-value for the entire construction.

### Construction types of floor slabs

Heating pipes can be integrated in the following types of concrete:

- Reinforced concrete with bottom reinforcement
- Reinforced concrete with bottom and top reinforcement
- Steel fiber concrete without reinforcement mats

Surface treatments (such as in vacuum concrete) are easily possible.

### Construction types of industrial surface heating according to pipe fixing

**Option A:** Matt reinforced concrete, fixing of heating pipes by spring rails on the bottom reinforcement

**Option B:** Matt reinforced concrete, fixing of heating pipes by cable ties at the bottom reinforcement

**Option C:** Steel fiber concrete, fixing of heating pipes by spring rail on the film

Industrial surface heating must be subjected to a leak test. The pressure test is performed immediately prior to the concreting process. The test pressure of the water pressure test is at least 4 bar and not more than 6 bar. This pressure is to be kept during the concreting process.

The leak test must be documented. The test record is used as a confirmation for the architect and the constructor.

### Concreting

The concrete is placed in a ready-mixed consistency with the transport hose, distributed, levelled and compacted.

### Functional heating

Industrial surface heating has to be heated up after the placement of the concrete and top layer (functional heating). The earliest possible start of heating is dependent on the quality and thickness of the concrete and must be agreed with the concrete layer/structural engineer. The wait time is usually 28 days. The functional heating is simply a function test according to VOB DIN 18380.

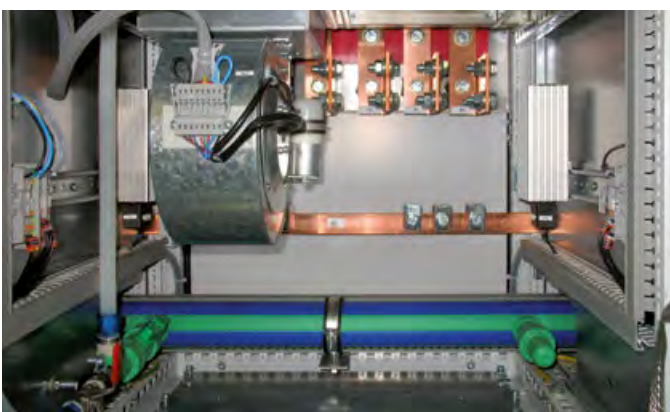




## SHIPBUILDING

Corrosion resistance against aggressive media and sea water with low pH-values makes aquatherm blue pipe the ideal pipe system in shipbuilding. For example for ballast and cooling systems or inert gas scrubber drains.

A major advantage of the saltwater resistant pipe systems is the fast processing and repair works that can be easily carried out, even on sea.





## APPLICATION AREAS



## UNDER SOIL HEATING

In order to keep a field with natural or artificial turf free of ice and snow, aquatherm offers a piping system for under soil heating that can be operated economically at the highest technical level, also from an ecological point of view.

This is possible thanks to the optimal combination of aquatherm green pipe and aquatherm blue pipe components.







## ICE SURFACE COOLING

aquatherm blue pipe meets the high demands of professionally used ice rink areas.

The distribution pipes as well as the manifold connecting pipes are made from aquatherm blue pipe and connected by reverse return (Tichelmann-principle). The weld-in saddle technique, developed by aquatherm, is applied for the production of manifold branches.







### COMPRESSED AIR

With aquatherm blue pipe you get a pipe system that guarantees the safe operation of your compressed air systems for decades. Whether for indoor or outdoor use, aquatherm blue pipe is characterized by its high compressive strength. Thanks to its lower weight compared to metallic pipes systems, even compressed air pipe system installation under hall roofs with high altitudes is easy. The corrosion-resistant polypropylene material is particularly resistant and can even be used for untreated compressed air containing oil.

### SWIMMING POOL

Only impeccable water guarantees the swimming pool operator the security of offering his guests unlimited bathing enjoyment in the long term, and only a functioning heating system guarantees smooth, low-loss operation, if possible 52 weeks a year.

The pipe systems made by aquatherm offer both for water management and for heating technology a complete and reliable all-round supply on the foundation of a more than 45-year experience.







APPLICATION AREAS

## AGRICULTURE

In the agricultural sector, the possible applications of the aquatherm blue pipe system are manifold. It can be used not only for the air-conditioning of stables, but also for the transport of disinfectants in professional barn cleaning to ensure the hygiene and health of livestock and thus e.g. to improve milk quality.

The system is also suitable for irrigating fields and green areas or for transporting fertilizers in gardening and landscaping.

## SPECIAL APPLICATIONS

### EXAMPLE: SKI JUMPS

In order to ensure the same conditions on the jump-off platform of a ski jump even in changing weather conditions and thus equal opportunities for the start-up speed, aquatherm cooling grids are inserted directly under the run-up track. A glycol / water mixture is fed to them through aquatherm blue pipe pipes - this way the track is cooled evenly and constantly.

The ski jump is just one example of the many special applications of the aquatherm blue pipe system.



## PART A: TOOLS AND ACCESSOIRES

The professional processing of aquatherm polypropylene medium pipes is made by the following tools for the connection of insulated pipes and fittings by socket welding or by butt-welding.

### IMPORTANT!

Only use the original aquatherm welding equipment except devices and tools which are especially approved by aquatherm.

1. **aquatherm** manual welding device (800 W) without welding tools (Art. no. 50337) for medium pipes of dimension 16–63 mm
2. **aquatherm** manual welding device (1400W) without welding tools (Art. no. 50341) for medium pipes of dimension 50–125 mm
3. **aquatherm** welding tools for manual welding devices
 

Art. no. 50208	20 mm
Art. no. 50210	25 mm
Art. no. 50212	32 mm
Art. no. 50214	40 mm
Art. no. 50216	50 mm
Art. no. 50218	63 mm
Art. no. 50220	75 mm
Art. no. 50222	90 mm
Art. no. 50224	110 mm
Art. no. 50226	125 mm
4. **aquatherm** welding machine (1400W) incl. welding tools 50–125 mm (Art. no. 50148) for medium pipes of dimension 50–125 mm
5. **aquatherm** butt-welding-machines for medium pipes of dimension 160–630 mm
6. **aquatherm** electrical welding jig Art. no. 50159 for medium pipes of dimension 63–125 mm



Manual welding device 800W with welding tools 16–63 mm



Manual welding device 1400W with welding tools 50–125 mm



Welding machine



Butt-welding machine type Light and accessories



Electrical welding jig



## PART A: ASSEMBLY OF WELDING TOOLS

1. aquatherm blue pipe und aquatherm green pipe are processed identically.
2. Assemble and tighten the cold welding tools manually.
3. Before fusing the distribution block, in which two connections are fused simultaneously, the welding tools have to be placed into the respective holes as described in the adjoining table A and drawing B.
4. All welding tools must be free from impurities. Check if they are clean before assembling. If necessary clean the welding tools with a non fibrous, coarse tissue and with methylated spirit.
5. Place the welding tools on the welding device so that there is full surface contact between the welding tool and the heating plate. Welding tools over  $\varnothing 40$  mm must always be fitted to the rear position of the heating plate.

### Electric supply:

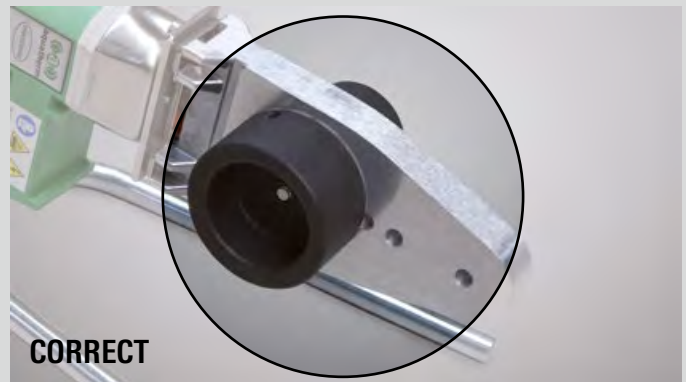
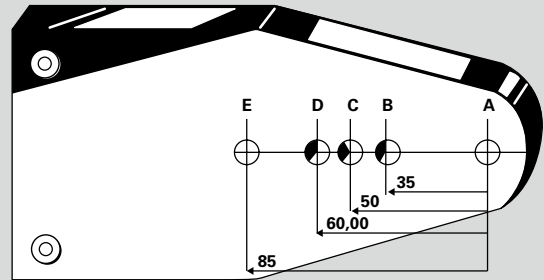
The power supply must coincide with the data on the type plate of the welding device and must be protected according to the local regulations. To avoid high power loss, the conductor cross-section of the used extension cables must be selected according to the power input of the welding devices.

6. Plug in the welding device. Depending on the ambient temperature it takes 10–30 minutes to heat up the heating plate.

A

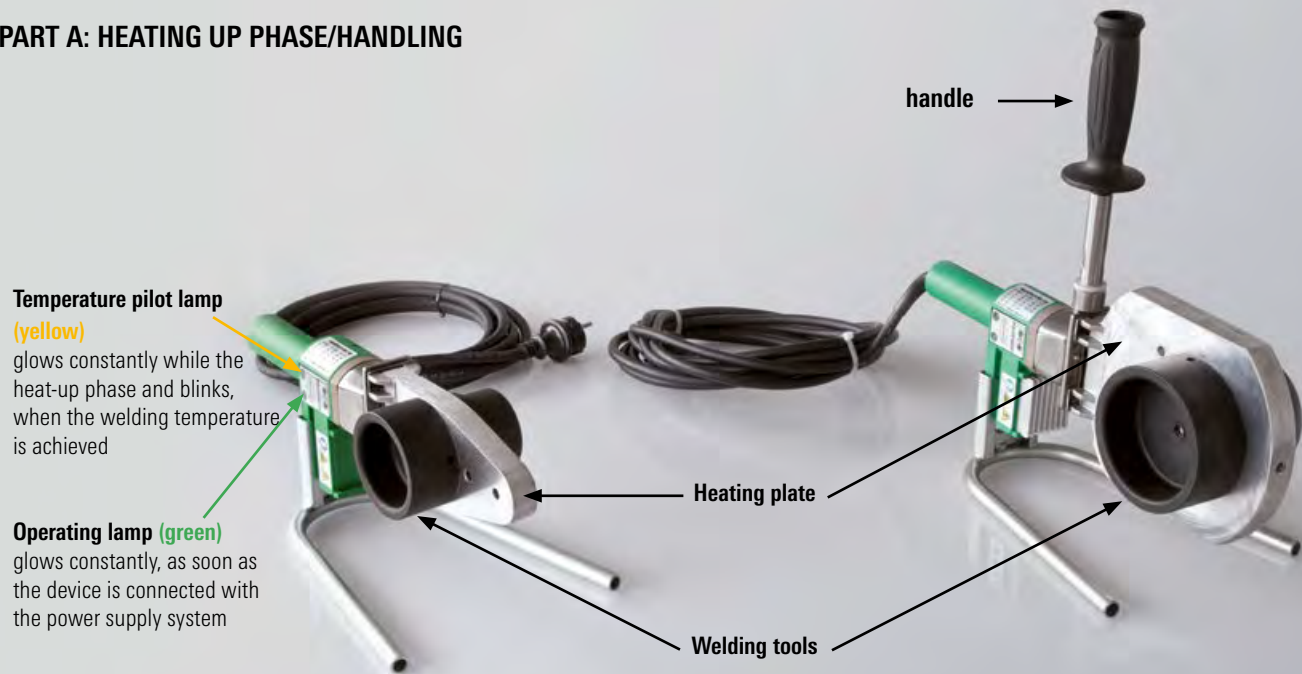
Art. no.	Passage	Hole	Branch	Hole
30115	$\varnothing 25$ mm	A + E	$\varnothing 20$ mm	A + C
85123	$\varnothing 20$ mm	A + B	$\varnothing 16$ mm	A + C

B





## PART A: HEATING UP PHASE/HANDLING



## Heat-up phase

7. During the heating up phase tighten the welding tools carefully with the Allan key.

Take care that the tools completely contact the heating plate. Never use pliers or any other unsuitable tools, as this will damage the coating of the welding tools.

8. The temperature of 260 °C is required for the welding of aquatherm PP-R/PP-PR pipes.

According to DVS-Welding Guidelines the temperature of the welding device has to be checked at its tool before starting the welding process.

This can be done with a fast indicating surface thermometer.

**ATTENTION:**

First welding – earliest 5 minutes after reaching of the welding temperature. DVS 2207, Part 11.

## Handling

9. A tool change on a heated device requires another check of the welding temperature at the new tool (after its heating up).
10. If the device has been unplugged, e.g. during longer breaks, the heating up process, has to be restarted (see item 6).
11. After use unplug the welding device and let it cool down. Water must never be used to cool the welding device, as this will destroy the heating resistances.
12. Protect aquatherm welding devices and tools against impurities. Burnt particles may lead to an incorrect fusion. The tools may be cleaned with aquatherm cleaning cloths, Art. no. 50193.

Always keep the welding tools dry.

13. After welding, do not lay the the device on the Teflon coated tool, but put it down in the provided supporting stand.

14. For a perfect fusion, damaged or dirty welding tools must be replaced, as only impeccable tools guarantee a perfect connection.

15. Never attempt to open or repair a defective device. Return the defective device for repair.

16. Check the operating temperature of aquatherm welding devices regularly by means of suitable measuring instruments.

**Guidelines**

1. For the correct handling of welding machines the following must be observed: General Regulations for Protection of Labour and Prevention of Accidents and particularly the Regulations of the Employers' Liability Insurance Association of the Chemical Industry regarding Machines for the Processing of Plastics, chapter: „Welding Machines and Welding Equipment“.
2. For the handling of aquatherm welding machines, devices and tools please observe General Regulations DVS 2208 Part 1 of the German Association for Welding Engineering, Registered Society (Deutscher Verband für Schweißtechnik e. V.).

## PART B: CHECKING OF DEVICES AND TOOLS

Check, if the aquatherm welding devices and tools comply with to the guidelines "Fusion Part A".

The devices and tools used must have reached the required operating temperature of 260 °C for heating element socket welding or 210 °C for butt-welding. This requires according to "Fusion Part A, item 8" a separate test, which is indispensable (DVS-Welding Guidelines):

Suitable measuring instruments have to measure a temperature of up to 350 °C with a high accuracy.

### NOTE:

aquatherm recommends the original aquatherm temperature measuring device Art. no. 50188

## PART B: PREPARATION FOR THE FUSION

1. Cut the pipe at right angles to the pipe axis. Only use aquatherm pipe cutters or other suitable cutting pliers. Take care that the pipe axis is free from burrs or cutting debris and remove where necessary.
2. Mark the welding depth at the end of the pipe with the enclosed pencil and template. and template.
3. Mark the desired position of the fitting on the pipe and/or fitting. The markings on the fitting and the uninterrupted line on the pipe may be used as a guide.



Measurement of temperature at the aquatherm manual welding device (800W )



Measurement of temperature at the aquatherm welding machine



Measurement of temperature at the aquatherm butt-welding machine



Cutting of the pipe



Marking of the welding depth

## PART B: HEATING OF PIPE AND FITTING

4. Push the end of the pipe, without turning, up to the marked welding depth into the welding tool.

pipe dimension mm	welding tool Art. no.
16 – 32	50336
16 – 63	50337
75 – 125	50341 / 50148

It is essential to observe the above mentioned heating times.

### ATTENTION:

The heating time starts, when pipe and fitting have been pushed to the correct welding depth on the welding tool. Not before!

## PART B: SETTING AND ALIGNMENT

5. After the required heating time quickly remove pipe and fitting from the welding tools. Join them immediately and without turning, until the marked welding depth is covered by the PP-bead from the fitting.

### ATTENTION:

Do not push the pipe too far into the fitting, as this would reduce the bore and in an extreme case will close up the pipe.

6. The joint elements have to be fixed during the specified assembly time. Use this time to correct the connection. Correction is restricted to the alignment of pipe and fitting. Never turn the elements or align the connection after the processing time.

7. After the required cooling time the fused joint is ready for use.

The result of the fusion of pipe and fitting is a permanent material joining of the system elements. Connection technique with security for a life-time.

### The fusion is subject to the following parameters

Pipe external- Ø	Welding depth	Heating time		Welding time	Cooling time
mm	mm	sec. DVS	sec. AQT*	sec.	min.
20	14,5	5	8	4	2
25	16,0	7	11	4	2
32	18,0	8	12	6	4
40	20,5	12	18	6	4
50	23,5	18	27	6	4
63	27,5	24	36	8	6
75	30,0	30	45	8	8
90	33,0	40	60	8	8
110	37,0	50	75	10	8
125	40,0	60	90	10	8

**ATTENTION:** sec. AQT\* heating times recommended by aquatherm at ambient temperatures below +5 °C.

The General Guidelines for Heated Socket Welding acc. to DVS 2207, Part 11 are applied hereupon.



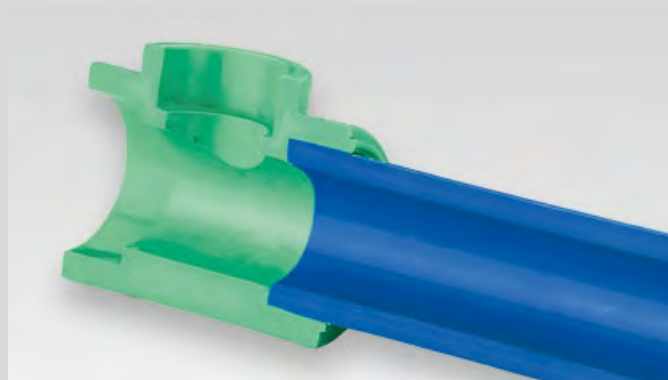
Heating-up of pipe and fitting



Joining, fixing and...



...aligning



The result: a permanent connection!

### Dimension 160–630 mm:

The dimension 160–630 mm are joined by butt-welding.

Detailed information page 64 + 65.

The General Guidelines for Heated Tool Socket Welding according to DVS 2207 Part 11 are applied hereupon.



## PART B: UNIVERSAL PEELING TOOLS

By using the aquatherm universal peeling tools the end pieces of the aquatherm blue pipe OT and UV can be peeled. By the uniform removal of the outer layer of the pipe any extension of the pipe system by electrofusion socket or fitting is possible. The universal peeling tools are available in the sizes Ø 20–125 mm (Art. no. 50479–50488). The peeling process is done either mechanically or manually. For the mechanical processing two attachment plates for pipe sizes Ø 20–63 mm (Art. no. 50499) and Ø 75–125 (Art. no. 50500) mm are available. For the mechanically processing of the electrofusion sockets the peeler is extended by an attachment (Art. no. 50489–50498). The power drill should have a high torque.

### 1. INSTRUCTIONS FOR THE MECHANICAL PEELING PROCESS

- 1.1. The attachment plate is clamped with the hexagon bolt in the power drill.
- 1.2. The peeler is fixed with its screws in the slot matching the diameter of the attachment plate and rotated clockwise so that the peeler adheres to the attachment plate.
- 1.3. The peeling tool clamped on the chuck is set by the lead to the end of the pipe.
- 1.4. The peeling process starts with rotation of the peeling tool upon slight force in axial direction. The peeling operation is completed when the attachment plate strikes against the pipe end.
- 1.5. The pipe now can be welded by socket welding method.

### 2. INSTRUCTIONS FOR THE MECHANICAL PEELING PROCESS FOR ELECTROFUSION SOCKETS

- 2.1. The extension is centered with the peeler through the superimposed chamfer fit and fastened with three Allen screws.
- 2.2. The attachment plate is clamped with the hexagon bolt in the power drill and connected with the peeling tool (see photo 1.2.).
- 2.3. The peeling process starts with rotation of the peeling tool upon slight force in axial direction. The peeling operation is completed when the carrier plate strikes against the pipe end.
- 2.4. The peeling tool is withdrawn from the pipe and the E-socket welding process can start.

### 3. PEELING INSTRUCTIONS FOR MANUAL PEELING

- 3.1. For the manual peeling two handles are mounted at the peeling tool.
- 3.2. The peeling tool is pushed onto the untreated pipe up to the stop.
- 3.3. The peeling tool is turned clockwise as long as the marked peeling depth (see table on the next page) is reached.
- 3.4. If the specified/marked peeling depth (see table on the next page) is reached, the peeling tool is removed and the socket welding process can start. If the electric socket can be used as a sliding sleeve, the peeling depth for the electric socket welding (see table) must be doubled.





**TABLE OF PEELING DEPTH:  
SOCKET AND ELECTRIC SOCKET WELDING**

Diameter	Peeling depth Socket welding	Peeling depth Electric socket welding
ø 20	16 mm	39 mm
ø 25	20 mm	43 mm
ø 32	22 mm	45 mm
ø 40	25 mm	50 mm
ø 50	28 mm	56 mm

Diameter	Peeling depth Socket welding	Peeling depth Electric socket welding
ø 63	32 mm	65 mm
ø 75	34 mm	69 mm
ø 90	37 mm	77 mm
ø 110	42 mm	85 mm
ø 125	44 mm	90 mm

## PART C: WELD-IN SADDLES

aquatherm weld-in saddles are available for pipe outer diameter of 40–630 mm.

Weld in saddles are used for

- Branch connections in existing installations
  - The substitution of a reduction-tee
  - Branch connections in risers
  - Sensor wells, etc.
1. Before starting the welding process, check whether the aquatherm welding devices and tools comply with the requirements of "Fusion Part A".
  2. The first step is to drill through the pipe wall at the intended outlet point by using the aquatherm drill (Art. no. 50940–50958).

### 3. IMPORTANT!

Only the oxygen barrier layer of the aquatherm blue pipe of Art. no. 2170708–2170138 must be removed with the mentioned aquatherm special peeling drills mentioned in the table beside.

For this the special peeling drill is inserted into the bore hole and swayed 2–3 times with light pressure and low rotating speed between the pipe walls until the oxygen barrier layer is completely peeled off.

The UV-layer is removed in the same way.

Remove burrs, debris and other dirt with a chamfering tool or the aquatherm cleaning wipes. Do not touch the peeled surface any more and protect it from new pollution.

4. The welding device/saddle welding tool must have reached the required operating temperature of 260 °C (check with reference to "Fusion Part B, item 2").
5. The welding surfaces have to be clean and dry.
6. Insert the heating tool on the concave side of the weld in saddle tool into the hole drilled in the pipe wall until the tool is completely in contact with the outer wall of the pipe. Next the weld-in saddle tool is inserted into the heating sleeve until the saddle surface is up against the convex side of the welding tool. The heating time of the elements is generally 30 seconds.
7. After the welding tool has been removed, the weld-in saddle tool is immediately inserted into the heated, drilled hole. Then the weld-in saddle should be pressed on the pipe for about 15 seconds. After being allowed to cool for 10 minutes the connection can be exposed to its full loading. The appropriate branch pipe is fitted into the sleeve on the aquatherm weld-in saddle using conventional fusion technology.

**By fusing the weld-in saddle with the pipe outer surface and the pipe inner wall the connection reaches highest stability.**



Drilling through the pipe wall



Removal of the oxygen barrier layer in case of the aquatherm blue pipe OT and of the UV layer in case of the aquatherm UV-pipe

**aquatherm** saddle peeling tools for  
**aquatherm blue pipe** OT-pipes  
**aquatherm blue pipe** UV-pipes  
 Ø 50–125 mm

Art. no.	Dimension
50921	for weld-in saddles Ø 20 & 25 mm
50922	for weld-in saddles Ø 32 mm
50924	for weld-in saddles Ø 40 mm
50926	for weld-in saddles Ø 50 mm
50928	for weld-in saddles Ø 63 mm

**aquatherm** saddle peeling tools for  
**aquatherm blue pipe** OT-pipes  
**aquatherm blue pipe** UV-pipes  
 Ø 160–250 mm

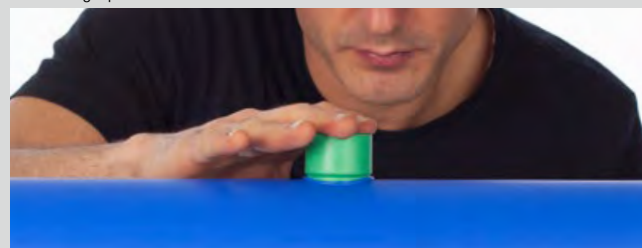
Art. no.	Dimension
50421	for weld-in saddles Ø 20 & 25 mm
50422	for weld-in saddles Ø 32 mm
50424	for weld-in saddles Ø 40 mm
50426	for weld-in saddles Ø 50 mm
50428	for weld-in saddles Ø 63 mm



The welding tool is inserted into the pipe wall ...



...heating-up of the elements



joining

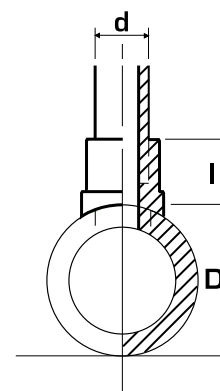


Ready!



## PART C: WELD-IN SADDLES

Art. no.	Dimension	D	d	l	Drill	Special peeling drill <sup>1</sup>	Tool
		mm	mm	mm	Art. no.	Art. no.	Art. no.
15156	40/20 mm	40	25	27.0	50940	50921	50614
15158	40/25 mm	40	25	28.0	50940	50921	50614
15160	50/20 mm	50	20	27.0	50940	50921	50616
15162	50/25 mm	50	25	28.0	50940	50921	50616
15164	63/20 mm	63	20	27.0	50940/50941	50921	50619
15166	63/25 mm	63	25	28.0	50940/50941	50921	50619
15168	63/32 mm	63	32	30.0	50942	50922	50620
15170	75/20 mm	75	20	27.0	50940/50941	50921	50623
15172	75/25 mm	75	25	28.0	50940/50941	50921	50623
15174	75/32 mm	75	32	30.0	50942	50922	50624
15175	75/40 mm	75	40	34.0	50944	50924	50625
15176	90/20 mm	90	20	27.0	50940/50941	50921	50627
15178	90/25 mm	90	25	28.0	50940/50941	50921	50627
15180	90/32 mm	90	32	30.0	50942	50922	50628
15181	90/40 mm	90	40	34.0	50944	50924	50629
15182	110/20 mm	110	20	27.0	50940/50941	50921	50631
15184	110/25 mm	110	25	28.0	50940/50941	50921	50631
15186	110/32 mm	110	32	30.0	50942	50922	50632
15188	110/40 mm	110	40	34.0	50944	50924	50634
15189	110/50 mm	110	50	34.0	50946	50926	50635
15190	125/20 mm	125	20	27.0	50940/50941	50921	50636
15192	125/25 mm	125	25	28.0	50940/50941	50921	50636
15194	125/32 mm	125	32	30.0	50942	50922	50638
15196	125/40 mm	125	40	34.0	50944	50924	50640
15197	125/50 mm	125	50	34.0	50946	50926	50642
15198	125/63 mm	125	63	38.0	50948	50928	50644
15206	160/20 mm	160	20	27.5	50940/50941	50421	50648
15208	160/25 mm	160	25	28.5	50940/50941	50421	50648
15210	160/32 mm	160	32	30.0	50942	50422	50650
15212	160/40 mm	160	40	34.0	50944	50424	50652
15214	160/50 mm	160	50	34.0	50946	50426	50654
15216	160/63 mm	160	63	38.0	50948	50428	50656
15218	160/75 mm	160	75	42.0	50987**	-	50657
15220	160/90 mm	160	90	45.0	50988**	-	50658
15228	200–250/20 mm	200–250	20	27.5	50941	50421	50660 / 50672
15229	200–250/25 mm	200–250	25	28.5	50941	50421	50660 / 50672
15230	200–250/32 mm	200–250	32	30	50942	50422	50662 / 50674
15231	200/40 mm	200	40	34	50944	50424	50664
15232	200/50 mm	200	50	34	50946	50426	50666
15233	200/63 mm	200	63	37.5	50948	50428	50668
15234	200/75 mm	200	75	42.0	50987**	-	50667
15235	200/90 mm	200	90	42.0	50988**	-	50669
15236	200/110 mm	200	110	49.0	50989**	-	50670
15237	200/125 mm	200	125	55.0	50990**	-	50671
15251	250/40 mm	250	40	34	50944	50424	50676
15252	250/50 mm	250	50	34	50946	50426	50678
15253	250/63 mm	250	63	37.5	50948	50428	50680
15254	250/75 mm	250	75	42.0	50987**	-	50682
15255	250/90 mm	250	90	45.0	50988**	-	50684
15256	250/110 mm	250	110	49.0	50989**	-	50686
15257	250/125 mm	250	125	55.0	50990**	-	50688
15260	315/63 mm	315	63	37.5	50948	-	50690
15261	315/75 mm	315	75	42.0	50987**	-	50692
15262	315/90 mm	315	90	45.0	50988**	-	50694
15263	315/110 mm	315	110	49.0	50989**	-	50696
15264	315/125 mm	315	125	55.0	50990**	-	50698
15268	355/90 mm	355	90	45.0	50988**	-	50716
15269	355/110 mm	355	110	49.0	50989**	-	50718
15270	355/125 mm	355	125	55.0	50990**	-	50720
315265	315/160 mm	315	160	80.0	50991**	-	50699
315271	355/160 mm	355	160	80.0	50991**	-	50722
15265	315/160 mm	315	160	80.0	50991**	-	50699
15271	355/160 mm	355	160	-	50991**	-	50722
15275	400–500/75 mm	400–500	75	-	50987**	-	50728
15277	400–450/110 mm	400–500	110	-	50989**	-	50736
15278	400/125 mm	400	125	-	50990**	-	50742
15288	400–500/90 m	400–500	90	-	50988**	-	50732
15290	450–500/125 m	400–500	125	-	50990**	-	50744
15300	400–630/63 mm	400	63	-	50948	-	50726
15303	500–560/110 mm	500–560	110	-	50989**	-	50738
15315	560–630/75 mm	560–630	75	-	50987**	-	50730
15316	560–630/90 mm	560–630	90	-	50988**	-	50734
15318	560–630/125 mm	560–630	125	-	50990**	-	50746
15331	630/110 mm	630	110	-	50989**	-	50740

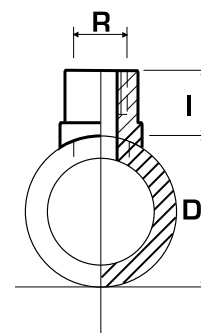


1) only for aquatherm blue pipe OT fibre composite pipes Art. no. 2170708–2170138  
 \*\* only in conjunction with the aquatherm hole saw system

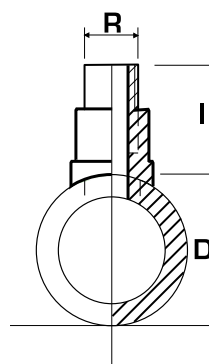


## PART C: WELD-IN SADDLES

Art. no.	Dimension	D	d	l	Sensorwels	Drill	Special peeling drill*	Tool
		mm	mm	mm	Art. no.	Art. no.	Art. no.	Art. no.
28214	40/25 x 1/2" f	40	1/2"	39,0	14	50940	50920	50614
28216	50/25 x 1/2" f	50	1/2"	39,0	14	50940	50921	50616
28218	63/25 x 1/2" f	63	1/2"	39,0	14	50940/50941	50921	50619
28220	75/25 x 1/2" f	75	1/2"	39,0	14	50940/50941	50921	50623
28222	90/25 x 1/2" f	90	1/2"	39,0	14	50940/50941	50921	50627
28224	110/25 x 1/2" f	110	1/2"	39,0	14	50940/50941	50921	50631
28226	125/25 x 1/2" f	125	1/2"	39,0	14	50940/50941	50921	50636
28230	160/25 x 1/2" f	160	1/2"	39,0	14	50940/50941	50921	50648
28232	200–250/25 mm x 1/2" f	200–250	1/2"	39,0	14	50941	50921	50660 / 50672
28234	40/25 x 3/4" f	40	3/4"	39,0	16	50940	50920	50614
28236	50/25 x 3/4" f	50	3/4"	39,0	16	50940	50921	50616
28238	63/25 x 3/4" f	63	3/4"	39,0	16	50940/50941	50921	50619
28240	75/25 x 3/4" f	75	3/4"	39,0	16	50940/50941	50921	50623
28242	90/25 x 3/4" f	90	3/4"	39,0	16	50940/50941	50921	50627
28244	110/25 x 3/4" f	110	3/4"	39,0	16	50940/50941	50921	50631
28246	125/25 x 3/4" f	125	3/4"	39,0	16	50940/50941	50921	50636
28250	160/25 x 3/4" f	160	3/4"	39,0	16	50940/50941	50921	50648
28254	200–250/25 mm x 3/4" f	200–250	3/4"	39,0	16	50941	50921	50660 / 50672
28260	75/32 x 1" f	75	1"	43,0	20	50942	50922	50624
28262	90/32 x 1" f	90	1"	43,0	20	50942	50922	50628
28264	110/32 x 1" f	110	1"	43,0	20	50942	50922	50632
28266	125/32 x 1" f	125	1"	43,0	20	50942	50922	50638
28270	160/32 x 1" f	160	1"	43,0	20	50942	50922	50650
28274	200–250/32 mm x 1" f	200–250	1"	43,0	20	50942	50922	50662 / 50674



Art. no.	Dimension	D	d	l	Drill	Special peeling drill*	Tool
		mm	mm	mm	Art. no.	Art. no.	Art. no.
28314	40/25 x 1/2" m	40	1/2"	55,0	50940	50920	50614
28316	50/25 x 1/2" m	50	1/2"	55,0	50940	50921	50616
28318	63/25 x 1/2" m	63	1/2"	55,0	50940/50941	50921	50619
28320	75/25 x 1/2" m	75	1/2"	55,0	50940/50941	50921	50623
28322	90/25 x 1/2" m	90	1/2"	55,0	50940/50941	50921	50627
28324	110/25 x 1/2" m	110	1/2"	55,0	50940/50941	50921	50631
28326	125/25 x 1/2" m	125	1/2"	55,0	50940/50941	50921	50636
28330	160/25 x 1/2" m	160	1/2"	55,0	50940/50941	50921	50648
28334	40/25 x 3/4" m	40	3/4"	56,0	50940	50921	50614
28336	50/25 x 3/4" m	50	3/4"	56,0	50940	50921	50616
28338	63/25 x 3/4" m	63	3/4"	56,0	50940/50941	50921	50619
28340	75/25 x 3/4" m	75	3/4"	56,0	50940/50941	50921	50623
28342	90/25 x 3/4" m	90	3/4"	56,0	50940/50941	50921	50627
28344	110/25 x 3/4" m	110	3/4"	56,0	50940/50941	50921	50631
28346	125/25 x 3/4" m	125	3/4"	56,0	50940/50941	50921	50636
28350	160/25 x 3/4" m	160	3/4"	56,0	50940/50941	50921	50648



\* only for aquatherm blue pipe OT fibre composite pipes

## PART C: WELD-ON SADDLE

### Drilling of aquatherm PP pipes with the hot tapping tool Art. no. 50890 under pressure.

The aquatherm weld-on saddle set (consisting of ball valve, pipe and saddle in the dimensions 40 mm and 63 mm) is used for the additional installation of branch connections.

The polypropylene pipes aquatherm green pipe and blue pipe with the pipe structure S, MF and MF UV in the dimensions 75–630 mm can be drilled under pressure.

#### SAFETY INSTRUCTION:

The medium pressure (e.g. water) in the main pipe of 6 bar and the medium temperature of max. 60 °C must not be exceeded.

#### 1. Preparation and fusion

After removal of the oxide layer on the main pipe and the cleaning of the welding surfaces, the welding device is placed with the weld-on saddle tool on the surfaces to be welded. Under gentle pressure and a warm-up time of 90 sec. an even bead must be there on the welding surfaces. After a warm-up time, the component is placed quickly on the main pipe. The component is fixed and aligned on the main pipe for max. 15 seconds. The connection is fully able to work under pressure after a cooling time of 15 minutes.

#### 2. Assembly of the hot tapping tool

The hot tapping tool is screwed onto the component with the retracted drill rod, which is secured by the clamping claw. The screw connection on the ball valve is tightened by hand. After the ball valve has been opened, the welded component in conjunction with the hot tapping tool is tested for leaks with water or air.

#### 3. Drilling process

When the clamping claw is loosened, the drill rod is pushed until the drilling tool contacts the pipe. Depending on the branch size, the appropriate feed rate must be set. The drilling is carried out by actuating the ratchet handle and simultaneously by giving a manually sensitive feed on the feed handles. After completion of the drilling and the release of the clamping claw, the drill rod is lead back to the stop by hand. Caution: The drill rod can rebound by the pressure in the pipe. The ball valve is then closed and the hot tapping device is relieved of pressure.

#### 4. Disassembly

Detach the hot tapping device by holding the screw on the ball valve and remove it from the component. Pull the drill rod out of the hot tapping device and screw the drilling tool from the drill rod using a suitable wrench or armature tongs.



Hot tapping device Art.no. 50890



1. Welding-on of weld-on saddle set onto the main pipe



2. Assembly of the hot tapping tool onto the component



3. Start of the drilling process



4. Removal of the drilling residues out of the drilling tool

## PART D: PULLING JIG (HITCH)

### Note

The following description of the electric pulling jig applies to the type of the year 2013.

### Operation and fusion

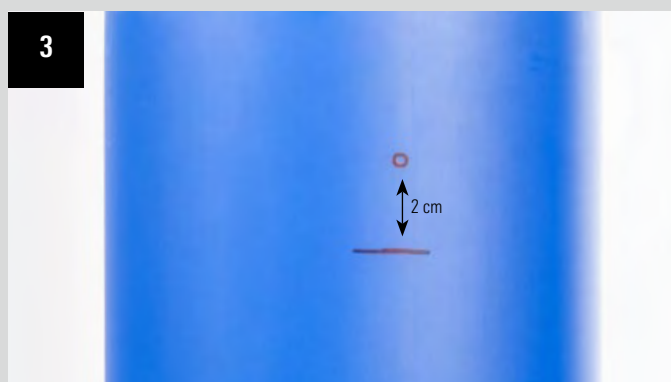
With the help of the electric pulling jig, all aquatherm polypropylene pipes and fittings in dimensions from 63 to 125 mm are in a very simple manner without any effort welded together.

Also the pulling jig simplifies the welding of pipes and fittings under ceilings, in narrow shafts and other hard-to-reach places.



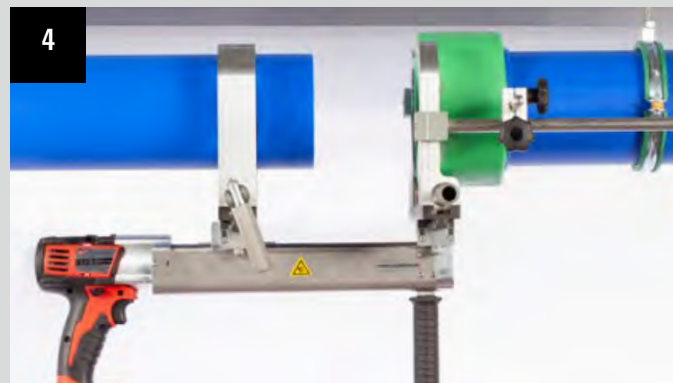
### Preparation for the fusion

Mark the welding depth with the included green marking template on the pipe end. (Fig. 1). In addition, the clamping depth is measured 2 cm from the welding depth marking and marked again. (Fig. 2+3)

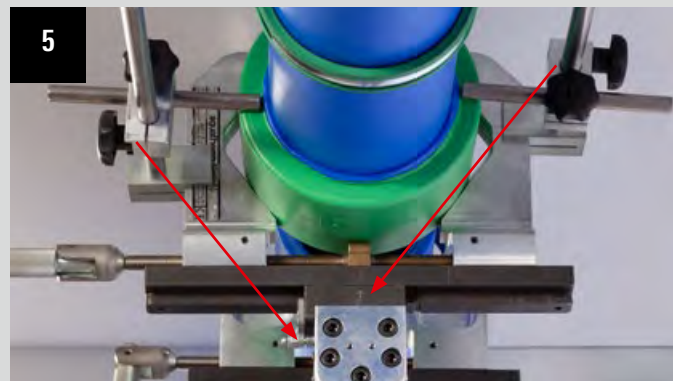


## FUSION

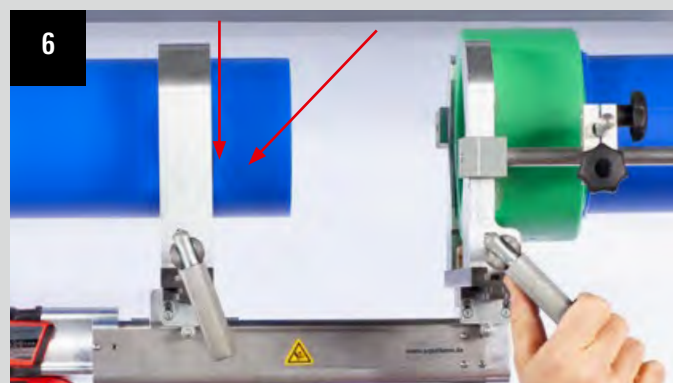
The pulling jig is now placed on the fitting or pipe to be welded with the clamping jaws. (Fig. 4)



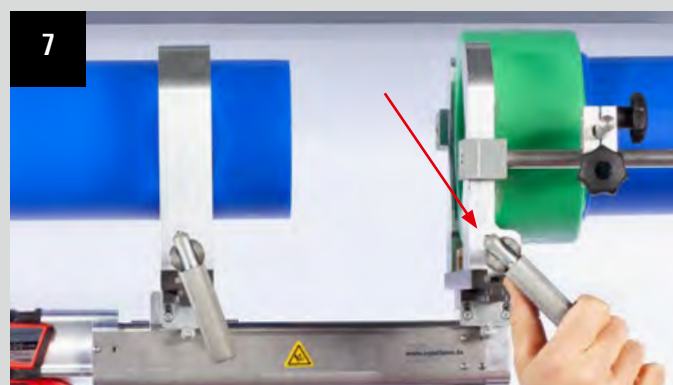
The two arrows of the jaws and the machine must be flush with each other. The jaws are to be fixed with the help of the clamping device (Fig. 5).



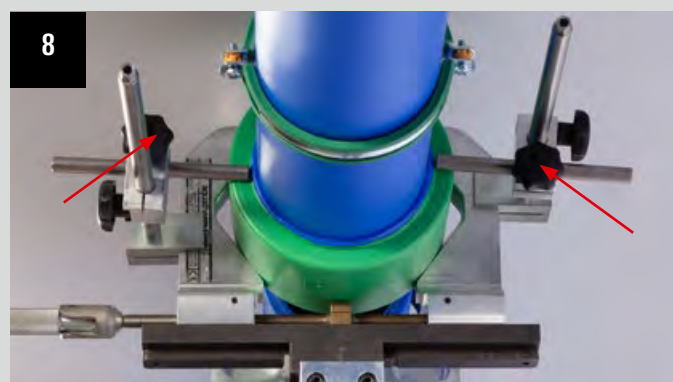
Align the pipe so that the rear marking is flush with the inner edge of the clamping jaw. The front marking identifies the welding depth (Fig. 6).



Lock pipe and fitting by using the front adjusting screws. (Fig. 7)



Never clamp so tight that deformations appear. Additionally, with the fitting support, all fittings are supported. The support is mounted on the clamping jaw for fittings. (Fig. 8)





## Fusion

Hold the welding device between pipe and fitting and ride machine carriage in batches together (pay attention to the welding depth).

Basically the jaws must be released after the insertion of pipe and fitting in the welding tool by a short return of the machine (3–7 mm)! The jaws must always be parallel to each other. (Fig. 9 +10)

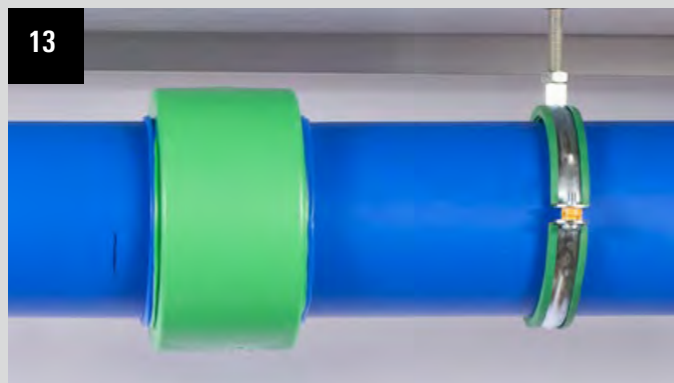
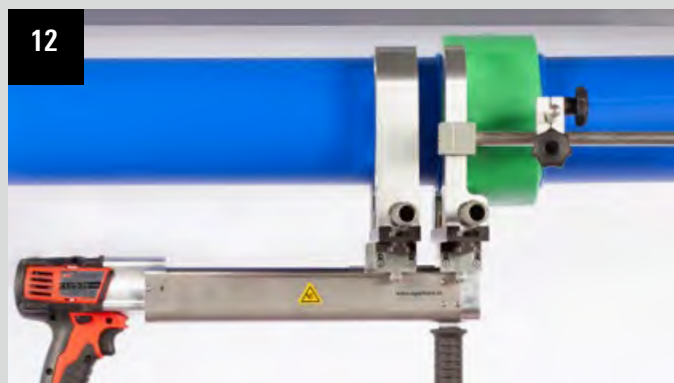
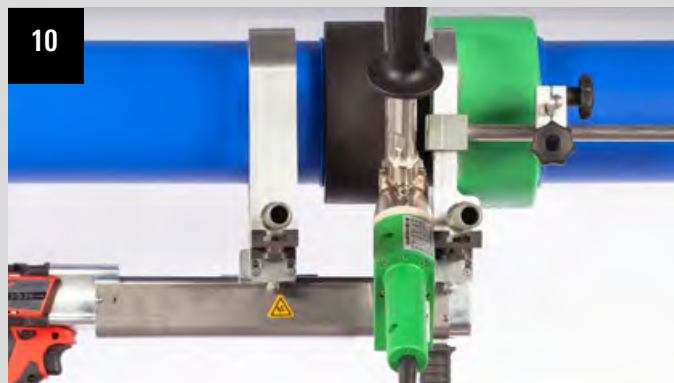
After finishing of the warm-up drive the machine carriage apart and remove the welding device. (Fig. 11)

Ride the jaws together again and release the clamping jaws again by a short return of the machine (3–7 mm). (Fig. 12)

## CAUTION:

Jaws may be released only after the specified cooling time!

Pipe and fitting are now joined by fusion to a material unit. (Fig. 13)



The fusion is subject to the following parameters

Pipe external- Ø	Welding depth	Heating time		Welding time	Cooling time
		sec. DVS	sec. AQT*		
50	23,5	18	27	6	4
63	27,5	24	36	8	6
75	30,0	30	45	8	8
90	33,0	40	60	8	8
110	37,0	50	75	10	8
125	40,0	60	90	10	8

**ATTENTION:** sec. AQT\* heating times recommended by aquatherm at ambient temperatures below +5 °C.

The General Guidelines for Heated Socket Welding according to DVS 2207, Part 11 are applied hereupon.

## PART E: AQUATHERM WELDING MACHINE

for stationary processing 50–125 mm

precise pre-assembly and facilitation by hand creek

clamping jaws 50–125 mm, tools 50–125 mm,

Scope of supply:

wooden transport box, slide with sub construction, clamping jaws 50–125 mm, welding tools 50–125 mm, stay with rolls

For welding of aquatherm blue pipe a welding temperature of 260 °C at the welding tools is necessary (see page 47).

Instructions for use can be taken from the attached operation manual.

The fusion is subject to the following parameters

Pipe external- Ø	Welding depth	Heating time		Welding time	Cooling time
		sec. DVS	sec. AQT*		
50	23,5	18	27	6	4
63	27,5	24	36	8	6
75	30,0	30	45	8	8
90	33,0	40	60	8	8
110	37,0	50	75	10	8
125	40,0	60	90	10	8

## PART E: WELDING MACHINE PRISMA-LIGHT

welding machine prisma-light with heating plate without tools

clamping fixture for fixing the prisma-light e. g. at the work bench

1. Check machine: temperature lamp blinks after reaching the welding temperature (260 °C), adjust clamping jaws 63–125 mm coarsely. Mark welding depth with the template at the pipe.
2. Fix the fitting against the clamping jaws.
3. Place the pipe loose in the opposite clamping jaws.
4. Position the welding device centrally to the pipe-fitting axis and remove it.
5. Lock the front calibration knob and drive up the slide as far as it will go.
6. In this position push the pipe against the fitting and fix it with the clamping jaws.
7. Regulate the welding time according to the table on page 57, place the welding device and push the fitting and pipe slowly as far as it will go up to the marking.
8. The heating time starts when pipe and fitting are completely pushed on the tool. When heating time is complete slide return the slide, remove the heating device quickly and join the pipe and fitting.
9. Consider cooling times from the table on page 57.

More detailed information can be found in the enclosed operating manuals.



**ATTENTION:** sec. AQT\* heating times recommended by aquatherm at ambient temperatures below +5 °C.

The General Guidelines for Heated Socket Welding according to DVS 2207, Part 11 are applied hereupon.

\*heating times recommended by aquatherm at ambient temperatures below + 5 °C

**Dimension 160–630 mm:**

The dimension 160–630 mm are joined by butt-welding.

Detailed information on page 64 + 65.



## PART F: ELECTROFUSION DEVICE

### Fusion

The aquatherm electrofusion device was specially developed for electrofusion sockets from Ø 20–250 mm.

The fusion of 160–250 mm aquatherm blue pipe MF OT with the electrofusion socket is not possible.

### Technical information:

supply voltage: 230 V (nominal voltage)

nominal capacity: 2.800 VA, 80 % ED

rated frequency: 50 Hz–60 Hz

protection class: IP 54

### 1. General and inspection

Cleanliness is – besides correct workmanship – the most important precondition for a correct fusion. For keeping the sockets clean do not unwrap them before processing.

The pipe surface must also be clean and undamaged. Deformed pipe ends must be cut off.

All parts of the system to be fused as well the temperature sensors shall have the same temperature (e.g. sun radiation or unadapted storing may cause differences in temperature!) within the acceptable range of temperature (e.g. +5 °C to 40 °C according to DVS 2207).

### 2. Preparation

Follow carefully the order of working steps!

Preparation is one of the most important steps of the electrofusion process!

2.1 Cut the ends of the pipes rectangularly and deburr them thoroughly

2.2 Clean and dry the ends of the pipes at the necessary length

2.3 Mark the depth of aquatherm electro-fusion-socket on the end of the pipe



aquatherm electrofusion device Ø 20–250 mm



aquatherm electrofusion socket



aquatherm peeling tool (Art. no. 50558–50572, up to 90 mm)  
(from 110–250 mm: Art. no. 50574–50592 (without picture))

Welding depth up to 250 mm													
Ø	20	25	32	40	50	63	75	90	110	125	160	200	250
ET	35,0	39,0	40,0	46,0	51,0	59,0	65,0	72,5	80,0	86,0	93,0	105,0	125,0

## PART F: ELECTROFUSION DEVICE

### Fusion

Peel the surface of both pipes up to the marks thoroughly with a peeling tool (use the aquatherm peeling tool with the respective pipe diameter)

### IMPORTANT!

Before the fusion peel off the oxygen barrier layer of the aquatherm blue pipe OT and the UV-layer of the fibre-composite-pipe-UV completely to the stop by using the double peeling tools (Art. no. 50507, 50511, 50516, 50519, 50525) considering the pipe diameter.

By turning the adjusting screw clockwise to the stop, the peeling tools can be adjusted into small depths (sockets), by turning them counter clockwise up to the stop they can be adjusted into big peeling depth (electrofusion sockets), see page 48.

### Clean again thoroughly

Without complete peeling of the fusion surface a homogeneous and tight welding connection is not assured. Damages of the surface like axial grooves and scratches are not accepted in the fusion zone. Never touch peeled surfaces and protect them against dirt and grease. Start the fusion process within 30 mins after peeling.

### 3. Assembling the electrofusion sockets

Avoid soiling and fix all parts securely!

3.1 Open the protective wrapping of the aquatherm electrofusion sockets (cut with knife along the edge of the bore), leaving the rest of the foil intact. Clean the inside of the entire fitting carefully with aquatherm cleaning wipes. The socket must be dry after cleaning. Assemble the fitting within 30 mins after opening of the protective foil.

3.2 Push the aquatherm electrofusion sockets on the clean and dry end of the pipe (up to the marked depth). Use pressing clamps if necessary.



Cut the pipes to be welded, peel, clean and dry thoroughly with a lint-free cloth or paper



Clean the electrofusion socket's inner surface with a lint-free cloth or paper. Remove moisture that may occur **immediately before the welding process** again.



Push the electrofusion socket onto the pipe end





## PART F: ELECTROFUSION DEVICE

Remove the protective foil completely and push the other prepared, dry pipe end into the aquatherm electro-fusion sockets tighten in the fixation.

Leave the pipes, free from bending stress or own weight, within the aquatherm electrofusion socket. the socket is movable at both pipe ends after assembling. The air gap has to be even around the circumference. Pipes and fittings must be welded stress-free.

### 4. Fusion process

- 4.1 Position the fitting with even air gap around the circumference.
- 4.2 Regulate fusion equipment for the right fusion parameter.
- 4.3 Compare the indications of the fusion equipment with the parameters of the label.
- 4.4 Start and watch the fusion process.

Do not move or stress pipe and fitting during the whole fusion process and cooling time.

### 5. Cooling time and pressure test

A fused pipe-joint shall not be moved (no release of the fixation) or stressed before complete cooling.

The minimum required cooling time is marked on each aquatherm electrofusion socket. Ambient temperatures of more than 25 °C or strong sun-radiation need longer cooling times.

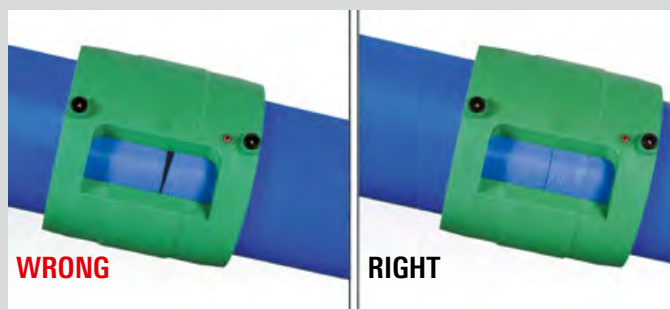
### Working pressure

The operation pressure can be taken from the imprint on the electric welding socket. The relation between working temperature, pressure load and service life is given in the tables "Permissible working pressure."

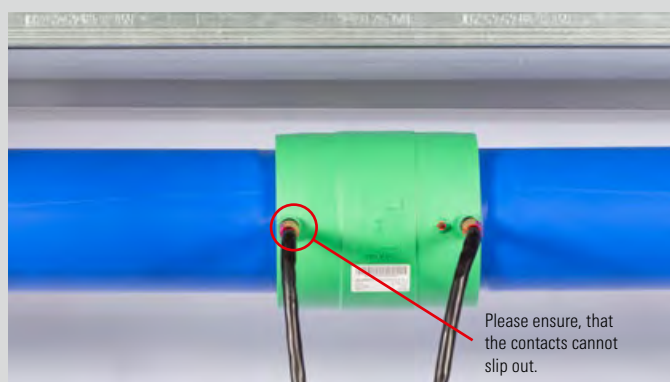
For further information concerning electrofusion socket and details about the aquatherm electrofusion device read the enclosed operating instructions.



Push the second pipe – also peeled and cleaned – into the socket



For a stable welding result it is important that both pipe ends inside the electrofusion socket are with parallel faces! Follow the minimum welding depth – absolutely!



Adjust the socket diameter on the welding device. Start and control welding process. Keep the cooling time. Finished!

Kind of stress	Compressive stress	Minimum waiting period
Tension, bend, torsion of unpressurized pipes		20 minutes
Test- or working pressure of pipes pressurized	up to 0.1 bar (1.5 psi) 0.1 up to 1 bar (1.5–14.5 psi) over 1 bar (14.5 psi)	20 minutes 60 minutes 120 minutes
Repeating of the welding process		60 minutes



### QUICK CONNECTIONS IN MINUTES, FOR LIFETIME SECURITY

Leak-free joints in just a few minutes: This is what the new aquatherm push-fit fittings offer. They provide a simple, fast and at the same time secure connection for aquatherm blue pipes in heating, cooling and industrial applications.

Thanks to the simple push-fit system, aquatherm piping systems can be connected up to 40% faster than with electrofusion socket welding. The tool requirement is also significantly lower. Joint assembly can be done in any weather conditions, in tight spaces such as shafts for risers or in trenches, and even under the ceiling.

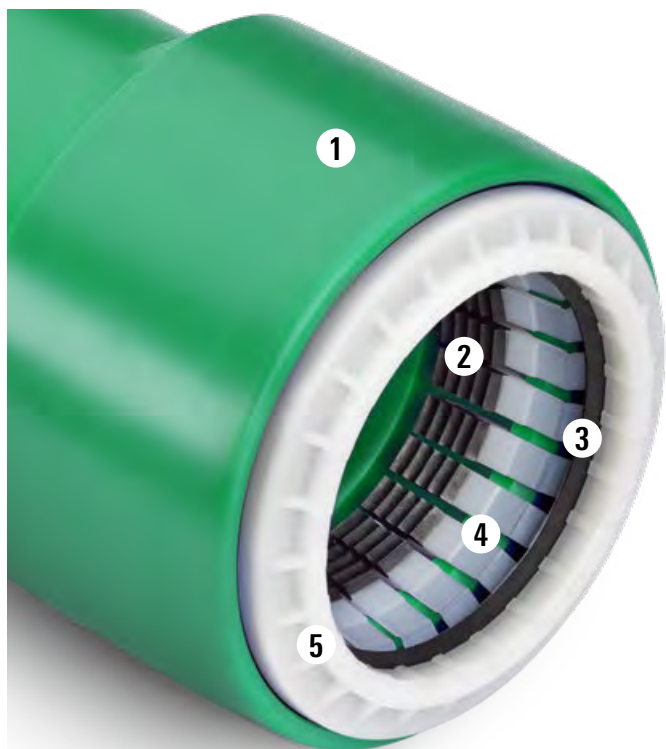
Made from the high-quality and robust material fusiole® PP-RCT, the aquatherm push-fit fitting is suitable for fluid temperatures between 0 °C and 95 °C (32-203°F). This is confirmed by the test institute IMA Dresden, Germany.

The product portfolio ranges from push-fit adapters and push-fit couplings to moulded and fabricated fittings in various configurations and sizes. aquatherm thus offers all components for piping installation in plant engineering. The piping system is not only corrosion-free but can be subjected to full pressure immediately after installation without any waiting times.

### ADVANTAGES

- increased pressure and temperature resistance through fusiole® PP-RCT
- secure connection
- profile sealing gasket protects the mechanics of the push-fit fittings from dirt, debris and contaminants
- corrosion-free
- long life span
- full bore flow, no reduction in diameter
- can be used with standard and UV aquatherm blue pipe products in SDR 11 and SDR 17.6, for sizes 90 mm (3-in) to 450 mm (18-in)





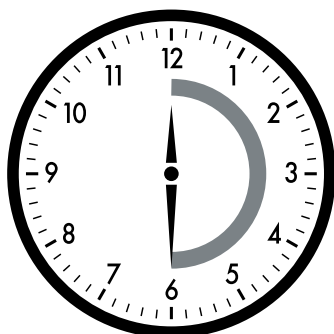
- 1 Body of socket**  
extremely rugged and made of the durable fusiolen® PP-RCT material
- 2 Grip elements made of high-strength engineered thermoplastic**  
for extra tensile strength
- 3 Profile gasket**  
prevents the penetration of dirt, debris and contaminants
- 4 Spring-loaded elements**  
lead the grip elements and create the required radial forces
- 5 Thrust protection unit**  
can be easily replaced if necessary

## INSTALLATION ADVANTAGES

- fast installation times
- can be done in all weather conditions, even at temperatures below 0 °C or when raining or snowing
- assembly in confined spaces such as shafts for risers or trench laying
- no heavy or expensive tools necessary
- residual fluid in the pipes is not a problem when installing in existing systems
- leakproof connection immediately, no wait time

### 30 MINUTES OR 6 MINUTES?

NO COOLING OR WAIT TIME FOR PUSH-FIT CONNECTIONS!



Electrofusion joint completed:  
**30 minutes/piece**



aquatherm push-fit fittings assembled:  
**6 minutes/piece**

## ASSEMBLY INSTRUCTIONS SUMMARY

**Note:** The following steps are a summary of the assembly procedure. Please consult the full assembly instructions provided with the fittings for proper installation. Or send an email to [infoservice@aquatherm.de](mailto:infoservice@aquatherm.de) to receive the PDF.



1

Cut the pipe ends to length at a right angle.



2

Chamfer the pipe end with the aquatherm chamfering tool (see table minimum chamfer length).



3

Read insertion depth on the push-fit fitting ...



4

... and mark the insertion depth on the pipe.



5

Apply lubricant evenly on the pipe (5 cm or 2-1/2 in.).



6

Apply lubricant also on the rubber gaskets of the push-fit fitting.

### **WARNING: SHARP EDGES!**

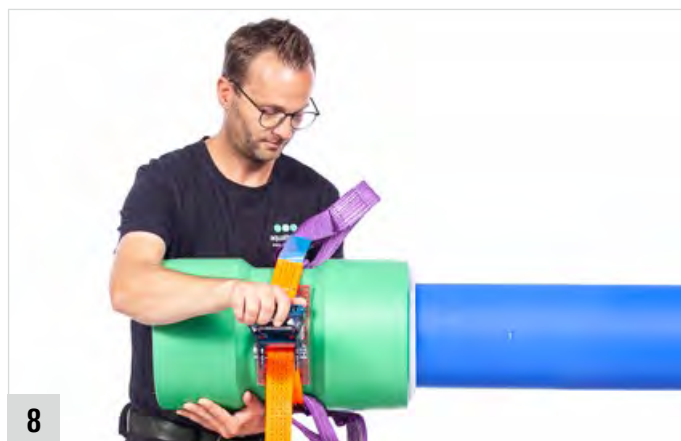
The grip ring on the interior of the fitting contains sharp components. Hand protection and proper tools must be used when applying lubricant to the interior of the fitting or reaching inside the fitting for any other purpose.



**Note:** When processing pipe dimensions  $\leq 160$  mm, no pulling/alignment device is required. However, proper alignment must be maintained in all sizes when assembling.



Place the push-fit fitting on the pipe end and press it over the first rubber seal.



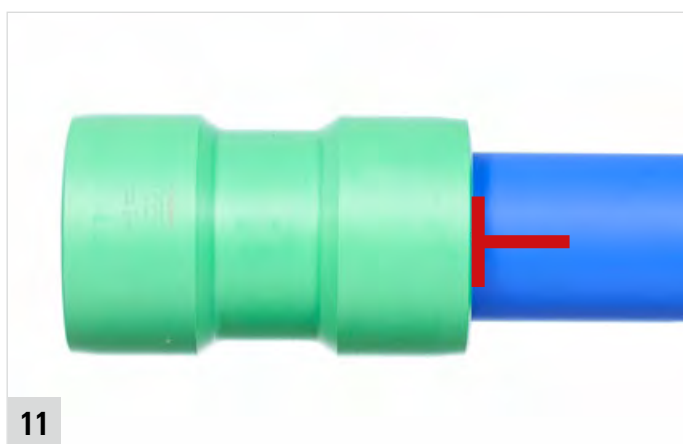
Final insertion of the pipe into the fitting must be done with an alignment tool.



Attach the alignment tool securely to the pipe and the push-fit fitting.



Pull the push-fit fitting onto the pipe end up to the marked insertion depth.



Completed assembly showing proper alignment and insertion.

TOOLS	
Art.-no.	Description
50530	ratchet puller (come-along)
50532	chamfering tool Widos 250 – 500 mm
50510	chamfering tool 32 – 250 mm
50533	Tension band width 50 mm including drawbar eyes
50534	brush
50535	lubricant

MINIMUM CHAMFER LENGTH	
Outer diameter [mm]	Chamfer length [mm]
90	10
110	
125	
160	
200	15
250	20
315	
355	
400	
450	

MINIMUM CHAMFER LENGTH	
Nominal size [inch]	Chamfer length [inch]
3	3/8
3-1/2	
4	
6	
8	5/8
10	7/8
12	
14	
16	
18	

## FLANGE CONNECTIONS

### THE FOLLOWING MUST BE OBSERVED IN THE USE OF FLANGE CONNECTIONS:

Flange adapter respectively the sealing surfaces must always be aligned parallel to each other. A subsequent tightening of the flange connection after the welding process must be avoided. It is important to ensure that the flange faces are clean and undamaged.

The screw length should be selected so that the screw thread is as flush as possible, maximum two threads from the nut. To distribute the force of the screw head and the nut over a larger area, washers are used. Screws, nuts and washers must be clean and undamaged.

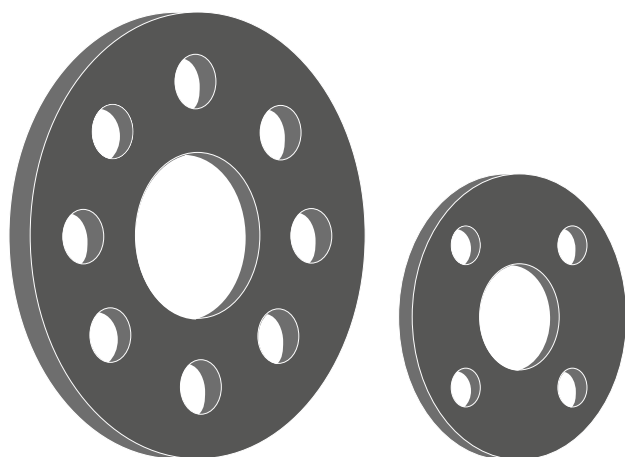
In order to achieve proper force distribution (surface pressure) acting on the seal, note the following:

- Screw joints must be tightened diagonally and evenly
- Torque information on the individual flanges according to DVS 2210-1 supplement 3 must be followed (see table). For valve or device connections, the manufacturer's instructions must be observed.

For flange connections, exposed to a mutual load, take care that they are checked as part of the maintenance and retightened, if necessary.

### TORQUE FLANGE according to manufacturer's instructions

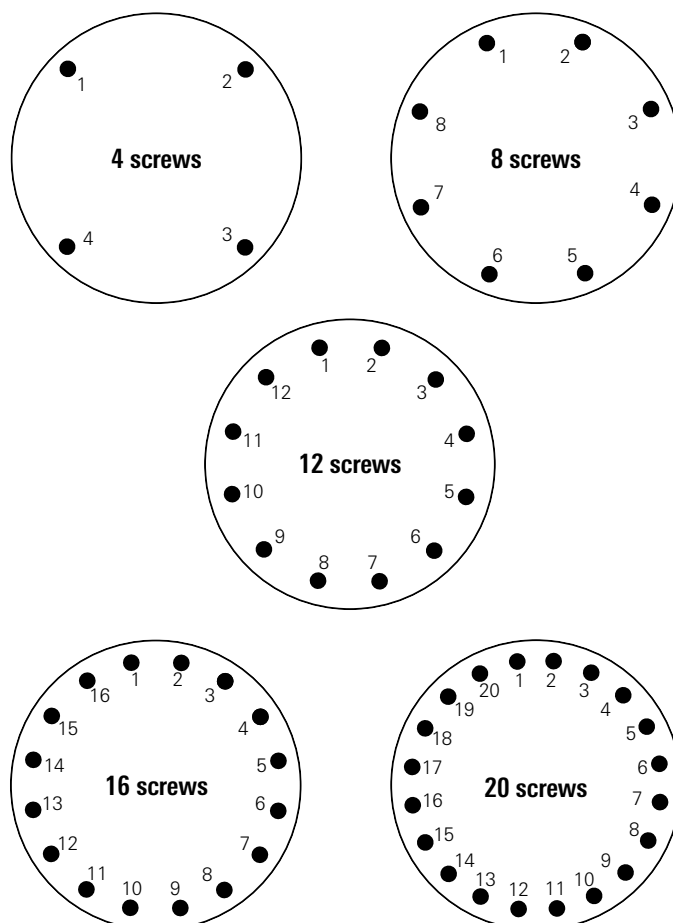
Art. no.	Dimension	DN specification	Nm
15712	32 mm	25	15
15714	40 mm	32	20
15716	50 mm	40	30
15718	63 mm	50	35
15720	75 mm	65	40
15722	90 mm	80	40
15724	110 mm	ohne	50
15726	125 mm	100	50
15730	160 mm	125	60
15734	200 mm	150	75
15738	250 mm	200	95
15742	315 mm	250	100
15744	355 mm	300	100
15746	400 mm	350	100
15748	450 mm	400	120
15750	500 mm	450	190
15752	560 mm	500	220
15754	630 mm	500	220



### TIGHTENING SEQUENCE

Number of screws	Criss-Cross Pattern Tightening Sequence
4	1 - 3 - 2 - 4
8	1 - 5 - 3 - 7 - 2 - 6 - 4 - 8
12	1 - 7 - 4 - 10 - 2 - 8 - 5 - 11 - 3 - 9 - 6 - 12
16	1 - 9 - 5 - 13 - 3 - 11 - 7 - 15 - 2 - 10 - 6 - 14 - 4 - 12 - 8 - 16
20	1 - 11 - 6 - 16 - 3 - 13 - 8 - 18 - 5 - 15 - 10 - 20 - 4 - 14 - 9 - 19 - 7 - 17 - 2 - 12

Following the table, tighten the given screw number to the desired torque value for the given round of tightening.



## REPAIR OPTIONS

Pipe repairs with the aquatherm green pipe electrofusion socket

Cut squarely 3 to 4 lengths of a fitting out of the defect pipe, symmetrically to the defect. Fit the new pipe into this gap. Prepare the pipe ends of the existing pipe as in the case of a new welding.

Peel the new piece of pipe on both sides with the peeling tool on a length of more than the length of one fitting.

Unwrap two fittings and carefully move the fittings over both ends of the new pipe.

Then place the repair-pipe into the gap and move the fittings until they are aligned with the markings on the existing pipes.

Take care, that the fittings are exactly aligned and completely free of stress before welding.

### Additional possibilities of repair

Damaged pipes may be repaired by means of

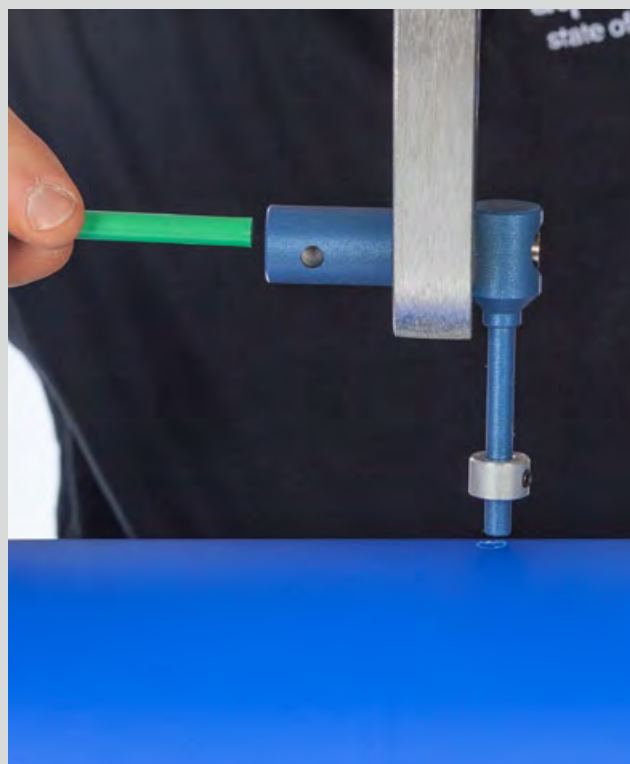
fusion (see Part B)  
electrofusion socket (see Part F).

In addition to this the aquatherm PP-R/PP-RP systems offers the possibility of the

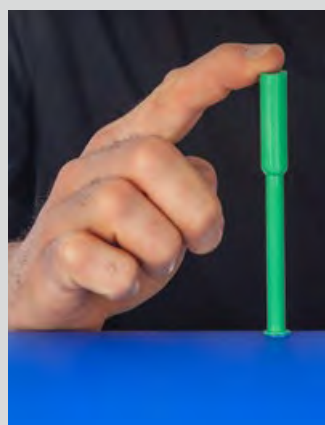
### pipe repair stick.

The required welding tool (Art. no. 50307/11) and repair stick (Art. no. 60600) are described on page 175.

The installation information is enclosed with the welding tool, but may also be ordered separately (Order-No. D 11450) from aquatherm.



Heat-up



Repair stick



Cutting

## PART G: BUTT-WELDING OF PIPE DIMENSION 160–630 MM

The following aquatherm pipes series are available:

aquatherm blue pipe SDR 11 MF fibre-composite pipe

aquatherm blue pipe SDR 11 MF OT fibre-composite pipe

aquatherm blue pipe SDR 17,6 MF fibre-composite pipe

Pipes and fittings are fused, as explained below, by butt welding:

1. Protect your place of work from weather influences
2. Check, if welding machine works properly and heat it up
3. Cut pipes into required length
4. Plastic pipes are aligned and fixed by means of the clamping elements
5. Use the milling machine for planing the pipe end to be plane-parallel
6. Remove the debris and clean the pipe ends with methylated spirit
7. Check if pipes match (tolerance: max. 0.1 x wall thickness)
8. Check width of gap between the two pipes to be welded (tolerance: max. 0.5 mm)
9. Check the temperature of the heating element (210 °C +/- 10 °C)
10. Clean the heating element

### IMPORTANT:

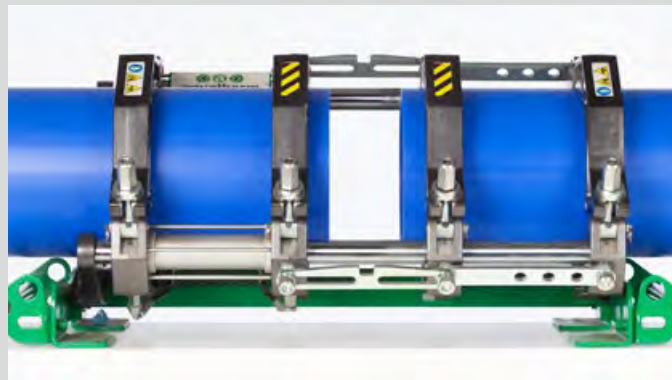
Before welding, the side to be welded of the aquatherm blue pipe ot must be chamfered with the aquatherm chamfering tool (page 177)

To ensure an optimal weld joint, the heating plates' surfaces have to be cleaned before each welding process and be free of visible and invisible residues.

Before welding, pipes are cut into the required lengths



Check performance of the welding machine and heat it up



The parts to be welded are fixed and aligned respectively, the milling machine is used



Chamfering of the front side in case of the OT and UV pipe



## PART G: BUTT-WELDING OF PIPE DIMENSION 160–630 MM

11. After the heating element has been positioned, the pipes are pushed onto the heating plate with a defined adjusting pressure.
12. After reaching the specified bead height (see tablet) the pressure is reduced. This process marks the beginning of the heating time. This time is for heating up the pipe ends up to the right welding temperature.

Specified bead height in mm:

	SDR 11	SDR 17,6
160 mm	1,0	1,0
200 mm	1,0	1,0
250 mm	1,5	1,0
315 mm	2,0	1,0
355 mm	2,0	1,5
400 mm	2,0	1,5
450 mm	2,5	1,5
500 mm		2,0
560 mm		2,0
630 mm		2,0

13. When heating time has expired, divide the machine slide, remove heating element quickly and join the pipes (by putting both parts of the slide together).
14. The pipes are fused with the required welding pressure and cooled down under pressure.
15. The welded connection can be unclamped – the welding process is finished.

Additionally please follow the instructions given in the operating manual of the welding machine and observe guideline DVS 2207, part 11.

### Important Note

1. The welding machines have to be suitable for the welding of pipes with a diameter/wall thickness ratio of up to SDR 7.4

aquatherm recommends the following manufacturers of welding machines for butt welding:

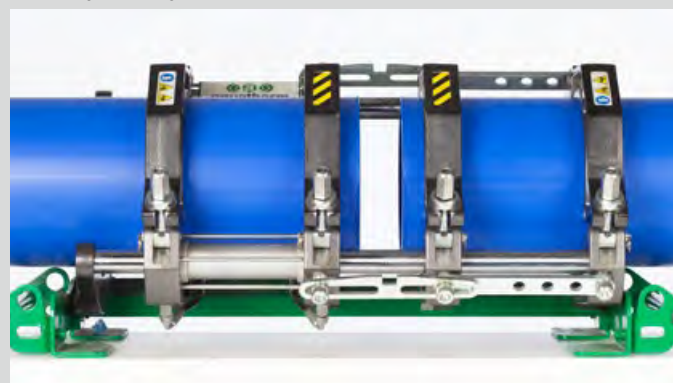
Company Ritmo  
Company Widos

2. For hydraulically operated welding machines, the real manometer pressure has to be calculated in consideration of the hydraulic piston area.

This value can be taken from the respective operating manuals.



Positioning of heating element



Divide the machine slide, remove heating element



Join the pipes, cool under pressure.

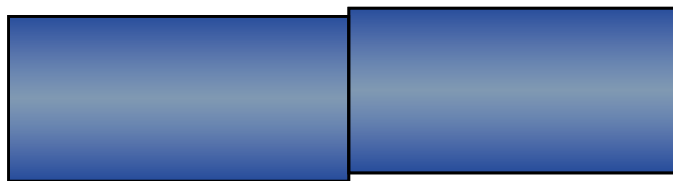


Unclamp and work on...

## Visual inspection of fusion seam – Misalignment and gap width for butt welding



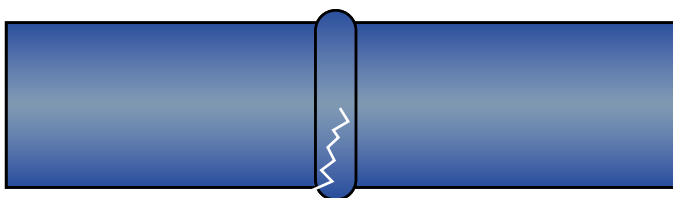
Gap width up to 355 mm outer diameter = 0.5 mm  
Gap width from 400 mm to 630 mm outer diameter = 1 mm



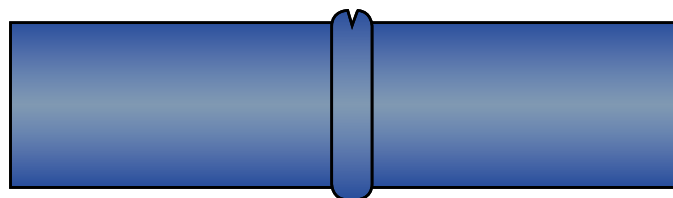
The misalignment cannot be more than 10 % of the wall thickness or max. 2 mm

## Welding defects during butt-welding

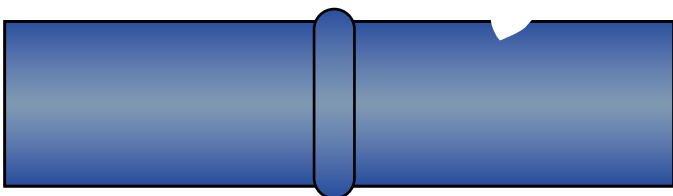
Normally a bead around the entire circumference is formed at the edge of the socket during the welding process. This bead indicates the proper welding. It is important to assure that the following welding defects are avoided:



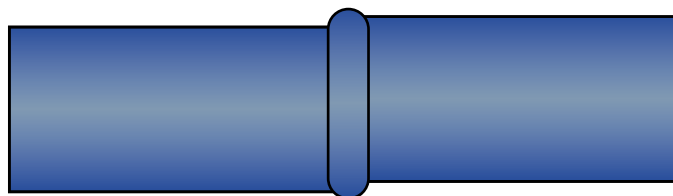
Cracks



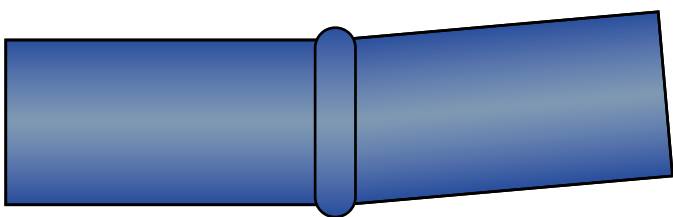
Grooves in the bead



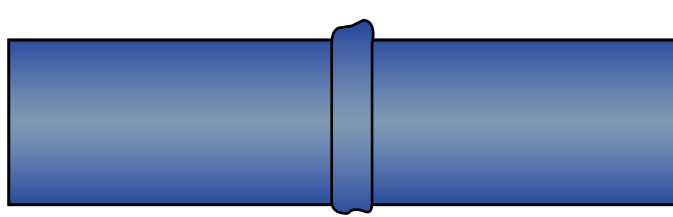
Grooves and scratches



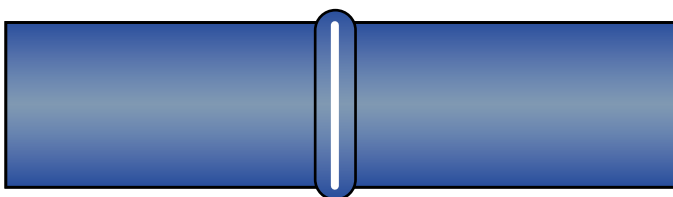
Misalignment of the joining area



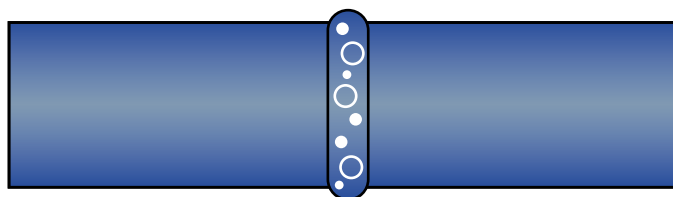
Tilting of the joining area



Uneven welding bead

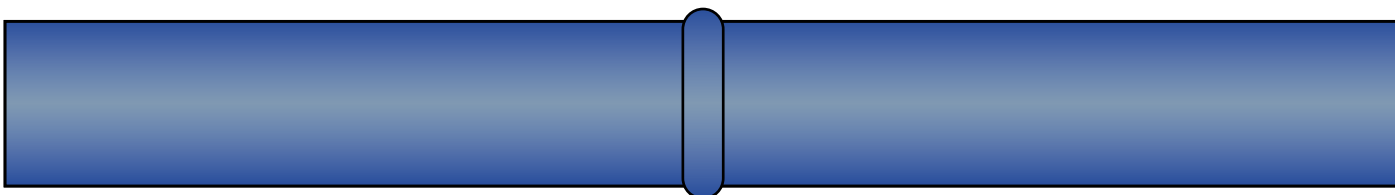


Lack of fusion at the joining area



Pores, voids and inclusion of impurities

## Correct butt welded seam



The visual inspection may be only a first indication of the welding seam quality.  
It is not a replacement for the leak test, which has to be carried out after the completion of the installation.

## Requirements for welding



The immediate welding area is to be protected against bad climatic conditions (e.g. wind, moisture and low temperatures).



If the pipes are heated unevenly as a result of sun exposure, temperature compensation by timely covering of the welding area is to be created. Cooling down by draft during the welding process should be avoided.



For perfect welding joints, both the welding areas and tools must be clean and free of grease.

## FASTENING TECHNIQUE / FIXED POINTS / SLIDING POINTS

### Fastening technique

Pipe clamps for aquatherm pipes must be dimensioned for the external diameter of the plastic pipe.

Take care, that the fastening material does not mechanically damage the surface of the pipe (aquatherm pipe clamps Art. no.: 60516–60660).

All pipes should be fastened with only aquatherm's green rubber compound fasteners, with expansion spacers, or other as deemed equal or approved by aquatherm and /or the project's Hydraulic Consultant.

Basically it must be distinguished on pipe assembly, whether the fastening material is used as

- a fixed point or
- a sliding point.

### Fixed points

On locating fixed points the pipelines are divided into individual sections. This avoids uncontrolled movements of the pipe.

In principle fixed points have to be measured and installed in a way, that the forces of expansion of aquatherm pipes as well as probable additional loads are accommodated.

On using threaded rods or threaded screws the drop from the ceiling should be as short as possible. Swinging clamps should not be used as fixed points.

Basically vertical distributions can be installed. Risers do not require expansion loops, provided that fixed points are located immediately before or after a branch.

To compensate the forces arising from the linear expansion of the pipe there must be sufficient and stable clamps and mountings.

aquatherm pipe clamps meet all mentioned requirements and – when considering the following installation instructions – are perfect for fixed point installations.

### Sliding points

Sliding clamps have to allow axial pipe movements without damaging the pipe.

On locating a sliding clamp it has to be ensured that movements of the pipelines are not hindered by fittings or armatures installed next to the clamps.

aquatherm pipe clamps have an extra even and sliding surface of the sound insulation insert.

## INSTALLATION ADVICE / LINEAR EXPANSION / CONCEALED INSTALLATION

### Installation advices

aquatherm pipe clamps are perfectly suited for fixed point and sliding point installations.

The application of distance rings depends on the type of pipe.

Fastening	MF Pipes (fibre composite pipe) & S Pipes (single layer)
Sliding Point	1 distance ring
Fixed point	no distance ring

### Linear expansion

The linear expansion of pipes depends on the difference of operating temperature to installation temperature:

$$\Delta T = T_{\text{operating temperature}} - T_{\text{installation temperature}}$$

Therefore cold water pipes have practically no linear expansion.

Because of the heat dependent expansion of the material, the linear expansion must especially be considered in case of hot and heating installations. This requires a distinction of the types of installation, e.g.

- **Concealed installation**
- **Installation in ducts**
- **Open installation.**

### Concealed installation

Concealed installations generally do not require a consideration of the expansion of aquatherm pipes.

The insulation according to DIN 1988 or the EnEV (energy saving regulation) provides enough expansion space for the pipe. In the case where the expansion is greater than the room to move in the insulation, the material absorbs any stress arising from a residual expansion.

The same applies to pipes, which do not have to be insulated according to current regulations.

A temperature induced linear expansion is prevented by the embedding in the floor, concrete or plaster. The compressive strain and tensile stress arising from this are not critical as they are absorbed by the material itself.



## INSTALLATION IN DUCTS

### Installation in ducts

Due to the different linear expansion of the aquatherm pipes with or without stabilization, the installation of pipe branches in risers has to be made according to the selected type of pipe.

#### aquatherm blue pipe MF

The linear expansion of aquatherm fibre composite pipes in vertical risers can be ignored.

The positioning of a fixed point directly before each branch-off point is sufficient. All clamps in the riser must be installed as fixed points (see 1).

In general it is possible to install risers rigidly, that means without expansion joints. This directs the expansion on the distance between the fixed points, where it is ineffective.

For a maximum distance between two fixed points please refer pages 76/77.

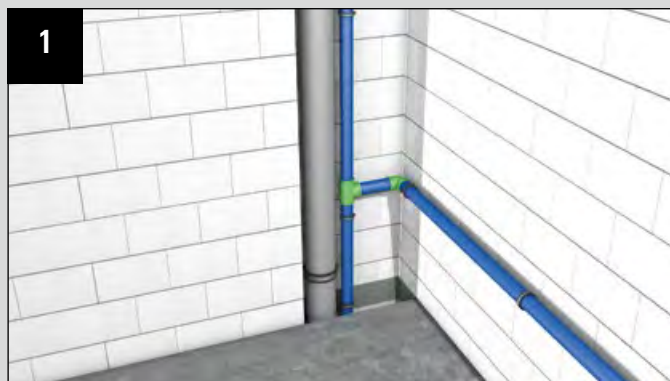
The installation of risers of aquatherm pipes without stabilizing components (fibre) requires a branch pipe, which is elastic enough to take the linear expansion of the riser.

This can be ensured by a favourable fixing of the riser in the duct (see 2).

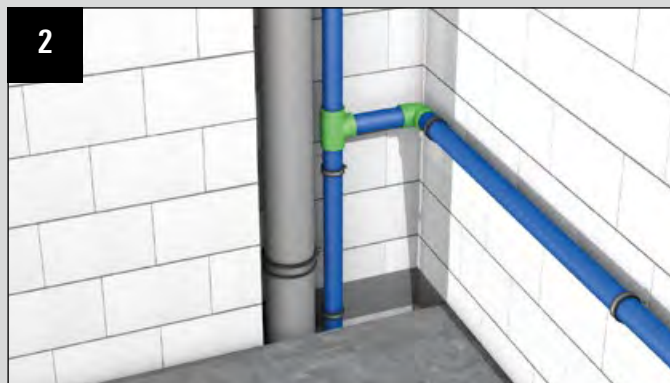
An adequate large pipe liner also gives sufficient elasticity to the branch-off pipe (see 3).

Furthermore the installation of a spring leg gives the appropriate elasticity (see 4).

When laying aquatherm pipes through the wall and ceiling, the fire protection must be observed (see pages 26-28).



Positioning of the fixed point clamp



Favourable fixing



Large diameter pipe liner



Installation of a spring leg

## OPEN INSTALLATION / CALCULATION OF THE LINEAR EXPANSION

### Open installation

In case of open installed pipes (e.g. in the basement), excellent optical characteristics and form stability are important. aquatherm pipes for cold water and aquatherm fibre composite pipes for hot water and heating plants make this possible. The coefficient ( $\alpha$ ) of linear expansion of aquatherm composite pipes is only

$$\alpha_{\text{green/blue pipe MF}} = 0.035 \text{ mm/mK}$$

and therefore nearly identical with the linear expansion of metal pipes.

The coefficient of linear expansion of aquatherm pipes without stabilizing components is

$$\alpha_{\text{green/blue pipe}} = 0.150 \text{ mm/mK}$$

aquatherm fibre composite pipes must have enough space to expand (see page 68 and 69). An expansion control must be required for long and straight fibre composite pipes (over 40 m).

aquatherm pipes without the stabilizing compound should have the expansion control after 10 m straight pipelines. Risers of composite pipes may be installed rigidly without expansion compensation. The following formula, calculation examples, data-tables and diagrams help to determine the linear expansion. The difference between working temperature and maximum or minimum installation temperature is essential for the calculation of linear expansion.

### Calculation of the linear expansion

Given and required values

Symbol	Meaning	Value	Measuring unit
$\Delta L$	Linear expansion	?	[mm]
$\alpha_2$	Coefficient of linear expansion aquatherm fibre composite pipe	0,035	mm/mK
$\alpha_3$	Linear expansion coefficient	0,15	mm/mK
L	Pipe length	25,0	[m]
$T_B$	Working temperature	60	°C
$T_M$	Installation temperature	20	°C
$\Delta T$	Temperature difference between working and installation temperature ( $\Delta T = T_W - T_M$ )	40	K

The linear expansion  $\Delta L$  is calculated according to the following formula:

$$\Delta L = \alpha \times L \times \Delta T$$

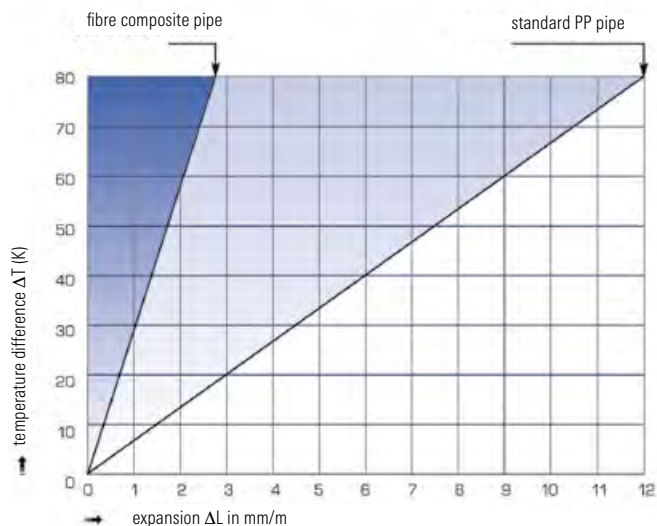
#### Material:

aquatherm MF-fibre composite pipe ( $\alpha = 0.03 \text{ mm/mK}$ )

$$\Delta L = 0.035 \text{ mm/mK} \times 25.0 \text{ m} \times 40 \text{ K}$$

$$\Delta L = 35.0 \text{ mm}$$

### Linear expansion comparison: fibre composite to standard PP pipe



## LINEAR EXPANSION

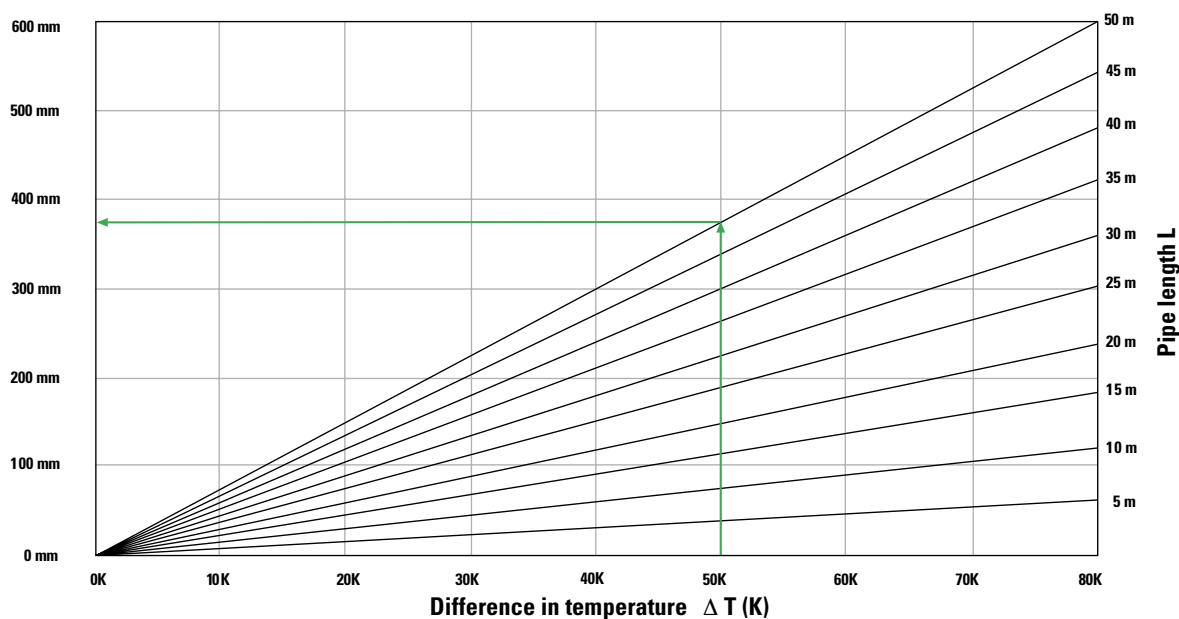
### aquatherm blue pipe

(without fibre layer)

The linear expansion, described on the preceding pages, can be taken from the following tables and graphs.

Linear expansion  $\Delta L$  in [mm]: aquatherm blue pipe -  $\alpha = 0.150 \text{ mm/mK}$

Pipe length	Difference in temperature $\Delta T = T_{\text{operating temperature}} - T_{\text{installation temperature}}$							
	10 K	20 K	30 K	40 K	50 K	60 K	70 K	80 K
	Linear expansion $\Delta L$ (mm)							
5 m	8	15	23	30	38	45	53	60
10 m	15	30	45	60	75	90	105	120
15 m	23	45	68	90	113	135	158	180
20 m	30	60	90	120	150	180	210	240
25 m	38	75	113	150	188	225	263	300
30 m	45	90	135	180	225	270	315	360
35 m	53	105	158	210	263	315	368	420
40 m	60	120	180	240	300	360	420	480
45 m	68	135	203	270	338	405	473	540
50 m	75	150	225	300	375	450	525	600



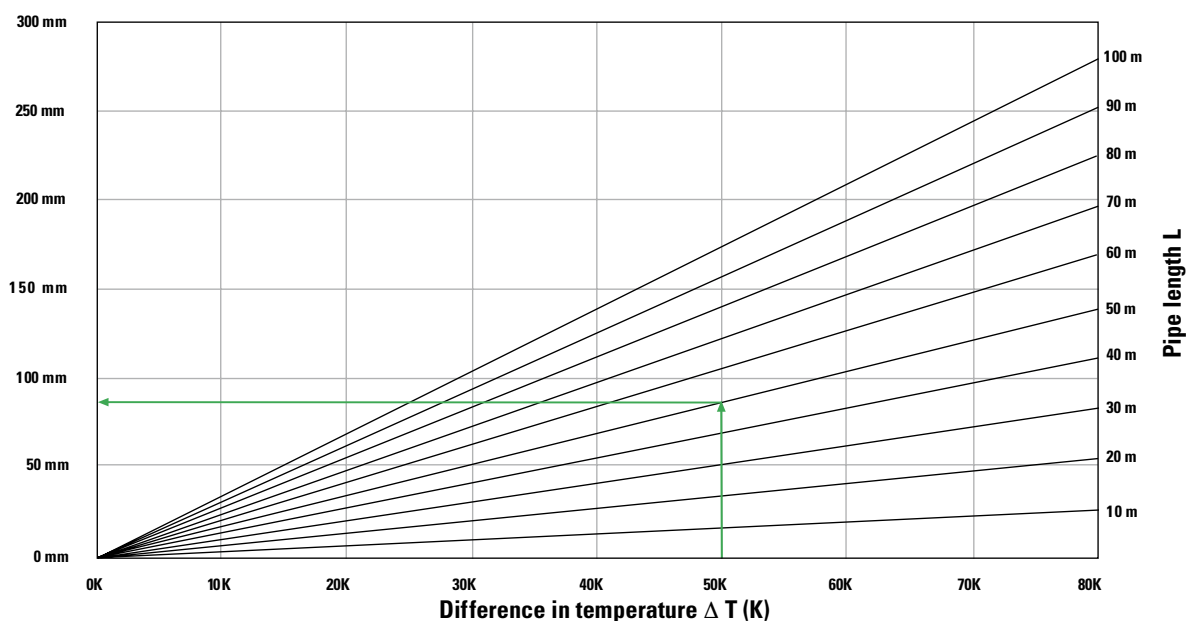
## LINEAR EXPANSION

### aquatherm blue pipe MF (faser composite pipe)

Due to the integration and positive bond of the different materials, the aquatherm fibre composite pipes offer much higher stability. The linear expansion reduces its value to  $\frac{1}{5}$  of the mere PP pipes.

Linear expansion  $\Delta L$  in [mm]: aquatherm fibre composite pipes -  $\alpha = 0.035 \text{ mm/mK}$

Pipe length	Difference in temperature $\Delta T = T_{\text{operating temperature}} - T_{\text{installation temperature}}$							
	10 K	20 K	30 K	40 K	50 K	60 K	70 K	80 K
	Linear expansion $\Delta L$ (mm)							
10 m	4	7	11	14	18	21	25	28
20 m	7	14	21	28	35	42	49	56
30 m	11	21	32	42	53	63	74	84
40 m	14	28	42	56	70	84	98	112
50 m	18	35	53	70	88	105	123	140
60 m	21	42	63	84	105	126	147	168
70 m	25	49	74	98	123	147	172	196
80 m	28	56	84	112	140	168	196	224
90 m	32	63	95	126	158	189	221	252
100 m	35	70	105	140	175	210	245	280





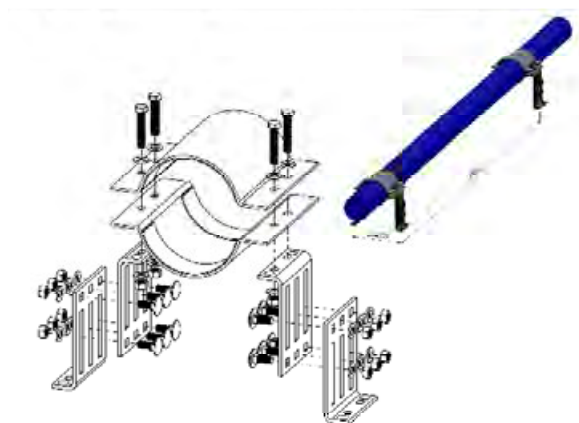
## PIPE CLAMPS suitable as fixing point

aquatherm offers fixed-point fastenings for pipes from 160–630 mm (Art. no. 60768–60790). Packing unit is each with 1 piece.

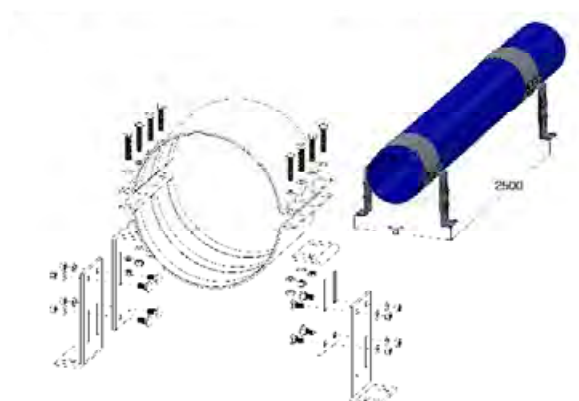
### Advantages:

- Reliable and permanent protection against perforation corrosion and breakdown of the static load capacity
- 1000 hours salt spray test without ferric oxide (rust)
- Suitable for installation in corrosive inner and outside areas
- Considerably higher corrosion protection than with electrogalvanized and hot-dip galvanized products (after spread test according to DIN EN ISO 9227)

Art. no.	diameter	min. torque clamp locking	min. torque height adjustment	height adjustment	fixig on building	measure „a“	weight per set
[-]	[mm]	[Nm]	[Nm]	[mm]	[-]	[mm]	[kg]
0060768	160	25	75	192,5–283,5	M 12	354,1	8,55
0060770	200	25	75	192,5–283,5	M 12	394,5	9,45
0060774	250	50	75	192,5–283,5	M 12	444,8	19,37
0060778	315	50	75	192,5–283,5	M 12	510	22,75
0060780	355	50	75	192,5–283,5	M 12	550,1	24,84



Art. no.	diameter	min. torque clamp locking	min. torque height adjustment	height adjustment	fixig on building	measure „a“	weight per set
[-]	[mm]	[Nm]	[Nm]	[mm]	[-]	[mm]	[kg]
0060782	400	50	120	404,5 - 497,5	M16	823,2	43,64
0060784	450	50	120	404,5 - 497,5	M16	873,3	46,25
0060786	500	50	120	404,5 - 497,5	M16	923,4	48,87
0060788	560	50	120	404,5 - 497,5	M16	983,4	52,00
0060790	630	50	120	404,5 - 497,5	M16	1053,5	55,66



## BENDING SIDE

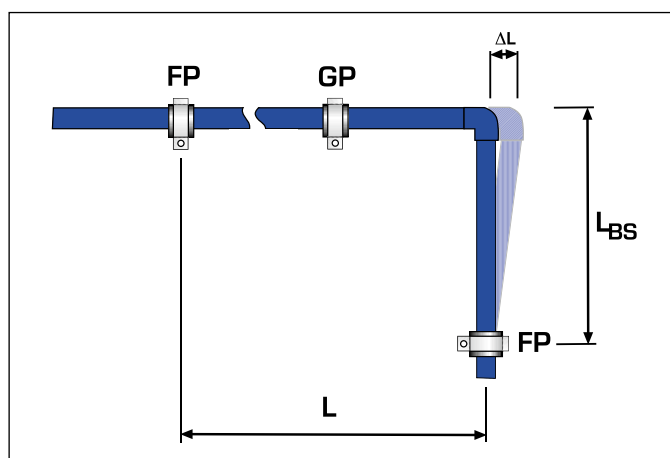
Linear expansion due to temperature difference between operating temperature and installation temperature can be compensated by different installation techniques.

### Bending side

In most cases direction changes can be used to compensate for linear expansion in pipes.

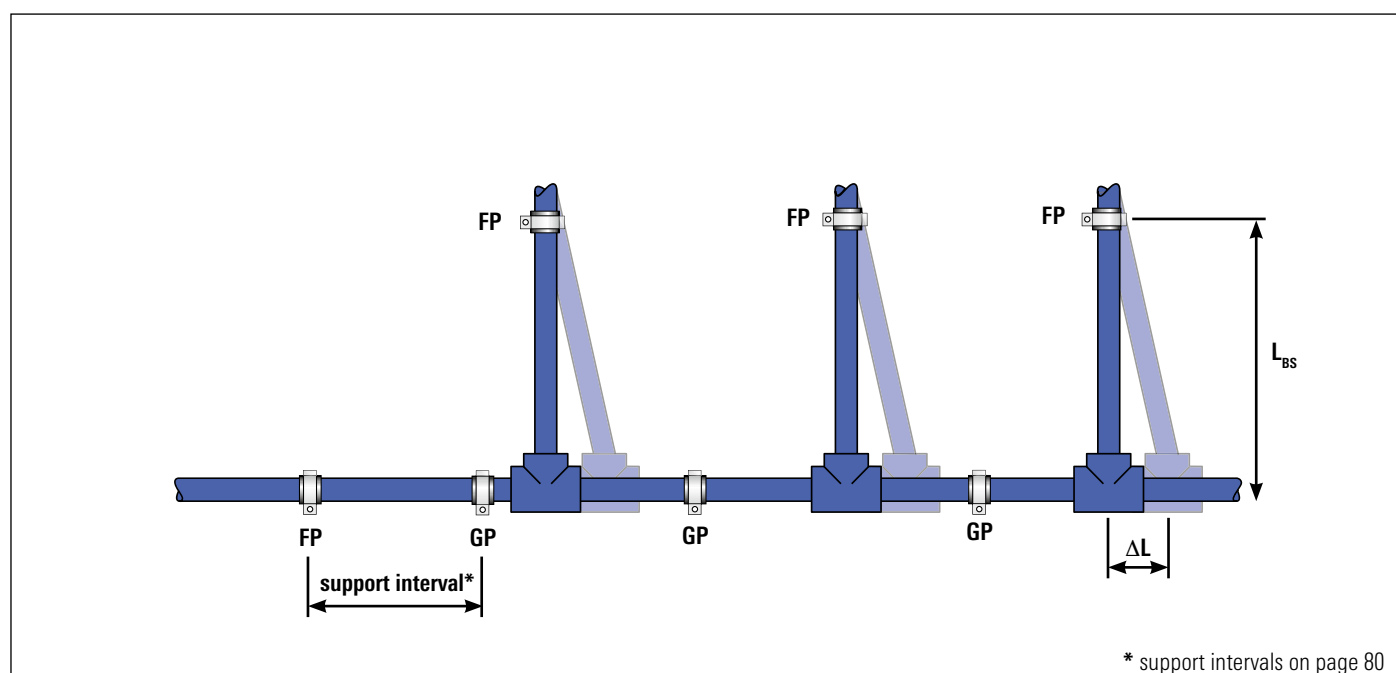
The values of the bending side can be taken directly from the tables and graphs on the following pages.

Symbol	Meaning	
$L_{BS}$	Length of the bending side	[mm]
K	Material specific constant	15,0
d	Outside diameter	[mm]
$\Delta L$	Linear expansion	[mm]
L	Pipe Length	[m]
FP	Fixed point	
GP	Sliding point	



Calculational determination of the bending side length

$$L_{BS} = K \times \sqrt{d \times \Delta L}$$



\* support intervals on page 80

## PRE-STRESS/BELLOW EXPANSION JOINT

### Expansion loop

If the linear expansion cannot be compensated by a change in direction, it will be necessary to install an expansion loop with long and straight pipelines.

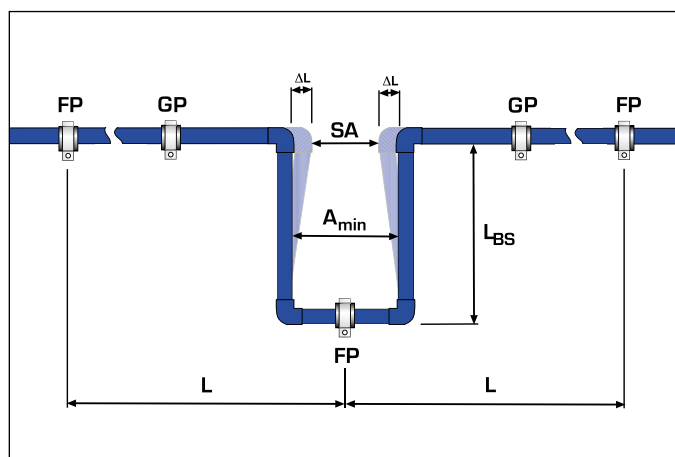
In addition to the length of the bending side  $L_{BS}$  the width of the pipe bend  $A_{min}$  must be considered.

Symbol	Meaning	
$A_{min}$	Width of the expansion loop	[mm]
SA	Safety distance	150 mm

The pipe bend  $A_{min}$  is calculated according to the following formula:

$$A_{min} = 2 \times \frac{\Delta L}{2} + SA$$

The width of the expansion loop  $A_{min}$  should be at least 210 mm.



### Determination size of expansion loop

Example

Specification: Pipeline, length 80 m (MF pipe)

Determined expansion:  $112 \text{ mm} = (\Delta L = \frac{0,035 \text{ mm}}{\text{mK}} \times 80 \text{ m} \times 40 \text{ K})$

The expansion loop should be installed exactly in the center of the pipe.

Calculation:

Given:  $\Delta L = 112 \text{ mm}$   
 $SA = 150 \text{ mm}$

Formula:

$$A_{min} = 2 \times \frac{\Delta L}{2} + SA$$

$$A_{min} = 2 \times \frac{112 \text{ mm}}{2} + 150 \text{ mm}$$

$$A_{min} = 262 \text{ mm}$$

The width of the expansion loop should be 262 mm in this example.

### Pre-stress

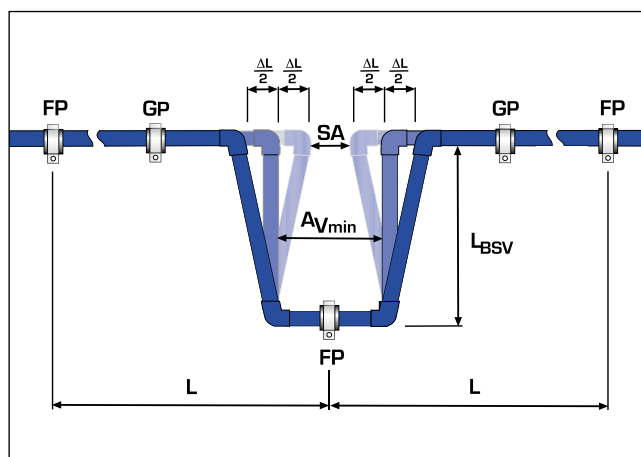
Where space is limited, it is possible to shorten the total width  $A_{min}$  as well as the length of the bending side  $L_{BSV}$  by pre-stressing.

Pre-stress installations, if planned and carried out carefully, offer an optically perfect installation, as the linear expansion is hardly visible.

Symbol	Meaning	
$L_{BSV}$	Length of pre-stress	[mm]

The side length of expansion loops with pre-stress is calculated according to the following example:

$$L_{BSV} = K \times \sqrt{d \times \Delta L}$$



### Bellow expansion joint

All bellow expansion joints for corrugated pipes designed for metal materials are unsuitable for aquatherm PP-R pipes.

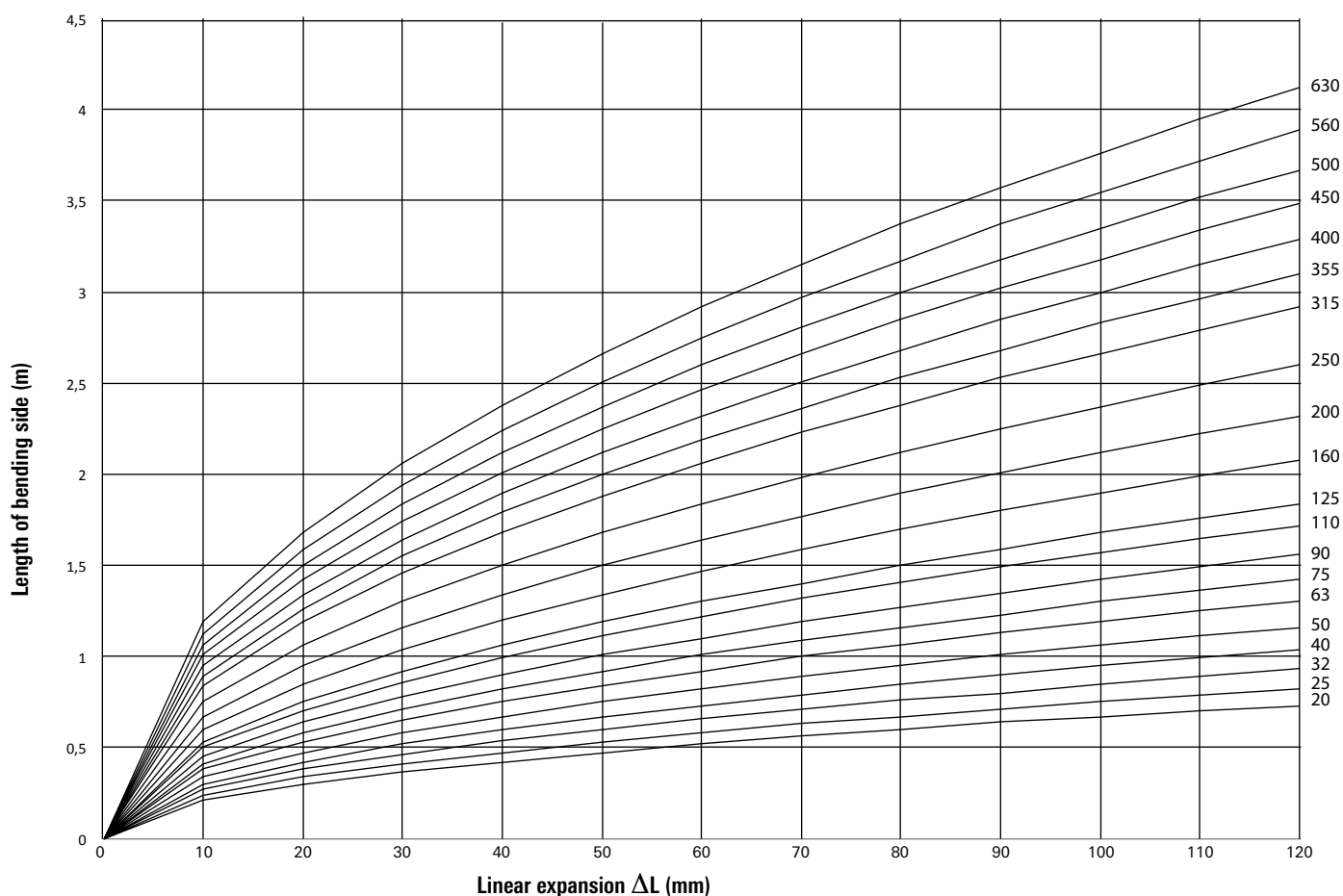
When using axial expansion joints observe the manufacturers instructions.



## LENGTH OF BENDING SIDE

for aquatherm polypropylene pipes The length of the bending side with pre-stress  $L_{BSV}$  can be taken from the tables and graphs in consideration of the applied pipe dimensions and determined linear expansion.

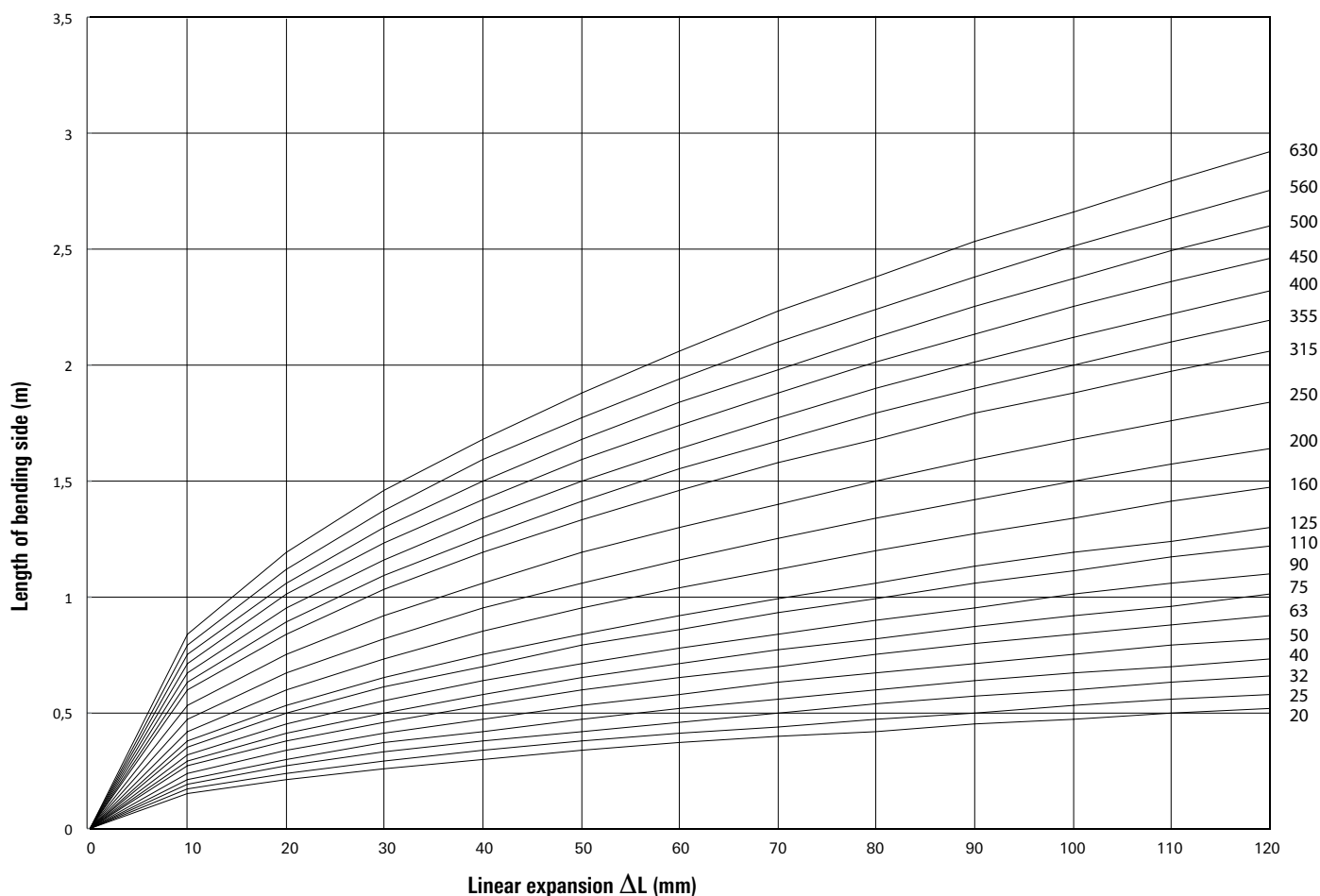
Pipe Dimension	Linear expansion (mm)											
	10	20	30	40	50	60	70	80	90	100	110	120
	Length of bending side (m)											
20 mm	0,21	0,30	0,37	0,42	0,47	0,52	0,56	0,60	0,64	0,67	0,70	0,73
25 mm	0,24	0,34	0,41	0,47	0,53	0,58	0,63	0,67	0,71	0,75	0,79	0,82
32 mm	0,27	0,38	0,46	0,54	0,60	0,66	0,71	0,76	0,80	0,85	0,89	0,93
40 mm	0,30	0,42	0,52	0,60	0,67	0,73	0,79	0,85	0,90	0,95	0,99	1,04
50 mm	0,34	0,47	0,58	0,67	0,75	0,82	0,89	0,95	1,01	1,06	1,11	1,16
63 mm	0,38	0,53	0,65	0,75	0,84	0,92	1,00	1,06	1,13	1,19	1,25	1,30
75 mm	0,41	0,58	0,71	0,82	0,92	1,01	1,09	1,16	1,23	1,30	1,36	1,42
90 mm	0,45	0,64	0,78	0,90	1,01	1,10	1,19	1,27	1,35	1,42	1,49	1,56
110 mm	0,50	0,70	0,86	0,99	1,11	1,22	1,32	1,41	1,49	1,57	1,65	1,72
125 mm	0,53	0,75	0,92	1,06	1,19	1,30	1,40	1,50	1,59	1,68	1,76	1,84
160 mm	0,60	0,85	1,04	1,20	1,34	1,47	1,59	1,70	1,80	1,90	1,99	2,08
200 mm	0,67	0,95	1,16	1,34	1,50	1,64	1,77	1,90	2,01	2,12	2,22	2,32
250 mm	0,75	1,06	1,30	1,50	1,68	1,84	1,98	2,12	2,25	2,37	2,49	2,60
315 mm	0,84	1,19	1,46	1,68	1,88	2,06	2,23	2,38	2,53	2,66	2,79	2,92
355 mm	0,89	1,26	1,55	1,79	2,00	2,19	2,36	2,53	2,68	2,83	2,96	3,10
400 mm	0,95	1,34	1,64	1,90	2,12	2,32	2,51	2,68	2,85	3,00	3,15	3,29
450 mm	1,01	1,42	1,74	2,01	2,25	2,46	2,66	2,85	3,02	3,18	3,34	3,49
500 mm	1,06	1,50	1,84	2,12	2,37	2,60	2,81	3,00	3,18	3,35	3,52	3,67
560 mm	1,12	1,59	1,94	2,24	2,51	2,75	2,97	3,17	3,37	3,55	3,72	3,89
630 mm	1,19	1,68	2,06	2,38	2,66	2,92	3,15	3,37	3,57	3,76	3,95	4,12



## LENGTH OF BENDING SIDE WITH PRE-STRESS

for aquatherm polypropylene pipes The length of the bending side with pre-stress  $L_{BSV}$  can be taken from the tables and graphs in consideration of the applied pipe dimensions and determined linear expansion.

Pipe Dimension	Linear expansion (mm)											
	10	20	30	40	50	60	70	80	90	100	110	120
	Length of bending side (m)											
20 mm	0,15	0,21	0,26	0,30	0,34	0,37	0,40	0,42	0,45	0,47	0,50	0,52
25 mm	0,17	0,24	0,29	0,34	0,38	0,41	0,44	0,47	0,50	0,53	0,56	0,58
32 mm	0,19	0,27	0,33	0,38	0,42	0,46	0,50	0,54	0,57	0,60	0,63	0,66
40 mm	0,21	0,30	0,37	0,42	0,47	0,52	0,56	0,60	0,64	0,67	0,70	0,73
50 mm	0,24	0,34	0,41	0,47	0,53	0,58	0,63	0,67	0,71	0,75	0,79	0,82
63 mm	0,27	0,38	0,46	0,53	0,60	0,65	0,70	0,75	0,80	0,84	0,88	0,92
75 mm	0,29	0,41	0,50	0,58	0,65	0,71	0,77	0,82	0,87	0,92	0,96	1,01
90 mm	0,32	0,45	0,55	0,64	0,71	0,78	0,84	0,90	0,95	1,01	1,06	1,10
110 mm	0,35	0,50	0,61	0,70	0,79	0,86	0,93	0,99	1,06	1,11	1,17	1,22
125 mm	0,38	0,53	0,65	0,75	0,84	0,92	0,99	1,06	1,13	1,19	1,24	1,30
160 mm	0,42	0,60	0,73	0,85	0,95	1,04	1,12	1,20	1,27	1,34	1,41	1,47
200 mm	0,47	0,67	0,82	0,95	1,06	1,16	1,25	1,34	1,42	1,50	1,57	1,64
250 mm	0,53	0,75	0,92	1,06	1,19	1,30	1,40	1,50	1,59	1,68	1,76	1,84
315 mm	0,60	0,84	1,03	1,19	1,33	1,46	1,58	1,68	1,79	1,88	1,97	2,06
355 mm	0,63	0,89	1,09	1,26	1,41	1,55	1,67	1,79	1,90	2,00	2,10	2,19
400 mm	0,67	0,95	1,16	1,34	1,50	1,64	1,77	1,90	2,01	2,12	2,22	2,32
450 mm	0,71	1,01	1,23	1,42	1,59	1,74	1,88	2,01	2,13	2,25	2,36	2,46
500 mm	0,75	1,06	1,30	1,50	1,68	1,84	1,98	2,12	2,25	2,37	2,49	2,60
560 mm	0,79	1,12	1,37	1,59	1,77	1,94	2,10	2,24	2,38	2,51	2,63	2,75
630 mm	0,84	1,19	1,46	1,68	1,88	2,06	2,23	2,38	2,53	2,66	2,79	2,92



## SUPPORT INTERVALS

### aqualtherm blue pipe SDR 11 S

Table to determine support intervals in conjunction with temperature and outside diameter.

Pipe diameter d (mm)		
20	25	32
Support intervals in cm		
60	75	90

### aqualtherm blue pipe SDR 17.6 MF

Table to determine support intervals in conjunction with temperature and outside diameter.

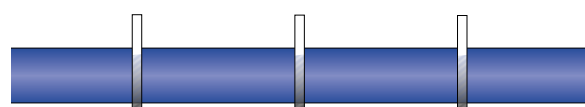
Difference in temperature $\Delta T$ [K]	Pipe diameter d (mm)										
	125	160	200	250	315	355	400	450	500	560	630
	Support intervals in cm										
0	255	260	265	275	280	285	295	305	315	325	330
20	185	190	200	205	210	215	230	240	255	270	280
30	175	180	190	195	200	205	220	230	245	260	275
40	170	175	180	190	190	195	210	225	235	250	265
50	160	165	175	180	185	190	200	215	230	240	255
60	150	155	165	170	175	180	185	200	215	230	240
70	140	145	155	160	170	175	180	190	205	220	230

### aqualtherm blue pipe SDR 7.4 MF (fibre composite pipe)

Table to determine support intervals in conjunction with temperature and outside diameter.

Difference in temperature $\Delta T$ [K]	Pipe diameter d (mm)		
	20	25	32
	Support intervals in cm		
0	120	140	160
20	90	105	120
30	90	105	120
40	85	95	110
50	85	95	110
60	80	90	105
70	70	80	95

### SUPPORT SPACINGS PP PIPE AND FIBRE COMPOSITE PIPE



PP pipe



Fibre composite pipe approx. 30 % more fixing distance

### aqualtherm blue pipe SDR 11 MF (fibre composite pipe)

Table to determine support intervals in conjunction with temperature and outside diameter.

Difference in temperature $\Delta T$ [K]	Pipe diameter d (mm)														
	32	40	50	63	75	90	110	125	160	200	250	315	355	400	450
	Support intervals in cm														
0	150	170	195	220	235	250	275	280	285	290	300	310	315	325	325
20	110	125	145	165	175	185	200	205	210	220	225	230	235	250	265
30	110	125	145	165	175	185	190	195	200	210	215	220	225	240	255
40	100	115	135	155	165	175	180	185	190	200	210	210	215	230	245
50	100	115	135	155	160	170	170	175	180	190	200	205	205	220	235
60	95	110	125	145	150	160	160	165	170	180	185	190	195	205	220
70	85	100	120	135	140	145	150	155	160	170	175	185	190	195	210

Pipe clamp distances of vertically installed pipes can be increased by 20 % of the tabular values, e.g. to multiply the tabular value by 1.2.

# THERMAL INSULATION OF HOT WATER PIPES

minimum insulation thickness in [mm] against condensation

medium temperature 5 °C - thermal conductivity value of caoutchouc insulation 0.040 W/(mK)												
Dimension	humidity	ambient temperature										
		20 °C	22 °C	24 °C	26 °C	28 °C	30 °C	32 °C	34 °C	36 °C	38 °C	40 °C
75mm	50 %		1	1	2	2	3	3	4	4	5	5
	60 %	2	3	3	4	5	5	6	7	7	8	8
	70 %	5	6	7	8	8	9	10	11	12	13	13
	80 %	9	11	12	14	15	17	18	19	20	21	22
110mm	50 %				1	2	2	3	3	4	4	4
	60 %	1	2	3	3	4	5	5	6	7	7	8
	70 %	4	5	6	7	8	9	10	10	11	12	13
	80 %	9	11	12	14	15	17	18	19	20	21	22
160mm	50 %						1	1	2	2	3	3
	60 %		1	1	2	3	4	4	5	5	6	7
	70 %	3	4	5	6	7	8	9	9	11	11	12
	80 %	8	10	11	13	14	16	17	19	20	21	22

The decree for energy saving thermal protection and energy saving technique for buildings Decree for Energy Saving (EnEV energy saving regulation) regulates the thermal insulation of hot water supplies and fittings in Germany.

Central heating pipes, line 1–4 installed in heated rooms or building parts between heated rooms of the one user, where heat output can be controlled by open stop valves do not require a minimum thickness of the insulation.

This even applies to hot water pipes up to an inner diameter of 22 mm in flats, which are neither in the circulation nor have an additional electric heating. Applying material with thermal conductivities different to 0.035 W/(mK) the minimum thickness of the insulation has to be converted correspondingly.

For the conversion and the thermal conductivity of the insulation the ways and values of calculation described in the technical regulations must be applied.

The minimum insulation according to the table for heating distributions and heating pipes can be reduced as far as the same limit of heat output even for further insulation requirements in consideration of the insulating effect of the pipe walls are guaranteed.

Cooling pipes must be provided with suitable insulation to prevent condensation. For further information please contact our service hotline +49 2722 950 200

## EnEV 2019, § 14, addendum 5, chart 1

Thermal insulation of heat distribution and hot water pipes, cold distribution and cold water pipes and fittings

Line	Type of pipe/fitting	minimum thickness of insulation referred to thermal conductivity of 0.035 W/(mK)
1	inner diameter up to 22 mm	20 mm
2	inner diameter more than 22 mm up to 35 mm	30 mm
3	inner diameter more than 35 mm up to 100 mm	same as inner diameter
4	inner diameter more than 100 mm	100 mm
5	pipes and fittings after line 1–4 in wall- and ceiling openings, in crossing area of pipes, at pipe connections, at distributors	½ of the requirements of line 1 to 4
6	pipes of central heating after line 1–4, which have been installed after 31. January 2002 between heated rooms of various users	½ of the requirements of line 1 to 4
7	pipes after line 6 in floor construction	6 mm
8	Cooling distribution and cold water pipes and fittings of air handling and air conditioning systems	6 mm

If in cases of § 14, paragraph 5 the heat distribution and hot water pipes border on outside air, they must be insulated with twice the minimum thickness according to table 1, lines 1 to 4.



## INSULATION THICKNESS ACCORDING TO ENERGY SAVING REGULATION

According to energy saving regulation (EnEV) aquatherm pipes and fittings have to be insulated against loss of heat. The insulation thickness depends on the respective installation.

The heat conductivity figure of fusiolen® polypropylene is 0.15 W/(mK). aquatherm pipes and fittings offer a significantly higher degree of insulation compared to metal pipes.

Due to the high insulation values of fusiolen® the insulation thickness – compared to metallic pipe systems – can be reduced.

Undermentioned are the recommendation based on EnEV 2009. Regional standards might vary and are to be considered.

It is possible to reduce the thickness of insulation layer by approximately 50%, this depends on local and operating conditions.

### Thermal insulation from heat distribution and hot water pipes, cooling distribution and cold water pipes according EnEV 2009

Minimum thickness of insulation referred to thermal conductivity of 0.035 W/(mK)

pipe diameter	*50 %	*100 %
16 mm	10 mm	20 mm
20 mm	10 mm	20 mm
25 mm	10 mm	20 mm
32 mm	15 mm	30 mm
40 mm	15 mm	30 mm
50 mm	18 mm	35 mm
63 mm	23 mm	45 mm
75 mm	28 mm	55 mm
90 mm	33 mm	65 mm
110 mm	40 mm	80 mm
125 mm	45 mm	90 mm
160 mm	50 mm	100 mm
200 mm	50 mm	100 mm
250 mm	50 mm	100 mm
315 mm	50 mm	100 mm
355 mm	50 mm	100 mm
400 mm	50 mm	100 mm
450 mm	50 mm	100 mm
500 mm	50 mm	100 mm
560 mm	50 mm	100 mm
630 mm	50 mm	100 mm

\* The insulation thickness has to be calculated due to the thermal conductivity of polypropylene pipes acc. to test report no.: G.2 - 136/97 of FIW-Munich

## **PRESSURE TEST/TEST CONTROL/ MEASURING OF THE TEST PRESSURES/TEST RECORD**

### **Pressure test/Test control**

All aquatherm pipe systems shall be subjected to a hydraulic pressure test with a test pressure of 10 bar.

The material properties of the aquatherm pipe systems result in an expansion of the pipes during the pressure test. This affects the test result. Due to the thermal expansion coefficients of the aquatherm pipe systems the results are influenced additionally. The temperature differences between the pipe and the test medium lead to changes in pressure. Hereby a temperature change of 10 K corresponds to a pressure difference of 0.5 up to 1 bar.

Therefore pressure testing of the aquatherm pipe systems should be made with a constant temperature of the test medium. The hydraulic pressure test requires a preliminary, principal and final test.

In the preliminary test a pressure of **18 bar\*** is applied 3 x 5 minutes for the expansion/release of the pipes. Between the cycles the pipe system must be depressurized.

Immediately after the preliminary test the principal test should be performed. The test duration is 15 min. Here, the test pressure (10 bar) may not fall more than 0.5 bar.

After completion of the preliminary and principle test finally the final test must be performed.

The test duration is 60 minutes. Here, the test pressure – read after the principle test – may not fall more than 0.5 bar.

### **Measuring of the test pressures**

When measuring the system use a pressure measuring device that is able to read a pressure change of 0.1 bar. Place the measuring device at the lowest point (highest static pressure) of the installation.

### **Test record**

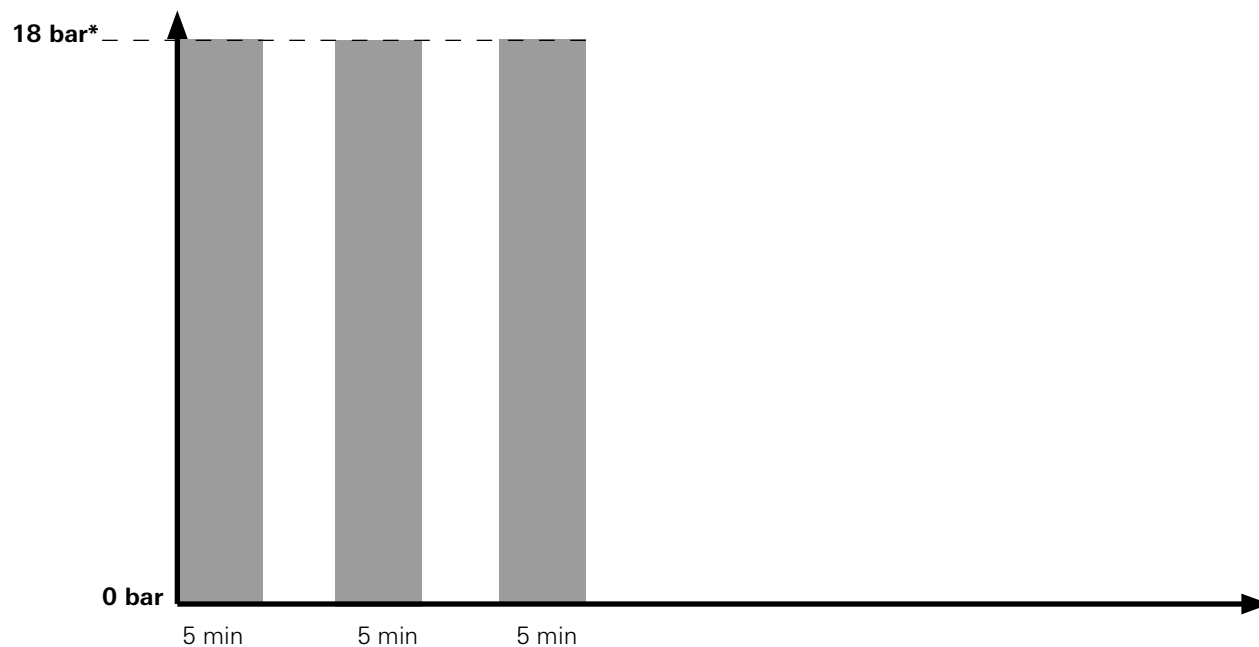
A record of the hydraulic pressure test has to be prepared and signed by the client and contractor stating place and date (see page 85).

\* Exception: aquatherm blue pipe SDR 17.6: 10 bar

## LEAKAGE TEST/PRESSURE DIAGRAM

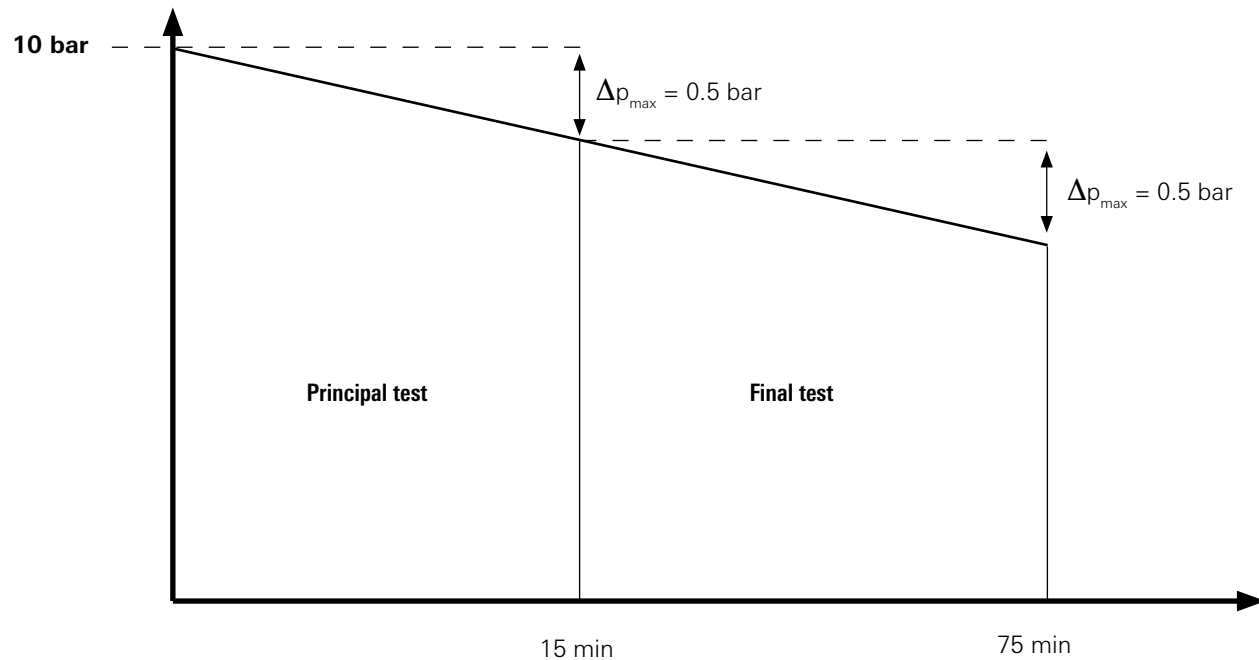
### PRELIMINARY TEST

Working pressure



### PRINCIPAL- AND FINAL TEST

Working pressure



\* Exception: aquatherm blue pipe SDR 17.6: 10 bar

## TEST RECORD AQUATHERM SYSTEM INSTALLATION

Place: \_\_\_\_\_

Object: \_\_\_\_\_

**Note before the test:**

3 x 5 minutes system pressure of 18 bar or 10 bar for expansion/release of the pipes are required.

**Preliminary test for SDR 6, SDR 7.4 and SDR 11**

The pipe system must be unpressurized between each cycle.

<b>18 bar</b>	5 min	realized:	yes	no
<b>18 bar</b>	5 min	realized:	yes	no
<b>18 bar</b>	5 min	realized:	yes	no

**Preliminary test for SDR 17.6**

The pipe system must be unpressurized between each cycle.

<b>10 bar</b>	5 min	realized:	yes	no
<b>10 bar</b>	5 min	realized:	yes	no
<b>10 bar</b>	5 min	realized:	yes	no

**Principal test**Test pressure: 10 barPressure decline after 15 min:                      bar **max. 0.5 bar****Final test**

(directly after the principal test, without changing the pressure)

Result principal test:                      barPressure decline after 60 min:                      bar **max. 0.5 bar**

Notes: \_\_\_\_\_

Place, Date \_\_\_\_\_

Stamp/Signature \_\_\_\_\_



## DESCRIPTION OF INSTALLATION

Place: \_\_\_\_\_

Object: \_\_\_\_\_

### Pipe length:

Ø 20 mm	_____	m	Ø 160 mm	_____	m
Ø 25 mm	_____	m	Ø 200 mm	_____	m
Ø 32 mm	_____	m	Ø 250 mm	_____	m
Ø 40 mm	_____	m	Ø 315 mm	_____	m
Ø 50 mm	_____	m	Ø 355 mm	_____	m
Ø 63 mm	_____	m	Ø 400 mm	_____	m
Ø 75 mm	_____	m	Ø 450 mm	_____	m
Ø 90 mm	_____	m	Ø 500 mm	_____	m
Ø 110 mm	_____	m	Ø 560 mm	_____	m
Ø 125 mm	_____	m	Ø 630 mm	_____	m

Start of test: \_\_\_\_\_

End of test: \_\_\_\_\_

Test period: \_\_\_\_\_

Test medium: ☐ water ☐ water/glycol

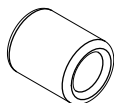



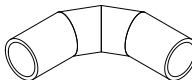


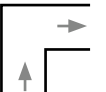
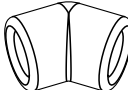

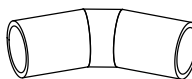

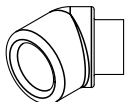


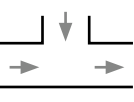

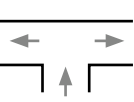
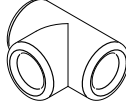
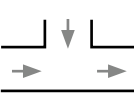

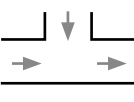
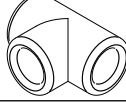
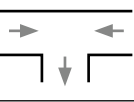

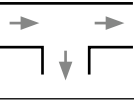
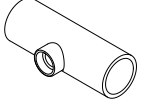
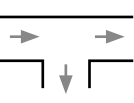

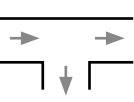
Client: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Contractor: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Place, Date \_\_\_\_\_

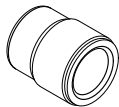









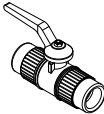
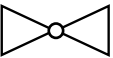


Stamp/Signature \_\_\_\_\_

Coefficient of loss  $\zeta$  aquatherm green pipe- & aquatherm blue pipe-fittings

Fitting	Drawing	Graphic illustration	ξ-Value																			
			16	20	25	32	40	50	63	75	90	110	125	160	200	250	315	355	400	450	500	630
Socket			0,8	0,5	0,5	0,7	0,9	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
Elbow 90°			2	1,3	1,2	2	1,9	0,5	0,5	0,7	0,7	0,7	0,7	0,7	0,7	0,7						
Segment Elbow 90°															0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8
Elbow 90° m./f.				1,3	1,2	2	1,9															
Elbow 45°				2	1,9	1,9	0,5	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4						
Elbow 45°															0,4	0,4	0,4	0,4	0,4	0,4	0,4	0,4
Elbow 45° m./f.				2	1,9	1,9	0,5															
Tee			1,1	0,9	0,9	0,9	0,6	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
Tee			0	0,3	0,3	0,4	0,7	0,7	1,1	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,3	1,3
Tee			2	1,9	1,8	1,8	1,6	1,6	1,6	2	2	2	2	2	2	2	2	2	2	2	2	2
Tee			3,8	3,5	3,2	3,2	3	3,2	3,2	4	4	4	4	4	4	4	4	4	4	4	4	4
Tee			2,2	2,3	2,3	2	1,6	1,9	1,9	2,7	2,7	2,7	2,7	2,7	2,7	2,7	2,7	2,7	2,7	2,7	2,7	2,7
Tee			2,4	2,6	1,4	2,3	1,8	1,2	1,1	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
Reducing tee (saddle technology)			The zeta value results from the addition of the zeta values T-piece and Red-piece																			
Reducing tee			The zeta value results from the addition of the zeta values T-piece and Red-piece																			

( → = flow direction)

Coefficient of loss  $\zeta$  aquatherm green pipe- & aquatherm blue pipe-fittings

Fitting	Drawing	Graphic illustration	$\zeta$ -Value																			
			16	20	25	32	40	50	63	75	90	110	125	160	200	250	315	355	400	450	500	630
Reducer			2,4	1,9	1,9	1,9	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	
Back plate				3,7	3,7																	
Back plate				3,5	3,5																	
Back plate				2	2																	
Stop valve/ inclined valve				2	2	2	2															
Ball valve				0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3								
Screw-down stop globe valve				7	7	7	7															

( → = flow direction)

Source: DIN 1988 Part 3

$$Z = \frac{\zeta v^2 \delta}{2}$$

Z = Pressure lost in [Pa]

v = Flow rate [m/s]

$\zeta$  = Coefficient of loss of fitting

$\delta$  = Density of medium [kg/m³]

$K_v$  = volume flow [m³/h] of water [5–30 °C] at a pressure difference of 1 bar

**Note:** For the determination of pressure loss in (mbar) the result has to be divided by the factor 100 (100Pa = 1 mbar).

## Notice on planning & design of compressed air applications

When planning and designing pipe systems for compressed air applications, the following working pressures are to be observed.

aquatherm blue pipe SDR 11	aquatherm green pipe SDR 9
10 bar	10 bar

This chart is valid for temperatures from 10 °C to 40 °C. For temperatures and conditions other than those noted in the chart, please contact our technical service department.

**Warning:** Failure of a compressed gas (air or inert gas) system can be extremely violent and dangerous. In a compressed gaseous media piping system, energy is applied to compress the gaseous media in addition to pressurizing the system. If failure occurs, both energies can be suddenly released and can be extremely violent compared to failure during leak testing or system operation with an incompressible liquid testing media.

aquatherm recommends that thermoplastics piping intended for the transport of compressed air or other compressed gases should be installed by burial, encasement in shatter-resistant material or other appropriate means, to prevent or minimize the possibility of mechanical damage. The piping must also be protected from other sources of degradation such as ultraviolet light (UV) exposure, chemical effects, temperature and oxidation.

Always make sure to eliminate risks for persons near compressed air systems, also observing the applicable national and international regulations of installation, accident prevention and safety for the installation of pipe systems, as well as the applicable laws, standards, guidelines and technical rules.



## CHEMICAL RESISTANCE OF PIPES AND FITTINGS

The following chemical resistance document can be used as a general guideline, but should not be considered a formal recommendation or approval by aquatherm. The actual behavior of the piping system when exposed to a specific chemical is very dependent on the exposure conditions (temperature, pressure, flow, duration, etc.), the stresses on the piping material and system (mechanical, thermal, cyclic, etc.), and the ancillary materials in the system (o-rings, seals, gaskets, metal components, etc.). Due to the comprehensive warranty provided by aquatherm, specific applications must be submitted to aquatherm for review and evaluation using the form in the technical catalogue or the online submittal form. A written response will be provided once the review is completed. The attached guidance document should **NOT** be used as a definitive reference for determining the chemical compatibility of aquatherm piping in a specific application. This can only be determined by submitting the information to aquatherm for review.

### Polypropylene (PP) pipes; chemical resistance of pipes and pipe fittings.

The behavior of pipes and pipe fittings towards flow substances depends on the one hand on the particular nature and type of plastic, the design of the pipe fitting and the manufacturing conditions, and, on the other hand, on the nature of the flow substance. In particular, the duration of the action, temperatures and mechanical stresses acting at the same time and other types of influences which additionally have an effect also determine the behavior. The effects of these influences, which frequently are not clearly foreseeable at the outset, are decisive for the suitability for an application. Furthermore, special requirements on the pipe or pipe fitting (e.g. dimensional stability or mechanical strength) shall be taken into consideration, depending on the application.

For these reasons, the suitability of pipes and pipe fittings for a flow substance can be evaluated only from case to case.

The chemical resistance indicates the gradual behavior of the material of the pipe wall towards the action of the flow substance. It depends in each case on the type of interacting substances, their composition, the temperature and the duration of the action.

In an application, the chemical resistance can be influenced by further stresses (e.g. of a mechanical nature).

Note: The chemical resistance does not correspond to the term "chemical stability" hitherto used in everyday language, because this contains an evaluation for the particular application.

### Data on chemical resistance

Various processes may occur when the flow substances come into contact with the material of the pipe wall, such as absorption of the liquid (swelling), extraction of soluble constituents of the material (shrinkage) and chemical reactions (hydrolysis, oxidation and the like), which in certain circumstances may cause changes in the properties of the pipes and pipe fittings.

The behavior of the pipes and pipe fittings towards the flow substances is classified into the following groups:

- : **resistant**  
The material of the pipe wall is generally evaluated as suitable.
- ◐: **conditionally resistant**  
The suitability of the material of the pipe wall for the particular application shall be investigated; if necessary, further experiments shall be carried out.
- : **not resistant**  
The material of the pipe wall is generally evaluated as unsuitable.
- : No data on the chemical resistance is available

**Detailed information regarding the resistance of our pipe systems to the listed fluids can be obtained from the aquatherm laboratory:**

**Hotline +49 2722 950 0**

**For inquiries on resistance, medium and operating conditions (operating pressure and temperature) needs to be specified.**

<sup>1)</sup> Table taken from the English translation of DIN 8078 Supplement 1, Feb. 1982, Chemical resistance of (PP-) pipes and pipe fittings. Reproduction with the permission of DIN Deutsches Institut für Normung e. V.. Important: When applying said standard the edition with the most recent release date should be used (can be purchased at Beuth Verlag GmbH, Burggrafenstrasse 6, 10787 Berlin, Germany).

The following designations are used for the composition of the flow substances:

- a) If the content data is not followed by "(Vol.)", the data is the weight in % (previously % by weight).
  - VL: aqueous solution, the weight content of which is ≤ 10 %.
  - L: aqueous solution, the weight content of which is greater than 10 %.
  - GL: saturated (at 20 °C) aqueous solution.
  - TR: flow substance is as least technically pure.
  - H: commercially available composition.

- b) Volume content in % (previously % by volume): this is characterized specially by "(Vol)".  
The chemical resistance of pipes and pipe fittings is generally not reduced for weight or volume contents and temperatures lower than those given in the table.

<sup>2)</sup> These flow substances and/or chemical resistance data are not contained in ISO/TR 7471.

<sup>3)</sup> The chemical resistance is evaluated as one group lower in ISO/TR 7471.

<sup>4)</sup> The chemical resistance is evaluated as one group higher in ISO/TR 7471.

## CHEMICAL RESISTANCE

Due to their special material properties aquatherm green pipe resp. aquatherm blue pipe and fittings are generally chemical resistant. However, aquatherm green pipe transition elements with thread inserts made of brass are not suitable for all media.

For industrial application of aquatherm green pipe and aquatherm blue pipe we recommend to use aquatherm green pipe flanges and/or coupling screws.

**Note:** On request, you will receive threaded inserts for aquatherm green pipe connecting pieces also in stainless steel.  
Prices on request.

## INQUIRY FOR THE CHEMICAL RESISTANCE OF THE AQUATHERM GREEN PIPE AND AQUATHERM BLUE PIPE SYSTEM:

### aquatherm GmbH

Biggen 5 · 57439 Attendorn · Germany

Phone: +49 2722 950 0

info@aquatherm.de · www.aquatherm.de

#### Installer:

##### Company

Contact

Street

PC/City

Phone

Fax

E-mail

#### Field of application:

##### Flow medium

Operating temperature °C/°F

Working pressure bar/psi

Service life h/d

Concentration %

#### Building project:

#### Ambient medium:

Ambient temperature °C/°F

Ambient pressure bar/psi

#### Address:

Street

PC/City

Place, Date/Signature

	Data sheets	enclosed	not enclosed
Fluid transported	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ambient medium	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Flow Substance	Content <sup>1)</sup> %	Behavior at	
		20 °C / 68 °F	60 °C / 140 °F
Waste gases <sup>2)</sup> or air/gas mixtures			
- containing hydrogen fluoride	traces	●	●
- containing carbon dioxide	any	●	●
- containing carbon monoxide	any	●	●
- containing nitroses (nitrogen oxide)	traces	●	●
- containing hydrochloric acid	any	●	●
- containing sulphur dioxide	any	●	●
- containing sulphuric acid	any	●	●
- containing sulphur: trioxide (oleum)	traces	○	○
Acetaldehyde <sup>2)</sup>	TR	◐	—
Acetaldehyde, aqueous <sup>2)</sup>	40 %	●	●
Acetic anhydric (acetic acid anhydride)	TR	●	—
Acetone	TR	●	●
Acetophenone	TR	●	◐
Acrylonitrile	TR	●	● <sup>2)</sup>
Adipic acid <sup>2)</sup>	GL	●	●
Malic acid	L	●	●
Caustic soda see sodium hydroxide solution	up to 60 %	●	●
Battery acid <sup>2)</sup>	H	●	●
Alums (Me(I)-Me(III)-sulphates) <sup>2)</sup>	GL	●	●
Allyl alcohol (prop-2-en-1-ol), aqueous <sup>2)</sup>	96 %	●	●
Aluminium chloride <sup>2)</sup>	GL	●	●
Aluminium sulphate <sup>2)</sup>	GL	●	●
Formic acid, aqueous	10 %	●	●
Formic acid, aqueous	85 %	●	◐ <sup>3)</sup>
2 - Aminoethanol (ethanolamine)	TR	●	—
Ammonia, liquid	TR	●	—
Ammonia, gaseous	TR	●	● <sup>2)</sup>
Aqueous ammonia (ammonia solution)	GL	●	● <sup>2)</sup>
Ammonium acetate	GL	●	●
Ammonium carbonate <sup>2)</sup> and bicarbonate	GL	●	●
Ammonium chloride	GL	●	● <sup>2)</sup>
Ammonium fluoride	L	●	●
Ammonium nitrate	GL	●	●
Ammonium phosphate <sup>2)</sup>	GL	●	●
Ammonium sulphate	GL	●	●
Ammonium sulphide <sup>2)</sup>	GL	●	●
Amyl acetate (acetate (acetic acid isoamyl ester)	TR	◐	—
Amyl alcohol (fermentation amyl alcohol)	TR	●	●
Aniline	TR	◐ <sup>4)</sup>	◐ <sup>4)</sup>
Anilium chloride (aniline hydrochloride)	GL	●	●
Anisole <sup>2)</sup>	TR	◐	◐
Anone see cyclohexanone	TR	◐	○
Antimony(III) chloride, aqueous <sup>2)</sup>	90 %	●	●
Apple juice	H	●	● <sup>2)</sup>

Flow Substance	Content <sup>1)</sup> %	Behavior at	
		20 °C / 68 °F	60 °C / 140 °F
Malic acid	L	●	●
Apple wine <sup>2)</sup>	H	●	●
Arsenic acid, ortho, aqueous <sup>2)</sup>	10 %	●	●
Arsenic acid, ortho, aqueous <sup>2)</sup>	80 %	●	●
Barium hydroxide	GL	●	●
Barium salts <sup>2)</sup>	GL	●	●
Cottonseed oil	TR	●	●
Benzaldehyde <sup>2)</sup>	GL	●	●
Benzaldehyde <sup>2)</sup>	L	●	–
Benzine (aliphatic hydrocarbons)	H	◐ <sup>3)</sup>	○
Benzine/benzene mixture <sup>2)</sup>	80 %/20 % (Vol.)	◐	○
Benzoic acid	GL	●	● <sup>2)</sup>
Benzene	TR	◐	○
Benzoyl chloride <sup>2)</sup>	TR	◐	–
Benzyl alcohol	TR	●	◐
Succini acid	GL	●	●
Beeswax <sup>2)</sup>	H	●	◐
Beer <sup>2)</sup>	H	●	●
Caramel <sup>2)</sup>	VL	●	●
Hydrocyanic acid <sup>2)</sup> (hydrogen cyanide)	TR	●	●
Lead acetate <sup>2)</sup>	GL	●	●
Bleaching liquor (sodium hypochlorite)	20 %	◐ <sup>4)</sup>	◐
Lead tetraethyl (tetraethyl-lead) <sup>2)</sup>	TR	●	–
Borax (sodium tetraborate)	L	●	●
Boric acid	GL	●	● <sup>2)</sup>
All types of spirits <sup>2)</sup>	H	●	●
Bromine (bromine water) <sup>2)</sup>	GL	◐	○
Bromine, gaseous	any	◐	○
Bromine, liquid	TR	○	○
Bromomethyl see methyl bromide	TR	○	○
Hydrobromic acid, aqueous	48 %	●	◐
Butane, gaseous	TR	●	● <sup>2)</sup>
Butadiene, gaseous <sup>2)</sup>	TR	◐	○
Butanols (butyl alcohols)	TR	●	◐
Butane-1,2,4-triol <sup>2)</sup>	TR	●	●
But-2-ene-1,4-diol <sup>2)</sup>	TR	●	●
But-2-ine-1,4-diol <sup>2)</sup>	TR	●	–
Butyric acids, aqueous	20 %	●	–
Butyl acetates(acetic acid butyl esters)	TR	◐	○
Butylenes, liquid <sup>2)</sup> (butenes)	TR	◐	–
Butylene glycols (butanediols) aqueous <sup>2)</sup>	10 % (Vol.)	●	◐
Butylene glycols (butanediols) <sup>2)</sup>	TR	●	●
Butylglycol (ethylene glycol monobutyl ether)	TR	●	–
Butylphenols	GL	●	–
Butylphenone <sup>2)</sup>	TR	○	–



Flow Substance	Content <sup>1)</sup> %	Behavior at	
		20 °C / 68 °F	60 °C / 140 °F
Butyl phthalate (dibutyl phthalate)	TR	●	◐
Calcium carbonate	GL	●	●
Calcium chloride	GL	●	●
Calcium hydroxide	GL	●	●
Calcium hypochlorite	L	●	–
Calcium nitrate	GL	●	●
Camphor oil	TR	○	○
Carbolineum <sup>2)</sup>	H	●	–
Chlorine, gaseous, dry	TR	○	○
Chlorine, gaseous, moist <sup>2)</sup>	0.50 %	◐	–
Chlorine, gaseous, moist <sup>2)</sup>	1 %	○	○
Chlorine, liquid	TR	○	○
Chloral <sup>2)</sup> (trichloroacetaldehyde)	TR	●	●
Chloral hydrate <sup>2)</sup>	TR	◐	○
Chloramine <sup>2)</sup>	L	●	–
Chlorobenzene <sup>2)</sup>	TR	◐	–
Chloroacetic acid, mono, aqueous	L	●	● <sup>2)</sup>
Chloroacetic, mono, aqueous	85 % 2)	●	●
Chloroethane (ethyl chloride)	TR	○	○
2-Chloroethanol (ethylene chlorohydrin)	TR	●	● <sup>2)</sup>
Bleaching powder suspension in water <sup>2)</sup>	any	●	●
Chloroform (trichloromethane)	TR	◐	○
Chloric acid, aqueous <sup>2)</sup>	1 %	●	◐
Chloric acid, aqueous <sup>2)</sup>	10 %	●	◐
Chloric acid, aqueous	20 %	●	○
Chlorosulphonic acid (chlorosulphuric acid)	TR	○	○
Hydrogen chloride, dry gas	TR	●	●
Hydrogen chloride, moist gas <sup>2)</sup> (hydrochloric acid)	TR	●	●
Chrome alum (alums)	GL	●	●
Chromic acid, aqueous	40 %	◐ <sup>4)</sup>	◐
Chromic acid/sulphuric acid/water <sup>2)</sup> (chromic/sulphuric acid)	15/35/50 %	○	○
Citric acid	VL	●	●
Crotonaldehyde <sup>2)</sup> (2-butenal)	TR	●	–
Potassium cyanide	L	●	● <sup>2)</sup>
Cyclohexane	TR	●	–
Cyclohexanol	TR	●	◐
Cyclohexanone	TR	◐	○
Dekalin (decahydronaphthalene)	TR	◐ <sup>3)</sup>	○
Dextrin (starch gum)	L	●	●
Dextrose (glucose)	20 %	●	●
1,2-Diaminoethane (ethylenediamine) <sup>2)</sup>	TR	●	●

Flow Substance	Content <sup>1)</sup> %	Behavior at	
		20 °C / 68 °F	60 °C / 140 °F
Di-n-butyl ether <sup>2)</sup>	TR	●	○
Dibutyl phthalate (phehalic acid dibutyl ester)	TR	●	●
Dichloroethylene (1,1- and 1,2-)	TR	●	—
Dichlorobenzenes <sup>2)</sup>	TR	●	—
Dichloroacetic acid	TR	●	—
Dichloroacetic acid, aqueous <sup>2)</sup>	50 %	●	●
Dichloroacetic acid methyl ester <sup>2)</sup>	TR	●	●
Diesel fuel <sup>2)</sup>	H	●	●
Diethanolamine	TR	●	—
Diethyl ether (ether)	TR	●	●
Diglycollic acid	GL	●	● <sup>2)</sup>
Dihexyl phthalate <sup>2)</sup>	TR	●	●
Diisobutyl ketone <sup>2)</sup> (2,6-dimethylheptan-4-one)	TR	●	○
Diisopropyl ether	TR	●	○ <sup>2)</sup>
Diisooctyl phthalate	TR	●	●
Dimethylamine, gaseous	100 %	●	—
N, N-Dimethylformamide	TR	●	●
Dinonyl phthalate <sup>2)</sup> (DNP)	TR	●	●
Dioctyl phthalate (DOP)	TR	● <sup>3)</sup>	●
1,4-dioxane (diethylene dioxide)	TR	●	●
Fertilizer salts <sup>2)</sup>	GL	●	●
Iron (II) and (III) chloride <sup>2)</sup>	GL	●	●
Natural gas	TR	●	—
Peanut oil	TR	●	●
Vinegar (wine vinegar)	H	●	●
Acetic acid, aqueous (glacial acetic acid)	TR	●	●
Acetic acid, aqueous and vinegar essence	50 %	●	●
Acetic acid, aqueous	up to 40 %	●	●
Acetic acid anhydride	TR	●	—
Acetic acid ethyl ester (ethyl acetate)	TR	● <sup>3)</sup>	● <sup>3)</sup>
Acetic acid methyl ester (methyl acetate)	TR	●	●
Ethanol (ethyl alcohol)	TR	●	●
Ethanol, denatured with 2 % of toluene <sup>2)</sup>	96 % (Vol.)	●	—
Ethylbenzene <sup>2)</sup>	TR	●	○
Ethyl chloride, gaseous (chloroethane)	TR	○	○
Ethylene chlorohydrin (chloroethanol)	TR	●	● <sup>2)</sup>
Ethylenediamine (1,2-diaminoethane)	TR	●	●
Ethylene glycol	TR	●	●
Ethylene oxide, liquid <sup>2)</sup> (oxirane)	TR	○	—
Fatty acids (from C <sub>4</sub> ) <sup>2)</sup>	TR	●	●
Pine-needle oil <sup>2)</sup>	H	●	●
Fluorine, dry <sup>2)</sup>	TR	●	—
Fluorosilicic acid <sup>2)</sup> , aqueous	32 %	●	●
Hydrofluoric acid, aqueous <sup>2)</sup>	40 %	●	●

Flow Substance	Content <sup>1)</sup> %	Behavior at	
		20 °C / 68 °F	60 °C / 140 °F
Hydrofluoric acid, aqueous <sup>2)</sup>	70 %	●	◐
Formaldehyde, aqueous	40 %	●	● <sup>2)</sup>
Photo emulsions <sup>2)</sup>	H	●	●
Photo developer baths <sup>2)</sup>	H	●	●
Photo fixing baths <sup>2)</sup>	H	●	●
Antifreeze (automobiles) <sup>2)</sup>	H	●	●
Fruit drinks and fruit juices	H	●	●
Fructose (fruit sugar)	L	●	●
Furfuryl alcohol <sup>2)</sup>	TR	●	◐
Fermentation mash <sup>2)</sup>	H	●	●
Gelatine	L	●	●
Tannin extract, vegetable <sup>2)</sup>	H	●	○
Tannic acid (tannin), aqueous <sup>2)</sup>	10 %	●	○
Glucose, aqueous	20 %	●	●
Glycerol	TR	●	●
Glycollic acid, aqueous	30 %	●	◐ <sup>2)</sup>
Urea	GL	●	● <sup>2)</sup>
Yeast <sup>2)</sup>	any	●	—
Heating Oil <sup>2)</sup>	H	●	◐
Heptanes	TR	● <sup>3)</sup>	◐ <sup>3)</sup>
Hexanes	TR	●	◐
Hexane-1,2,6-triol <sup>2)</sup>	TR	●	●
Hydrazine hydrate <sup>2)</sup>	TR	●	—
Hydroquinone <sup>2)</sup>	L	●	—
Hydroxylammonium sulphate <sup>2)</sup>	12 %	●	●
Isooctane	TR	● <sup>3)</sup>	◐ <sup>3)</sup>
Isopropanol (propan-2-ol)	TR	●	●
Tincture of iodine	H	●	◐ <sup>2)</sup>
Potassium hydroxide solution, aqueous	50 %	●	●
Potassium bromate, aqueous	10 %	●	●
Potassium bromide	GL	●	●
Potassium carbonate (potash)	GL	●	● <sup>2)</sup>
Potassium chlorate	GL	●	●
Potassium chloride	GL	●	● <sup>2)</sup>
Potassium chromate	GL	●	●
Potassium cyanide	L	●	● <sup>2)</sup>
Potassium dichromate <sup>2)</sup>	GL	●	●
Potassium fluoride	GL	●	●
Potassium hexacyanoferrate-(II) and -(III) <sup>2)</sup> (yellow and red potassium ferro- and ferricyanide)	GL	●	●
Potassium bicarbonate	GL	●	●
Potassium iodide	GL	●	● <sup>2)</sup>
Potassium nitrate	GL	●	●

Flow Substance	Content <sup>1)</sup> %	Behavior at	
		20 °C / 68 °F	60 °C / 140 °F
Potassium perchlorate, aqueous	10 %	●	●
Potassium permanganate	GL	●	○ <sup>2)</sup>
Potassium peroxodisulphate (potassium persulphate)	GL	●	● <sup>2)</sup>
Potassium sulphate	GL	●	● <sup>2)</sup>
Fluoro silicic acid	32 %	●	●
Silicic acid, aqueous <sup>2)</sup>	any	●	●
Common salt (sodium chloride)	VL	●	●
Aqua regia (HCl/HNO <sub>3</sub> )	75 %/25 %	○	○
Carbon dioxide, gaseous	any	●	●
Carbon dioxide (carbonic acid), aqueous <sup>2)</sup>	any	●	●
Coconut fat alcohol <sup>2)</sup>	TR	●	◐
Coconut oil (coconut fat, copra)	TR	●	–
Cresols	90 %2	●	●
Cresols	>90 %	●	–
Copper(II) chloride	GL	●	●
Copper(I) cyanide <sup>2)</sup>	GL	●	●
Copper(II) nitrate, aqueous	30 %	●	●
Copper(II) sulphate	GL	●	●
Lanolin (wool fat)	H	●	◐
Linseed oil	H	●	●
Illuminating gas <sup>2)</sup>	H	●	–
Air	TR	●	●
Magnesium chloride	GL	●	●
Magnesium hydroxide carbonate	GL	●	●
Magnesium salts <sup>2)</sup>	GL	●	●
Magnesium sulphate	GL	●	●
Maize germ oil	TR	●	◐
Machine oil <sup>2)</sup>	TR	●	◐
Sea-water	H	●	●
Molasses <sup>2)</sup>	H	●	●
Menthol <sup>2)</sup>	TR	●	◐
Methanol (methyl alcohol)	TR	●	●
Methanol (methyl alcohol)	5 %	●	● <sup>3)</sup>
Methanesulphonic acid, aqueous <sup>2)</sup> (methylsulphuric acid)	50 %	◐	◐
Methanesulphonic acid, aqueous <sup>2)</sup> (methylsulphuric acid)	50 bis 100 %	◐	○
Methoxybutanol <sup>2)</sup>	TR	●	◐
Methyl acetate see (acetic acid methyl ester)	TR	●	●
Methylamine, aqueous	32 %	●	–
Methyl bromide (bromomethyl)	TR	○	○
Methyl chloride, gaseous <sup>2)</sup> (chloromethyl)	TR	○	○
Methylene chloride (dichloromethane)	TR	◐	○
Methyl ethyl ketone <sup>2)</sup>	TR	●	◐
Milk	H	●	●
Lactic acid	90 %	●	●
Mineral water	H	●	●



Flow Substance	Content <sup>1)</sup> %	Behavior at	
		20 °C / 68 °F	60 °C / 140 °F
Engine lubrication oils <sup>2)</sup>	TR	●	◐
Naphtha	H	●	○
Sodium acetate	GL	●	●
Sodium benzoate, aqueous	35 %	●	● <sup>2)</sup>
Sodium borate-hydrogen peroxide (sodium perbarate)	GL	●	—
Sodium carbonate, aqueous	50 %	●	●
Sodium chlorate	GL	●	● <sup>2)</sup>
Sodium chloride	VL	●	●
Sodium chlorite, aqueous	2 to 20 %	●	◐
Sodium dichromate	GL	●	●
Sodium hexametaphosphate	L	●	● <sup>2)</sup>
Sodium bicarbonate	GL	●	●
Sodium bisulphate	GL	●	●
Sodium bisulphite	L	●	—
Sodium hypochlorite, aqueous	10 %	●	—
Sodium hypochlorite, aqueous	20 %	◐ <sup>4)</sup>	◐
Sodium nitrate	GL	●	●
Sodium nitrite <sup>2)</sup>	G	●	●
Sodium phosphate, tri	GL	●	●
Sodium silicate, (water-glass)	L	●	●
Sodium sulphate	GL	●	●
Sodium sulphide	GL	●	● <sup>2)</sup>
Sodium sulphite, aqueous	40 %	●	●
Sodium tetraborate	L	●	●
Sodium thiosulphate	GL	●	● <sup>2)</sup>
Sodium hydroxide solution, aqueous	up to 60 %	●	●
Nickel salts <sup>2)</sup>	GL	●	●
Nitrobenzene	TR	●	◐
2-Nitrotoluene <sup>2)</sup>	TR	●	◐
Fruit pulps <sup>2)</sup>	H	●	—
Octylcresol <sup>2)</sup>	TR	◐	○
Oils and fats (animal and vegetable)	TR	●	◐
Oleic acid	TR	●	◐
Oleum (H <sub>2</sub> SO <sub>4</sub> + SO <sub>3</sub> )	TR	○	○
Olive oil	TR	●	●
Oxalic acid	GL	●	● <sup>3)</sup>
Ozone <sup>2)</sup>	0.5ppm	●	◐
Paraffin emulsions <sup>2)</sup>	H	●	●
Paraffin oil	TR	●	◐
Perchloroethylene (tetrachloroethylene) <sup>2)</sup>	TR	◐	◐
Perchloric acid, aqueous	20 %	●	● <sup>2)</sup>
Petroleum ether	TR	● <sup>3)</sup>	◐

Flow Substance	Content <sup>1)</sup> %	Behavior at	
		20 °C / 68 °F	60 °C / 140 °F
Petroleum	TR	●	◐
Peppermint oil	TR	●	—
Phenol, aqueous	5 %	●	●
Phenol, aqueous	90 %	●	—
Phenylhydrazine <sup>2)</sup>	TR	◐	◐
Phenylhydrazinium chloride <sup>2)</sup>	TR	●	◐
Phosgene, gaseous <sup>2)</sup> (carbonyl chloride)	TR	◐	◐
Phosphates <sup>2)</sup> (inorganic)	GL	●	●
Phosphorus(III) chloride <sup>2)</sup>	TR	◐	—
Phosphorus oxychloride	TR	◐	—
Phosphoric acid, ortho	85 %	●	●
Phthalic acid <sup>2)</sup>	GL	●	●
Picric acid (2, 4, 6 - trinitrophenol)	GL	●	—
Propane, gaseous	TR	●	—
Propan-1-ol <sup>2)</sup> (propyl alcohol)	TR	●	●
Propargyl alcohol, aqueous <sup>2)</sup>	7 %	●	●
Propionic acid, aqueous	>50 %	●	● <sup>2)</sup>
Propylene glycols <sup>2)</sup>	TR	●	●
Pyridine	TR	◐	◐ <sup>2)</sup>
Mercury	TR	●	●
Mercury salts <sup>2)</sup>	GL	●	●
Castor oil	TR	●	●
Aqueous ammonia (ammonia water)	GL	●	● <sup>2)</sup>
Nitric acid, aqueous	10 %	●	◐ <sup>3)</sup>
Nitric acid, aqueous	10–50 %	◐	○ <sup>2)</sup>
Nitric acid, aqueous	>50 %	○	○
Hydrochloric acid, aqueous	up to 20 %	●	●
Hydrochloric acid, aqueous	>20 to 36 %	●	◐ <sup>2)</sup>
Oxygen	TR	●	—
Lubricating oils <sup>2)</sup>	H	◐	—
Sulphur dioxide, gaseous	TR	●	● <sup>2)</sup>
Sulphur dioxide, gaseous (sulphurous acid)	any	●	● <sup>2)</sup>
Carbon disulphide	TR	○	○
Sulphuric acid, aqueous	10 %	●	●
Sulphuric acid, aqueous	>10 to 80 %	●	●
Sulphuric acid, aqueous	>80 to TR	◐	○
Sulphuric acid, fuming (oleum)		○	○
Hydrogen sulphide, gaseous	TR	●	●
Sea-water	H	●	●
Silver nitrate	GL	●	●
Silver salts <sup>2)</sup>	GL	●	●
Silicone oil	TR	●	●
Silicone emulsion <sup>2)</sup>	H	●	●

Flow Substance	Content <sup>1)</sup> %	Behavior at	
		20 °C / 68 °F	60 °C / 140 °F
Soda (sodium carbonate)	50 %	●	●
Soybean oil	TR	●	◐
Spindle oil <sup>2)</sup>	TR	●	◐
Starch	any	●	●
Starch gum (dextrin)	L	●	●
Starch syrup <sup>2)</sup>	any	●	●
Sulphuryl chloride <sup>2)</sup>	TR	○	○
Terpentine oil	TR	○	○
White spirit <sup>2)</sup>	TR	●	◐
Tetrachloroethane <sup>2)</sup>	TR	◐	○
Tetrachloroethylene (perchloroethylene)	TR	◐	◐
Carbon tetrachloride (tetrachloromethane)	TR	○	○
Tetrahydrofuran	TR	◐	○
Tetrahydronaphthalene (tetralin)	TR	○	○
Thionyl chloride <sup>2)</sup>	TR	◐	○
Thiophene	TR	●	◐
Toluene	TR	◐	○
Transformer oil (insulating oil) <sup>2)</sup>	TR	◐	○
Grape sugar (glucose)	20 %	●	●
Triethanolamine	L	●	–
Trichloroethylene	TR	○	○
Trichloroacetic acid, aqueous	50 %	●	●
Tricresyl phosphate <sup>2)</sup> (phosphoric acid tritolyl ester)	TR	●	◐
Drinking water, chlorinated <sup>2)</sup>	TR	●	●
Triocyl phosphate <sup>2)</sup>	TR	●	–
Vaseline oil <sup>2)</sup>	TR	●	◐
Vinyl acetate <sup>2)</sup>	TR	●	◐
Vinylidene chloride (1,1-dichloroethylene)	TR	◐	–
Detergents <sup>2)</sup>	VL	●	●
Water, pure	H	●	●
Hydrogen	TR	●	● <sup>2)</sup>
Hydrogen peroxide, aqueous	30 %	●	◐
Wines	H	●	● <sup>2)</sup>
Wine vinegar, table vinegar	H	●	●
Tartaric acid, aqueous	10 %	●	●
Xdylene (all isomers)	TR	◐ <sup>3)</sup>	○
Zinc salts <sup>2)</sup>	GL	●	●
Tin(II) chloride	GL	●	●
Tin(IV) chloride	GL	●	●
Citric acid	VL	●	●
Sugar syrup <sup>2)</sup>	H	●	●







**aquatherm**  
state of the pipe

## EXPLANATORY COMMENTS ON THE AQUATHERM GMBH WARRANTY

### 1. Foreword

Thank you very much for making the decision to use a product from aquatherm GmbH, Germany (herein referred to as "aquatherm"). With more than 45 years of experience in the international plastic pipes market, and our trendsetting innovations, we have the expertise needed to offer you engineered piping solutions made in Germany.

The trust placed in the quality of our products has motivated us to offer all pipes and molded, fabricated, machined, and/or assembled parts with a 10-year warranty instead of the standard 2-year warranty required by German law. This extended time covered by warranty is backed by a comprehensive insurance policy from a leading insurance company for our line of business. The warranty period will begin with the date of delivery by aquatherm GmbH, but only comes valid with the successful pressure test, which must be carried out and documented in accordance with the aquatherm specification.

### 2. Scope of warranty

The aquatherm warranty protects you from financial loss proven to be caused by material defects, manufacturing defects and/or aquatherm's consulting/engineering services. The warranty coverage shall apply for the following product groups:

- aquatherm green pipe (fusiotherm and aquatherm ISO)
- aquatherm blue pipe (climatherm and aquatherm ISO)
- aquatherm red pipe (firestop)
- aquatherm black system (climasystem)
- aquatherm lilac pipe (aquatherm lilac)
- aquatherm orange system (aquatherm heating systems)
- aquatherm grey pipe (aquatherm SHT system)
- assemblies fabricated by aquatherm from these product groups

#### 2.1 What is covered by the aquatherm warranty?

The aquatherm warranty covers three aspects of damages: property damage, financial loss and personal injury.

##### 2.1.1 What is property damage?

The damage to or destruction of a tangible item as a result of a defective product (e.g. classic water damages as a result of a leak). As a result of this, the suitability of the tangible item to fulfill its actual purpose is impaired. The term property damage is used if tangible items are damaged or destroyed. Considerable costs can be incurred as a result of property damage, such as renovation costs, repair costs or replacement costs.

##### 2.1.2 What is meant by financial loss?

Financial loss may either be out-of-pocket loss or loss of business. Out-of-pocket financial loss is for example the costs of removing products and installing replacements after damage. Loss of business is the financial disadvantage suffered by an injured party as a result of a damaging event (e.g. lost income as a result of renovations following property damage).

##### 2.1.3 What is meant by personal injury?

If a person suffers physical injury, this is known as personal injury. For the purposes of this document, the coverage of personal injury means the direct medical costs incurred as a result of the injury.

### 3. What is not covered?

Costs related to the damages incurred such as a result of:

- Non-compliance with the operating parameters defined and specified by aquatherm as found in aquatherm's technical documents. In cases of doubt, contact your local aquatherm manufacturer's rep. Exceptions must be provided for, in writing, by a member of aquatherm's engineering team.
- Non-compliance with the installation guidelines as set out in the aquatherm Catalogue, with emphasis to the required installation of aquatherm propriety clipping or other compatible with aquatherm piping.
- Non-compliance with respective National Plumbing Standards and Regulations.
- Joints which were not made in accordance with the aquatherm guidelines, including but not limited to: improper fusion technique, use of contaminated materials or tools, use of faulty or unsuitable tools, use of damaged materials or tools, or any connection made by an installer without sound knowledge of the aquatherm connection techniques and their processes.
- Improperly assembled connections to other pipeline systems and/or components (threads, flanges, stubs, mechanical joints not intended for use with aquatherm PP piping etc.).
- All sealing elements used in the product lines manufactured by aquatherm.
- Tools and accessories sold by aquatherm GmbH are covered for the warranty period by law under the statutory warranty provisions.
- Systems with defective pipeline sections or fittings that were not subjected to the aquatherm pressure test or alternative testing approved by aquatherm prior to start-up.
- Damage to our products caused by incorrect handling after the material has left aquatherm's possession.
- Damage caused or exacerbated by copper in the water resulting from erosion/corrosion or other degradation of copper components in a domestic hot water recirculating system.
- Time delay, caused by incorrect planning, delivery problems and/or incorrect orders.
- Damage caused by entrained air, cavitation and pressure fluctuations.

**Note:** This list only includes the most prominent examples. Other circumstances, which compromise the integrity of the products, may also jeopardize the coverage.


**aquatherm**

state of the pipe

## EXPLANATORY COMMENTS ON THE AQUATHERM GMBH WARRANTY

### 4. How is the amount of compensation under the aquatherm warranty determined?

In the event of a material failure, samples of the damaged/faulty product are collected by the national aquatherm partner to forward them to aquatherm GmbH for examination and analysis. Working in collaboration with the injured party, aquatherm will identify the cause of the damage, and call in external bodies (test institutes, laboratories, assessors, etc.) as needed. If the damage has been caused by a material and/or manufacturing defect or by aquatherm's consulting/engineering services, the underwriter shall quantify the compensation claim for damages. All expenditures associated with the damages for this claim must be verified/recorded in detail and in a verifiable format as a required measure.

### 5. How much is the maximum coverage?

For the first 5 years of the warranty period, property damage, personal injury and financial loss is covered for the sum of €20 million per insurance claim. Total coverage for all claims made in a year is a maximum of €40 million. For years 6-10 of the warranty period, these coverage amounts are €7.5 and €15 million respectively.

### 6. Why is the coverage stated in Euro?

The insured manufacturer, aquatherm, as well as the insurer, are both based in the EU, so that their agreements are issued in Euros (€). Since exchange rates fluctuate, the exchange rate current on the date of compensation shall apply.

### 7. What is the channel of communication for notifying claims under warranty and making inquiries about them?

Warranty claims have to be made to aquatherm via the national aquatherm GmbH partners. Information about the progress of the claim will only be released by the aquatherm partner or aquatherm GmbH.

### 8. Legal note

If a discrepancy or conflict arises between this document and the underlying insurance policy, the latter shall in all cases prevail.

If a discrepancy or conflict arises between this translated document and the German document, the German document shall in all cases prevail.

### 9. Information about avoiding damage

#### I) **Manufacture under certified quality level**

As a trusted manufacturer, aquatherm works to a certified quality standard (ISO 9001); constant internal quality controls are part of the daily routine. In addition to this, all employees are integrated into a quality assurance program. As a result of this, products failing to comply with our high standards are quickly identified and removed from our product range.

#### II) **Preventing damage caused by incorrect handling**

Our products must be handled conscientiously and carefully when they are delivered from our production plants. Experience shows that most damage is caused in transit, storage and/or when working on site. At this point we would draw close attention to the fact that correct handling contributes to maintaining the product quality.

#### III) **Work is to be carried out by qualified installers**

Installation defects are easy to avoid. Our training courses teach the correct techniques in detail for working with our products. In doing so, particular importance is attached to work being carried out attentively and with care. The work of installers trained by us or our aquatherm partners is much more reliable and carried out much more efficiently.

**For a safe connection, we recommend using only aquatherm PP products in a piping system. Mixing with other PP piping systems should be avoided.**

June 2020  
aquatherm GmbH, Biggen 5, 57439 Attendorn, Germany

## REFERENCES

The application pictures in this catalogue show the aquatherm blue pipe pipes as they were produced until March 2020. With the material change to fusiolen® PP-RCT, the pipes are now single-coloured blue.

aquatherm factory, Attendorf, Germany





aquatherm factory, Attendorn, Germany



CIO, Cologne, Germany





Ecolab, Monheim, Germany



Millerntor stadium, FC St. Pauli 1910 e.V., Hamburg, Germany





The Oval, Cyprus





Miraggio Thermal Spa, Kanistros, Greece





Hellenic Telecoms AG, Athens, Greece

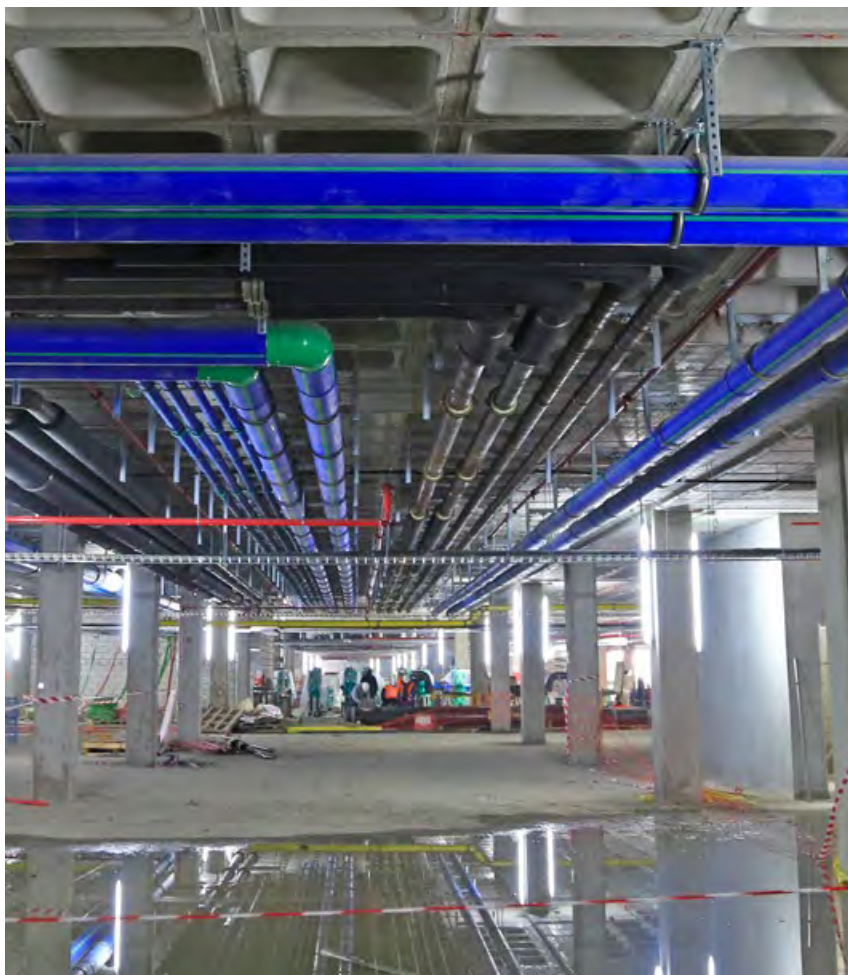


Hotel Kalimera, Crete, Greece



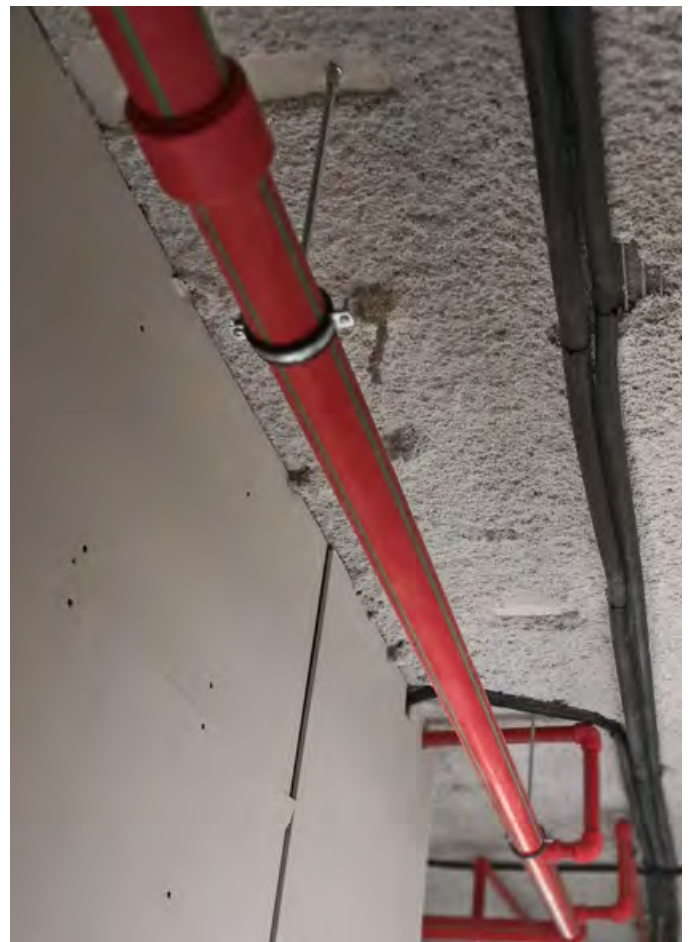


Shopping Center, Seville, Spain



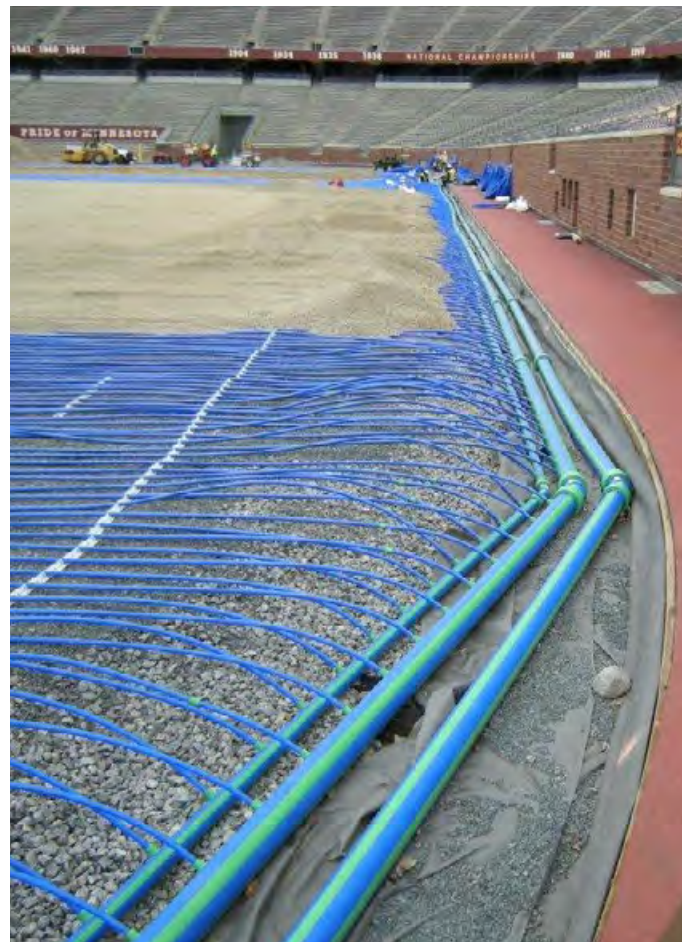


Riu Plaza de Espana, Madrid, Spain



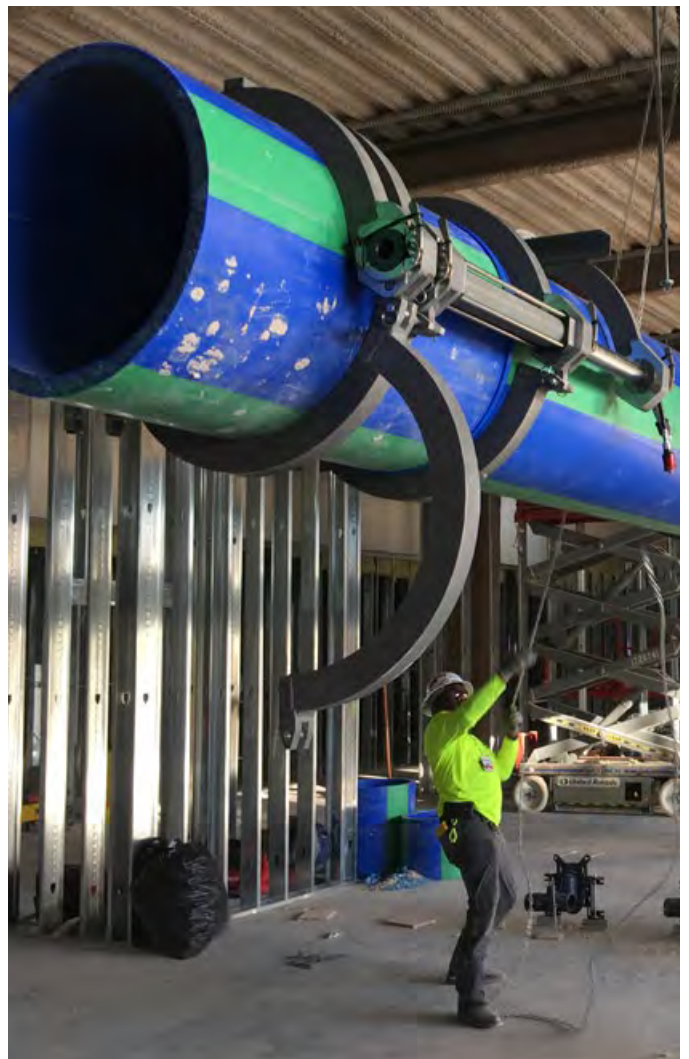
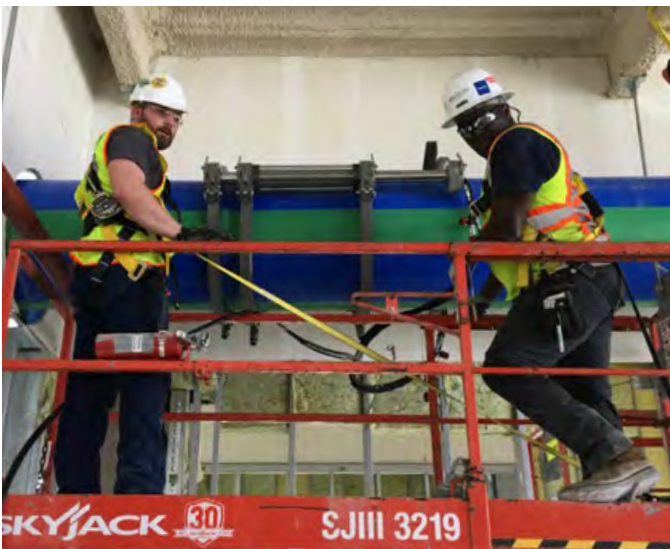


TCF Bank Stadion, Minneapolis (MN), USA





Seminole Hard Rock Hotel, Hollywood (FL), USA

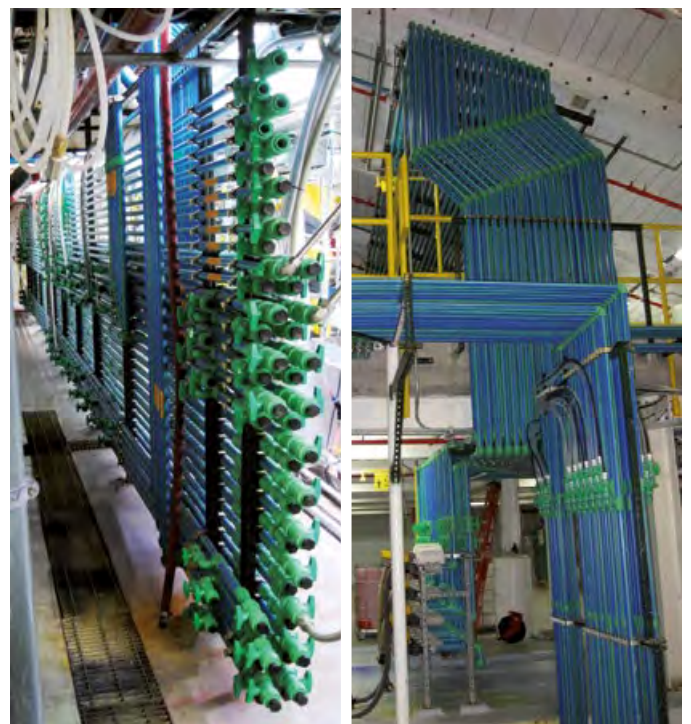
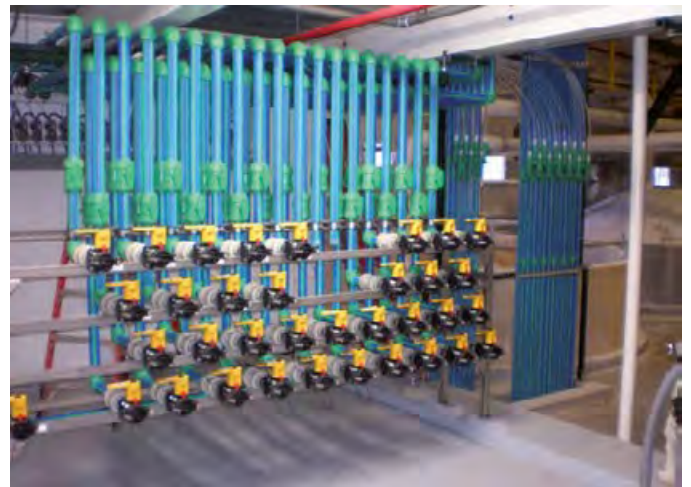




LLNL, Livermore (CA), USA



Neenah Paper, Stevens Point (WI), USA





Daikin AC, Irvine (CA), USA



Epic Brewery, Denver (CO), USA





Hancock Medical, Bay St. Louis (MS) USA





Park Orchard Elementary School, Kent (WA), USA



Colorado State University, Fort Collins (CO), USA





The Standard Building, Cleveland (OH), USA

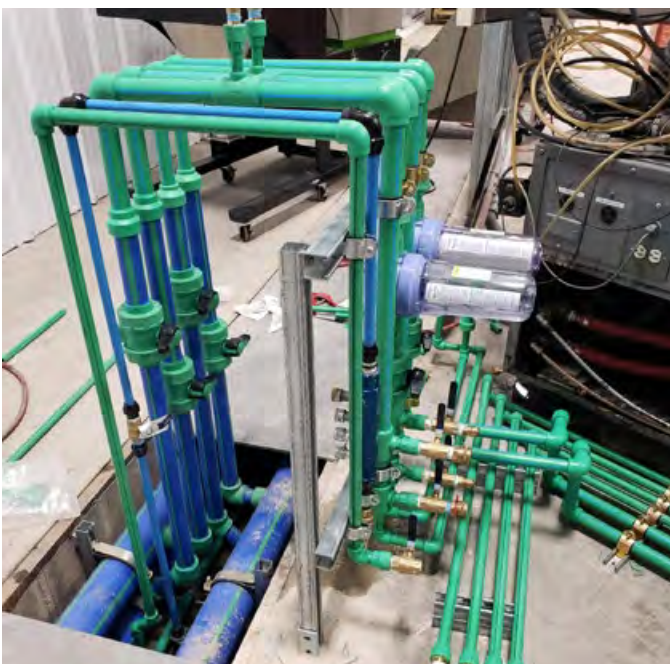




Old Dominion University, Norfolk (VA), USA



One-Six Multi-Family Residence, Calgary (AB), Canada





Flex Tower, Ras Al Khaimah, UAE



Al Sayegh Tower, Sharjah, UAE





## TRANSPORT AND STORAGE

aquatherm polypropylene pipes may be stored outside at any temperature. A solid base for the pipe is very important to avoid a deformation of the pipes while in transport and storage.

At temperatures below 0 °C it is possible to damage the pipes through strong impacts. The material has to be treated with caution at low temperatures.

In spite of its high resistance aquatherm pipes should be treated with care.

UV-radiation has effects on all high polymer plastics. Do not store permanently outdoor.

The maximum permissible storage time outdoors is 6 months.



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**aquatherm blue pipe** pipes

aquatherm prefabrication

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Peeling tools

Saddle welding tools

Drills & saddle peeling tool

Hot tapping tool & accessoires

# aquatherm blue pipe

Made of corrosion-resistant polypropylene, aquatherm blue pipe is ideal for the transport of cooling and heating media in closed systems. It is particularly well suited for a wide variety of industrial applications. The physical properties of the plastic, such as its high temperature capacity and pressure resistance, are tailored to the specific needs of the heating and cooling sector. aquatherm blue pipe is joined via reliable heat fusion, which produces a virtually leak-free and cohesive unit with excellent safety and durability. aquatherm blue pipe combined with aquatherm green pipe fittings provides all the technology and components required for the piping installation of commercial air conditioning and heating systems and industrial applications.

## Pipe system made of polypropylene

for heating and cooling and various industrial applications

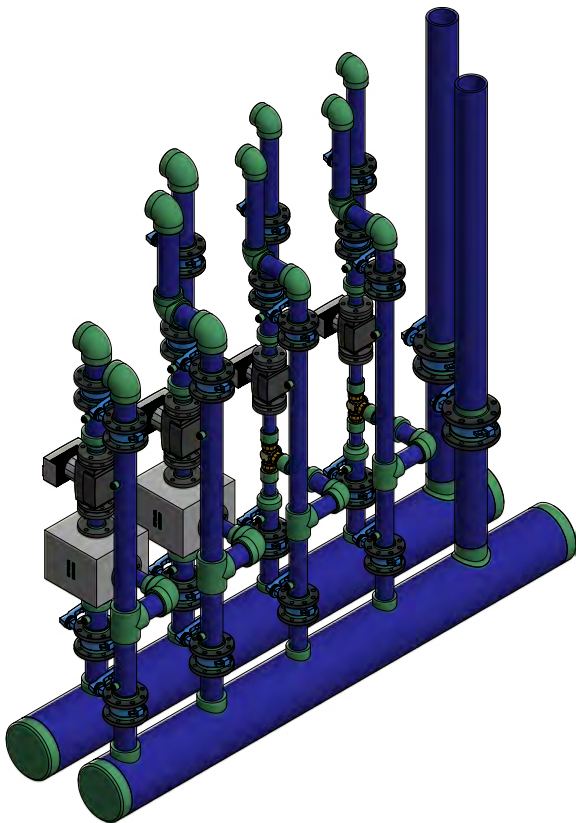
		Dimension [mm]																		
		20	25	32	40	50	63	75	90	110	125	160	200	250	315	355	400	450	500	630
aquatherm blue pipe	SDR 7.4 MF	●	●																	
aquatherm blue pipe	SDR 7.4 MF UV	●	●																	
aquatherm blue pipe	SDR 7.4 MF OT	●	●																	
aquatherm blue pipe	SDR 9 MF RP			●																
aquatherm blue pipe	SDR 9 MF RP UV			●																
aquatherm blue pipe	SDR 9 MF RP OT			●																
aquatherm blue pipe	SDR 9 MF RP TI			●																
aquatherm blue pipe	SDR 9 MF RP OT TI			●																
aquatherm blue pipe	SDR 11 S	●	●																	
aquatherm blue pipe	SDR 11 MF RP				●	●	●	●	●	●	●	●	●	●	●	●	●	●		
aquatherm blue pipe	SDR 11 MF RP UV				●	●	●	●	●	●	●	●	●	●	●	●	●	●		
aquatherm blue pipe	SDR 11 MF RP OT				●	●	●	●	●	●	●	●	●	●						
aquatherm blue pipe	SDR 11 MF RP TI				●	●	●	●	●	●	●	●	●	●	●	●				
aquatherm blue pipe	SDR 11 MF RP OT TI				●	●	●	●	●	●	●	●	●	●						
aquatherm blue pipe	SDR 17.6 MF RP										●	●	●	●	●	●	●	●	●	●
aquatherm blue pipe	SDR 17.6 MF RP UV										●	●	●	●	●	●	●	●	●	●
aquatherm blue pipe	SDR 17.6 MF RP TI										●	●	●	●	●	●				

### CUSTOMIZED PREFABRICATION

We design and construct your manifolds in our factory according to your specifications and dispatch them pre-finished to any place of the world.











To start the process, only the corresponding planning data, 3D-data and/or drawings with dimensions are required. We return the offer including material list and drawings. A qualified team of experienced technicians will assist you.

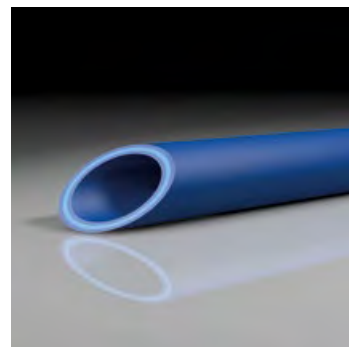
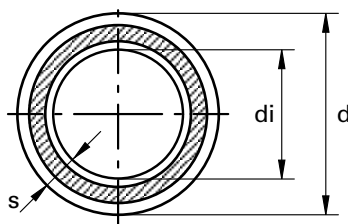
For detailed about our prefabrication service please contact our technical hotline: +49 2722 950 200.





## aquatherm blue pipe SDR 7.4 MF || SDR 9/11/17.6 MF RP

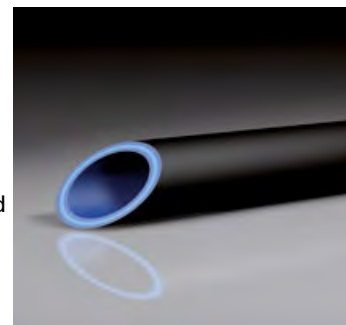
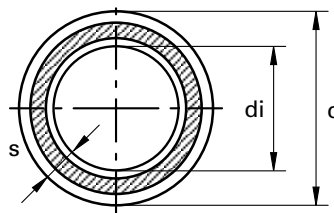
<b>Pipe structure:</b>	MF = multi-layer, fibre-reinforced
<b>Special feature:</b>	RP = raised pressure resistance
<b>Material:</b>	fusiolen® PP-R / PP-RCT
<b>Pipe series:</b>	SDR 7.4 / S 3.2 & SDR11 / S 5 & SDR 17.6 / S 8.3 SDR 9 / S 4
<b>Standard:</b>	SKZ HR 3.28, ASTM F 2389, CSA B 137.11, ISO 21003
<b>Colour:</b>	blue
<b>Delivery form:</b>	ø 20 – 125 mm straight lengths 4 m ø 160 – 630 mm straight lengths 5.8 m
<b>Packing unit:</b>	PU in meter
<b>Application:</b>	         



SDR	Art. no.	Dimension d [mm]	Wall thickness s [mm]	Internal diameter di [mm]	Water content [l/m]	Weight [kg]	DN	PU [m]	Price € m
<i>Socket welding</i>									
7.4	2070708	20	2,8	14,40	0,163	0,157	15	100	
	2070710	25	3,5	18,00	0,254	0,244	20	100	
9	2071112	32	3,6	24,8	0,539	0,334	25	40	
11	2071114	40	3,7	32,6	0,834	0,430	32	40	
	2071116	50	4,6	40,8	1,307	0,651	40	20	
	2071118	63	5,8	51,4	2,074	1,062	50	20	
	2071120	75	6,8	61,4	2,959	1,494	65	20	
	2071122	90	8,2	73,6	4,252	2,141	80	12	
	2071124	110	10,0	90	6,359	3,239	-	8	
	2071126	125	11,4	102,2	8,199	4,092	100	4	
	<i>Butt welding</i>								
	2071130	160	14,6	130,8	13,430	6,710	125	5.8	
	2071134	200	18,2	163,6	21,010	10,442	150	5.8	
	2071138	250	22,7	204,6	32,861	16,579	200	5.8	
	2071142	315	28,6	257,8	52,172	26,223	250	5.8	
	2071144	355	32,2	290,6	66,29	33,276	300	5.8	
	2071146	400	36,3	327,6	84,290	42,266	300	5.8	
	2071148	450	40,9	368,2	106,477	53,566	400	5.8	
17.6	<i>Socket welding</i>								
	3570125	125	7,1	110,8	9,637	2,667	100	4	
	<i>Butt welding</i>								
	3570130	160	9,1	141,8	15,792	4.39	150	5.8	
	3570134	200	11,4	177,2	24,661	6.93	200	5.8	
	3570138	250	14,2	221,6	38,568	10.64	250	5.8	
	3570142	315	17,9	279,2	61,223	16,606	300	5.8	
	3570144	355	20,1	314,8	77,832	21,589	350	5.8	
	3570146	400	22,7	354,6	98,756	27,468	350	5.8	
	3570148	450	25,5	399,0	125,036	34,716	400	5.8	
	3570150	500	28,4	443,2	154,272	42,955	450	5.8	
	3570154	630	35,7	558,6	245,070	68,044	500	5.8	

## aquatherm blue pipe SDR 7.4 MF UV || SDR 9/11/17.6 MF RP UV

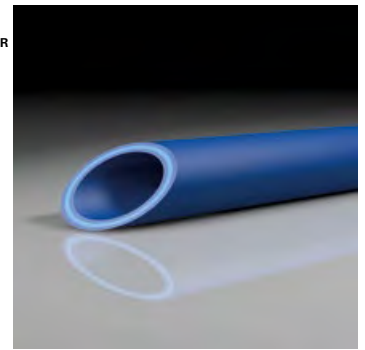
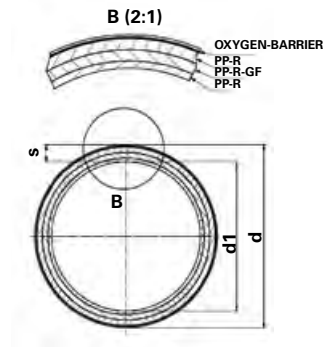
<b>Pipe structure:</b>	MF = multi-layer, fibre-reinforced
<b>Special feature:</b>	RP = raised pressure resistance UV = UV-resistant
<b>Material:</b>	fusiole® PP-R / PP-RCT
<b>Pipe series:</b>	SDR 7.4 / S 3.2 & SDR11/SDR 17.6 / S 8.3 SDR 9 / S 4
<b>Standard:</b>	SKZ HR 3.28, ASTM F 2389, CSA B 137.11, ISO 21003
<b>Colour:</b>	outside: black, inside: blue
<b>Delivery form:</b>	ø 20 – 125 mm straight lengths 4 m ø 160 – 630 mm straight lengths 5.8 m
<b>Packing unit:</b>	PU in meter
<b>Application:</b>	



SDR	Art. no.	Dimension d [mm]	Wall thickness s [mm]	Internal diameter di [mm]	Water content [l/m]	Weight [kg]	DN	PU [m]	Price € m
<i>Socket welding</i>									
7.4	2070758	20	2,8	14,40	0,163	0,210	15	100	
	2070760	25	3,5	18,00	0,254	0,314	20	100	
9	2071162	32	3,6	24,80	0,483	0,328	25		
11	2070164	40	3,7	32,60	0,834	0,555	32	40	
	2070166	50	4,6	40,80	1,307	0,827	40	20	
	2070168	63	5,8	51,40	2,074	1,260	50	20	
	2070170	75	6,8	61,40	2,959	1,712	65	20	
	2070172	90	8,2	73,60	4,252	2,480	80	12	
	2070174	110	10,0	90,00	6,359	3,693	-	8	
	2070176	125	11,4	102,20	8,199	4,774	100	4	
	<i>Butt welding</i>								
	2070180	160	14,6	130,80	13,430	7,181	125	5.8	
	2070184	200	18,2	163,60	21,010	11,029	150	5.8	
17.6	2070188	250	22,7	204,60	32,861	17,312	200	5.8	
	2070192	315	28,6	257,80	52,172	26,223	250	5.8	
	2070194	355	32,2	290,60	66,292	34,315	300	5.8	
	2070196 ◆	400	36,3	327,40	84,145	43,437	300	5.8	
	2070198 ◆	450	40,9	368,20	106,423	54,883	400	5.8	
	2570180	160	9,1	141,80	15,784	4,860	150	5.8	
	2570184	200	11,4	177,20	24,649	7,514	200	5.8	
	2570188	250	14,2	221,60	38,549	11,369	250	5.8	
	2570192 ◆	315	17,9	279,20	61,193	17,529	300	5.8	
	2570194 ◆	355	20,1	314,8	77,793	21,647	350	5.8	
17.6	2570196 ◆	400	22,7	354,6	98,707	27,339	350	5.8	
	2570198 ◆	450	25,5	399,0	124,973	34,454	400	5.8	
	2570200 ◆	500	28,4	443,2	154,195	42,525	450	5.8	
	2570204 ◆	630	35,7	558,6	245,947	66,976	500	5.8	

## aquatherm blue pipe SDR 7.4 OT || SDR 9/11 MF RP OT

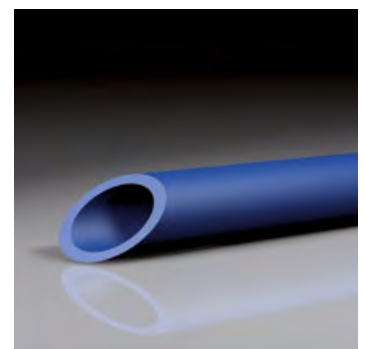
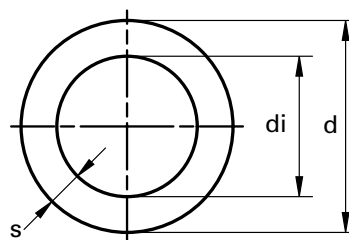
<b>Pipe structure:</b>	MF = multi-layer, fibre-reinforced
<b>Special feature:</b>	RP = raised pressure resistance OT = oxygen-tight
<b>Material:</b>	fusiolen® PP-R / PP-RCT
<b>Pipe series:</b>	SDR 7.4 / S 3.2 & SDR11 / S 5 / SDR 9 / S 4
<b>Standard:</b>	DIN 8077/78, DIN EN ISO 15874, ASTM F 2389, CSA B 137.11, ISO 21003
<b>Colour:</b>	blue
<b>Delivery form:</b>	ø 20 – 125 mm straight lengths 4 m ø 160 – 250 mm straight lengths 5,8 m
<b>Packing unit:</b>	PU in meter
<b>Application:</b>	



SDR	Art. no.	Dimension d [mm]	Wall thickness s [mm]	Internal diameter d1 [mm]	Water content [l/m]	Weight [kg]	DN	PU [m]	Price € m
<i>Socket welding</i>									
7.4	2170708	20	2,8	14,40	0,163	0,211	15	100	
	2170710	25	3,5	18,00	0,254	0,316	20	100	
9	2171712	32	3,6	24,80	0,483	0,328	25	40	
	2170114	40	3,7	32,60	0,834	0,562	32	40	
	2170116	50	4,6	40,80	1,307	0,695	40	20	
	2170118	63	5,8	51,40	2,074	1,279	50	20	
	2170120	75	6,8	61,40	2,959	1,739	65	20	
	2170122	90	8,2	73,60	4,252	2,533	80	12	
11	2170124	110	10,0	90,00	6,359	3,752	-	8	
	2170126	125	11,4	102,20	8,199	4,201	100	4	
<i>Butt welding</i>									
	2170130	160	14,6	130,80	13,430	6,847	125	5.8	
	2170134	200	18,2	163,60	21,010	10,520	150	5.8	
	2170138	250	22,7	204,60	32,861	16,226	200	5.8	

## aquatherm blue pipe SDR 11 S

<b>Pipe structure:</b>	S = single-layer
<b>Material:</b>	fusiolen® PP-R
<b>Pipe series:</b>	SDR 11/S 5
<b>Standard:</b>	DIN 8077/78, DIN EN ISO 15874, ASTM F 2389, CSA B 137.11, NSF 14, ISO 21003
<b>Colour:</b>	blue
<b>Delivery form:</b>	4 m straight lengths, *in coils
<b>Packing unit:</b>	PU in meter
<b>Application:</b>	



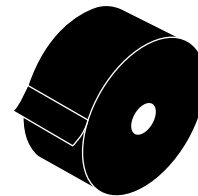
SDR	Art. no.	Dimension d [mm]	Wall thickness s [mm]	Internal diameter di [mm]	Water content [l/m]	Weight [kg]	DN	PU [m]	Price € m/pc
<i>Socket welding</i>									
11	2010208	20	1,9	16,20	0,206	0,108	15	100	
	2010210	25	2,3	20,40	0,327	0,165	20	100	
	2010308 *◆	20	1,9	16,20	0,206	0,108	15	100	
	2010310 *◆	25	2,3	20,40	0,327	0,165	20	100	
	2010312 *◆	32	2,9	26,20	0,539	0,261	25	50	



## ADHESIVE TAPE TO PROTECT AGAINST UV-RADIATION

for aquatherm MF UV pipes

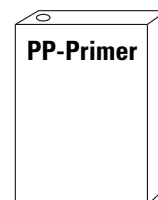
Art. no.	Dimension	PU	Price € pc
<b>10871</b>	50mm x 10m	1	



## AQUATHERM PP-PRIMER

for aquatherm PP pipes

Art. no.	Dimension	PU	Box unit	Price € pc
<b>50230</b>		1l		
<b>50231</b>		10l		



## AQUATHERM SPECIAL TOP COAT

for aquatherm PP-pipes

Art. no.	Colour	PU	Box unit	Price € pc
<b>50232</b>	black	2,5l		
<b>50233</b>	white	2,5l		

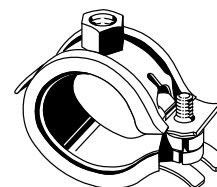


## PIPE CLAMPS

suitable for sliding and fixed point installation

Thread connection: M8 & M10 for 16 – 125 mm | M10 for 160 mm | M16 for 200 – 355 mm

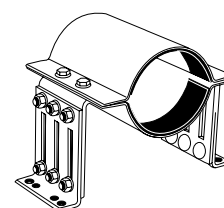
Art. no.	for pipe dimension [mm]	PU	Box unit	Price € pc
<b>60516</b>	<b>16</b>	50		
<b>60520</b>	<b>20</b>	50		
<b>60525</b>	<b>25</b>	50		
<b>60532</b>	<b>32</b>	50		
<b>60540</b>	<b>40</b>	50		
<b>60550</b>	<b>50</b>	50		
<b>60563</b>	<b>63</b>	25		
<b>60575</b>	<b>75</b>	25		
<b>60590</b>	<b>90</b>	25		
<b>60594</b>	<b>110</b>	25		
<b>60595</b>	<b>125</b>	25		
<b>60597</b>	<b>160</b>	25		
<b>60650</b>	<b>200</b>	1		
<b>60654</b>	<b>250</b>	1		
<b>60658</b>	<b>315</b>	1		
<b>60660</b>	<b>355</b>	1		



## PIPE CLAMPS

suitable for fixed point installation

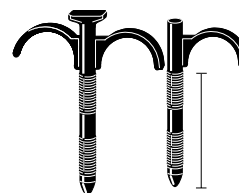
Art. no.	for pipe dimension [mm]	PU	Box unit	Price € pc
<b>60768</b>	<b>160</b>	1		
<b>60770</b>	<b>200</b>	1		
<b>60774</b>	<b>250</b>	1		
<b>60778</b>	<b>315</b>	1		
<b>60780</b>	<b>355</b>	1		
<b>60782</b>	<b>400</b>	1		
<b>60784</b>	<b>450</b>	1		
<b>60786</b>	<b>500</b>	1		
<b>60790</b>	<b>630</b>	1		



## PIPE FASTENING BOW

suitable for  $\varnothing$  16 – 32 mm pipes

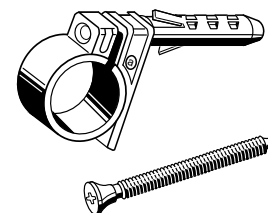
Art. no.	for pipe dimension	PU	Box unit	Price € pc
60604	1-fold - length = 45mm	50		
60606	1-fold - length = 75mm	50		
60608	2-fold - length = 45mm	50		
60610	2-fold - length = 75 mm	50		



## PLASTIC PIPE CLAMPS

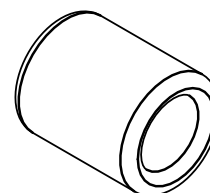
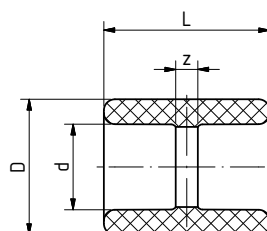
suitable for  $\varnothing$  16 – 40 mm pipes

Art. no.	for pipe dimension [mm]	PU	Box unit	Price € pc
60616	16	50		
60620	20	50		
60625	25	30		
60632	32	30		
60640	40	30		



## SOCKET

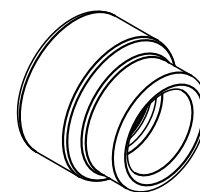
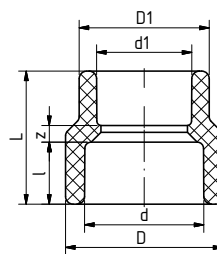
**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



SDR	Art. no.	Dimension d [mm]	l [mm]	z [mm]	D [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11 17.6	11008	20	32,0	3,0	27,0	0,008	10	1900	
	11010	25	35,0	3,0	34,0	0,013	10	1000	
	11012	32	40,5	4,5	43,0	0,026	5	600	
	11014	40	47,5	6,5	52,0	0,044	5	400	
	11016	50	53,0	6,0	68,0	0,084	5	200	
	11018	63	60,5	5,5	84,0	0,139	1	100	
	11020	75	66,5	6,5	100,0	0,226	1	70	
	11022	90	72,5	6,5	120,0	0,343	1	50	
	11024	110	82,0	8,0	147,0	0,581	1	30	
	11026	125	92,0	12,0	167,0	0,845	1	25	

## REDUCING SOCKET FEMALE/FEMALE

**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green

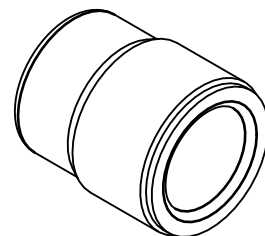
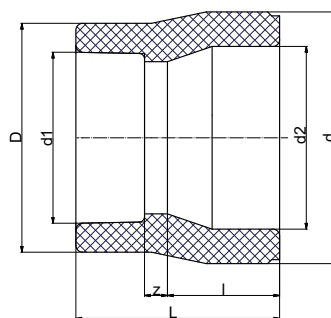


SDR	Art. no.	Dimension d [mm]	Dimension d1 [mm]	L [mm]	l [mm]	z [mm]	D [mm]	D1 [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>double-sided socket welding</i>												
6 7.4 9 11 17.6	11222	40	32	44,0	20,5	5,5	52,0	43,0	0,035	1		
	11228	50	32	53,0	23,5	11,5	68,0	43,0	0,066	1		
	11230	50	40	50,5	23,5	6,3	68,0	52,0	0,069	1		
	11236	63	40	61,0	27,5	13,0	84,0	52,0	0,115	1		
	11238	63	50	56,0	27,5	5,0	84,0	68,0	0,120	1		
	11240	75	50	68,0	30,0	14,5	100,0	68,0	0,192	1		
	11242	75	63	62,5	30,0	5,0	100,0	84,0	0,185	1		
	11252	90	63	74,0	33,0	13,5	120,0	84,0	0,276	1		
	11253	90	75	69,0	33,0	6,0	120,0	100,0	0,297	1		
	11257	110	75	85,0	37,0	18,0	147,0	100,0	0,516	1		
	11259	110	90	77,3	37,0	7,3	147,0	120,0	0,520	1		
	11263	125	90	91,0	40,0	18,0	167,0	120,0	0,749	1		
	11265	125	110	87,0	40,0	10,0	167,0	147,0	0,726	1		



## REDUCING SOCKET, SOCKET WELDING

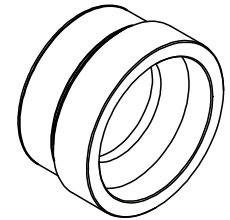
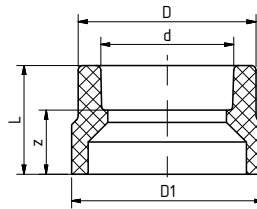
**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



SDR	Art. no.	Dimension d [mm]	Dimension d1 [mm]	Dimension d2 [mm]	L [mm]	L [mm]	z [mm]	D [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>double-sided socket welding</i>												
6 7.4 9 11 17.6	11112	25	20	16,50	16,0	38,5	8,0	29,5	0,012	10	1500	
	11114	32	20	21,50	18,0	37,5	5,0	29,5	0,015	5	1000	
	11116	32	25	21,00	18,0	38,0	4,0	34,0	0,016	5	1000	
	11118	40	20	26,50	20,5	45,0	10,0	29,5	0,025	5	750	
	11120	40	25	26,50	20,5	50,0	13,5	34,0	0,028	5	600	
	11122	40	32	26,50	20,5	50,0	11,5	43,0	0,032	5	500	
	11124	50	20	33,50	23,5	55,0	17,0	29,5	0,045	5	500	
	11126	50	25	33,50	23,5	55,0	15,5	34,0	0,044	5	400	
	11128	50	32	33,50	23,5	54,0	12,5	43,0	0,048	5	350	
	11130	50	40	33,50	23,5	53,0	9,0	52,0	0,053	5	300	
	11131	63	20	42,00	27,5	65,0	23,0	29,5	0,073	1	200	
	11132	63	25	42,00	27,5	65,0	21,5	34,0	0,071	1	200	
	11134	63	32	42,00	27,5	62,0	16,5	43,0	0,080	1	200	
	11136	63	40	42,00	27,5	64,5	16,5	52,0	0,089	1	200	
	11138	63	50	42,00	27,5	63,5	12,5	68,0	0,107	1	150	
	11139	75	40	50,00	30,0	69,5	19,0	52,0	0,131	1		
	11140	75	50	50,00	30,0	63,0	9,5	68,0	0,141	1		
	11142	75	63	50,00	30,0	71,0	13,5	84,0	0,170	1		
	11143	75	20	50,00	30,0	65,5	21,0	34,5	0,113	1		
	11144	75	25	50,00	30,0	65,5	19,5	34,5	0,111	1		
	11145	75	32	50,00	30,0	69,5	21,5	52,0	0,140	1		
	11151	90	50	60,00	33,0	75,0	18,5	68,0	0,193	1		
	11152	90	63	60,00	33,0	78,0	17,5	84,0	0,224	1		
	11153	90	75	60,00	33,0	81,5	18,5	100,0	0,273	1		
	11155	110	63	73,50	37,0	86,0	21,5	84,0	0,356	1		
	11157	110	75	73,50	37,0	89,0	22,0	100,0	0,383	1		
	11159	110	90	73,50	37,0	99,0	29,0	120,0	0,500	1		
	11161	125	75	84,00	40,0	101,0	31,0	100,0	0,518	1		
	11163	125	90	84,00	40,0	99,0	26,0	120,0	0,588	1		
	11165	125	110	84,00	40,0	112,0	35,0	147,0	0,832	1		

## REDUCING SOCKET, SOCKET & BUTT WELDING

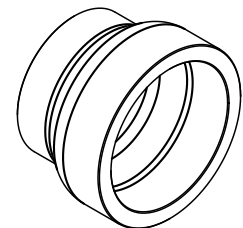
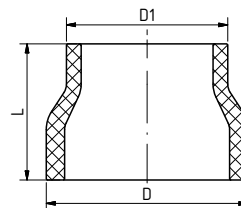
**Material:** fusiolen® PP-RCT  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



SDR	Art. no.	D1 [mm]	Dimension d [mm]	L [mm]	z [mm]	D [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>onesided socket welding, other side butt welding</i>										
11	11175	160	110	90,0	53,0	147,0	0,655	1		
	11177	160	125	90,0	50,0	167,0	0,636	1		
	11183	200	125	135,0	95,0	167,0	1,341	1		
17.6	2511174	160	110	90,0	53,0	147,0	0,618	1		
	2511176	160	125	90,0	50,0	167,0	0,628	1		
	2511182	200	125	135,0	95,0	167,0	1,055	1		

## REDUCING SOCKET, BUTT WELDING

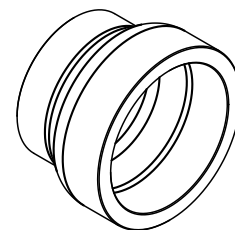
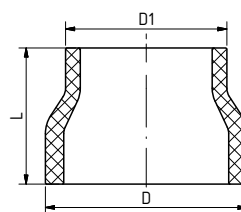
**Material:** fusiolen® PP-RCT  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



SDR	Art. no.	D [mm]	D1 [mm]	L [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>double-sided butt welding</i>								
11	11185	200	160	135,0	1,206	1		
	11189	250	160	172,5	2,313	1		
	11191	250	200	172,5	2,389	1		
	11193	315	200	225,0	4,389	1		
	11195	315	250	225,0	4,690	1		
	11197	355	250	170,0	4,510	1		
	11199	355	315	160,0	4,635	1		
	11201	400	250	152,0	5,160	1		
	11203	400	315	122,0	4,550	1		
	11204	400	355	110,0	4,620	1		
	11206	450	315	142,0	6,500	1		
	11207	450	355	132,0	6,500	1		
	11208	450	400	122,0	6,000	1		

## REDUCING SOCKET, BUTT WELDING

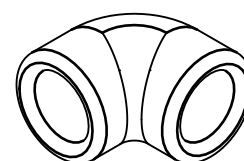
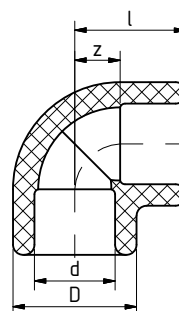
**Material:** fusiolen® PP-RCT  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



SDR	Art. no.	D [mm]	D1 [mm]	L [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>double-sided butt welding</i>								
17.6	2511184	200	160	135,0	1,012	1		
	2511188	250	160	172,5	1,500	1		
	2511190	250	200	172,5	1,338	1		
	2511193	315	200	225,0	4,141	1		
	2511195	315	250	225,0	3,420	1		
	2511197	355	250	170,0	4,480	1		
	2511199	355	315	160,0	3,108	1		
	2511201	400	250	152,0	3,240	1		
	2511203	400	315	122,0	3,000	1		
	2511204	400	355	112,0	2,500	1		
	2511206	450	315	142,0	4,000	1		
	2511207	450	355	132,0	4,000	1		
	2511208	450	400	122,0	4,000	1		
	2511209	500	315	172,0	6,500	1		
	2511210	500	355	152,0	7,000	1		
	2511211 ♦	500	400	142,0	6,500	1		
	2511212 ♦	500	450	122,0	5,500	1		
	2511216 ♦	630	400	192,0	14,500	1		
	2511217 ♦	630	450	172,0	12,500	1		
	2511218 ♦	630	500	152,0	11,000	1		

## ELBOW 90°

**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



SDR	Art. no.	Dimension d [mm]	z [mm]	l [mm]	D [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>									
6 7.4 9 11 17.6	12108	20	11,0	25,5	27,0	0,013	10	1400	
	12110	25	13,5	29,5	34,0	0,023	10	800	
	12112	32	17,0	35,0	43,0	0,043	5	400	
	12114	40	21,0	41,5	52,0	0,077	5	250	
	12116	50	26,0	49,5	68,0	0,162	5	125	
	12118	63	32,5	60,0	84,0	0,293	1	70	
	12120	75	38,5	68,5	100,0	0,445	1	40	
	12122	90	46,0	79,0	120,0	0,729	1	25	
	12124	110	56,0	93,0	147,0	1,292	1		
	12126	125	76,5	116,5	167,0	2,004	1		



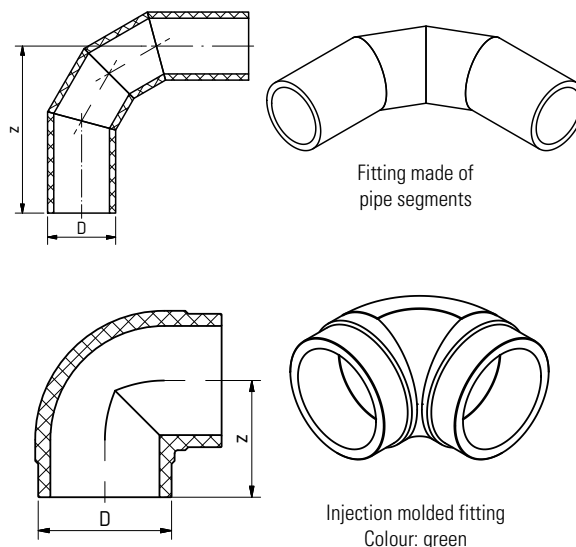
## ELBOW 90° BUTT WELDING

**Material:** fusiolen® PP-R & PP-RCT  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Notice:**

There is a gradual conversion of the XXL-fittings made of pipe segments to an injection molded design. The table shows which articles are already available in new design at the time of printing this catalogue. In the aquatherm technews we will inform you of further changes, but first the current stock of the elbows made of pipe segments has to be sold.

All fittings, which are converted to the injection molding production, are still available on inquiry as special fittings made of pipe segments. No article numbers are defined for special fittings of any type.

**Please note!** Electrofusion sockets can not be processed directly with injection molded fittings. When using electrofusion sockets either segment welded special fittings must be used or pipe pieces must be welded to the injection molded fittings.

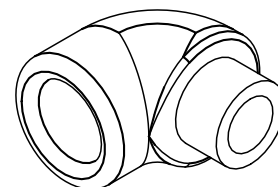
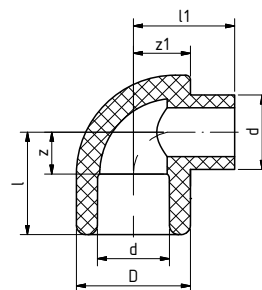


SDR	Art. no.	D [mm]	z [mm]	Weight [kg]	pipe segments	injection molded (green)	PU	Box unit	Price € pc
<i>butt welding</i>									
11	12131	160	145,0	2,145		•	1		
	12135	200	209,0	4,653		•	1		
	12139	250	240,0	7,180		•	1		
11	2012143 <sup>1)</sup>	315	773,0	37,300	•		1		
	2012145 <sup>1)</sup>	355	833,0	57,074	•		1		
	2012147 <sup>1)</sup>	400	900,0	74,500	•		1		
	2012149 <sup>1)</sup>	450	975,0	89,080	•		1		
17.6	2512130	160	145,0	1,642		•	1		
	2512134	200	209,0	3,640		•	1		
	2512138	250	240,0	6,200		•	1		
	2512142 <sup>1)</sup>	315	773,0	24,000	•		1		
	2512144 <sup>1)</sup>	355	833,0	32,000	•		1		
	2512146 <sup>1)</sup>	400	900,0	42,549	•		1		
	2512148 <sup>1)</sup>	450	975,0	62,200	•		1		
	2512150 <sup>1)</sup> ◆	500	1100,0	91,000	•		1		
	2512154 <sup>1)</sup> ◆	630	1295,0	164,600	•		1		

<sup>1)</sup> mechanically stabilized through a fibre mix integrated in the middle layer of the fusiolen® PP-RCT

## ELBOW 90° FEMALE/MALE

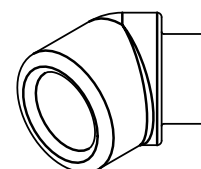
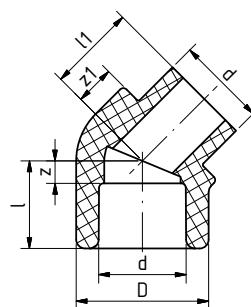
**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



SDR	Art. no.	Dimension d [mm]	z [mm]	l [mm]	D [mm]	l1 [mm]	z1 [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>											
6	<b>12308</b>	<b>20</b>	11,0	25,5	27,0	25,5	13,5	0,032	10	1200	
7.4	<b>12310</b>	<b>25</b>	13,5	29,5	34,0	29,5	17,0	0,023	10	800	
9	<b>12312</b>	<b>32</b>	17,0	35,0	43,0	39,0	21,5	0,048	5	400	
11	<b>12314</b>	<b>40</b>	21,0	41,5	52,0	45,5	26,0	0,080	5	300	

## ELBOW 45° FEMALE/MALE

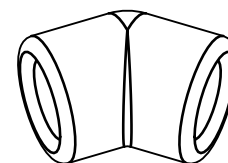
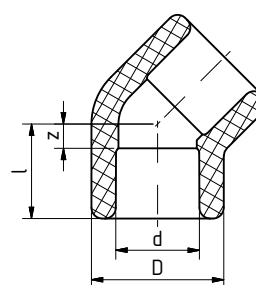
**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



SDR	Art. no.	Dimension d [mm]	z [mm]	l [mm]	D [mm]	l1 [mm]	z1 [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>											
6	<b>12708</b>	<b>20</b>	5,0	19,5	29,5	19,5	9,0	0,013	10	1500	
7.4	<b>12710</b>	<b>25</b>	6,0	22,0	34,0	22,0	8,5	0,017	10	1000	
9	<b>12712</b>	<b>32</b>	7,5	25,5	43,0	29,0	11,5	0,036	5	500	
11	<b>12714</b>	<b>40</b>	9,5	30,0	52,0	33,0	13,5	0,057	5	300	

## ELBOW 45° SOCKET WELDING

**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



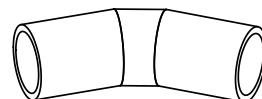
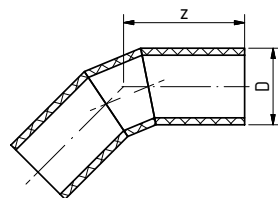
SDR	Art. no.	Dimension d [mm]	z [mm]	l [mm]	D [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>									
6 7.4 9 11 17.6	<b>12508</b>	<b>20</b>	5,0	19,5	29,5	0,014	10	1500	
	<b>12510</b>	<b>25</b>	6,0	22,0	34,0	0,018	10	1000	
	<b>12512</b>	<b>32</b>	7,5	25,5	43,0	0,035	5	500	
	<b>12514</b>	<b>40</b>	9,5	30,0	52,0	0,053	5	300	
	<b>12516</b>	<b>50</b>	11,5	35,0	68,0	0,112	5	150	
	<b>12518</b>	<b>63</b>	14,0	41,5	84,0	0,227	1	75	
	<b>12520</b>	<b>75</b>	16,5	46,5	100,0	0,350	1	60	
	<b>12522</b>	<b>90</b>	19,5	52,5	120,0	0,568	1	30	
	<b>12524</b>	<b>110</b>	23,5	60,5	147,0	1,025	1	20	
	<b>12526</b>	<b>125</b>	27,0	67,0	167,0	1,329	1		

## ELBOW 45° BUTT WELDING

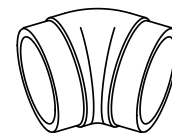
**Material:** fusiolen® PP-RCT  
**Standard:** DIN 16962, DIN EN ISO 15874

**Notice:** There is a gradual conversion of the XXL-fittings made of pipe segments to an injection molded design. The table shows which articles are already available in new design at the time of printing this catalogue. In the aquatherm technews we will inform you of further changes, but first the current stock of the elbows made of pipe segments has to be sold. All fittings, which are converted to the injection molding production, are still available on inquiry as special fittings made of pipe segments. No article numbers are defined for special fittings of any type.

**Please note!** Electrofusion sockets can not be processed directly with injection molded fittings. When using electrofusion sockets either segment welded special fittings must be used or pipe pieces must be welded to the injection molded fittings.



Fitting made of pipe segments



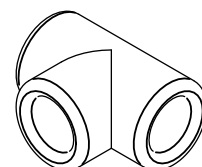
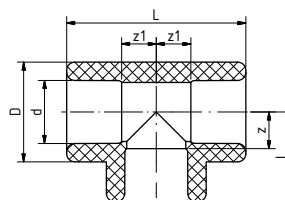
Injection molded fitting  
Colour: green

SDR	Art. no.	D [mm]	z [mm]	Weight [kg]	pipe segments	injection molded	PU	Box unit	Price € pc
<i>butt welding</i>									
11	12531	160	95,0	1,393		•	1		
	12535	200	146,0	3,408		•	1		
	12539	250	182,0	13,500		•	1		
11	2012543 <sup>1)</sup>	315	498,0	27,100	•		1		
	2012545 <sup>1)</sup>	355	520,0	38,158	•		1		
	2012547 <sup>1)</sup>	400	548,0	44,712	•		1		
	2012549 <sup>1)</sup>	450	580,0	60,260	•		1		
17.6	2512530	160	95,0	1,080		•	1		
	2512534	200	146,0	1,990		•	1		
	2512538	250	182,0	3,875		•	1		
	2512542 <sup>1)</sup>	315	498,0	18,000	•		1		
	2512544 <sup>1)</sup>	355	520,0	22,058	•		1		
	2512546 <sup>1)</sup> ◆	400	548,0	30,800	•		1		
	2512548 <sup>1)</sup>	450	580,0	39,123	•		1		
	2512550 <sup>1)</sup> ◆	500	665,0	55,112	•		1		
	2512554 <sup>1)</sup> ◆	630	741,0	97,148	•		1		

<sup>1)</sup> mechanically stabilized through a fibre mix integrated in the middle layer of the fusiolen® PP-RCT

## T-PIECE SOCKET WELDING

**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green  
**Form:** injection moulded fittings



SDR	Art. no.	Dimension d [mm]	z [mm]	z1 [mm]	l [mm]	L [mm]	D [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>											
6 7.4 9 11 17.6	13108	20	11,0	11,0	25,5	51,0	27,0	0,017	10	1000	
	13110	25	14,5	15,0	30,5	62,0	34,0	0,033	10	500	
	13112	32	15,5	17,0	33,5	70,0	43,0	0,054	5	300	
	13114	40	20,0	20,0	40,5	81,0	52,0	0,099	5	175	
	13116	50	26,0	26,0	49,5	99,0	68,0	0,177	5	100	
	13118	63	32,5	32,5	60,0	120,0	84,0	0,368	1	50	
	13120	75	38,5	38,5	68,5	137,0	100,0	0,541	1	30	
	13122	90	46,0	46,0	79,0	158,0	120,0	0,920	1	25	
	13124	110	56,0	56,0	93,0	186,0	147,0	1,598	1	14	
	13126	125	76,5	76,5	116,5	233,0	167,0	2,673	1		



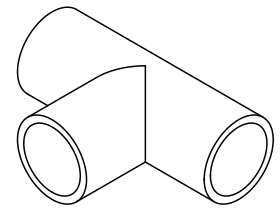
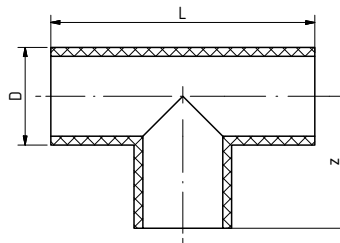
## T-PIECE BUTT WELDING

**Material:** fusiolen® PP-RCT  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Notice:**

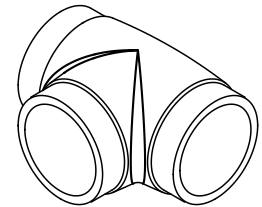
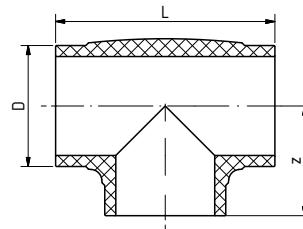
There is a gradual conversion of the XXL-fittings made of pipe segments to an injection molded design. The table shows which articles are already available in new design at the time of printing this catalogue. In the aquatherm technews we will inform you of further changes, but first the current stock of the t-pieces made of pipe segments has to be sold.

All fittings, which are converted to the injection molding production, are still available on inquiry as special fittings made of pipe segments. No article numbers are defined for special fittings of any type.

**Please note!** Electrofusion sockets can not be processed directly with injection molded fittings. When using electrofusion sockets either segment welded special fittings must be used or pipe pieces must be welded to the injection molded fittings.



Fitting made of  
pipe segments



Injection molded fitting  
Colour: green

SDR	Art. no.	D [mm]	L [mm]	z [mm]	Weight [kg]	pipe segments	injection molded (green)	PU	Box unit	Price € pc
<i>butt welding</i>										
11	13131	160	290,0	145,0	3,005		•	1		
	13135	200	410,0	205,0	6,255		•	1		
	13139	250	486,0	243,0	10,710		•	1		
11	2013143	315	920,0	460,0	36,74	•		1		
	2013145	355	960,0	480,0	40,000	•		1		
	2013147	400	1000,0	500,0	62,100	•		1		
	2013149	450	1050,0	525,0	82,792	•		1		
17.6	2513130	160	290,0	145,0	2,348		•	1		
	2513134	200	410,0	205,0	4,500		•	1		
	2513138	250	486,0	243,0	9,000		•	1		
	2513142 <sup>1)</sup> ◆	315	920,0	460,0	19,800	•		1		
	2513144 <sup>1)</sup> ◆	355	960,0	480,0	27,500	•		1		
	2513146 <sup>1)</sup> ◆	400	1000,0	500,0	40,395	•		1		
	2513148 <sup>1)</sup> ◆	450	1050,0	525,0	45,400	•		1		
	2513150 <sup>1)</sup> ◆	500	1200,0	600,0	75,726	•		1		
	2513154 <sup>1)</sup> ◆	630	1330,0	665,0	122,500	•		1		

<sup>1)</sup> mechanically stabilized through a fibre mix integrated in the middle layer of the fusiolen® PP-RP

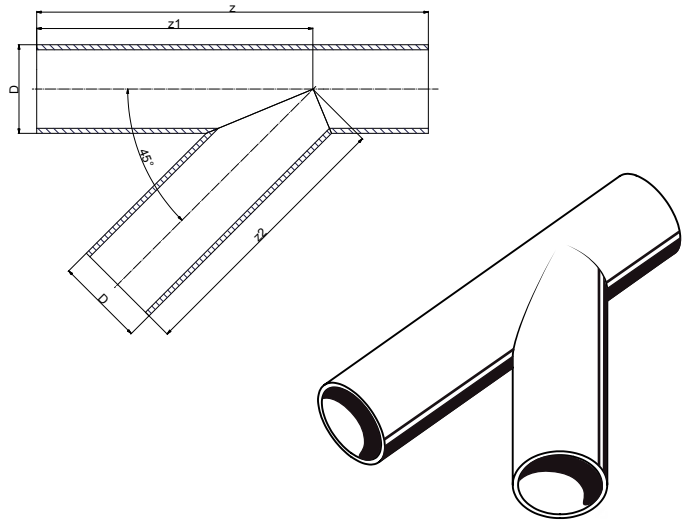
## aquatherm blue pipe Y-PIECES

Special fittings on demand

### ATTENTION – PLEASE NOTE!

These branches are for special applications in the **unpressurized** areas, e.g. in vacuum dewatering in the shipbuilding. **In no case** they may be exposed to the pressures, given in the working pressure table on page 21.

**Material:** fusiolen® PP-RCT  
**Standard:** DIN16962-2  
**Colour:** blue

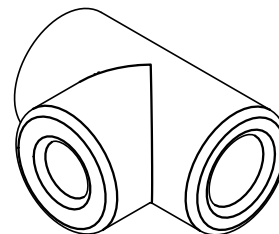
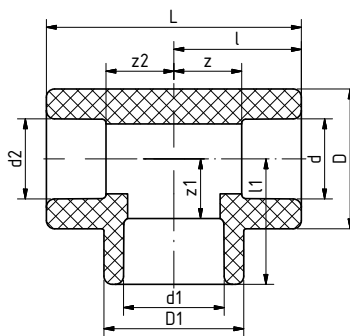


SDR	Art. no.	Dimension D [mm]	z [mm]	z1 [mm]	z2 [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>Socket welding</i>									
11	<b>2013018</b>	<b>63</b>	560,0	380,0	380,0	0,843	1		
	<b>2013020</b> ◆	<b>75</b>	570,0	405,0	405,0	1,210	1		
	<b>2013022</b> ◆	<b>90</b>	577,0	412,0	412,0	1,750	1		
	<b>2013024</b>	<b>110</b>	610,0	435,0	435,0	2,730	1		
	<b>2013026</b>	<b>125</b>	665,0	475,0	475,0	3,840	1		
	<i>Butt welding</i>								
17.6	<b>2013031</b>	<b>160</b>	782,0	551,0	551,0	7,300	1		
	<b>2013035</b>	<b>200</b>	925,0	650,0	650,0	13,360	1		
	<b>2013039</b> ◆	<b>250</b>	1105,0	780,0	780,0	24,780	1		
	<i>Socket welding</i>								
	<b>2513026</b> ◆	<b>125</b>	665,0	475,0	475,0	2,470	1		
	<i>Butt welding</i>								
	<b>2513030</b>	<b>160</b>	782,0	551,0	551,0	4,700	1		
	<b>2513034</b> ◆	<b>200</b>	925,0	650,0	650,0	8,640	1		
	<b>2513038</b> ◆	<b>250</b>	1105,0	780,0	780,0	16,010	1		

Mechanically stabilized through a fibre mix integrated in the middle layer of the fusiolen® PP-RCT

## RED.-T-PIECE, SOCKET WELDING

**Material:** fusiole® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green  
**Form:** injection moulded fittings



SDR	Art. no.	d [mm]	d1 [mm]	d2 [mm]	L [mm]	l [mm]	l1 [mm]	z [mm]	z1 [mm]	z2 [mm]	D [mm]	D1 [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>																
6 7.4 9 11 17.6	13511	20	25	20	62,0	31,0	30,5	16,5	14,5	16,5	34,0	34,0	0,040	10		
	13520	25	20	20	62,0	31,0	30,5	15,0	16,0	16,5	34,0	34,0	0,039	10	500	
	13522	25	20	25	62,0	31,0	30,5	15,0	16,0	15,0	34,0	34,0	0,036	10	500	
	13528	32	16	32	70,0	35,0	31,0	17,0	18,0	17,0	43,0	29,5	0,053	5	300	
	13532	32	20	20	73,5	36,8	37,0	18,8	22,5	22,3	43,0	43,0	0,076	5	300	
	13534	32	20	32	70,0	35,0	31,0	17,0	16,5	17,0	43,0	29,5	0,053	5	300	
	13538	32	25	25	70,0	35,0	34,5	17,0	18,5	19,0	43,0	43,0	0,069	5		
	13540	32	25	32	70,0	35,0	32,0	17,0	16,0	17,0	43,0	34,0	0,050	5	300	
	13542	40	20	40	83,0	41,5	36,0	21,0	21,5	21,0	52,0	34,0	0,091	5	200	
	13544	40	25	40	83,0	41,5	36,0	21,0	20,0	21,0	52,0	34,0	0,089	5	200	
	13546	40	32	40	84,0	42,0	40,5	21,5	22,5	21,5	52,0	52,0	0,092	5	200	
	13547	50	20	50	99,0	49,5	40,5	26,0	26,0	26,0	68,0	29,5	0,162	5	100	
	13548	50	25	50	99,0	49,5	44,5	26,0	28,5	26,0	68,0	34,0	0,158	5	100	
	13550	50	32	50	99,0	49,5	44,5	26,0	26,5	26,0	68,0	43,0	0,160	5	100	
	13551	50	40	50	99,0	49,5	49,5	26,0	29,0	26,0	68,0	68,0	0,161	5	100	
	13552	63	20	63	120,0	60,0	48,5	32,5	34,0	32,5	84,0	34,0	0,335	1	50	
	13554	63	25	63	120,0	60,0	48,5	32,5	32,5	32,5	84,0	34,0	0,331	1	50	
	13556	63	32	63	120,0	60,0	53,0	32,5	35,5	32,5	84,0	52,0	0,340	1	50	
	13558	63	40	63	120,0	60,0	53,0	32,5	33,0	32,5	84,0	52,0	0,332	1	50	
	13560	63	50	63	120,0	60,0	56,0	32,5	36,5	32,5	84,0	68,0	0,398	1		
	13561	75	20	75	137,0	68,5	54,5	38,5	40,0	38,5	100,0	34,0	0,501	1		
	13562	75	25	75	137,0	68,5	54,5	38,5	38,5	38,5	100,0	34,0	0,497	1		
	13564	75	32	75	137,0	68,5	59,0	38,5	41,0	38,5	100,0	52,0	0,505	1		
	13566	75	40	75	137,0	68,5	59,0	38,5	38,5	38,5	100,0	52,0	0,497	1		
	13568	75	50	75	137,0	68,5	66,0	38,5	42,5	38,5	100,0	84,0	0,550	1		
	13570	75	63	75	137,0	68,5	66,0	38,5	38,5	38,5	100,0	84,0	0,515	1		
	13576	90	32	90	158,0	79,0	64,0	46,0	46,0	46,0	120,0	43,0	0,880	1		
	13578	90	40	90	158,0	79,0	66,5	46,0	46,0	46,0	120,0	52,0	0,862	1		
	13580	90	50	90	158,0	79,0	69,5	46,0	46,0	46,0	120,0	68,0	0,905	1		
	13582	90	63	90	158,0	79,0	73,5	46,0	46,0	46,0	120,0	84,0	0,876	1		
	13584	90	75	90	158,0	79,0	76,0	46,0	46,0	46,0	120,0	100	0,991	1		
	13586	110	63	110	186,0	93,0	83,5	56,0	56,0	56,0	147,0	84,0	1,534	1		
	13588	110	75	110	186,0	93,0	86,0	56,0	56,0	56,0	147,0	100,0	1,517	1		
	13590	110	90	110	186,0	93,0	89,0	56,0	56,0	56,0	147,0	120,0	1,548	1		
	13592	125	75	125	233,0	116,5	106,5	76,5	76,5	76,5	167,0	100,0	2,427	1		
	13594	125	90	125	233,0	116,5	109,5	76,5	76,5	76,5	167,0	120,0	2,509	1		
	13596	125	110	125	233,0	116,5	113,5	76,5	76,5	76,5	167,0	147,0	2,563	1		

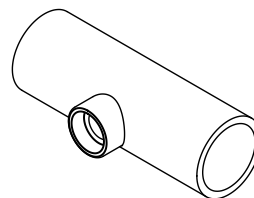
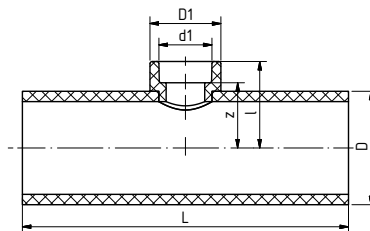
## RED.-T-PIECE, SOCKET- & BUTT WELDING

**Material:** fusiolen® PP-R / PP-RCT  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green

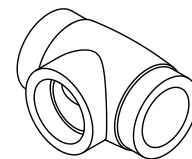
**Note:** There is a gradual conversion of the XXL-fittings made of pipe segments to an injection molded design. The table shows which articles are already available in new design at the time of printing this catalogue. In the aquatherm technews we will inform you of further changes, but first the current stock of the red.-t-pieces made of pipe segments has to be sold.

All fittings, which are converted to the injection molding production, are still available on inquiry as special fittings made of pipe segments. No article numbers are defined for special fittings of any type.

**Please note!** Electrofusion sockets can not be processed directly with injection molded fittings. When using electrofusion sockets either segment welded special fittings must be used or pipe pieces must be welded to the injection molded fittings.



Fitting made of  
pipe segments



Injection molded fitting

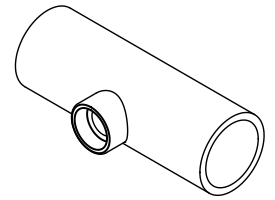
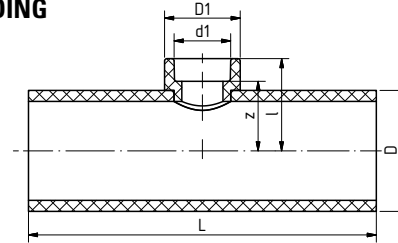
SDR	Art. no.	D [mm]	d1 [mm]	D1 [mm]	L [mm]	l [mm]	z [mm]	Weight [kg]	pipe segments	injection molded*	PU	Box unit	Price € pc
<i>branch: socket welding</i>													
11	<b>13601</b>	<b>160</b>	<b>75</b>	100,0	460,0	122,0	92,0	3,140	•		1		
	<b>13603</b>	<b>160</b>	<b>90</b>	120,0	460,0	125,0	92,0	3,176	•		1		
	<b>13607</b>	<b>160</b>	<b>125</b>	167,0	290,0	120,0	80,0	2,842		•	1		

<sup>1)</sup> mechanically stabilized through a fibre mix integrated in the middle layer of the fusiolen® PP-R



## aquatherm blue pipe RED.-T-PIECE, SOCKET- & BUTT WELDING

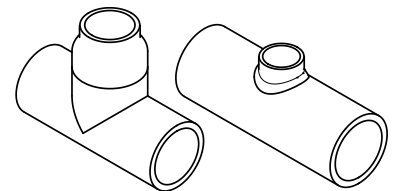
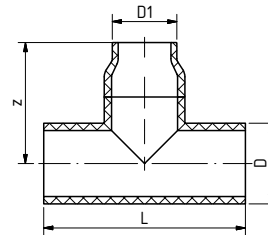
**Material:** fusiolen® PP-R / PP-RCT  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** blue/green  
**Branch:** socket welding  
**Form:** pipes with weld-in saddle



SDR	Art. no.	D [mm]	d1 [mm]	D1 [mm]	L [mm]	l [mm]	z [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>branch: socket welding</i>											
11	2013609	200	75	100,0	500,0	142,0	112,0	5,460	1		
	2013611	200	90	120,0	500,0	145,0	112,0	5,580	1		
	2013613	200	110	147,0	500,0	149,0	112,0	5,810	1		
	2013615	200	125	167,0	500,0	155,0	115,0	6,100	1		
	2013625	250	75	100,0	750,0	167,0	137,0	12,440	1		
	2013627	250	90	120,0	750,0	170,0	137,0	12,420	1		
	2013629	250	110	147,0	750,0	174,0	137,0	12,760	1		
	2013631	250	125	167,0	750,0	180,0	140,0	13,030	1		
	2013651	315	125	167,0	920,0	213,0	173,0	25,000	1		
	2013663	355	125	167,0	960,0	233,0	193,0	32,500	1		
	2013676	400	125	167,0	1000,0	255,0	215,0	42,100	1		
	2013690	450	125	167,0	1050,0	280,0	240,0	55,700	1		

## aquatherm blue pipe RED.-T-PIECE, BUTT WELDING

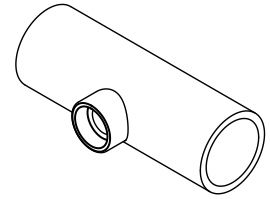
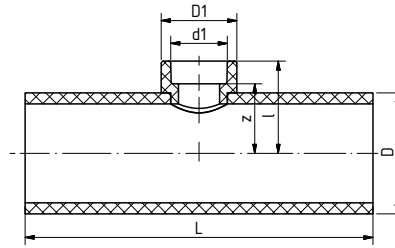
**Material:** fusiolen® PP-RCT  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** blue/green  
**Branch:** butt welding



SDR	Art. no.	D [mm]	D1 [mm]	L [mm]	z [mm]	Weight [kg]	Pipe with reducer	Pipe with weld-in saddle	PU	Box unit	Price € pc
<i>branch: butt welding</i>											
11	2013619	200	160	500,0	300,0	7,650	•		1		
	2013635	250	160	750,0	375,0	19,030	•		1		
	2013641	250	200	750,0	375,0	21,100	•		1		
	2013653	315	160	920,0	237,5	25,000		•	1		
	2013655	315	200	920,0	460,0	33,200	•		1		
	2013657	315	250	920,0	460,0	31,500	•		1		
	2013665	355	160	960,0	257,5	32,500		•	1		
	2013667	355	200	960,0	267,5	30,200		•	1		
	2013669	355	250	960,0	480,0	40,000	•		1		
	2013671	355	315	960,0	480,0	40,000	•		1		
	2013678	400	160	1000,0	354,0	44,100		•	1		
	2013680	400	200	1000,0	318,0	44,100		•	1		
	2013682	400	250	1000,0	280,0	46,000		•	1		
	2013684	400	315	1000,0	500,0	57,790	•		1		
	2013685	400	355	1000,0	500,0	52,715	•		1		
	2013692	450	160	1050,0	379,0	57,900		•	1		
	2013694	450	200	1050,0	343,0	57,900		•	1		
	2013696	450	250	1050,0	305,0	57,900		•	1		
	2013698	450	315	1050,0	315,0	58,400		•	1		
	2013699	450	355	1050,0	525,0	62,491	•		1		
	2013700	450	400	1050,0	525,0	62,683	•		1		

## aquatherm blue pipe RED.-T-PIECE SOCKET- & BUTT WELDING

**Material:** fusiolen® PP-R / PP-RCT  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** blue/green  
**Branch:** socket welding  
**Form:** pipes with weld-in saddle

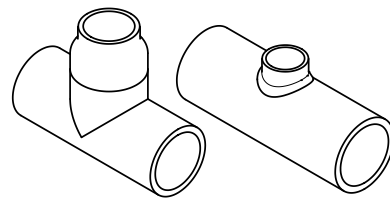
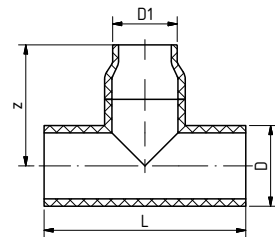


SDR	Art. no.	D [mm]	d1 [mm]	D1 [mm]	L [mm]	l [mm]	z [mm]	Weight [kg]	pipe segments	injection molded*	PU	Box unit	Price € pc
<i>branch: socket welding</i>													
17.6	2513600	160	75	100,0	460,0	122,0	92,0	2,227	•		1		
	2513602	160	90	120,0	460,0	125,0	92,0	2,364	•		1		
	2513606	160	125	167,0	290,0	120,0	80,0	2,309		•	1		
	2513608	200	75	100,0	500,0	142,0	112,0	3,620	•		1		
	2513610	200	90	120,0	500,0	145,0	112,0	3,742	•		1		
	2513612	200	110	147,0	500,0	149,0	112,0	3,976	•		1		
	2513614	200	125	167,0	500,0	155,0	115,0	4,269	•		1		
	2513624	250	75	100,0	750,0	167,0	137,0	8,149	•		1		
	2513626	250	90	120,0	750,0	170,0	137,0	8,274	•		1		
	2513628	250	110	147,0	750,0	174,0	137,0	8,504	•		1		
	2513630	250	125	167,0	750,0	180,0	140,0	9,000	•		1		
	2513651	315	125	167,0	920,0	213,0	173,0	17,570	•		1		
	2513663	355	125	167,0	960,0	233,0	193,0	21,500	•		1		
	2513676	400	125	167,0	1000,0	255,0	215,0	27,690	•		1		
	2513690	450	125	167,0	1050,0	280,0	240,0	36,470	•		1		
	2513804	500	125	167,0	1200,0	305,0	265,0	51,250	•		1		
	2513839	630	125	167,0	1330,0	370,0	330,0	89,170	•		1		

\* status quo at the time of printing, further injection molded parts follow

## aquatherm blue pipe RED.-T-PIECE, BUTT WELDING

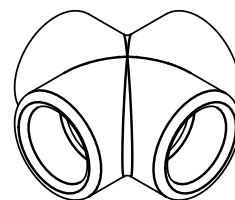
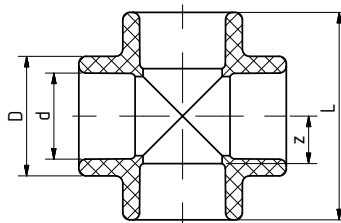
**Material:** fusiolen® PP-RCT  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** blue/green  
**Branch:** butt welding



SDR	Art. no.	D [mm]	D1 [mm]	L [mm]	z [mm]	Weight [kg]	Pipe with reducer	Pipe with weld-in saddle	PU	Box unit	Price € pc
<i>butt welding</i>											
17.6	2513618	200	160	500,0	300,0	5,000	•		1		
	2513634	250	160	750,0	375,0	11,600	•		1		
	2513640	250	200	750,0	375,0	11,500	•		1		
	2513653	315	160	920,0	237,5	16,500		•	1		
	2513655	315	200	920,0	460,0	23,600	•		1		
	2513657	315	250	920,0	460,0	22,600	•		1		
	2513665	355	160	960,0	257,5	21,500		•	1		
	2513667	355	200	960,0	267,5	21,900		•	1		
	2513669	355	250	960,0	480,0	28,300	•		1		
	2513671	355	315	960,0	480,0	30,500	•		1		
	2513678	400	160	1000,0	354,0	29,700		•	1		
	2513680	400	200	1000,0	318,0	29,700		•	1		
	2513682	400	250	1000,0	280,0	29,000		•	1		
	2513684	400	315	1000,0	500,0	30,667	•		1		
	2513685	400	355	1000,0	500,0	30,748	•		1		
	2513692	450	160	1050,0	379,0	37,000		•	1		
	2513694	450	200	1050,0	343,0	37,000		•	1		
	2513696	450	250	1050,0	305,0	37,000		•	1		
	2513698	450	315	1050,0	315,0	37,000		•	1		
	2513699	450	355	1050,0	525,0	50,500	•		1		
	2513700	450	400	1050,0	525,0	50,100	•		1		
	2513806	500	160	1200,0	404,0	53,400		•	1		
	2513808	500	200	1200,0	368,0	53,500		•	1		
	2513810	500	250	1200,0	330,0	53,500		•	1		
	2513812	500	315	1200,0	340,0	54,000		•	1		
	2513813	500	355	1200,0	600,0	57,039	•		1		
	2513814	500	400	1200,0	600,0	57,245	•		1		
	2513815	500	450	1200,0	600,0	57,365	•		1		
	2513841	630	160	1330,0	474,0	91,530		•	1		
	2513843	630	200	1330,0	438,0	91,500		•	1		
	2513845	630	250	1330,0	400,0	91,500		•	1		
	2513847	630	315	1330,0	405,0	92,350		•	1		
	2513849	630	400	1330,0	665,0	97,299	•		1		
	2513850	630	450	1330,0	665,0	97,703	•		1		
	2513851	630	500	1330,0	665,0	98,032	•		1		

## CROSS

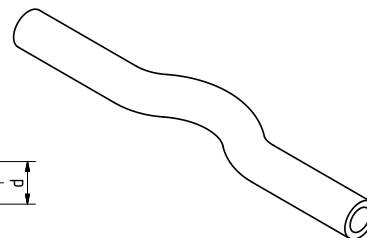
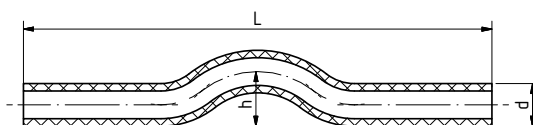
**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



SDR	Art. no.	Dimension d [mm]	D [mm]	L [mm]	z [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>									
6	<b>13708</b>	<b>20</b>	29,5	51,5	11,3	0,025	10		
7.4	<b>13710</b>	<b>25</b>	34,0	59,0	13,5	0,035	10		
9	<b>13712</b>	<b>32</b>	43,0	70,0	17,0	0,062	5		
11	<b>13714</b>	<b>40</b>	52,0	83,0	21,0	0,099	5		

## CROSS OVER FITTING

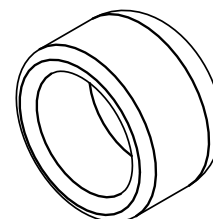
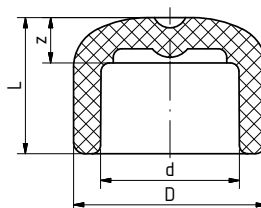
**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



SDR	Art. no.	Dimension d [mm]	h [mm]	L [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>								
6	<b>16108</b>	<b>20</b>	32,0	352,0	0,060	10		
7.4	<b>16110</b>	<b>25</b>	37,5	352,0	0,091	10		
9	<b>16112</b>	<b>32</b>	48,0	352,0	0,154	5		

## END CAP

**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green

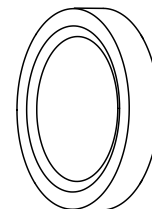
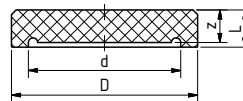


SDR	Art. no.	Dimension d [mm]	D [mm]	z [mm]	L [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>									
6 7.4 9 11	<b>14108</b>	<b>20</b>	29,5	9,5	24,0	0,009	10	2000	
	<b>14110</b>	<b>25</b>	34,0	8,0	24,0	0,011	10	1500	
	<b>14112</b>	<b>32</b>	43,0	11,0	29,0	0,023	5	1000	
	<b>14114</b>	<b>40</b>	52,0	17,5	38,0	0,042	5	500	
	<b>14116</b>	<b>50</b>	68,0	21,0	44,5	0,082	5	300	
	<b>14118</b>	<b>63</b>	84,0	24,5	52,0	0,146	1	150	
	<b>14120</b>	<b>75</b>	100,0	28,5	58,5	0,243	1	90	
	<b>14122</b>	<b>90</b>	120,0	34,5	67,5	0,365	1	60	
	<b>14124</b>	<b>110</b>	147,0	28,0	65,0	0,635	1	40	
	<b>14126</b>	<b>125</b>	167,0	42,0	82,0	0,872	1		



## END CAP BUTT-WELDING

**Material:** fusiolen® PP-RCT  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



SDR	Art. no.	Dimension D [mm]	L [mm]	z [mm]	d [mm]	Weight [kg]	PU	Box unit	Price € pc
11	14131	160	70,0	14,6	130,8	0,759	1		
	14135	200	80,0	18,2	163,6	1,070	1		
	14139	250	90,0	22,7	204,6	1,989	1		
	14143	315	70,0	52,5	257,8	4,200	1		
	14145	355	80,0	67,5	290,6	6,410	1		
	14147	400	70,0	60,0	327,4	7,190	1		
	14149	450	80,0	70,0	368,2	10,500	1		
17.6	2514130	160	70,0	9,1	141,8	0,679	1		
	2514134	200	80,0	11,4	177,2	0,925	1		
	2514138	250	90,0	14,2	221,6	2,109	1		
	2514142	315	70,0	60,0	279,2	4,500	1		
	2514144	355	70,0	60,0	314,8	5,540	1		
	2514146	400	75,0	65,0	354,6	6,000	1		
	2514148	450	70,0	56,0	399,0	8,520	1		
	2514150	500	75,0	62,0	443,2	12,500	1		
	2514154	630	90,0	78,0	558,6	23,500	1		

## WELD-IN SADDLE

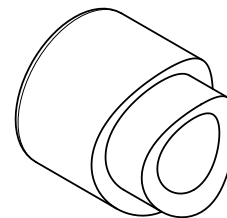
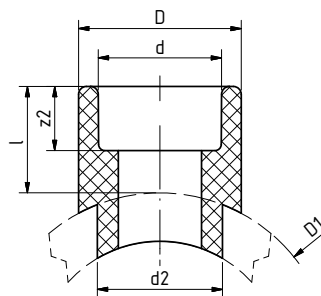
for pressureless installation

**Material:** fusiolen® PP-R

**Standard:** DIN 16962, DIN EN ISO 15874

**Colour:** green

**Notice:** \*do not use with aquatherm blue pipe OT

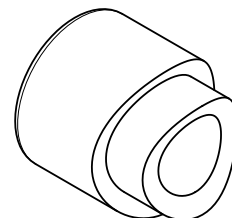
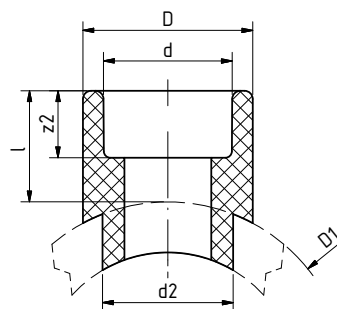


SDR	Art. no.	D1 [mm]	d [mm]	d2 [mm]	l [mm]	z2 [mm]	D [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>											
	15156*	40	20	25	27,0	14,5	29,5	0,016	5		
	15158*	40	25	25	28,5	16,0	34,0	0,017	5		
	15160	50	20	25	27,5	14,5	29,5	0,018	5		
	15162	50	25	25	28,5	16,0	34,0	0,019	5		
	15164	63	20	25	27,5	14,5	29,5	0,017	5		
	15166	63	25	25	28,5	16,0	34,0	0,019	5		
	15168	63	32	32	30,0	18,0	43,0	0,028	5		
	15170	75	20	25	27,5	14,5	29,5	0,018	5		
	15172	75	25	25	28,5	16,0	34,0	0,019	5		
	15174	75	32	32	30,0	18,0	43,0	0,028	5		
	15175	75	40	40	34,0	20,5	52,0	0,049	5		
	15176	90	20	25	27,5	14,5	29,5	0,018	5		
	15178	90	25	25	28,5	16,0	34,0	0,019	5		
	15180	90	32	32	30,0	18,0	43,0	0,029	5		
	15181	90	40	40	34,0	20,5	52,0	0,048	5		
	15182	110	20	25	27,5	14,5	29,5	0,019	5		
	15184	110	25	25	28,5	16,0	34,0	0,020	5		
	15186	110	32	32	30,0	18,0	43,0	0,030	5		
	15188	110	40	40	34,0	20,5	52,0	0,050	5		
	15189	110	50	50	34,0	23,5	68,0	0,091	5		
	15190	125	20	25	27,5	14,5	29,5	0,019	5		
	15192	125	25	25	28,5	16,0	34,0	0,020	5		
	15194	125	32	32	30,0	18,0	43,0	0,029	5		
	15196	125	40	40	34,0	20,5	52,0	0,050	5		
	15197	125	50	50	34,0	23,5	68,0	0,090	5		
	15198	125	63	63	38,0	27,5	84,0	0,149	5		
6	15206	160	20	25	27,5	14,5	29,5	0,021	5		
7.4	15208	160	25	25	28,5	16,0	34,0	0,023	5		
9	15210	160	32	32	30,0	18,0	43,0	0,034	5		
11	15212	160	40	40	34,0	20,5	52,0	0,054	5		
17.6	15214	160	50	50	34,0	23,5	68,0	0,094	5		
	15216	160	63	63	38,0	27,5	84,0	0,157	5		
	15218	160	75	75	42,0	30,0	100,0	0,238	5		
	15220	160	90	90	45,0	33,0	120,0	0,360	5		
	15228	200-250	20	25	27,5	14,5	29,5	0,020	5		
	15229	200-250	25	25	28,5	16,0	34,0	0,021	5		
	15230	200-250	32	32	30,0	18,0	43,0	0,031	5		
	15231	200	40	40	34,0	20,5	52,0	0,049	5		
	15232	200	50	50	34,0	23,5	68,0	0,087	5		
	15233	200	63	63	37,5	27,5	84,0	0,146	5		
	15234	200	75	75	42,0	30,0	100,0	0,225	5		
	15235	200	90	90	45,0	33,0	120,0	0,356	5		
	15236	200	110	110	49,0	37,0	147,0	0,638	5		
	15237	200	125	125	55,0	40,0	167,0	0,862	5		
	15251	250	40	40	34,0	20,5	52,0	0,053	5		
	15252	250	50	50	34,0	23,5	68,0	0,090	5		
	15253	250	63	63	37,5	27,5	84,0	0,152	5		
	15254	250	75	75	42,0	30,0	100,0	0,222	5		
	15255	250	90	90	45,0	33,0	120,0	0,348	5		
	15256	250	110	110	49,0	37,0	147,0	0,602	5		
	15257	250	125	125	55,0	40,0	167,0	0,820	5		

## WELD-IN SADDLE

for pressureless installation

**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



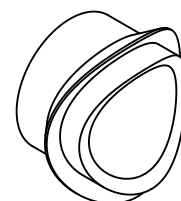
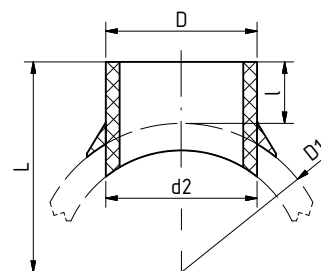
SDR	Art. no.	D1 [mm]	d [mm]	d2 [mm]	l [mm]	z2 [mm]	D [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>											
6 7.4 9 11 17.6	15260	315-355	63	63	37,5	27,5	84,0	0,153	1		
	15261	315-355	75	75	42,0	30,0	100,0	0,230	1		
	15262	315	90	90	45,0	33,0	120,0	0,363	1		
	15263	315	110	110	49,0	37,0	147,0	0,592	1		
	15264	315	125	125	55,0	40,0	167,0	0,830	1		
	15268	355	90	90	45,0	33,0	120,0	0,355	1		
	15269	355	110	110	49,0	37,0	147,0	0,586	1		
	15270	355	125	125	55,0	40,0	167,0	0,813	1		
	15275	400-500	75	75	42,0	30,0	100,0	0,216	1		
	15277	400-450	110	110	49,0	37,0	147,0	0,535	1		
	15278	400	125	125	55,0	40,0	167,0	0,693	1		
	15288	400-500	90	90	45,0	33,0	120,0	0,330	1		
	15290	450-500	125	125	55,0	40,0	167,0	0,671	1		
	15300	400-630	63	63	37,5	27,5	84,0	0,498	1		
	15303	500	110	110	49,0	37,5	147,0	0,533	1		
	15315	630	75	75	42,0	30,0	100,0	0,260	1		
	15316	630	90	90	45,0	33,0	120,0	0,350	1		
	15318	630	125	125	55,0	40,0	167,0	0,689	1		
	15331	630	110	110	49,0	37,0	147,0	0,567	1		

With weld-on surface and additional weld-in socket for the fusion with the inner pipe wall.

## WELD-IN SADDLE BUTT WELDING

for pressureless installation

**Material:** fusiolen® PP-RCT  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



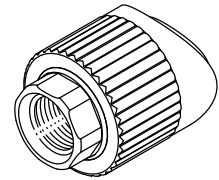
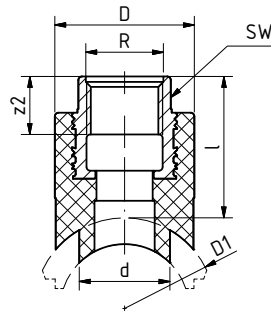
SDR	Art. no.	D1 [mm]	D [mm]	d2 [mm]	l [mm]	L [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>butt welding</i>										
9	315265	315	160	160	80,0	237,5	0,831	1		
	315271	355	160	160	80,0	257,5	0,845	1		
11	15265	315	160	160	80,0	237,5	0,868	1		
	15271	355	160	160	80,0	257,5	0,867	1		

With weld-on surface and additional weld-in socket for the fusion with the inner pipe wall.

## WELD-IN SADDLE WITH FEMALE THREAD

for pressureless installation, with spanner flat

**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
 fusiolen® PP-R, brass  
**Colour:** green  
**Notice:** \*do not use with aquatherm blue pipe OT



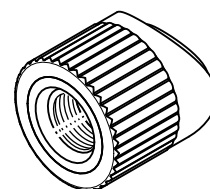
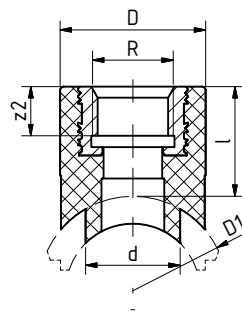
SDR	Art. no.	D1 [mm]	d [mm]	l [mm]	z2 [mm]	D [mm]	R	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>												
6 7.4 9 11 17.6	28214*	40	25	39,0	16,0	38,5	1/2"	24	0,088	5		
	28216	50	25	39,0	16,0	38,5	1/2"	24	0,090	5		
	28218	63	25	39,0	16,0	38,5	1/2"	24	0,089	5		
	28220	75	25	39,0	16,0	38,5	1/2"	24	0,083	5		
	28222	90	25	39,0	16,0	38,5	1/2"	24	0,090	5		
	28224	110	25	39,0	16,0	38,5	1/2"	24	0,089	5		
	28226	125	25	39,0	16,0	38,0	1/2"	24	0,092	5		
	28230	160	25	39,0	16,0	38,5	1/2"	24	0,092	5		
	28232	200-250	25	39,0	16,0	38,5	1/2"	24	0,092	5		
	28234	40	25	39,0	21,0	43,5	3/4"	31	0,107	5		
	28236	50	25	39,0	21,0	43,5	3/4"	31	0,110	5		
	28238	63	25	39,0	21,0	43,5	3/4"	31	0,109	5		
	28240	75	25	39,0	21,0	43,5	3/4"	31	0,109	5		
	28242	90	25	39,0	21,0	43,5	3/4"	31	0,110	5		
	28244	110	25	39,0	21,0	43,5	3/4"	31	0,110	5		
	28246	125	25	39,0	21,0	43,5	3/4"	31	0,112	5		
	28250	160	25	39,0	21,0	43,5	3/4"	31	0,112	5		
	28254	200-250	25	39,0	21,0	43,5	3/4"	31	0,112	5		
	28260	75	32	43,0	22,0	60,0	1"	39	0,223	5		
	28262	90	32	43,0	22,0	60,0	1"	39	0,223	5		
	28264	110	32	43,0	22,0	60,0	1"	39	0,223	5		
	28266	125	32	43,0	22,0	60,0	1"	39	0,224	5		
	28270	160	32	43,0	22,0	60,0	1"	39	0,226	5		
	28274	200-250	32	43,0	22,0	60,0	1"	39	0,244	5		



## WELD-IN SADDLE WITH FEMALE THREAD

for pressureless installation

**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
fusiolen® PP-R, stainless steel  
**Colour:** green  
**Notice:** \*do not use with aquatherm blue pipe OT

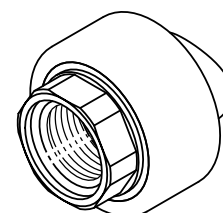
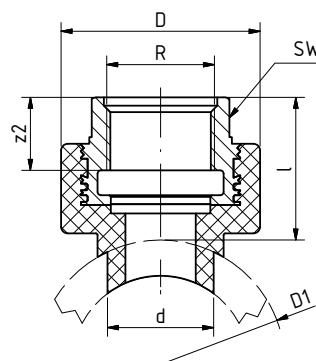


SDR	Art. no.	D1 [mm]	d [mm]	l [mm]	z2 [mm]	D [mm]	R	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>											
6 7.4 9 11 17.6	928214*	40	25	39,0	16,0	38,5	1/2"	0,062	5		
	928216	50	25	39,0	16,0	38,5	1/2"	0,064	5		
	928218	63	25	39,0	16,0	38,5	1/2"	0,064	5		
	928220	75	25	39,0	16,0	38,5	1/2"	0,064	5		
	928222	90	25	39,0	16,0	38,5	1/2"	0,064	5		
	928224	110	25	39,0	16,0	38,5	1/2"	0,069	5		
	928226	125	25	39,0	16,0	38,5	1/2"	0,065	5		
	928230	160	25	39,0	16,0	38,5	1/2"	0,066	5		
	928232	200-250	25	39,0	16,0	38,5	1/2"	0,065	5		
	928234	40	25	39,0	21,0	43,5	3/4"	0,082	5		
	928236	50	25	39,0	21,0	43,5	3/4"	0,074	5		
	928238	63	25	39,0	21,0	43,5	3/4"	0,073	5		
	928240	75	25	39,0	21,0	43,5	3/4"	0,074	5		
	928242	90	25	39,0	21,0	43,5	3/4"	0,074	5		
	928244	110	25	39,0	21,0	43,5	3/4"	0,083	5		
	928246	125	25	39,0	21,0	43,5	3/4"	0,074	5		
	928250	160	25	39,0	21,0	43,5	3/4"	0,076	5		
	928254	200-250	25	39,0	21,0	43,5	3/4"	0,084	5		

## WELD-IN SADDLE WITH FEMALE THREAD

for pressureless installation, with spanner flat

**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
fusiolen® PP-R, stainless steel  
**Colour:** green

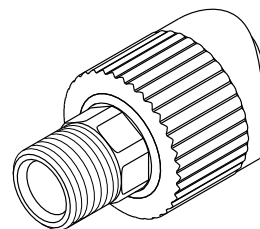
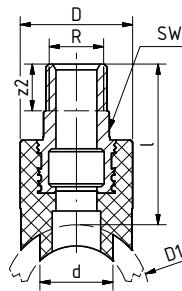


SDR	Art. no.	D1 [mm]	d [mm]	l [mm]	z2 [mm]	D [mm]	R	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>												
6 7.4 9 11 17.6	928260	75	32	43,0	22,0	60,0	1"	39	0,234	5		
	928262	90	32	43,0	22,0	60,0	1"	39	0,235	5		
	928264	110	32	43,0	22,0	60,0	1"	39	0,236	5		
	928266	125	32	43,0	22,0	60,0	1"	39	0,235	5		
	928270	160	32	43,0	22,0	60,0	1"	39	0,238	5		
	928274	200-250	32	43,0	22,0	60,0	1"	39	0,237	5		

## WELD-IN SADDLE WITH MALE THREAD

for pressureless installation, with spanner flat

**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green  
**Notice:** \*do not use with aquatherm blue pipe OT



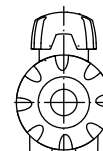
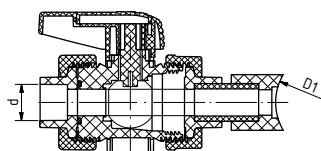
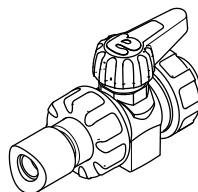
SDR	Art. no.	D1 [mm]	d [mm]	l [mm]	z2 [mm]	D [mm]	R	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>												
6 7.4 9 11 17.6	28314*	40	25	55,0	16,0	38,5	1/2"	21	0,088	5		
	28316	50	25	55,0	16,0	38,5	1/2"	21	0,090	5		
	28318	63	25	55,0	16,0	38,5	1/2"	21	0,089	5		
	28320	75	25	55,0	16,0	38,5	1/2"	21	0,097	5		
	28322	90	25	55,0	16,0	38,5	1/2"	21	0,090	5		
	28324	110	25	55,0	16,0	38,5	1/2"	21	0,089	5		
	28326	125	25	55,0	16,0	38,5	1/2"	21	0,092	5		
	28330	160	25	55,0	16,0	38,5	1/2"	21	0,092	5		
	28334*	40	25	56,0	17,0	43,5	3/4"	24	0,107	5		
	28336	50	25	56,0	17,0	43,5	3/4"	24	0,110	5		
	28338	63	25	56,0	17,0	43,5	3/4"	24	0,109	5		
	28340	75	25	56,0	17,0	43,5	3/4"	24	0,109	5		
	28342	90	25	56,0	17,0	43,5	3/4"	24	0,110	5		
	28344	110	25	56,0	17,0	43,5	3/4"	24	0,110	5		
	28346	125	25	56,0	17,0	43,5	3/4"	24	0,112	5		
	28350	160	25	56,0	17,0	43,5	3/4"	24	0,112	5		

With hex shaped male thread, weld-in surface and weld-in socket for fusion with the inner wall of the pipe.

## aquatherm WELD-ON SADDLE SET WITH BALL VALVE ◆

for installation under pressure in use with tapping tool

**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green  
**Notice:** do not use with aquatherm blue pipe OT

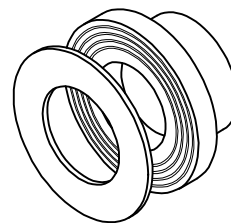
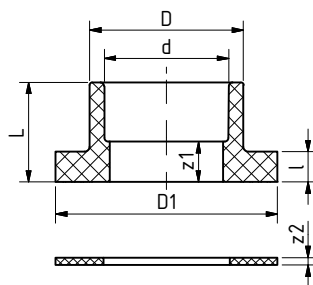


SDR	Art. no.	d [mm]	D1 [mm]	PU	Box unit	Price € pc
6 7.4 9 11 17.6	16175	40	75	1		
	16181	40	90	1		
	16188	40	110	1		
	16196	40	125	1		
	16198	63	125	1		
	16212	40	160	1		
	16216	63	160	1		
	16231	40	200	1		
	16233	63	200	1		
	16251	40	250	1		
	16253	63	250	1		
	16260	63	315-355	1		
	16300	63	400-630	1		

## FLANGE ADAPTER SOCKET WELDING

with gasket

**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green

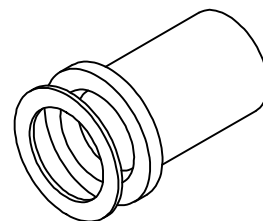
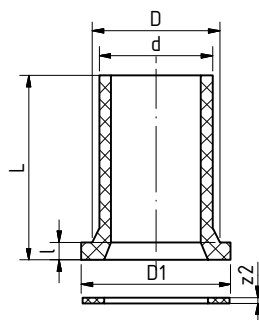


SDR	Art. no.	Dimension d [mm]	L [mm]	I [mm]	D [mm]	D1 [mm]	z1 [mm]	z2 [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>												
6 7.4 9 11	15512	32	34,0	10,0	41,0	68,0	16,0	3	0,053	1		
	15514	40	35,5	11,0	50,0	78,0	15,0	3	0,071	1		
	15516	50	39,5	12,0	61,0	88,0	16,0	3	0,071	1		
	15518	63	43,5	14,0	76,0	102,0	16,0	3	0,112	1		
	15520	75	46,0	16,0	90,0	122,0	16,0	3	0,169	1		
	15522	90	50,0	17,0	108,0	138,0	17,0	3	0,261	1		
	15524	110	55,5	18,5	131,0	158,0	18,5	3	0,329	1		
	15527	125	63,0	20,0	165,0	188,0	23,0	3	0,724	1		

## FLANGE ADAPTER SOCKET WELDING

with gasket

**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



SDR	Art. no.	Dimension d [mm]	L [mm]	I [mm]	D [mm]	D1 [mm]	z2 [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	15526	125	195,0	18,5	131,0	158,0	3	1,180	1		

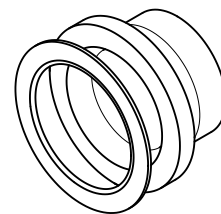
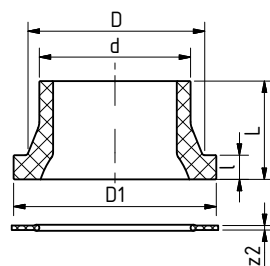
\*Only use with fitting 125 mm; with 110 mm flange adapter suitable for Art. no. 15724

Suitable flange adapter for shut-off valves are available on request.

## FLANGE ADAPTER BUTT WELDING

with gasket

**Material:** fusiolen® PP-RCT  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



SDR	Art. no.	Dimension d [mm]	L [mm]	l [mm]	D [mm]	D1 [mm]	z2 [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>butt welding</i>											
11	15531	160	93,0	25,0	175,0	212,0	3	0,955	1		
	15535	200	130,0	32,0	232,0	268,0	6	1,957	1		
	15539	250	130,0	35,0	285,0	320,0	6	2,717	1		
	15543	315	168,0	35,0	335,0	370,0	6	6,000	1		
	15545	355	180,0	40,0	373,0	430,0	6	7,930	1		
	15547	400	195,0	46,0	427,0	482,0	6	12,000	1		
	15549	450	139,0	60,0	514,0	585,0	7	14,540	1		
17.6	2515530	160	80,0	18,0	175,0	212,0	3	0,821	1		
	2515534	200	130,0	32,0	232,0	268,0	6	1,849	1		
	2515538	250	130,0	35,0	285,0	320,0	6	2,736	1		
	2515542	315	168,0	25,0	335,0	370,0	6	4,500	1		
	2515544	355	184,0	30,0	373,0	430,0	6	7,000	1		
	2515546	400	195,0	33,0	427,0	482,0	6	7,360	1		
	2515548	450	142,0	46,0	514,0	585,0	7	10,400	1		
	2515550	500	138,0	46,0	530,0	585,0	7	8,700	1		
	2515554 ♦	630	140,0	50,0	642,0	685,0	7	12,530	1		

Up to 160 mm EPDM-gasket without steel ring insert. From 200 mm EPDM-gasket with steel ring insert.

Suitable flange adapter for shutt-off valves available on request.



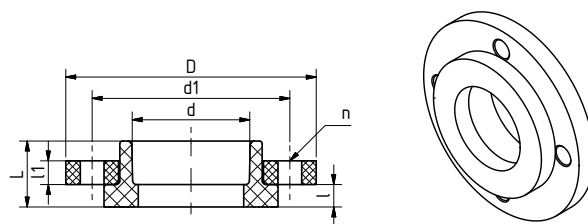
## FLANGE ADAPTER INCL. FLANGE PN6

without gasket

**Material:** Flange: Steel galvanized  
Flange adapter: fusiolen® PP-R

**Colour:** Flange: black  
Flange adapter: green

d = Connection dimension, d1 = hole-circle,  
PN 6 = Flange according to DIN 2641



SDR	Art. no.	Diameter d [mm]	D [mm]	d1 [mm]	L [mm]	l1 [mm]	l [mm]	n	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>												
6 7.4 9 11 17.6	<b>15012</b>	<b>32</b>	100,0	75,0	34,0	10,0	10,0	4	1,090	1		
	<b>15014</b>	<b>40</b>	120,0	90,0	35,5	10,0	11,0	4	1,170	1		
	<b>15016</b>	<b>50</b>	130,0	100,0	39,5	10,0	12,0	4	1,360	1		
	<b>15018</b>	<b>63</b>	140,0	110,0	43,5	10,0	14,0	4	0,886	1		
	<b>15020</b>	<b>75</b>	160,0	130,0	46,0	10,0	16,0	4	1,148	1		
	<b>15022</b>	<b>90</b>	190,0	150,0	50,0	10,0	17,0	4	1,618	1		
	<b>15024</b>	<b>110</b>	210,0	170,0	55,5	10,0	18,5	4	1,824	1		
	<b>15027</b>	<b>125</b>	240,0	200,0	63,0	12,0	20,0	8	3,945	1		

Delivery time: on request

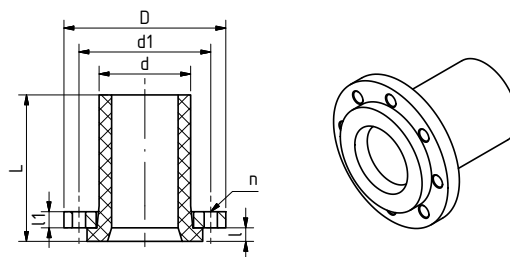
## FLANGE ADAPTER INCL. FLANGE PN6

without gasket

**Material:** Flange: Steel galvanized  
Flange adapter: fusiolen® PP-R

**Colour:** Flange: black  
Flange adapter: green

d = Connection dimension, d1 = hole-circle,  
PN 6 = Flange according to DIN 2641



SDR	Art. no.	Diameter d [mm]	D [mm]	d1 [mm]	L [mm]	l1 [mm]	l [mm]	n	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11 17.6	<b>15026</b>	<b>125</b>	210,0	170,0	195,0	10,0	18,5	4	2,715	1		

Delivery time: on request

125mm Fitting with 110mm Flange adapter incl. flange PN6  
Use only in combination with a fitting

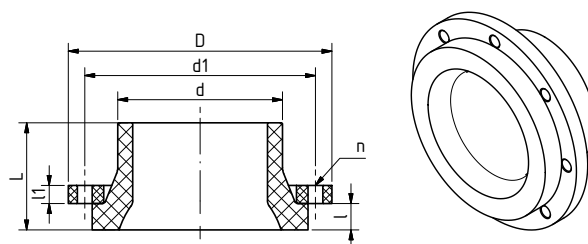
## FLANGE ADAPTER INCL. FLANGE PN6

without gasket

**Material:** Flange: Steel galvanized  
Flange adapter: fusiolen® PP-RCT

**Colour:** Flange: black  
Flange adapter: green

d = Connection dimension, d1 = hole-circle,  
PN 6 = Flange according to DIN 2641



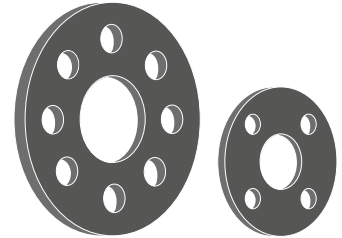
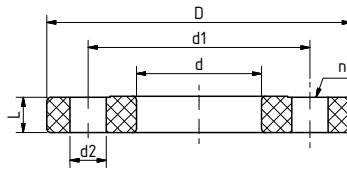
SDR	Art. no.	Diameter d [mm]	D [mm]	d1 [mm]	L [mm]	l1 [mm]	l [mm]	n	Weight [kg]	PU	Box unit	Price € pc
<i>Butt welding</i>												
11	<b>15031</b>	160	265,0	225,0	93,0	12,0	25,0	8	4,136	1		
	<b>15035</b>	200	320,0	280,0	130,0	12,0	32,0	8	6,694	1		
	<b>15039</b>	250	375,0	335,0	130,0	12,0	35,0	8	9,500	1		

Delivery time: on request

## PLASTIC COATED STEEL FLANGE

**Material:** PP/steel  
**Colour:** grey

d = Connection dimension, d1 = hole-circle,  
 PN10/16= Flange according to DIN EN1092, DIN2501



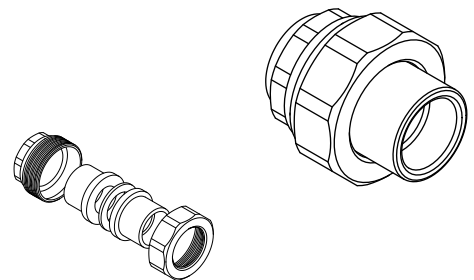
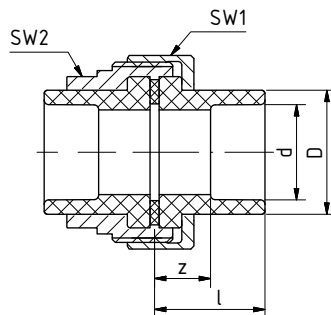
SDR	Art. no.	fits to Art. no.	Dimension flange adapter [mm]	DN	d [mm]	d1 [mm]	D [mm]	d2 [mm]	L [mm]	n	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>														
6 7.4 9 11 17.6	<b>15712</b>	15512	<b>32</b>	25	42,0	85,0	116,0	14,0	15,5	4	0,469	1		
	<b>15714</b>	15514	<b>40</b>	32	51,0	100,0	141,0	18,0	17,5	4	0,722	1		
	<b>15716</b>	15516	<b>50</b>	40	62,0	110,0	151,0	18,0	17,5	4	0,770	1		
	<b>15718</b>	15518	<b>63</b>	50	78,0	125,0	166,0	18,0	19,0	4	0,911	1		
	<b>15720</b>	15520	<b>75</b>	65	92,0	145,0	186,0	18,0	19,0	4	1,132	1		
	<b>15722</b>	15522	<b>90</b>	80	110,0	160,0	201,0	18,0	21,0	8	1,356	1		
	<b>15724</b>	15524/26	<b>110</b>	100	133,0	180,0	221,0	18,0	22,0	8	1,475	1		
	<b>15726</b>	15527	<b>125</b>	125	167,0	210,0	251,0	18,0	26,0	8	2,082	1		
	<b>15730</b>	15531 315530 2515530	<b>160</b>	150	178,0	240,0	286,0	22,0	27,0	8	3,671	1		
	<b>15734*</b>	15535 315534 2515534	<b>200</b>	200	235,0	295,0	341,0	22,0	28,0	8	4,709	1		
	<b>15738*</b>	15539 315538 2515538	<b>250</b>	250	288,0	350,0	406,0	22,0	31,0	12	7,094	1		
	<b>15742*</b>	15543 315542 2515542	<b>315</b>	300	340,0	400,0	460,0	22,0	33,5	12	9,500	1		
	<b>15744*</b>	15545 315544 2515544	<b>355</b>	350	376,0	460,0	520,0	22,0	39,0	16	15,300	1		
	<b>15746*</b>	15547 2515546	<b>400</b>	400	430,0	515,0	565,0	26,0	34,0	16	19,680	1		
	<b>15748**</b>	15549 2515548	<b>450</b>	500	517,0	620,0	670,0	26,0	42,0	20	22,880	1		
	<b>15750**</b>	2515550	<b>500</b>	500	533,0	620,0	670,0	26,0	38,0	20	19,000	1		
	<b>15754**</b>	2515554	<b>630</b>	600	645,0	725,0	785,0	30,0	40,0	20	25,800	1		

\*Flange PN16 ø 200 – 630 mm (Art. no. 15934 – 15954) available on request.

\*\*Material: steel/epoxyd

## COUPLING SCREW JOINT

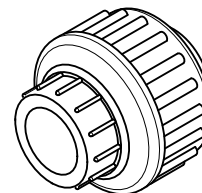
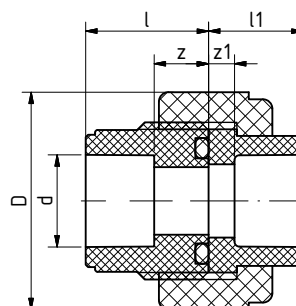
**Material:** fusiolen® PP-R, brass  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green, brassy



SDR	Art. no.	Dimension d [mm]	l [mm]	z [mm]	D [mm]	SW1 [mm]	SW2 [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>											
6 7.4 9 11	<b>15812</b>	<b>32</b>	36,5	18,5	41,0	64	50	0,479	1		
	<b>15814</b>	<b>40</b>	38,0	17,5	50,0	80	60	0,841	1		
	<b>15816</b>	<b>50</b>	41,0	17,5	61,0	86	70	0,821	1		
	<b>15818</b>	<b>63</b>	45,0	17,5	76,0	108	90	1,498	1		
	<b>15820</b>	<b>75</b>	31,0	17,5	90,0	128	104	1,998	1		

## COUPLING SCREW JOINT

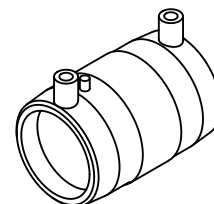
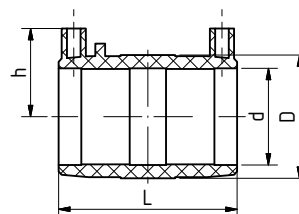
**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



SDR	Art. no.	Dimension d [mm]	l [mm]	z [mm]	l1 [mm]	z1 [mm]	D [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>											
6 7.4 9 11	15838	20	26,0	12,0	20,0	5,5	46,0	0,036	10		
	15840	25	28,0	12,0	21,0	5,0	56,0	0,058	10		
	15842	32	30,0	12,0	23,0	5,0	66,0	0,089	5		
	15844	40	34,0	13,5	25,5	5,0	79,0	0,136	5		
	15846	50	39,0	15,5	28,8	5,0	87,0	0,170	5		
	15848	63	47,5	20,0	32,5	5,0	107,0	0,240	1		
	15850	75	50,0	20,0	36,0	6,0	128,0	0,546	1		

## ELECTROFUSION SOCKET

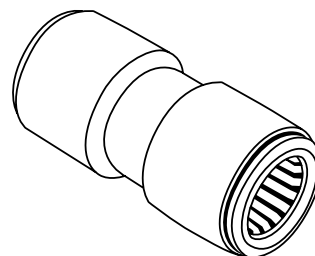
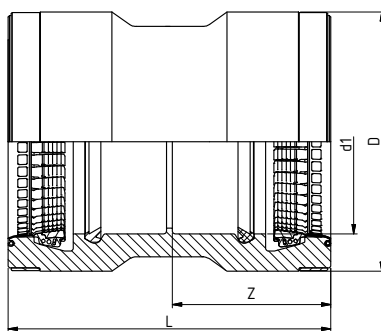
**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green  
**Notice:** do not use with 160 – 250 mm fittings  
 \*do not use with aquatherm blue pipe MF OT



SDR	Art. no.	Dimension d [mm]	L [mm]	h [mm]	D [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>Electro-socket welding</i>									
6 7.4 9 11 17.6	17208	20	70,0	36,0	31,5	0,049	1		
	17210	25	78,0	38,5	36,5	0,057	1		
	17212	32	80,0	42,5	45,0	0,077	1		
	17214	40	92,0	47,0	54,0	0,103	1		
	17216	50	103,0	52,0	65,0	0,142	1		
	17218	63	118,0	58,0	81,5	0,239	1		
	17220	75	130,0	64,5	96,0	0,347	1		
	17222	90	145,0	72,0	113,5	0,501	1		
	17224	110	160,0	82,5	139,0	0,821	1		
	17226	125	172,0	90,0	156,0	1,097	1		
	17230*	160	186,0	109,5	197,0	1,754	1		
	17234*	200	210,0	134,0	243,0	3,625	1		
	17238*	250	250,0	170,0	315,0	7,142	1		

## NEW PUSH-FIT COUPLING

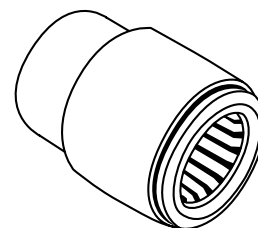
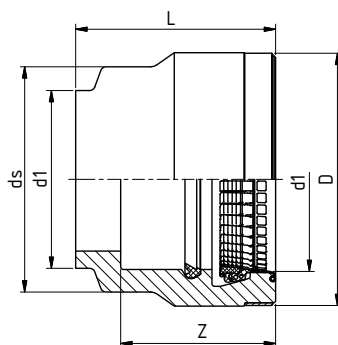
**Material:** fusiolen® PP-RCT/EPDM  
**Pipe series:** SDR 11/17.6  
**Standard:** DIN EN ISO 15874  
**Colour:** green  
**Notice:** do not use for aquatherm blue pipe MF RP OT



SDR	Art. no.	d1 [mm]	L [mm]	D [mm]	z [mm]	Weight [kg]	PU	Box unit	Price € pc
11 17.6	17322	90	285,0	152,0	140,0	2,300	1		
	17324	110	345,0	175,0	170,0	3,700	1		
	17326	125	350,0	190,0	172,0	4,300	1		
	17330	160	372,0	234,0	183,0	6,600	1		
	17334	200	470,0	285,0	231,0	11,000	1		
	17338	250	496,0	375,0	243,0	24,200	1		
	17342	315	560,0	450,0	275,0	40,200	1		
	17344	355	576,0	492,0	283,0	45,700	1		
	17346	400	610,0	540,0	300,0	54,800	1		
	17348	450	646,0	600,0	318,0	69,600	1		

## NEW PUSH-FIT ADAPTER

**Material:** fusiolen® PP-RCT/EPDM  
**Pipe series:** SDR 11/17.6  
**Standard:** DIN EN ISO 15874  
**Colour:** green  
**Notice:** do not use for aquatherm blue pipe MF RP OT



SDR	Art. no.	d1 [mm]	L [mm]	D [mm]	ds [mm]	z [mm]	Weight [kg]	PU	Box unit	Price € pc
11	17422	90	170,0	152,0	112,0	140,0	1,200	1		
	17424	110	205,0	175,0	140,0	170,0	2,000	1		
	17426	125	210,0	190,0	161,0	172,0	2,300	1		
	17430	160	227,0	234,0	202,0	183,0	3,800	1		
	17434	200	285,0	285,0	250,0	231,0	6,500	1		
	17438	250	315,0	375,0	317,0	243,0	15,000	1		
	17442	315	355,0	450,0	400,0	275,0	24,000	1		
	17444	355	370,0	492,0	450,0	283,0	28,000	1		
	17446	400	390,0	540,0	500,0	300,0	34,000	1		
	17448	450	415,0	600,0	560,0	318,0	44,000	1		
17.6	17526	125	210,0	190,0	161,0	172,0	2,300	1		
	17530	160	227,0	234,0	202,0	183,0	3,800	1		
	17534	200	285,0	285,0	250,0	231,0	6,500	1		
	17538	250	315,0	355,0	295,0	243,0	11,500	1		
	17542	315	345,0	425,0	370,0	275,0	16,300	1		
	17544	355	360,0	470,0	415,0	283,0	20,000	1		
	17546	400	390,0	510,0	465,0	300,0	23,800	1		
	17548	450	400,0	565,0	520,0	318,0	27,800	1		

Fittings and connecting parts e.g. elbows (45°/90°), T-pieces, red-T-pieces, etc. on request

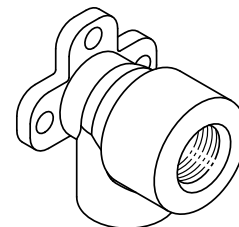
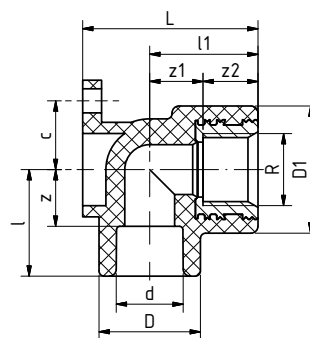


## BACK PLATE ELBOW

**Material:** fusiolen® PP-R, brass  
fusiolen® PP-R, stainless steel

**Standard:** DIN 16962, DIN EN ISO 15874

**Colour:** green

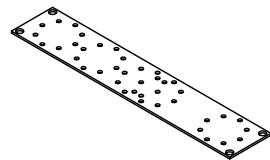
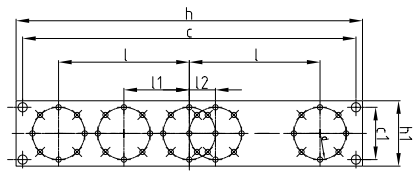


SDR	Art. no.	d [mm]	R	l [mm]	z [mm]	D [mm]	l1 [mm]	z1 [mm]	z2 [mm]	D1 [mm]	L [mm]	c [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>																
<b>brass</b>																
6 7.4 11	<b>20108</b>	<b>20</b>	<b>1/2"</b>	31,0	16,5	29,5	31,5	18,5	13,0	37,0	51,0	20,0	0,079		200	
	<b>20110</b>	<b>20</b>	<b>3/4"</b>	37,0	22,5	34,0	37,0	24,0	13,0	44,0	54,0	-	0,106			
	<b>20112</b>	<b>25</b>	<b>3/4"</b>	37,0	21,0	34,0	37,0	24,0	13,0	44,0	54,0	-	0,105			
	<b>20113</b>	<b>25</b>	<b>1/2"</b>	33,5	17,5	34,0	31,0	18,0	13,0	37,0	53,0	20,0	0,080			
	<b>stainless steel</b>															
	<b>920108</b>	<b>20</b>	<b>1/2"</b>	31,0	16,5	29,5	31,5	18,5	13,0	37,0	51,0	20,0	0,084			
	<b>920110</b>	<b>20</b>	<b>3/4"</b>	37,0	22,5	34,0	37,0	24,0	13,0	44,0	54,0	-	0,101			
	<b>920112</b>	<b>25</b>	<b>3/4"</b>	37,0	21,0	34,0	37,0	24,0	13,0	44,0	54,0	-	0,111			
	<b>920113</b>	<b>25</b>	<b>1/2"</b>	33,5	17,5	34,0	31,0	18,0	13,0	37,0	53,0	20,0	0,076			

MOUNTING PLATE

galvanized; to fix back plate elbows as double connection

Material: iron, galvanized  
Colour: zinc



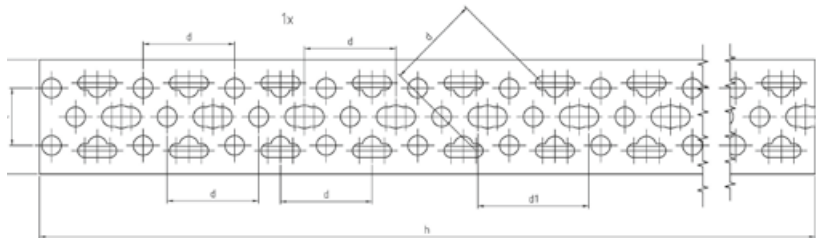
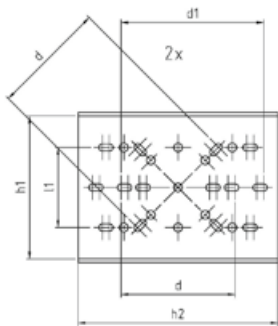
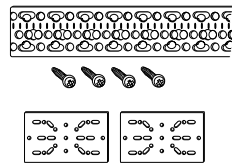
Art. no.	d [mm]	l [mm]	l1 [mm]	l2 [mm]	c [mm]	c1 [mm]	h [mm]	h1 [mm]	Weight [kg]	PU	Box unit	Price € pc
60010	40	100	50	20	255	40	265	50	0,221	1		

not suitable for connection with sound insulation plate (Art. no. 79080).  
We recommend mounting rail Art. no. 79090.

MOUNTING PLATE

galvanized; to fix back plate elbows as double connection including 2 fixing plates and 4 screws

Material: iron, galvanized  
Colour: zinc

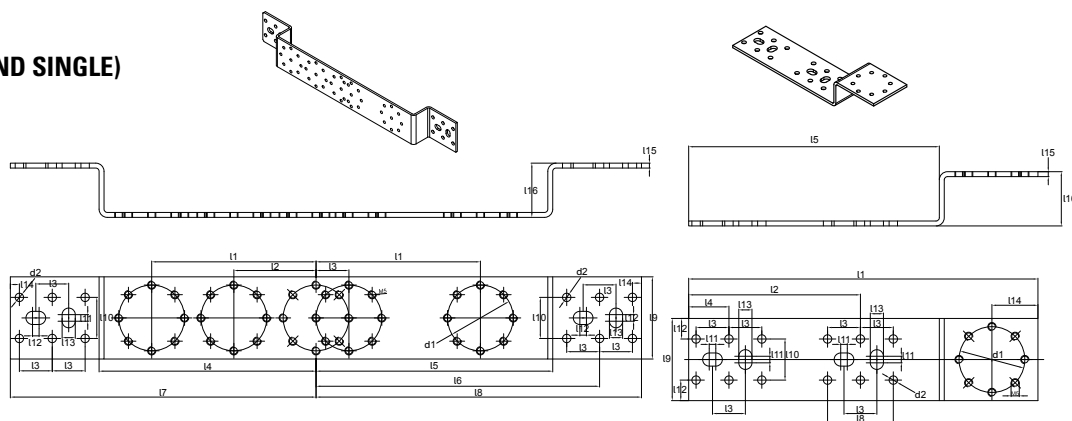


Art. no.	d [mm]	d1 [mm]	l [mm]	l1 [mm]	h [mm]	h1 [mm]	h2 [mm]	Weight [kg]	PU	Box unit	Price € pc
79090	40	50	25	28	560	70	70	0,546	1		

## MOUNTING RAIL (DOUBLE AND SINGLE)

**Material:** iron, galvanized

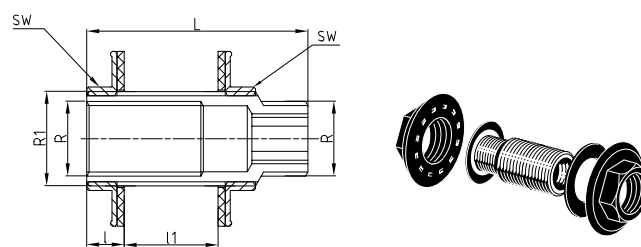
**Colour:** zinc



Art. no.	ø d1 [mm]	ø d2 [mm]	Weight [kg]	PU	Price € pc
<b>79095</b>	40	5,1	0,412	2	
<b>79096</b>	40	5,1	0,235	2	

## DRY CONSTRUCTION WALL FITTING

**Material:** brass



Art. no.	R	R1	l [mm]	l1 [mm]	L [mm]	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
<b>20114</b>	<b>1/2"</b>	<b>3/4"</b>	10,5	26,0	62,0	30	0,213	10		

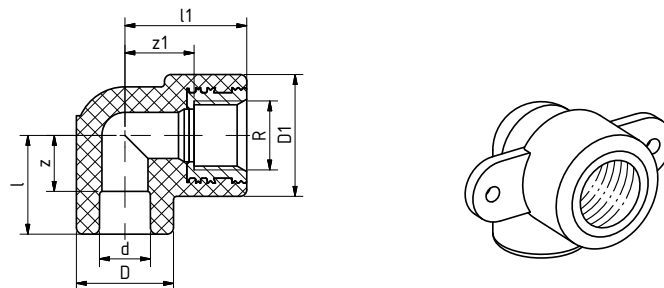
## BACK PLATE ELBOW FOR DRY CONSTRUCTION

**Material:** fusiolen® PP-R, brass

fusiolen® PP-R, stainless steel

**Standard:** DIN 16962, DIN EN ISO 15874

**Colour:** green



SDR	Art. no.	d [mm]	R	l [mm]	z [mm]	D [mm]	l1 [mm]	z1 [mm]	D1 [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 11	socket welding												
	brass												
	20158	20	1/2"	30,0	15,5	29,5	37,0	24,0	37,0	0,079	10		
	stainless steel												
	920158	20	1/2"	30,0	15,5	29,5	37,0	24,0	37,0	0,078	10		

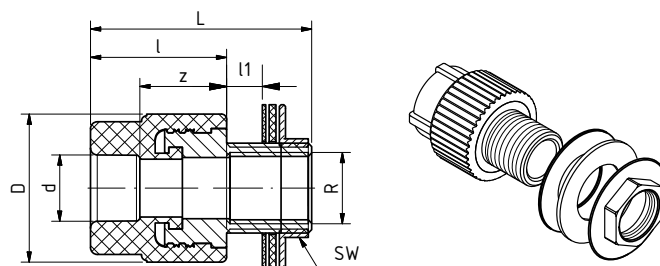
## TRANSITION PIECE

*with counternut, gasket and tension washer*

**Material:** fusiolen® PP-R, brass

**Standard:** DIN 16962, DIN EN ISO 15874

**Colour:** green



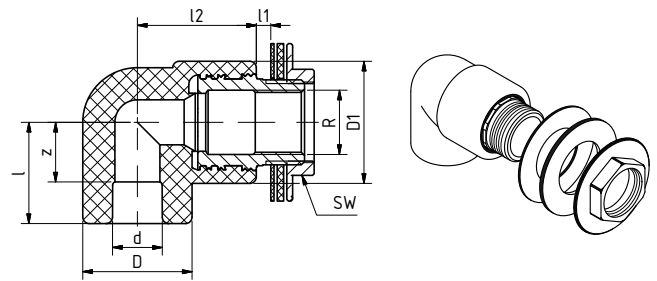
SDR	Art. no.	d [mm]	R	l [mm]	z [mm]	D [mm]	l1 [mm]	L [mm]	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>													
6	<b>20204</b>	<b>20</b>	<b>1/2"</b>	40,0	25,5	43,5	13,5	65,0	29	0,204	10		
7.4													
11													

e.g. for connection of a cistern or application with mounting plate (Art. no. 60110 – 60115)

## TRANSITION ELBOW

with counternut, gasket and tension washer

**Material:** fusiolen® PP-R, brass  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



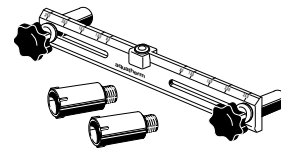
SDR	Art. no.	d [mm]	R	l [mm]	z [mm]	D [mm]	l1 [mm]	l2 [mm]	D1 [mm]	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
socket welding														
6	20208	20	1/2"	37,0	22,5	29,5	3,5	35,0	44,0	29	0,154	10		
7.4														
11	20209	25	1/2"	37,0	21,0	34,0	3,5	37,0	44,0	29	0,206	10		

e.g. for connection of a cistern or application with mounting plate (Art. no. 60110 – 60115)

## ASSEMBLING JIG

as water level with 2 plugs 1/2"

**Material:** fusiolen® PP-R  
**Colour:** green

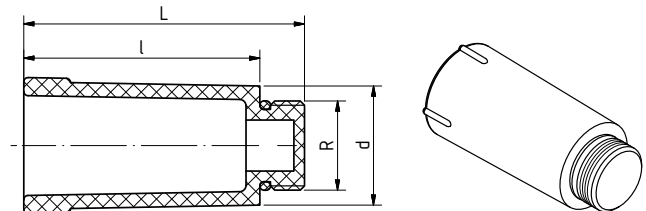


Art. no.	Weight [kg]	PU	Box unit	Price € pc
50700	0,252	1		

## PLUG FOR PRESSURE TESTS

with gasket

**Material:** fusiolen® PP-R  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green

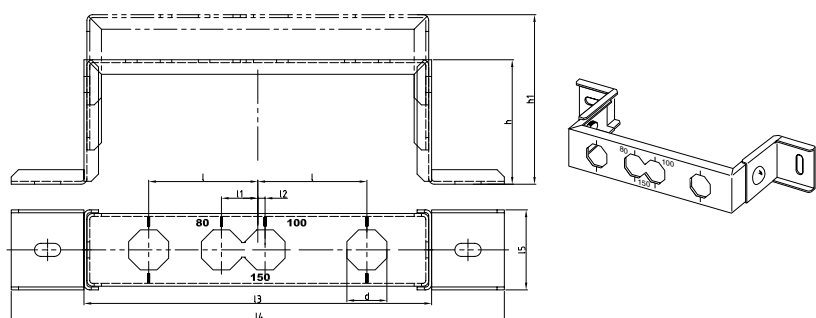


Art. no.	d [mm]	R	l [mm]	L [mm]	Weight [kg]	PU	Box unit	Price € pc
50708	28	1/2"	55,5	66,0	0,022	10		
50710	34	3/4"	55,5	66,0	0,027	10		

## MOUNTING UNIT

double

**Material:** iron/galvanized  
**Colour:** zinc



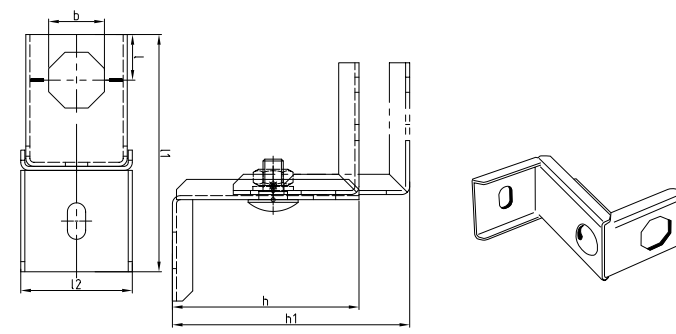
Art. no.	b [mm]	l [mm]	l1 [mm]	l2 [mm]	h [mm]	h1 [mm]	l3 [mm]	l4 [mm]	l5 [mm]	Weight [kg]	PU	Box unit	Price € pc
60110	27,5	75	25	5	92,5	122,5	239	339	55	0,630	1		



## MOUNTING UNIT

single

**Material:** iron/galvanized  
**Colour:** zinc

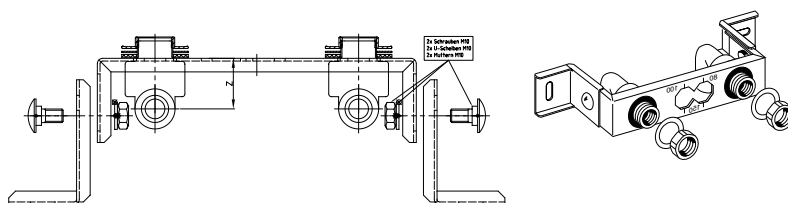


Art. no.	b [mm]	l [mm]	l1 [mm]	l2 [mm]	h [mm]	h1 [mm]	Weight [kg]	PU	Box unit	Price € pc
60115	27,5	118	22,5	55	92,5	122,5	0,278	1		

## MOUNTING UNIT

with two aquatherm green pipe transition elbows (Art. no. 20208), with counternut, gasket and tension washer

**Material:** fusiolen® PP-R, brass  
iron/galvanized  
**Colour:** green  
zinc

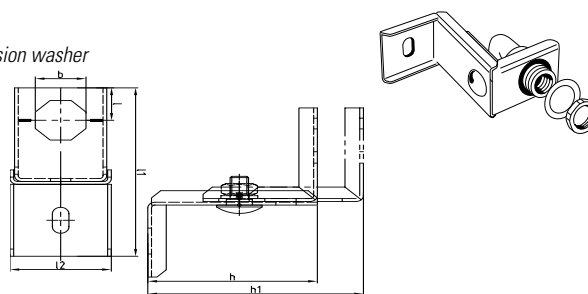


Art. no.	b [mm]	l [mm]	l1 [mm]	l2 [mm]	h [mm]	h1 [mm]	l3 [mm]	l4 [mm]	l5 [mm]	Weight [kg]	PU	Box unit	Price € pc
60150	27,5	75	25	5	92,5	122,5	239	339	55	0,942	1		

## MOUNTING UNIT

with one aquatherm green pipe transition elbow (Art. no. 20208), with counternut, gasket and tension washer

**Material:** fusiolen® PP-R, brass  
iron/galvanized  
**Colour:** green  
zinc

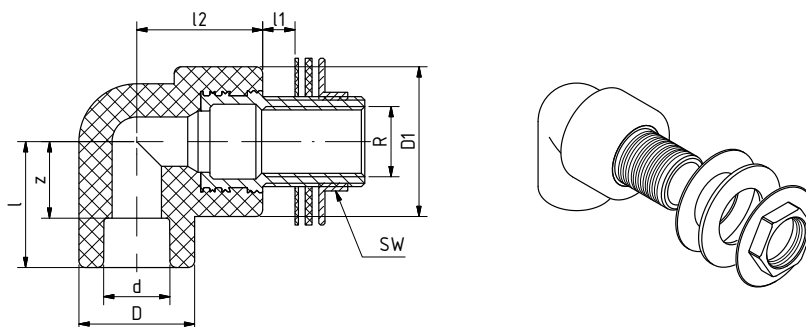


Art. no.	b [mm]	l [mm]	l1 [mm]	l2 [mm]	h [mm]	h1 [mm]	Weight [kg]	PU	Box unit	Price € pc
60155	27,5	22,5	118	55	92,5	122,5	0,434	1		

## TRANSITION ELBOW

for plasterboard

**Material:** fusiolen® PP-R, brass  
**Colour:** green



SDR	Art. no.	d [mm]	R	l [mm]	z [mm]	D [mm]	L [mm]	l1 [mm]	D1 [mm]	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
6														
7.4	20210	20	1/2"	37,0	22,5	29,5	18,5	35,0	44,0	29	0,223	10		
11														

with 30 mm thread, counternut, gasket and tension washer

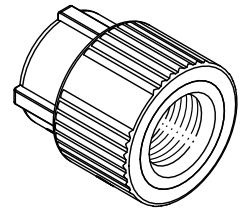
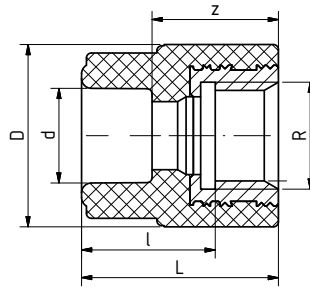
## TRANSITION PIECE WITH FEMALE THREAD

round

**Material:** fusiolen® PP-R, brass  
fusiolen® PP-R, stainless steel

**Standard:** DIN 16962, DIN EN ISO 15874

**Colour:** green



SDR	Art. no.	d [mm]	R	l [mm]	z [mm]	D [mm]	L [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	<b>brass</b>										
	21008	20	1/2"	27,5	26,0	37,5	40,5	0,064	10	400	
	21010	20	3/4"	27,5	26,0	43,5	40,5	0,089	10	300	
	21011	25	1/2"	29,5	26,5	38,5	42,5	0,065	10	400	
	21012	25	3/4"	27,5	24,5	43,5	40,5	0,087	10	300	
	21013	32	3/4"	30,5	25,5	43,5	43,5	0,092	5	250	
	<b>stainless steel</b>										
	921008	20	1/2"	27,5	26,0	37,5	40,5	0,069	10		
	921010	20	3/4"	27,5	26,0	43,5	40,5	0,090	10		
	921011	25	1/2"	29,5	26,5	38,5	42,5	0,069	10		
	921012	25	3/4"	27,5	24,5	43,5	40,5	0,086	10		
	921013	32	3/4"	30,5	25,5	43,5	43,5	0,092	5		
	921014	32	1/2"	28,0	23,0	37,0	41,0	0,078	5		

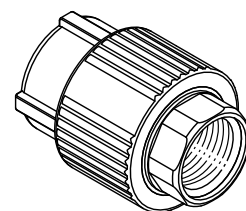
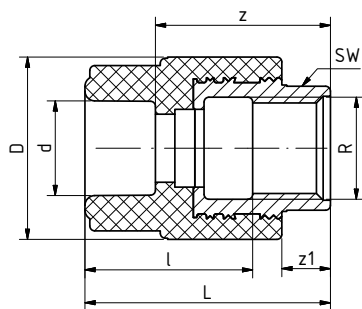
## TRANSITION PIECE WITH FEMALE THREAD

with spanner flat

**Material:** fusiolen® PP-R, brass  
fusiolen® PP-R, stainless steel

**Standard:** DIN 16962, DIN EN ISO 15874

**Colour:** green



SDR	Art. no.	d [mm]	R	l [mm]	z [mm]	z1 [mm]	D [mm]	L [mm]	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	<b>brass</b>												
	21108	20	1/2"	34,5	36,0	10,0	38,5	50,5	24	0,078	10	400	
	21110	20	3/4"	29,0	35,5	10,0	43,5	50,0	31	0,112	10	300	
	21111	25	1/2"	36,0	36,0	10,0	38,5	52,0	24	0,081	10	300	
	21112	25	3/4"	29,0	34,0	10,0	43,5	50,0	31	0,109	10	300	
	21113	32	3/4"	32,0	35,0	10,0	43,5	53,0	31	0,114	5	250	
	21114	32	1"	37,5	41,5	14,0	60,0	59,5	39	0,239	5	125	
	21115	40	1"	40,0	41,5	14,0	60,0	62,0	39	0,227	5		
	21116	40	1 1/4"	40,0	42,5	15,0	74,0	63,0	50	0,385	5		
	21117	50	1 1/4"	43,0	42,5	15,0	74,0	66,0	50	0,404	5		
	21118	50	1 1/2"	45,0	43,5	15,0	85,5	67,0	55	0,418	5		
	21119	63	1 1/2"	51,5	46,0	15,0	84,0	73,5	55	0,442	1		
	21120	63	2"	51,0	49,5	19,0	101,0	77,0	67	0,600	1		
	21122	75	2"	51,0	47,0	19,0	100,0	77,0	67	0,608	1		
	<b>stainless steel</b>												
	921114	32	1"	37,5	41,5	14,0	60,0	59,5	39	0,232	5		
	921115	40	1"	40,0	41,5	14,0	60,0	62,0	39	0,219	5		
	921116	40	1 1/4"	40,0	42,5	15,0	74,0	63,0	50	0,331	5		
	921117	50	1 1/4"	43,0	42,5	15,0	74,0	66,0	50	0,351	5		
	921118	50	1 1/2"	45,0	43,5	15,0	84,0	67,0	55	0,445	5		
	921119	63	1 1/2"	51,5	46,0	15,0	84,0	73,5	55	0,425	1		
	921120	63	2"	51,0	49,5	19,0	101,0	77,0	67	0,196	1		
	921122	75	2"	51,0	47,0	19,0	100,0	77,0	67	0,676	1		

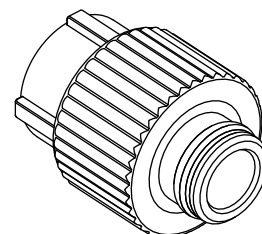
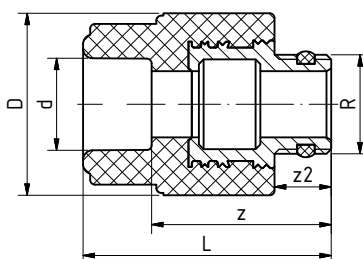
## TRANSITION PIECE WITH MALE THREAD

round, self sealing

**Material:** fusiolen® PP-R, brass

**Standard:** DIN 16962, DIN EN ISO 15874

**Colour:** green

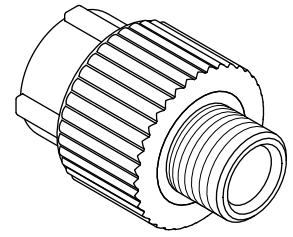
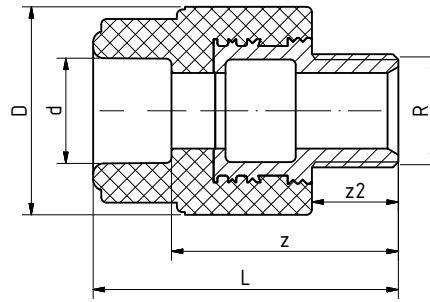


SDR	Art. no.	d [mm]	R	L [mm]	z [mm]	z2 [mm]	D [mm]	Weight [kg]	PU	Box unit	Price € pc
6	21258	20	1/2"	52,5	38,0	12,0	38,5	0,090	10		
7.4	21261	25	1/2"	54,0	38,0	12,0	38,5	0,078	10		
11	21262	25	3/4"	53,5	37,5	13,0	38,5	0,085	10		

## TRANSITION PIECE WITH MALE THREAD

round

**Material:** fusiolen® PP-R, brass  
fusiolen® PP-R, stainless steel  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green

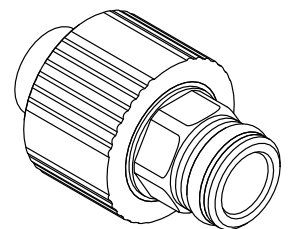
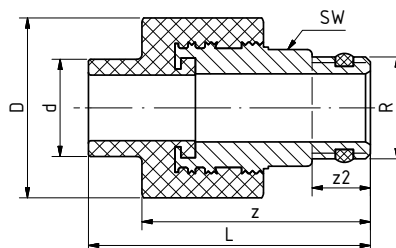


SDR	Art. no.	d [mm]	R	L [mm]	z [mm]	z2 [mm]	D [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	<b>brass</b>										
	21208	20	1/2"	56,5	42,0	16,0	38,5	0,084	10	300	
	21210	20	3/4"	57,5	43,0	17,0	38,5	0,109	10	300	
	21211	25	1/2"	58,0	42,0	16,0	38,5	0,085	10	300	
	21212	25	3/4"	57,5	41,5	17,0	38,5	0,090	10	300	
	21213	32	3/4"	59,5	41,5	17,0	38,5	0,095	5	250	
	<b>stainless steel</b>										
	921208	20	1/2"	56,5	42,0	16,0	38,5	0,096	10		
	921210	20	3/4"	57,5	43,0	17,0	38,5	0,108	10		
	921211	25	1/2"	58,0	42,0	16,0	38,5	0,098	10		
	921212	25	3/4"	57,5	41,5	17,0	38,5	0,108	10		
	921213	32	3/4"	59,5	41,5	17,0	38,5	0,115	5		

## TRANSITION PIECE WITH MALE THREAD

self-sealing, with hex shaped threaded transition  
male/male

**Material:** fusiolen® PP-R, brass  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



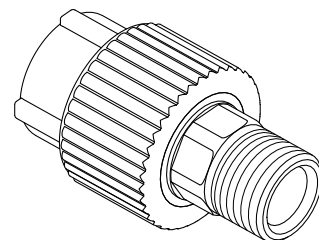
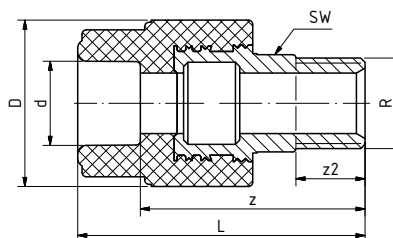
SDR	Art. no.	d [mm]	R	L [mm]	z [mm]	z2 [mm]	D [mm]	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 11	21355	20	1/2"	59,0	48,0	13,0	38,5	22	0,107	10		



## TRANSITION PIECE WITH MALE THREAD

with spanner flat

**Material:** fusiolen® PP-R, brass  
fusiolen® PP-R, stainless steel  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green

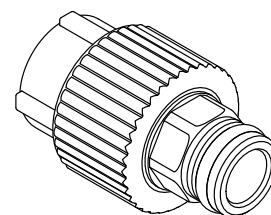
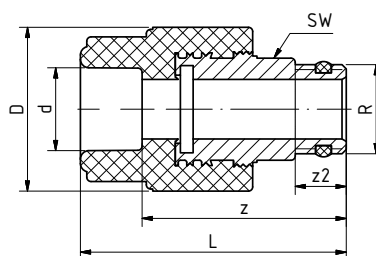


SDR	Art. no.	d [mm]	R	SW [mm]	L [mm]	z [mm]	z2 [mm]	D [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	brass											
	21308	20	1/2"	22	66,5	52,0	16,0	38,5	0,104	10		
	21310	20	3/4"	24	67,5	53,0	17,0	38,5	0,129	10		
	21311	25	1/2"	21	68,0	52,0	16,0	38,5	0,107	10		
	21312	25	3/4"	24	67,5	51,5	17,0	38,5	0,103	10	300	
	21314	32	1"	32	78,5	60,5	20,0	53,0	0,216	5	125	
	21316	32	1 1/4"	42	81,0	63,0	21,0	68,0	0,318	5	100	
	21317	40	1"	32	81,0	60,5	20,0	52,0	0,222	5	100	
	21318	40	1 1/4"	42	84,5	64,0	21,0	68,0	0,324	5	80	
	21319	50	1 1/4"	42	85,5	62,0	21,0	68,0	0,351	5		
	21320	50	1 1/2"	46	88,5	65,0	22,0	74,0	0,425	5		
	21321	63	1 1/2"	46	94,5	67,0	22,0	72,5	0,467	1		
	21322	63	2"	50	102,5	75,0	23,5	84,0	0,685	1		
	21323	75	2"	50	102,0	72,0	23,5	84,0	0,733	1		
	21324	75	2 1/2"	65	105,0	75,0	26,7	100,0	0,970	1		
	21325	90	3"	85	121,0	88,0	30,0	120,0	1,326	1		
	21327	110	4"	105	148,0	111,0	39,0	147,0	2,730	1		
	stainless steel											
	921314	32	1"	32	78,5	60,5	20,0	53,0	0,204	5		
	921316	32	1 1/4"	41	81,0	63,0	21,0	68,0	0,360	5		
	921317	40	1"	32	81,0	60,5	20,0	52,0	0,251	5		
	921318	40	1 1/4"	41	84,5	64,0	21,0	68,0	0,362	5		
	921319	50	1 1/4"	41	85,5	62,0	21,0	68,0	0,389	5		
921320	50	1 1/2"	46	88,5	65,0	22,0	74,0	0,480	5			
921321	63	1 1/2"	46	94,5	67,0	22,0	72,5	0,523	1			
921322	63	2"	50	102,5	75,0	23,5	84,0	0,708	1			
921323	75	2"	50	102,0	72,0	23,5	84,0	0,699	1			

## TRANSITION PIECE WITH MALE THREAD

self-sealing, with hex shaped threaded transition  
female/male

**Material:** fusiolen® PP-R, brass  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



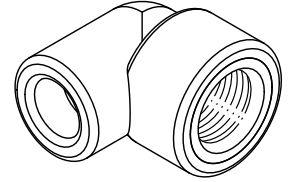
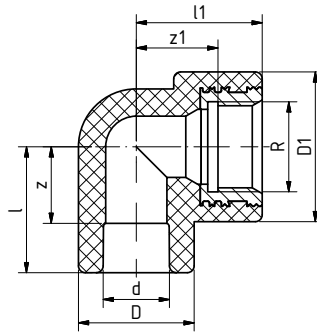
SDR	Art. no.	d [mm]	R	L [mm]	z [mm]	z2 [mm]	D [mm]	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 11	21358	20	1/2"	63,5	49,0	13,0	38,5	22	0,111	10		

## TRANSITION ELBOW WITH FEMALE THREAD

**Material:** fusiolen® PP-R, brass  
fusiolen® PP-R, stainless steel

**Standard:** DIN 16962, DIN EN ISO 15874

**Colour:** green



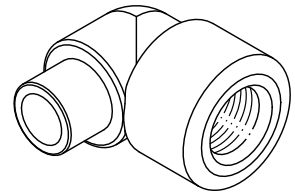
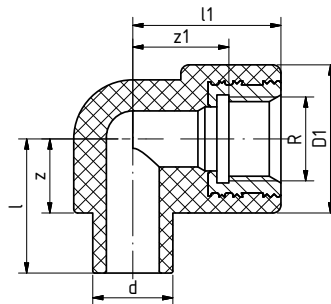
SDR	Art. no.	d [mm]	R	l [mm]	z [mm]	D [mm]	l1 [mm]	z1 [mm]	D1 [mm]	Weight [kg]	PU	Box unit	Price € pc
<b>brass</b>													
6 7.4 9 11	23008	20	3/4"	37,0	22,5	34,0	37,0	24,0	44,0	0,102	10		
	23010	20	1/2"	31,0	16,5	29,5	31,5	18,5	37,0	0,076	10	300	
	23012	25	3/4"	37,0	21,0	34,0	37,0	24,0	44,0	0,100	10	200	
	23014	25	1/2"	33,5	17,5	34,0	31,5	18,5	37,0	0,075	10	250	
	23016	32	3/4"	27,5	9,5	43,0	51,0	38,0	44,0	0,104	5		
	23018	32	1"	34,0	16,0	43,0	66,5	44,5	60,5	0,249	5		
	<b>stainless steel</b>												
	923008	20	3/4"	37,0	22,5	29,5	37,0	24,0	37,0	0,095	10		
	923010	20	1/2"	31,0	16,5	29,5	31,5	18,5	37,0	0,081	10		
	923012	25	3/4"	37,0	21,0	34,0	37,0	24,0	44,0	0,101	10		
	923014	25	1/2"	33,5	17,5	34,0	31,5	18,5	37,0	0,082	10		
	923015	32	1/2"	35,0	17,0	43,0	37,0	24,0	37,0	0,112	5		
	923016	32	3/4"	27,5	9,5	43,0	51,0	38,0	44,0	0,097	5		
	923018	32	1"	34,0	16,0	43,0	66,5	44,5	60,5	0,240	5		

## TRANSITION ELBOW WITH FEMALE THREAD

**Material:** fusiolen® PP-R, brass

**Standard:** DIN 16962, DIN EN ISO 15874

**Colour:** green



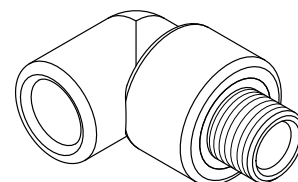
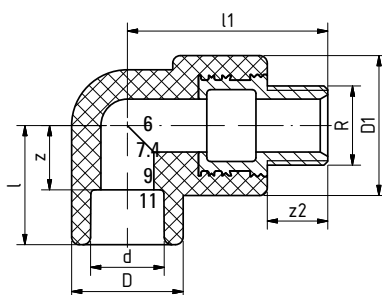
SDR	Art. no.	d [mm]	R	l [mm]	z [mm]	l1 [mm]	z1 [mm]	D1 [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 11	23208	20	1/2"	33,5	18,5	37,0	24,0	37,0	0,076	10		

## TRANSITION ELBOW WITH MALE THREAD

**Material:** fusiolen® PP-R, brass  
fusiolen® PP-R, stainless steel

**Standard:** DIN 16962, DIN EN ISO 15874

**Colour:** green



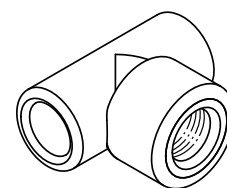
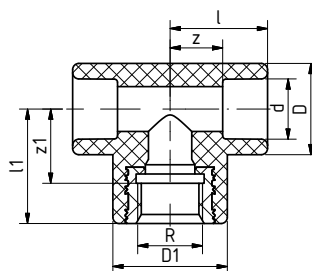
SDR	Art. no.	d [mm]	R	l [mm]	l1 [mm]	z [mm]	z2 [mm]	D [mm]	D1 [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	<b>brass</b>												
	23506	20	1/2"	31,5	53,0	17,0	16,0	29,5	37,0	0,108	10		
	23508	20	3/4"	31,5	54,0	17,0	17,0	34,0	38,0	0,128	10		
	23510	25	3/4"	31,5	54,0	15,5	17,0	34,0	38,0	0,104	10		
	23512	32	3/4"	27,5	68,0	9,5	17,0	43,0	38,0	0,112	5		
	23514	32	1"	31,0	85,5	13,0	20,0	43,0	52,0	0,231	5		
	<b>stainless steel</b>												
	923506	20	1/2"	31,5	53,0	17,0	16,0	29,5	37,0	0,035	10		
	923508	20	3/4"	31,5	54,0	17,0	17,0	34,0	38,0	0,123	10		
	923510	25	3/4"	31,5	54,0	15,5	17,0	34,0	38,0	0,121	10		
	923512	32	3/4"	27,5	68,0	9,5	17,0	43,0	38,0	0,128	5		

## THREADED BRANCH TEE WITH FEMALE THREAD

**Material:** fusiolen® PP-R, brass  
fusiolen® PP-R, stainless steel

**Standard:** DIN 16962, DIN EN ISO 15874

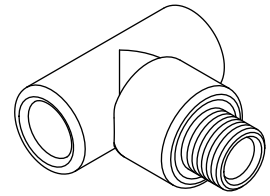
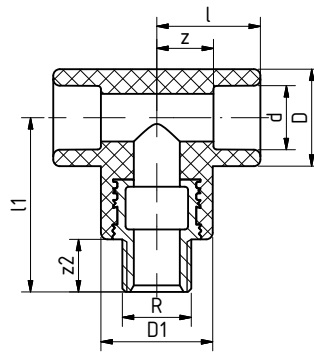
**Colour:** green



SDR	Art. no.	d [mm]	R	l [mm]	z [mm]	D [mm]	l1 [mm]	z1 [mm]	D1 [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	<b>brass</b>												
	25006	20	1/2"	31,5	17,0	29,5	37,0	24,0	37,0	0,086	10	200	
	25008	20	3/4"	37,0	22,5	34,0	37,0	24,0	44,0	0,121	10	170	
	25010	25	1/2"	34,0	18,0	34,0	38,0	25,0	37,0	0,090	10	150	
	25012	25	3/4"	37,0	21,0	34,0	37,0	24,0	44,0	0,109	10	150	
	25013	32	1/2"	35,0	17,0	43,0	37,0	24,0	37,0	0,103	5		
	25014	32	3/4"	27,5	9,5	43,0	51,0	38,0	44,0	0,111	5		
	25016	32	1"	31,5	13,5	43,0	67,0	45,0	60,0	0,255	5		
	25018	40	1/2"	42,0	21,5	52,0	40,0	27,0	37,0	0,142	5		
	25019	40	3/4"	40,5	20,0	52,0	40,5	27,5	52,0	0,147	5		
	25020	40	1"	41,5	21,0	52,0	56,0	34,0	60,0	0,276	5		
	25022	50	1"	49,5	26,0	68,0	63,5	41,5	60,0	0,385	5		
	25030	50	1/2"	49,5	26,0	68,0	44,5	31,5	43,0	0,237	5		
	25031	50	3/4"	49,5	26,0	68,0	44,5	31,5	43,0	0,243	5		
	<b>stainless steel</b>												
	925006	20	1/2"	31,5	17,0	29,5	37,0	24,0	37,0	0,087	10		
	925008	20	3/4"	37,0	22,5	34,0	37,0	24,0	44,0	0,108	10		
	925010	25	1/2"	34,5	18,5	34,0	38,0	25,0	37,0	0,093	10		
	925012	25	3/4"	37,0	21,0	34,0	37,0	24,0	44,0	0,111	10		
	925013	32	1/2"	35,0	17,0	43,0	37,0	24,0	37,0	0,113	5		
	925014	32	3/4"	27,5	9,5	43,0	51,0	38,0	44,0	0,111	5		
	925016	32	1"	31,5	13,5	43,0	67,0	45,0	60,0	0,082	5		

## THREADED BRANCH TEE WITH MALE THREAD

**Material:** fusiolen® PP-R, brass  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green

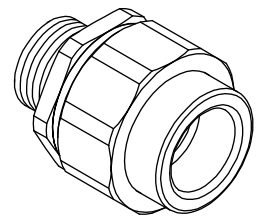
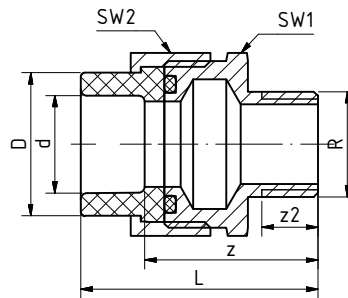


SDR	Art. no.	d [mm]	R	l [mm]	z [mm]	D [mm]	z2 [mm]	D1 [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 11	25506	20	1/2"	31,5	17,0	29,5	16,0	37,0	0,102	10		

## TRANSITION COUPLING WITH MALE THREAD

with union nut and welding socket

**Material:** fusiolen® PP-R, brass  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green

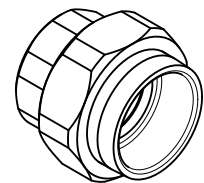
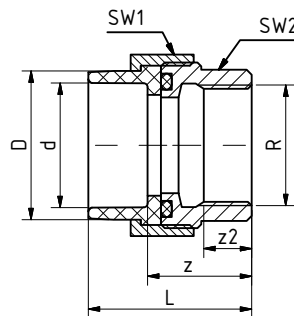


SDR	Art. no.	d [mm]	R	L [mm]	z [mm]	z2 [mm]	D [mm]	SW1 [mm]	SW2 [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	26608	20	1/2"	52,5	38,0	13,5	27,5	34	36	0,145	1		
	26610	25	3/4"	59,5	43,5	14,5	36,0	42	46	0,243	1		
	26612	32	1"	64,5	46,5	16,8	41,5	48	52	0,336	1		
	26614	40	1 1/4"	70,0	49,5	19,1	53,0	60	64	0,517	1		
	26616	50	1 1/2"	84,8	61,3	22,0	59,0	48	72	0,624	1		
	26618	63	2"	95,5	68,0	25,0	74,0	62	89	1,045	1		

## TRANSITION COUPLING WITH FEMALE THREAD

with union nut and welding socket

**Material:** fusiolen® PP-R, brass  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



SDR	Art. no.	d [mm]	R	z [mm]	z2 [mm]	D [mm]	L [mm]	SW1 [mm]	SW2 [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	26638	20	1/2"	30,5	15,0	27,5	45,0	36	24	0,112	1		
	26640	25	3/4"	33,0	15,5	36,0	49,0	46	32	0,193	1		
	26642	32	1"	36,0	15,0	41,5	54,0	52	40	0,291	1		
	26644	40	1 1/4"	36,0	20,0	53,0	56,5	64	47	0,423	1		
	26646	50	1 1/2"	41,3	19,0	59,0	64,8	72	57	0,610	1		
	26648	63	2"	47,0	18,0	74,0	74,5	89	68	0,924	1		



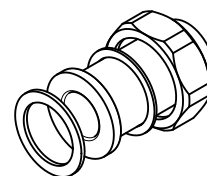
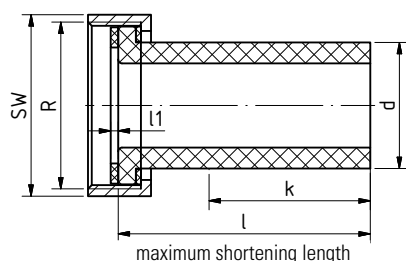
## LOOSE NUT ADAPTER

length: 100 mm, with gasket

**Material:** fusiolen® PP-R, brass

**Standard:** DIN 16962, DIN EN ISO 15874

**Colour:** green



SDR	Art. no.	d [mm]	Nut R	l [mm]	l1 [mm]	k [mm]	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	26708	20	1"	100,0	3,0	65,0	36	0,079	1		
	26710	25	1 1/4"	100,0	3,0	62,0	46	0,104	1		
	26712	32	1 1/2"	100,0	3,0	58,0	52	0,175	1		
	26714	40	2"	100,0	3,0	53,0	64	0,258	1		
	26716	50	2 1/4"	100,0	3,0	49,0	72	0,344	1		
	26718	63	2 3/4"	100,0	3,0	43,0	89	0,583	1		
	26720	75	3 1/2"	100,0	3,0	34,0	110	0,918	1		
	26722	90	4"	100,0	3,0	26,0	120	1,238	1		

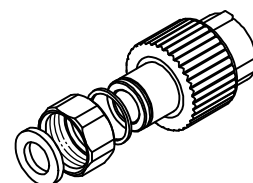
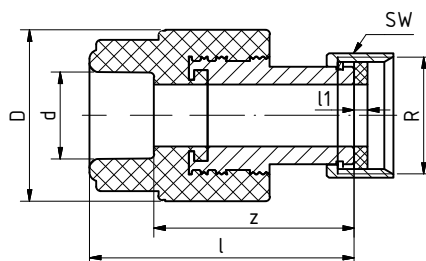
## WATER METER NUT ADAPTER

with gasket

**Material:** fusiolen® PP-R, brass

**Standard:** DIN 16962, DIN EN ISO 15874

**Colour:** green



SDR	Art. no.	d [mm]	l [mm]	l1 [mm]	z [mm]	D [mm]	R	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
6	26808	20	59,5	3,0	45,0	38,5	3/4"	30	0,136	1		
7,4	26810	25	61,0	3,0	45,0	38,5	3/4"	30	0,155	1		
9												
11	26812	32	62,0	3,0	44,0	43,5	3/4"	30	0,162	1		

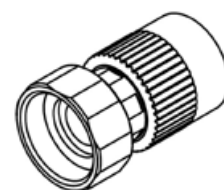
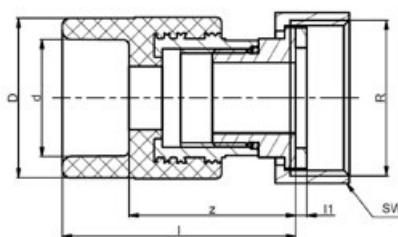
## NUT ADAPTER

ISO-standard

**Material:** fusiolen® PP-R, brass

**Standard:** DIN 16962, DIN EN ISO 15874

**Colour:** green

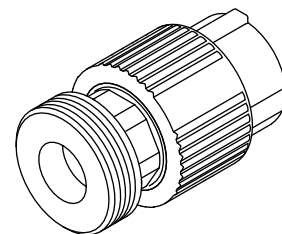
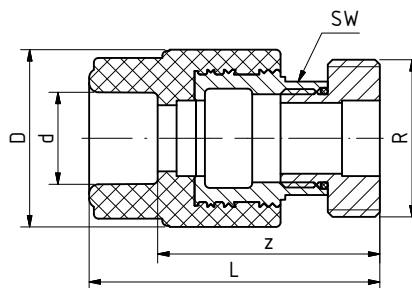


SDR	Art. no.	d [mm]	Nut R	l [mm]	l1 [mm]	z [mm]	D [mm]	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	27010	20	1"	58,5	3,0	34,0	38,5	36	0,182	10		
	27011	25	1"	60,0	3,0	44,0	38,5	36	0,186	10		
	27012	25	1 1/4"	60,0	3,0	44,0	43,5	46	0,274	10		
	27013	32	1 1/4"	63,0	3,0	45,0	43,5	46	0,279	5		
	27014	32	1 1/2"	69,5	3,0	51,5	60,0	52	0,446	5		
	27015	40	1 1/2"	72,0	3,0	51,5	60,0	52	0,421	5		
	27016	40	2"	72,0	3,0	51,5	74,0	64	0,719	5		
	27017	50	2"	75,0	3,0	51,5	74,0	64	0,736	5		
	27018	50	2 1/4"	77,0	3,0	53,5	84,0	72	0,831	5		
	27019	63	2 1/4"	83,5	3,0	56,0	84,0	72	0,889	1		
	27020	63	2 3/4"	82,5	3,0	55,0	101,0	89	1,306	1		
	27021	75	2 3/4"	85,0	3,0	55,0	100,0	89	1,275	1		
	27022	75	3 1/2"	91,0	3,0	61,0	100,0	110	1,818	1		

## COUNTERPART

with welding socket and male thread for ISO-standard adapter

**Material:** fusiolen® PP-R, brass  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green

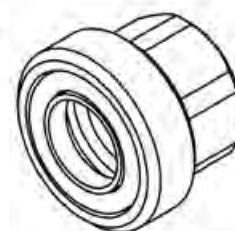
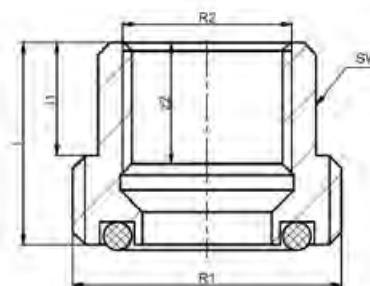


SDR	Art. no.	d [mm]	Thread R	L [mm]	z [mm]	D [mm]	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	27310	20	1"	61,5	47,0	37,5	24	0,151	10		
	27311	25	1"	63,0	47,0	37,5	24	0,153	10		
	27312	25	1 1/4"	63,0	47,0	43,5	31	0,221	10		
	27313	32	1 1/4"	66,0	48,0	43,5	31	0,226	5		
	27314	32	1 1/2"	76,5	58,5	60,0	39	0,408	5		
	27315	40	1 1/2"	79,0	58,5	60,0	39	0,414	5		
	27316	40	2"	79,0	58,5	74,0	50	0,650	5		
	27317	50	2"	82,0	58,5	74,0	50	0,634	5		
	27318	50	2 1/4"	83,0	59,5	84,0	55	0,750	5		
	27319	63	2 1/4"	89,5	62,0	84,0	55	0,728	1		
	27320	63	2 3/4"	95,0	65,5	101,0	67	1,093	1		
	27321	75	2 3/4"	95,0	65,0	100,0	67	1,117	1		
	27322	75	3 1/2"	100,0	70,0	100,0	67	1,436	1		

## BRASS COUNTERPART

with female thread, for ISO-standard adapter/loose nut adapter

**Material:** brass

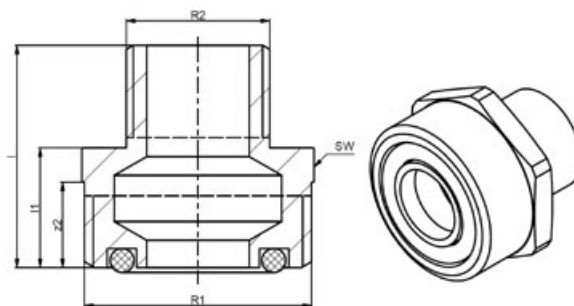


SDR	Art. no.	Male thread R1	Female thread R2	L [mm]	l1 [mm]	z2 [mm]	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	27510	1"	1/2"	25,0	14,0	15,0	25	0,063	10		
	27512	1 1/4"	3/4"	26,0	12,5	14,0	32	0,119	10		
	27514	1 1/2"	1"	31,0	15,0	17,0	40	0,175	5		
	27516	2"	1 1/4"	33,0	17,0	22,0	47	0,263	5		
	27518	2 1/4"	1 1/2"	36,0	20,0	19,0	57	0,333	5		
	27520	2 3/4"	2"	42,0	24,0	24,0	68	0,517	1		
	27522	3 1/2"	2 1/2"	46,0	24,0	27,0	84	0,801	1		
	27524	4"	3"	46,0	27,0	27,0	97	0,943	1		

## BRASS COUNTERPART

with male thread, for ISO-standard adapter/loose nut adapter

**Material:** brass



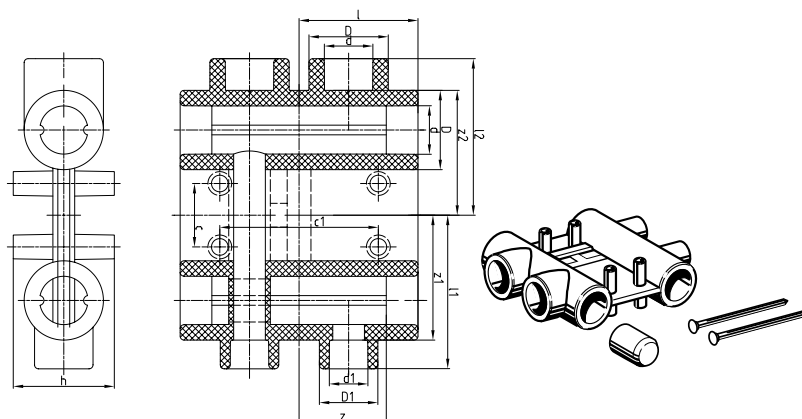
SDR	Art. no.	Thread R1	Thread R2	L [mm]	l1 [mm]	z2 [mm]	SW [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	27710	1"	1/2"	32,5	17,5	10,5	34	0,109	10		
	27712	1 1/4"	3/4"	38,5	21,0	12,5	42	0,188	10		
	27714	1 1/2"	1"	41,5	22,5	13,5	48	0,211	5		
	27716	2"	1 1/4"	44,5	22,5	13,0	60	0,363	5		
	27718	2 1/4"	1 1/2"	56,0	34,0	16,0	48	0,472	5		
	27720	2 3/4"	2"	63,0	38,0	16,0	62	0,803	1		
	27722	3 1/2"	2 1/2"	70,0	42,0	22,0	82	1,189	1		
	27724	4"	3"	74,0	42,0	22,0	97	1,398	1		

## DISTRIBUTION BLOCK PLUMBING

including 1 plug and 2 fasteners

**Material:** fusiolen® PP-R

**Colour:** green



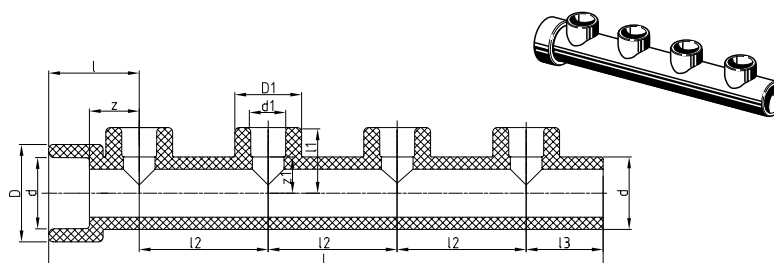
SDR	Art. no.	d [mm]	l [mm]	z [mm]	D [mm]	d1 [mm]	l1 [mm]	z1 [mm]	D1 [mm]	l2 [mm]	z2 [mm]	c [mm]	c1 [mm]	cl [mm]	l3 [mm]	h [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 11	30115	25	60	44	40	20	77,5	63	29,5	79	63	32	80	100	36	51	0,273	1		

## FOUR-PORT MANIFOLD

length: 246 mm, with 4 branches

**Material:** fusiolen® PP-R

**Colour:** green

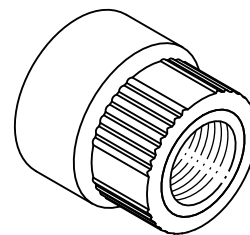
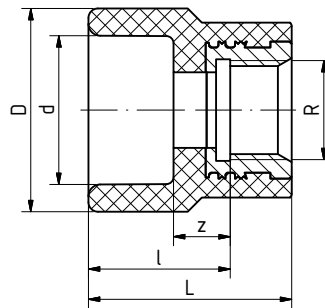


SDR	Art. no.	d [mm]	d1 [mm]	l [mm]	z [mm]	D [mm]	l1 [mm]	z1 [mm]	D1 [mm]	l2 [mm]	l3 [mm]	L [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	30604	32	20	40	22	43	29	14,5	29,5	57	36	245	0,134	1		

The four-port manifold can be shortened or extended by fusion with further four-port manifolds, if required.

## MANIFOLD END PIECE WITH FEMALE THREAD\*

**Material:** fusiolen® PP-R, brass  
**Standard:** DIN 16962, DIN EN ISO 15874  
**Colour:** green



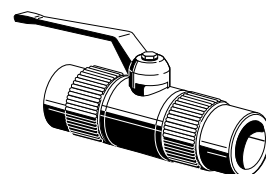
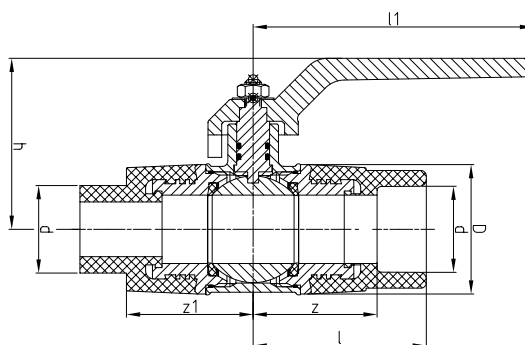
SDR	Art. no.	d [mm]	R	l [mm]	z [mm]	D [mm]	L [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	<b>30804</b>	<b>32</b>	<b>1/2"</b>	30,0	12,0	43,0	43,0	0,073	1		

\* transition piece as manifold endpiece with female thread

## BALL VALVE FOR MANIFOLD

female/male

**Material:** fusiolen® PP-R, brass  
**Colour:** green

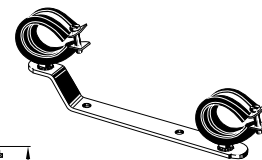
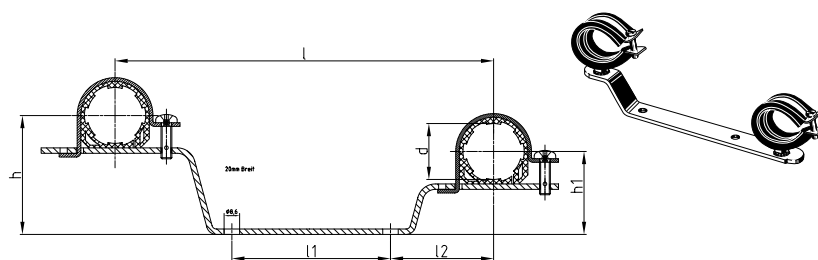


SDR	Art. no.	d [mm]	l [mm]	z [mm]	D [mm]	z1 [mm]	h [mm]	l1 [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	<b>78000</b>	<b>32</b>	63,0	45,0	47,5	46,5	78,0	108,0	0,575	2		

## SUPPORTING STRAP FOR FOUR-PORT MANIFOLD

with clamps, galvanized, double

**Material:** steel/galvanized  
**Colour:** zinc



Art. no.	d [mm]	l [mm]	l1 [mm]	l2 [mm]	h [mm]	h1 [mm]	Weight [kg]	PU	Box unit	Price € pc
<b>60210</b>	<b>32</b>	210,0	80,0	57,0	66,0	46,0	0,226	2		

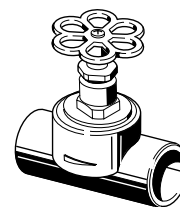
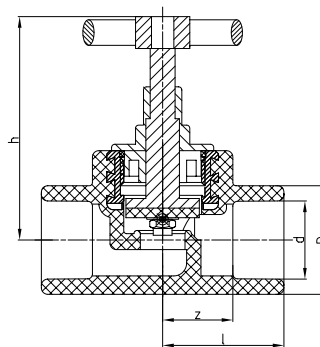


## GLOBE VALVE

for surface installation

**Material:** fusiolen® PP-R, brass

**Colour:** green



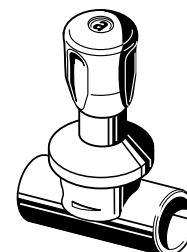
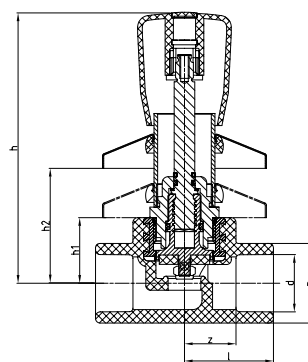
SDR	Art. no.	d [mm]	l [mm]	z [mm]	D [mm]	h [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	<b>40808</b>	<b>20</b>	35,0	20,5	29,5	75,3	0,165	1	100	
	<b>40810</b>	<b>25</b>	38,0	22,0	34,0	75,0	0,172	1	100	
	<b>40812</b>	<b>32</b>	49,0	31,0	43,0	97,0	0,314	1	60	
	<b>40814</b>	<b>40</b>	60,0	39,5	52,0	111,5	0,585	1		

## CONCEALED VALVE

chromium plated

**Material:** fusiolen® PP-R, brass

**Colour:** green



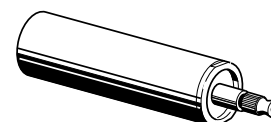
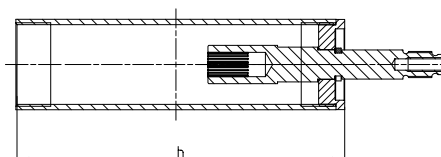
SDR	Art. no.	d [mm]	l [mm]	z [mm]	D [mm]	h [mm]	h1 [mm]	h2 [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	<b>40858</b>	<b>20</b>	35,0	20,5	29,5	116,0	28,0	59,0	0,319	1		
	<b>40860</b>	<b>25</b>	38,0	22,0	34,0	116,0	28,0	59,0	0,330	1		
	<b>40862</b>	<b>32</b>	49,0	31,0	43,0	121,0	34,0	59,0	0,416	1		

## EXTENSION FOR CONCEALED VALVE

chromium-plated for Art. no. 40858 – 40862

**Material:** brass

**Colour:** chrom



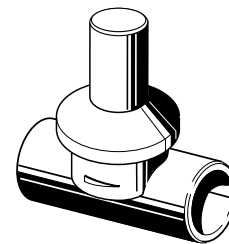
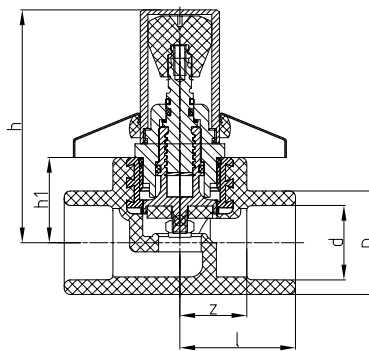
Art. no.	h [mm]	Weight [kg]	PU	Box unit	Price € pc
<b>40900</b>	92,0	0,148	1		
<b>40902</b>	132,0	0,209	1		

## CONCEALED VALVE

tamper proof/chromium-plated/short design

**Material:** fusiolen® PP-R, brass

**Colour:** green, chrom



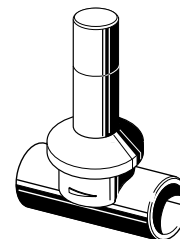
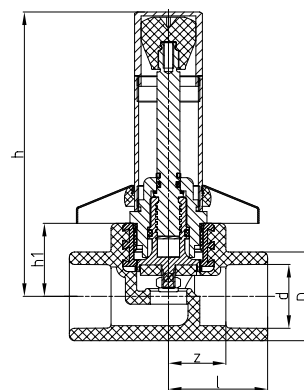
SDR	Art. no.	d [mm]	l [mm]	z [mm]	D [mm]	h [mm]	h1 [mm]	Weight [kg]	PU	Box unit	Price € pc
6	<b>40868</b>	<b>20</b>	35,0	20,5	29,5	71,5	28,0	0,258	1	50	
7.4	<b>40870</b>	<b>25</b>	38,0	22,0	34,0	72,0	28,0	0,288	1		
9											
11	<b>40872</b>	<b>32</b>	49,0	31,0	43,0	82,5	34,0	0,376	1		

## CONCEALED VALVE

tamper proof, chromium-plated, long design

**Material:** fusiolen® PP-R, brass

**Colour:** green, chrom



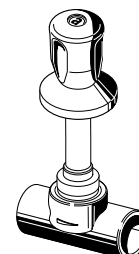
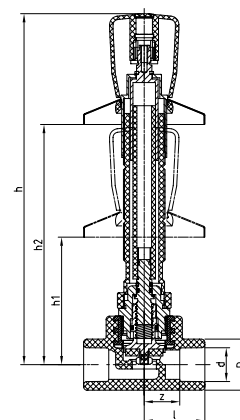
SDR	Art. no.	d [mm]	l [mm]	z [mm]	D [mm]	h [mm]	h1 [mm]	Weight [kg]	PU	Box unit	Price € pc
6	<b>40888</b>	<b>20</b>	35,0	20,5	29,5	109,0	28,0	0,342	1		
7.4	<b>40890</b>	<b>25</b>	38,0	22,0	34,0	109,0	28,0	0,350	1		
9											
11	<b>40892</b>	<b>32</b>	49,0	31,0	43,0	115,0	34,0	0,432	1		

## CONCEALED VALVE

suitable for construction depth of 55 mm to 100 mm

**Material:** fusiolen® PP-R, brass

**Colour:** green, chrom

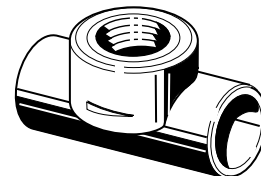
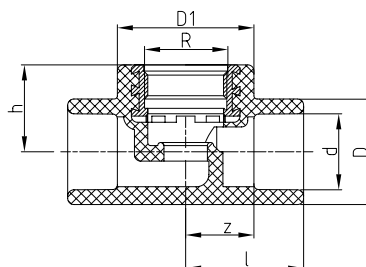


SDR	Art. no.	d [mm]	l [mm]	z [mm]	D [mm]	h [mm]	h1 [mm]	h2 [mm]	Weight [kg]	PU	Box unit	Price € pc
6	<b>40878</b>	<b>20</b>	35,0	20,5	29,5	213,0	59,0	147,0	0,357	1		
7.4	<b>40880</b>	<b>25</b>	38,0	22,0	34,0	213,0	59,0	147,0	0,369	1		
9												
11	<b>40882</b>	<b>32</b>	49,0	31,0	43,0	219,0	65,0	153,0	0,455	1		

## STOP VALVE BODY

**Material:** fusiolen® PP-R, brass

**Colour:** green



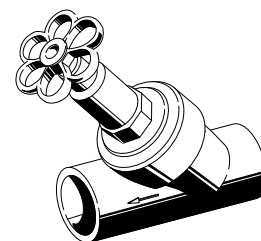
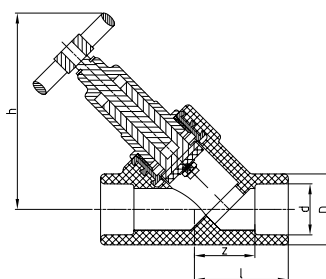
SDR	Art. no.	d [mm]	R	l [mm]	z [mm]	D [mm]	h [mm]	D1 [mm]	Weight [kg]	PU	Box unit	Price € pc
6	<b>40908</b>	<b>20</b>	<b>3/4"</b>	35,0	20,0	29,5	28,0	44,0	0,082	1		
7.4	<b>40910</b>	<b>25</b>	<b>3/4"</b>	38,0	22,0	34,0	28,0	44,0	0,101	1		
9	<b>40912</b>	<b>32</b>	<b>1"</b>	49,0	31,0	43,0	34,0	52,0	0,146	1		
11	<b>40914</b>	<b>40</b>	<b>1 1/4"</b>	60,0	39,5	52,0	41,0	69,0	0,313	1		

## INCLINED VALVE

*without drain*

**Material:** fusiolen® PP-R, brass

**Colour:** green



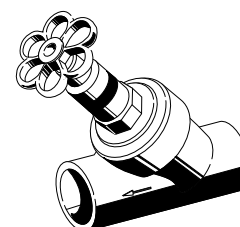
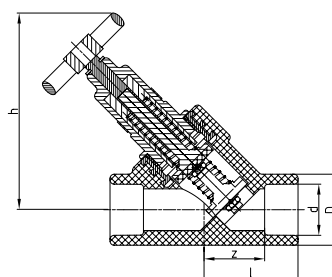
SDR	Art. no.	d [mm]	l [mm]	z [mm]	D [mm]	h [mm]	Weight [kg]	PU	Box unit	Price € pc
6	<b>41108</b>	<b>20</b>	45,0	30,5	34,0	95,5	0,294	1		
7.4	<b>41110</b>	<b>25</b>	45,0	29,0	34,0	95,5	0,283	1		
9	<b>41112</b>	<b>32</b>	56,0	38,0	43,0	111,5	0,421	1		
11	<b>41114</b>	<b>40</b>	65,0	44,5	52,0	135,0	0,834	1		

## NON-RETURN VALVE

*without drain*

**Material:** fusiolen® PP-R, brass

**Colour:** green

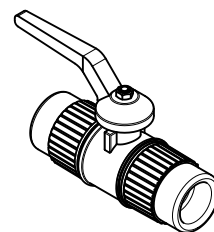
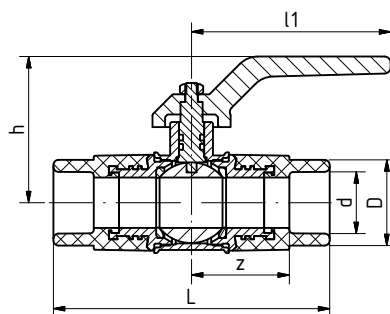


SDR	Art. no.	d [mm]	l [mm]	z [mm]	D [mm]	h [mm]	Weight [kg]	PU	Box unit	Price € pc
6	<b>41208</b>	<b>20</b>	45,0	30,5	34,0	95,5	0,297	1		
7.4	<b>41210</b>	<b>25</b>	45,0	29,0	34,0	95,5	0,292	1		
9	<b>41212</b>	<b>32</b>	56,0	38,0	43,0	111,5	0,432	1		
11	<b>41214</b>	<b>40</b>	65,0	44,5	52,0	135,0	0,840	1		

## BALL VALVE PP/BRASS

**Material:** fusiolen® PP-R, brass

**Colour:** green



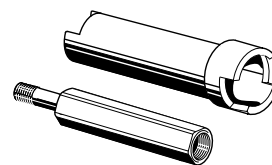
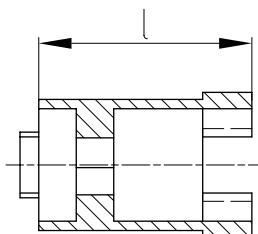
SDR	Art. no.	d [mm]	L [mm]	z [mm]	D [mm]	h [mm]	l1 [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	<b>41308</b>	<b>20</b>	110,00	40,50	29,50	56,00	79,00	0,280	1		
	<b>41310</b>	<b>25</b>	110,00	39,00	34,00	58,00	79,00	0,375	1		
	<b>41312</b>	<b>32</b>	127,00	45,50	43,00	66,00	103,00	0,592	1		
	<b>41314</b>	<b>40</b>	145,00	52,00	52,00	71,00	104,00	1,015	1		
	<b>41316</b>	<b>50</b>	167,00	60,00	68,00	79,00	140,00	1,689	1		
	<b>41318</b>	<b>63</b>	205,00	75,00	84,00	88,00	140,00	2,874	1		

## EXTENSION FOR AQUATHERM GREEN PIPE BALL VALVE

chromium-plated for Art. no. 41308 – 41318

**Material:** brass

**Colour:** chrom



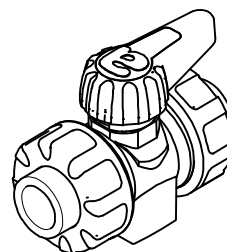
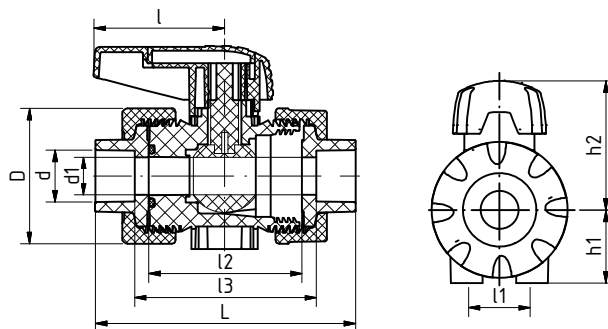
Art. no.	l [mm]	for Art. no.	Weight [kg]	PU	Box unit	Price € pc
<b>41378</b>	35,0	41308-41310	0,120	1		
<b>41382</b>	35,0	41312-41314	0,120	1		
<b>41386</b>	46,0	41316-41318	0,273	1		

## PP-BALL VALVE

with union nut and welding socket

**Material:** fusiolen® PP-R

**Colour:** green



SDR	Art. no.	d [mm]	d1 [mm]	D [mm]	h1 [mm]	h2 [mm]	l1 [mm]	l2 [mm]	l3 [mm]	L [mm]	l [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	<b>41488</b>	<b>20</b>	13,5	50,3	27,0	48,0	25,0	56,5	68,0	97,0	48,0	0,118	1		
	<b>41490</b>	<b>25</b>	18,5	59,0	30,0	56,5	25,0	65,5	78,0	110,0	59,0	0,184	1		
	<b>41492</b>	<b>32</b>	23,9	70,3	40,0	64,5	26,0	72,0	84,5	120,5	59,0	0,274	1		
	<b>41494</b>	<b>40</b>	31,0	85,9	46,0	83,3	45,0	85,0	100,0	141,0	63,5	0,483	1		
	<b>41496</b>	<b>50</b>	38,5	99,5	55,0	89,4	45,0	89,0	107,0	154,0	63,5	0,648	1		
	<b>41498</b>	<b>63</b>	50,0	125,5	70,0	115,0	45,0	101,0	118,0	173,0	108,0	1,206	1		

Also suitable for vacuum pipes.

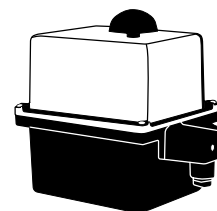


## ELECTRICAL DRIVE FOR BALL VALVE ◆

*incl. fixtures*

*For Art. no. 41488 – 41498*

**Colour:** black/red



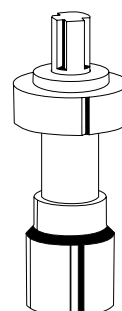
Art. no.	Dimension [mm]	for Art. no.	Weight [kg]	PU	Box unit	Price € pc
<i>230 Volt</i>						
<b>41489</b>	<b>20</b>	incl. fixtures for 41488	1,500	1		
<b>41491</b>	<b>25</b>	incl. fixtures for 41490	1,600	1		
<b>41493</b>	<b>32</b>	incl. fixtures for 41492	1,600	1		
<b>41495</b>	<b>40</b>	incl. fixtures for 41494	1,600	1		
<b>41497</b>	<b>50</b>	incl. fixtures for 41496	1,700	1		
<b>41499</b>	<b>63</b>	incl. fixtures for 41498	1,700	1		
<i>24 Volt</i>						
<b>41589</b>	<b>20</b>	incl. fixtures for 41488	1,500	1		
<b>41591</b>	<b>25</b>	incl. fixtures for 41490	1,600	1		
<b>41593</b>	<b>32</b>	incl. fixtures for 41492	1,600	1		
<b>41595</b>	<b>40</b>	incl. fixtures for 41494	1,600	1		
<b>41597</b>	<b>50</b>	incl. fixtures for 41496	1,700	1		
<b>41599</b>	<b>63</b>	incl. fixtures for 41498	1,700	1		

## EXTENSION FOR BALL VALVE

*For Art. no. 41488 – 41498*

**Material:** PVC

**Colour:** grey



Art. no.	l [mm]	for Art. no.	Weight [kg]	PU	Box unit	Price € pc
<b>98900</b>	100	41488	0,020	1		
<b>98901</b>	100	41490/41492	0,025	1		
<b>98902</b>	100	41494/41496	0,030	1		
<b>98903</b>	100	41498	0,125	1		

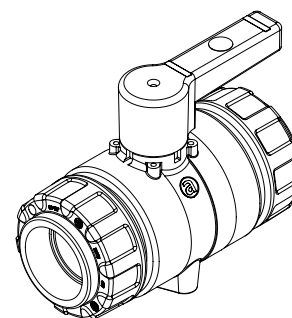
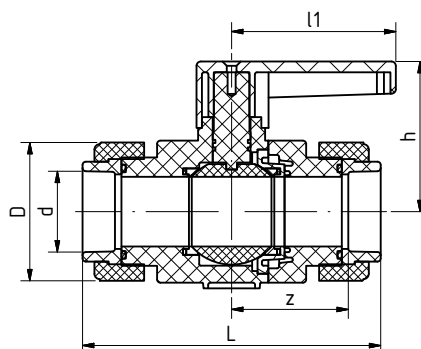
Delivery time: on request

## PP-BALL VALVE

*with union nut and welding socket*

**Material:** fusiolen® PP-R

**Colour:** green



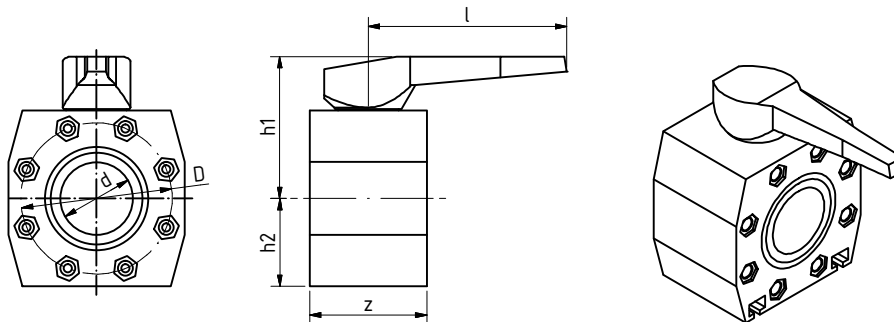
SDR	Art. no.	d [mm]	L [mm]	z [mm]	D [mm]	h [mm]	l1 [mm]	Inch R	DN	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	<b>41400</b>	<b>75</b>	276,0	108,0	129,0	139,0	152,0	0,00	65	2,441	1		

Also suitable for vacuum pipes.

## PP-BALL VALVE

with flange connection on both sides

**Material:** fusiolen® PP-R  
**Colour:** green



SDR	Art. no.	for ø [mm]	d [mm]	l [mm]	z [mm]	D [mm]	h1 [mm]	h2 [mm]	Weight [kg]	PU	Box unit	Price € pc
6	<b>41602</b>	<b>90</b>	77,0	210,0	124,0	160,0	150,0	93,0	4,196	1		
7.4	<b>41604</b>	<b>110</b>	94,0	260,0	145,0	180,0	165,0	103,0	5,612	1		
9												
11	<b>41607</b>	<b>160</b>	135,0	310,0	205,0	240,0	210,0	136,5	13,420	1		

Also suitable for vacuum pipes.

For dimension 125 mm the PP-ball valve Art. no. 41604 with flange adapter Art. no. 15526 and flange Art. no. 15724 is used.

For connection with aquatherm green pipe weldable flange adapter (Art. no. 15520 – 15531) and aquatherm green pipe plastic coated steel flange (Art. no. 15720 – 15730)

Hexagon screw M 16x60 mm for Art. no. 41602/41604

Hexagon screw M 20x80 mm for Art. no. 41607

corresponding flat washer M 16

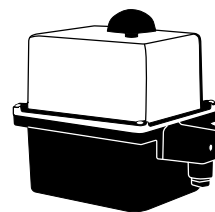
NOTICE: These are not included in delivery.

## ELECTRICAL DRIVE FOR BALL VALVE ♦

incl. fixtures

For Art. no. 41602 – 41607

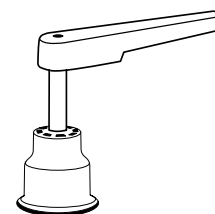
**Colour:** black/red



Art. no.	Dimension [mm]	for Art. no.	Weight [kg]	PU	Box unit	Price € pc
<i>230 Volt</i>						
<b>41603</b>	<b>90</b>	incl. fixtures for 41602	3,300	1		
<b>41605</b>	<b>110</b>	incl. fixtures for 41604	3,400	1		
<b>41608</b>	<b>160</b>	incl. fixtures for 41607	3,700	1		
<i>24 Volt</i>						
<b>41703</b>	<b>90</b>	incl. fixtures for 41602	3,300	1		
<b>41705</b>	<b>110</b>	incl. fixtures for 41604	3,400	1		
<b>41708</b>	<b>160</b>	incl. fixtures for 41607	3,700	1		

## EXTENSION FOR BALL VALVE ♦

For Art. no. 41602–41607



Art. no.	l [mm]	for Art. no.	Weight [kg]	PU	Box unit	Price € m/pc
<b>98904</b>	150	41602	0,788	1		
<b>98905</b>	150	41604	1,120	1		
<b>98906</b>	150	41607	1,391	1		

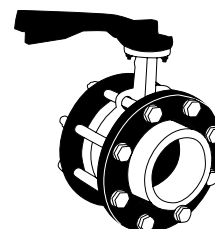
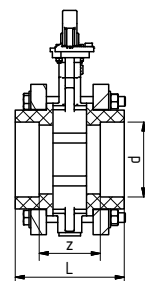
Delivery time: on request

### aquatherm blue pipe SHUT-OFF VALVE WITH LEVER ◆

Set consists of: 2 x flange adapter, 2 x flanges, fixing screws

**Material:** fusiolen® PP-RCT, Steel

**Colour:** blue



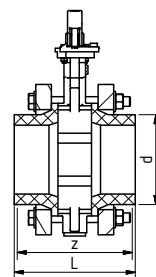
SDR	Art. no.	d [mm]	z [mm]	L [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>socket welding</i>								
6	<b>2041820</b>	<b>75</b>	<b>78</b>	<b>138</b>	<b>6,763</b>	<b>1</b>		
7.4								
9	<b>2041822</b>	<b>90</b>	<b>80</b>	<b>146</b>	<b>9,134</b>	<b>1</b>		
11	<b>2041824</b>	<b>110</b>	<b>89</b>	<b>163</b>	<b>10,400</b>	<b>1</b>		
17.6								
	<b>2041826</b>	<b>125</b>	<b>104</b>	<b>184</b>	<b>15,600</b>	<b>1</b>		

### aquatherm blue pipe SHUT-OFF VALVE WITH LEVER

Set consists of: 2 x flange adapter, 2 x flanges, fixing screws

**Material:** fusiolen® PP-RCT, Steel

**Colour:** blue



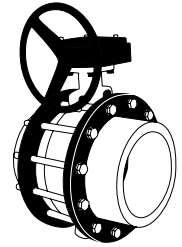
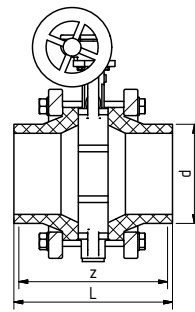
SDR	Art. no.	d [mm]	z [mm]	L [mm]	Weight [kg]	PU	Box unit	Price € pc
<i>Butt welding</i>								
11	<b>2041830</b> ◆	<b>160</b>	<b>227</b>	<b>242</b>	<b>22,000</b>	<b>1</b>		
17.6	<b>2541830</b>	<b>160</b>	<b>227</b>	<b>242</b>	<b>21,700</b>	<b>1</b>		

## aquatherm blue pipe SHUT-OFF VALVE WITH DRIVE ◆

Set consists of: 2 x flange adapter, 2 x flanges, fixing screws

**Material:** fusiolen® PP-RCT, Steel

**Colour:** blue



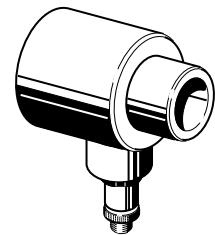
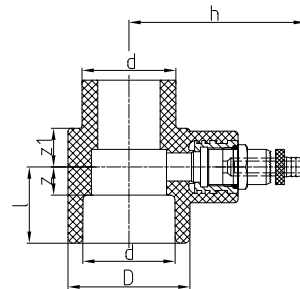
SDR	Art. no.	d [mm]	z [mm]	L [mm]	Weight [kg]	PU	Box unit	Price € pc
11	2041834	200	305	320	41,400	1		
	2041838	250	313	328	59,200	1		
	2041842	315	412	432	81,800	1		
17.6	2541834	200	305	320	40,900	1		
	2541838	250	313	328	58,400	1		
	2541842	315	412	432	78,600	1		

## DRAINING BRANCH

to weld in aquatherm green pipe valves

**Material:** fusiolen® PP-R, brass

**Colour:** green



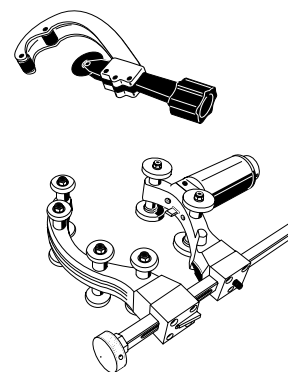
SDR	Art. no.	d [mm]	z [mm]	l [mm]	D [mm]	z1 [mm]	h [mm]	Weight [kg]	PU	Box unit	Price € pc
6 7.4 9 11	41408	20	11,5	26,0	34,0	16,5	71,0	0,098	1		
	41410	25	10,0	26,0	34,0	16,5	71,0	0,096	1		
	41412	32	14,0	32,0	43,0	17,0	74,5	0,118	1		
	41414	40	12,0	32,5	52,0	16,5	80,5	0,140	1		
	41416	50	15,5	39,0	68,0	17,0	88,0	0,202	1		
	41418	63	16,5	44,0	84,0	16,5	96,0	0,288	1		



**Important:** Do not cut the aquatherm pipes with customary hack saws.  
aquatherm pipes can be cut with customary saws equipped with saw blades suitable for plastic.

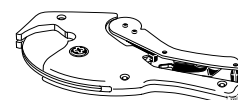
## PIPE CUTTER

Art. no.	for pipe dimensions	PU	Box unit	Price € pc
<b>50102</b>	16-40mm	1		
<b>50105</b>	50-125mm	1		
<b>50106</b>	63-200mm	1		



## PIPE CUTTER

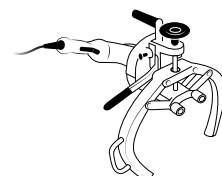
Art. no.	for pipe dimensions	PU	Box unit	Price € pc
<b>50104</b>	16-40mm	1		



## ORBITAL CIRCULAR SAW

Art. no.	for pipe dimensions	PU	Box unit	Price € pc
<b>50108</b>	160-355mm	1		

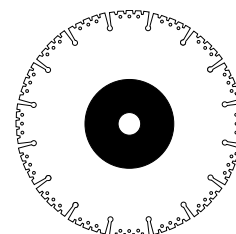
This orbital circular saw can be ordered directly from Rothenberger with Art. no. 55620 ([www.rothenberger.com](http://www.rothenberger.com)).  
High-performance orbital circular saw for fast, precise, perfectly aligned and right-angled cutting of plastic pipes 160 – 355 mm at the building site or in the workshop.



## CUTTING DISC FOR PLASTIC

Art. no.	Dimension	borehole	PU	Box unit	Price € pc
<b>50107</b>	ø 125mm	22,2 mm	1		
<b>50109</b>	ø 230mm	22,2 mm	1		

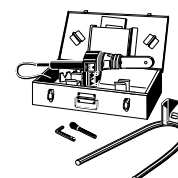
Application: for each angle grinder  
Design: diamant galvanized cutting disc



## MANUAL WELDING DEVICE (500 W)

Art. no.	for pipe dimensions	PU	Box unit	Price € pc
<b>50336</b>	ø 16-32mm	1		

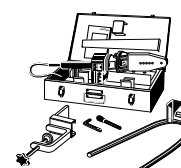
for one tool, with base and case for tools  
Also available: 110 V (Art. no. 450336)



## MANUAL WELDING DEVICE (800 W)

Art. no.	for pipe dimensions	PU	Box unit	Price € pc
<b>50337</b>	ø 16-63mm	1		

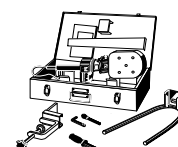
Also available: 110 V (Art. no. 450337)



## MANUAL WELDING DEVICE (1400 W)

Art. no.	for pipe dimensions	PU	Box unit	Price € pc
<b>50341</b>	ø 50-125mm	1		

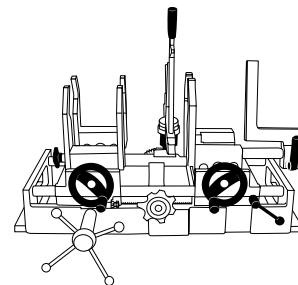
Also available: 110 V (Art. no. 450341)



## WELDING MACHINE (1400 W)

Art. no.	for pipe dimensions	PU	Box unit	Price € pc
<b>50148</b>	ø 50-125 mm - 230 V	1		

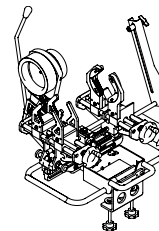
including welding tools 50 – 125 mm, roll stand and wooden transport case  
Also available: 110 V (Art. no. 450148)



## WELDING MACHINE (1400 W) LIGHT

Art. no.	for pipe dimensions	PU	Box unit	Price € pc
<b>50145</b>	ø 63-125mm	1		

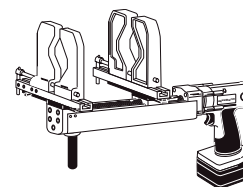
including manual welding device (1400 W) and wooden transport case  
Also available: 110 V (Art. no. 450145)



## ELECTRIC WELDING JIG

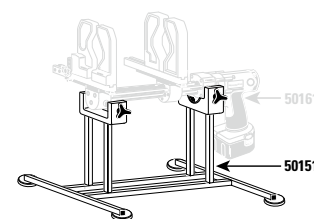
Art. no.	for pipe dimensions	Weight [kg]	PU	Box unit	Price € pc
<b>50161</b>	63-125mm	24,000	1		

including standby accumulator, charging station and metal case  
Also available: 110 V (Art. no. 450159)



## BASE FOR ART. NO. 50159

Art. no.	Dimension	PU	Box unit	Price € pc
<b>50151</b>		1		



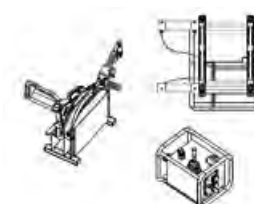
## BUTT WELDING MACHINE-TWO-RING-MACHINE WIDOS

Art. no.	Dimension [mm]	Weight [kg]	PU	Box unit	Price € pc
<b>50350*</b>	ø 160 - 250	154,000	1		
<b>50351*</b>	ø 160 - 315	178,000	1		

The butt-welding-two-ring machine can be purchased directly from Widos ([www.widos.de](http://www.widos.de))

Two-ring machine for pipes 160 – 355 mm available on request

\* Also available in design with 110 volt (Art. no. 450350 = ø 160 – 250 mm / 450351 = ø 160 – 315 mm)



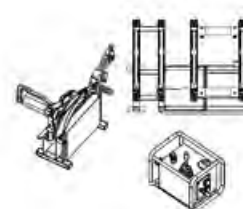
## BUTT WELDING MACHINE WIDOS

Art. no.	Dimension	Weight [kg]	PU	Box unit	Price € pc
<b>50352*</b>	ø 160-250mm	195,000	1		
<b>50353*</b>	ø 160-315mm	250,000	1		
<b>50354*</b>	ø 160-355mm	425,000	1		
<b>50355*</b>	ø 200-450mm	430,000	1		
<b>50356**</b>	ø 200-500mm	500,000	1		
<b>50357**</b>	ø 315-630mm	885,000	1		

The butt-welding-machine can be purchased directly from Widos ([www.widos.de](http://www.widos.de))

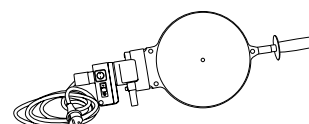
\* Also available in design with 110 volt (Art. no. 450352 = ø 160 – 250 mm / 450353 = ø 160 – 315 mm / 450354 = ø 160 – 355 mm / 450355 = ø 200 – 450 mm)

\*\* special voltage on demand



## MANUAL WELDING DEVICE (1500 W) FOR SADDLE WELDING Ø 50 – 160 MM

Art. no.	for pipe dimensions	PU	Box unit	Price € pc
<b>50330</b>	ø 50-160mm	1		



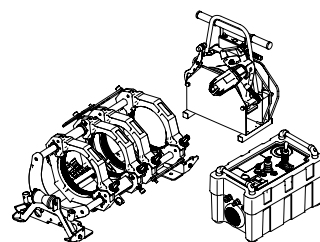
## BUTT WELDING MACHINE RITMO

Art. no.	for pipe dimensions	Weight [kg]	PU	Box unit	Price € pc
<b>50165*</b>	ø 160-250mm	176,500	1		
<b>50166*</b>	ø 160-315mm	160,000	1		
<b>50177</b>	ø 160-355mm	336,500	1		
<b>50169</b>	ø 400-630mm	710,000	1		

including wooden transport box. The butt welding machine can be obtained directly from Ritmo ([www.ritmo.it](http://www.ritmo.it))

\* Also available: 110 V (Art. no. 450165 for ø 160 – 250 mm / Art. no. 450166 for ø 160 – 315 mm)

Two-ring machine for pipes 160 – 355 mm available on request

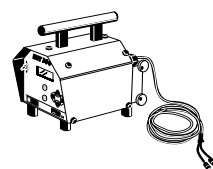


## ELECTROFUSION DEVICE

Art. no.	for pipe dimensions	PU	Box unit	Price € pc
<b>50175</b>	ø 20-250mm	1		

For processing with electro-fusion-sockets Art. no. 17208 – 17238.

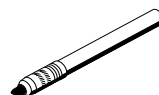
Special calibration-tools – obtainable on request – are required



## TEMPERATURE PENCIL

Art. no.	Dimension	PU	Box unit	Price € pc
<b>50190</b>		1		

to check the correct welding temperature



## SURFACE THERMOMETER

Art. no.	Dimension	PU	Box unit	Price € pc
<b>50188</b>		1		

to check the correct welding temperature



## TEMPERATURE PREDECTIVE GLOVE

for tool change

Art. no.	Dimension	PU	Box unit	Price € pc
<b>50195</b>		2		



## CLEANING WIPES

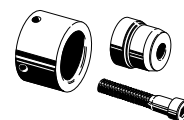
Art. no.	Dimension	PU	Box unit	Price € pc
<b>50193</b>	Box/100 towels	1		

for electrofusion sockets



## WELDING TOOLS

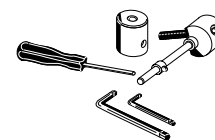
Art. no.	Dimension [mm]	PU	Box unit	Price € pc
<b>50206</b>	16	1		
<b>50208</b>	20	1		
<b>50210</b>	25	1		
<b>50212</b>	32	1		
<b>50214</b>	40	1		
<b>50216</b>	50	1		
<b>50218</b>	63	1		
<b>50220</b>	75	1		
<b>50222</b>	90	1		
<b>50224</b>	110	1		
<b>50226</b>	125	1		



## REPAIR SET

Art. no.	Dimension	PU	Box unit	Price € pc
<b>50307</b>	7mm	1		
<b>50311</b>	11mm	1		

to close holes of up to 10 mm in the pipe (pipe repair stick Art. no. 60600)



## PIPE REPAIR STICK

for pipe repairs

Art. no.	Dimension	PU	Box unit	Price € pc
<b>60600</b>	7/11mm	10		



## aquatherm UNIVERSAL PEELING TOOLS

for aquatherm green pipe MF UV, aquatherm green pipe MF RP UV, aquatherm blue pipe MF RP UV and aquatherm blue pipe MF OT

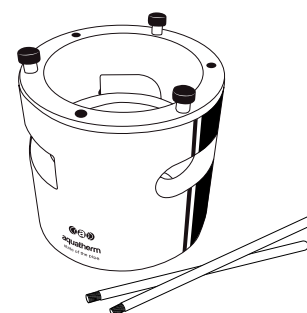


Required for the socket welding

(in combination with socket welding fittings, e.g. sockets, elbows, T-pieces, transition pieces with thread)

Also suitable for manual peeling (bolts included)

Art. no.	Dimension [mm]	PU	Box unit	Price € pc
<b>50479</b>	20	1		
<b>50480</b>	25	1		
<b>50481</b>	32	1		
<b>50482</b>	40	1		
<b>50483</b>	50	1		
<b>50484</b>	63	1		
<b>50485</b>	75	1		
<b>50486</b>	90	1		
<b>50487</b>	110	1		
<b>50488</b>	125	1		
<b>50501</b>	Spare blade with screw (Set)	1		



incl. bolts  
for manual peeling

not suitable for aquatherm green pipe S, aquatherm blue pipe S, aquatherm green pipe MF, aquatherm green pipe MF RP, aquatherm green pipe TI, aquatherm blue pipe RP TI

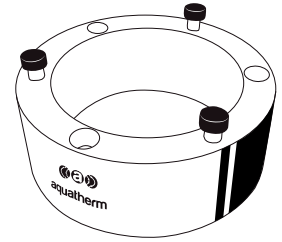
**S** = single, **MF** = multi-layer fibre, **OT** = oxygen-tight, **UV** = UV-resistant, **TI** = thermal insulation, **RP** = raised pressure



## aquatherm EXTENSION FOR UNIVERSAL PEELING TOOL

Required for the electrofusion socket welding

When electrofusion welding a longer welding depth is required, which is achieved by the combination of the universal peeling tool and the extension for the universal peeling tool (e.g. Art. no. 50479+50489)



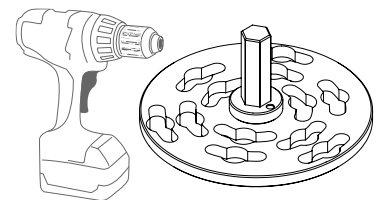
Art. no.	Dimension	PU	Box unit	Price € pc
<b>50489</b>	for peeling tool 20 mm Art. no. 50479	1		
<b>50490</b>	for peeling tool 25 mm Art. no. 50480	1		
<b>50491</b>	for peeling tool 32 mm Art. no. 50481	1		
<b>50492</b>	for peeling tool 40 mm Art. no. 50482	1		
<b>50493</b>	for peeling tool 50 mm Art. no. 50483	1		
<b>50494</b>	for peeling tool 63 mm Art. no. 50484	1		
<b>50495</b>	for peeling tool 75 mm Art. no. 50485	1		
<b>50496</b>	for peeling tool 90 mm Art. no. 50486	1		
<b>50497</b>	for peeling tool 110 mm Art. no. 50487	1		
<b>50498</b>	for peeling tool 125 mm Art. no. 50488	1		

## ATTACHMENT PLATE FOR UNIVERSAL PEELING TOOL

In combination with or without extension for universal peeling tools for drilling machine

Art. no.	Dimension	PU	Box unit	Price € pc
<b>50499</b>	for universal peeling tool 50479 – 50484	1		
<b>50500</b>	for universal peeling tool 50485 – 50488	1		

**Delivery without drilling machine!**



## UNIVERSAL PEELING TOOL-SET

20 – 63 mm

Art. no.	Dimension	PU	Box unit	Price € pc
<b>50477</b>	for ø 20 – 63 mm	1		

consisting of:

- 1x case
- Each 1x 50479 – 50484 peeling tool 20 – 63 mm
- 1x 50499 attachment plate for universal peeling tool 50479 – 50484
- 1x 50503 1 toggle-set
- 1x 50504 torx wrench
- 1x 50505 hexagon Allen key size 4
- 6x 99793 6 fixing screws for Art. no. 50489 – 50494 M5x25



## UNIVERSAL PEELING TOOL-SET

75 – 125 mm

Art. no.	Dimension	PU	Box unit	Price € pc
<b>50478</b>	for ø 75 - 125 mm	1		

consisting of:

- 1 x case
- Each 1x 50485 – 50488 peeling tool 75 – 125 mm
- 1x 50500 attachment plate for universal peeling tool 50485 – 50488
- 1x 50503 1 toggle-set
- 1x 50504 torx wrench
- 1x 50505 hexagon Allen key size 4
- 6x 99794 6 fixing screws for Art. no. 50495 – 50498 M5x35

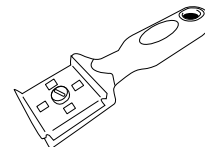


## MANUAL SCRAPER FOR aquatherm blue pipe OT PIPES

Art. no.	Dimension	PU	Box unit	Price € pc
<b>50509</b>	with 4-fold blade, 35 mm wide	1		

For removal of OT-coat before butt-welding.

In addition the manual scraper can be used for removal of oxid coating for the E-socket welding.



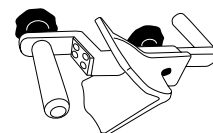
## SPARE BLADE SET FOR ART. NO. 50509

Art. no.	Dimension	PU	Box unit	Price € Set
<b>99909</b>	2 pieces = 1 set	1		

## CHAMFERING TOOL FOR aquatherm blue pipe OT AND UV PIPES

Art. no.	Dimension	PU	Box unit	Price € pc
<b>50510</b>	Anfasgerät 32-250mm	1		

For removing the OT-layer before the butt-welding process and for breaking the edges of the blue pipe for processing the push-fit adapter and push-fit coupling.

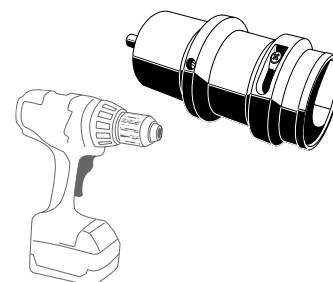


## aquatherm PEELING TOOLS FOR ELECTROFUSION SOCKET WELDING (ART. NO.17208 – 17238)

for aquatherm green pipe S, aquatherm green pipe MF, aquatherm green pipe MF RP, aquatherm green pipe MF TI, aquatherm blue pipe S RP, aquatherm blue pipe MF RP and aquatherm blue pipe MF RP TI

Required to remove the **oxid coating**

Art. no.	Dimension [mm]	PU	Box unit	Price € pc
<i>In combination with a drilling machine</i>				
<b>50558</b>	20	1		
<b>50560</b>	25	1		
<b>50562</b>	32	1		
<b>50564</b>	40	1		
<b>50566</b>	50	1		
<b>50568</b>	63	1		
<b>50570</b>	75	1		
<b>50572</b>	90	1		



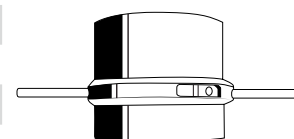
Art. no. 50558 – 50572

In combination with a drilling machine (not included!)

<b>50440</b>	spare blade	1		
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*For manual peeling*

<b>50574</b>	110	1		
<b>50576</b>	125	1		
<b>50580</b>	160	1		

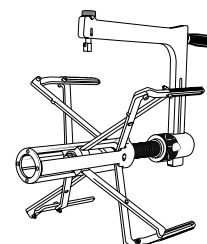


Art. no. 50574 – 50580

<b>50441</b>	spare blade	1		
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*For manual peeling*

<b>50592</b>	200 + 250	1		
<b>99739</b>	spare blade	1		



Art. no. 50592

Not suitable for aquatherm green pipe UV, aquatherm green pipe MF RP UV, aquatherm blue pipe MF RP UV and aquatherm blue pipe MF RP OT

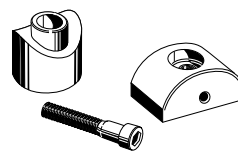
**S** = single, **MF** = multi-layer fibre, **OT** = oxygen-tight, **UV** = UV-resistant, **TI** = thermal insulation, **RP** = raised pressure

Spare parts such as blades can be requested under [service@aquatherm.de](mailto:service@aquatherm.de)!

## SADDLE WELDING TOOLS

for welding saddles

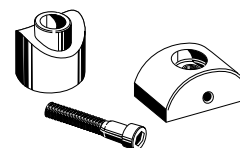
Art. no.	Dimension	PU	Box unit	Price € pc
50614	40x20/25mm	1		
50616	50x20/25mm	1		
50619	63x20/25mm	1		
50620	63x32mm	1		
50623	75x20/25mm	1		
50624	75x32mm	1		
50625	75x40mm	1		
50627	90x20/25mm	1		
50628	90x32mm	1		
50629	90x40mm	1		
50631	110x20/25mm	1		
50632	110x32mm	1		
50634	110x40mm	1		
50635	110x50mm	1		
50636	125x20/25mm	1		
50638	125x32mm	1		
50640	125x40mm	1		
50642	125x50mm	1		
50644	125x63mm	1		
50648	160x20/25mm	1		
50650	160x32mm	1		
50652	160x40mm	1		
50654	160x50mm	1		
50656	160x63mm	1		
50657	160x75mm	1		
50658	160x90mm	1		
50660	200x20/25mm	1		
50662	200x32mm	1		
50664	200x40mm	1		
50666	200x50mm	1		
50667	200x75mm	1		
50668	200x63mm	1		
50669	200x90mm	1		
50670	200x110mm	1		
50671	200x125mm	1		
50672	250x20/25mm	1		
50674	250x32mm	1		
50676	250x40mm	1		
50678	250x50mm	1		
50680	250x63mm	1		
50682	250x75mm	1		



## SADDLE WELDING TOOLS

for welding saddles

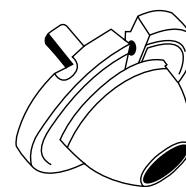
Art. no.	Dimension	PU	Box unit	Price € pc
50684	250x90mm	1		
50686	250x110mm	1		
50688	250x125mm	1		
50690	315x63mm	1		
50692	315x75mm	1		
50694	315x90mm	1		
50696	315x110mm	1		
50698	315x125mm	1		
50699	315x160mm	1		
50712	355x63mm	1		
50714	355x75mm	1		
50716	355x90mm	1		
50718	355x110mm	1		
50720	355x125mm	1		
50722	355x160mm	1		
50726	400-630x63mm	1		
50728	400-500x75mm	1		
50730	630x75mm	1		
50732	400-500x90mm	1		
50734	630x90mm	1		
50736	400-450x110mm	1		
50738	500x110mm	1		
50740	630x110mm	1		
50742	400x125mm	1		
50744	450-500x125mm	1		
50746	630x125mm	1		



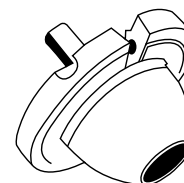


**SADDLE PEELING TOOLS FOR OT UND UV PIPES Ø 50 – 125 mm**

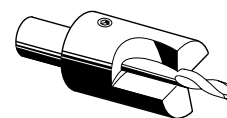
Art. no.	Dimension	PU	Box unit	Price € pc
50921	for welding saddles 20 & 25 mm	1		
50922	for ø 32 mm	1		
50924	for ø 40 mm	1		
50926	for ø 50 mm	1		
50928	for ø 63 mm	1		

**SADDLE PEELING TOOLS FOR OT UND UV PIPES Ø 160 – 250 mm**

Art. no.	Dimension	PU	Box unit	Price € pc
50421	for welding saddles ø 20 & 25 mm	1		
50422	for welding saddles ø 32 mm	1		
50424	for welding saddles ø 40 mm	1		
50426	for welding saddles ø 50 mm	1		
50428	for welding saddles ø 63 mm	1		

**DRILLS** *for installation of weld-in saddles*

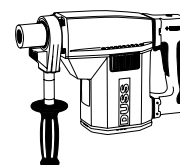
Art. no.	Dimension	PU	Box unit	Price € m/pc
50940	20&25mm (40-160mm)	1		
50941	20&25mm (63-250mm)	1		
50942	32mm	1		
50944	40mm	1		
50946*	50mm	1		
50948*	63mm	1		



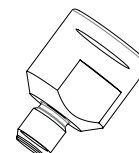
\* may only be used in fixed drilling machines!

**DRILL DUSS DIA303**

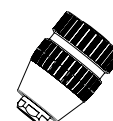
Art. no.	Dimension	PU	Box unit	Price € pc
50978		1		

**CHUCK ADAPTER FOR ART. NO. 50971**

Art. no.	Dimension	PU	Box unit	Price € pc
50969		1		

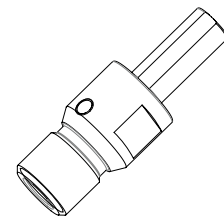
**KEYLESS CHUCK** *clamping range 1,5 – 13mm*

Art. no.	Dimension	PU	Box unit	Price € pc
50971		1		



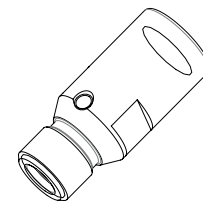
## HOLE SAW HOLDER LSA3

Art. no.	Dimension	PU	Box unit	Price € pc
50976	1/2" for drill chuck	1		



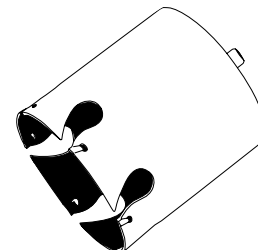
## HOLE SAW HOLDER LSA2

Art. no.	Dimension	PU	Box unit	Price € pc
50974	1/2" for DUSS-machines	1		



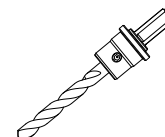
## SADDLE-HOLE SAW FOR BRANCH *for assembly of weld-in saddles*

Art. no.	Dimension	Required items	PU	Box unit	Price € pc
50987	75mm	50973	1		
50988	90mm	50973	1		
50989	110mm	50975 & 50976	1		
50990	125mm	50975 & 50976	1		
50991	160mm	50975 & 50976	1		



## QUICK CHANGE ADAPTER 75 – 90MM

Art. no.	Dimension	PU	Box unit	Price € pc
50973	for Art. no. 50987 – 50988	1		



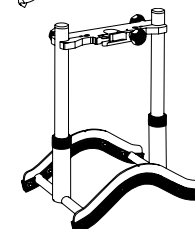
## CENTER DRILL LSZ 1

Art. no.	Dimension	PU	Box unit	Price € pc
50975	with capture sleeve	1		



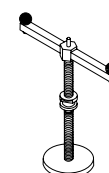
## DRILL RIG FOR DUSS-DRILL

Art. no.	Dimension	PU	Box unit	Price € pc
50977		1		

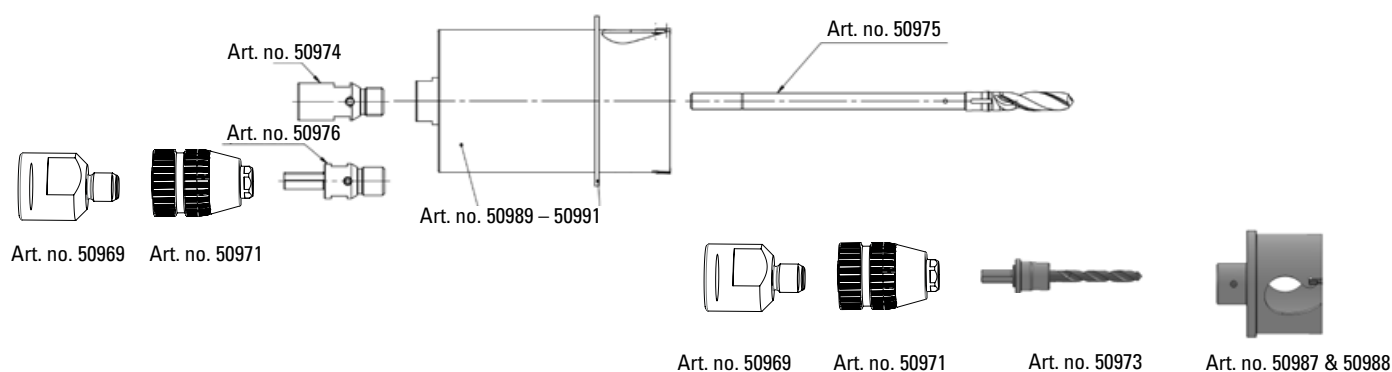


## WELDING FIXTURE FOR DRILL RIG 50977

Art. no.	Dimension	PU	Box unit	Price € pc
50979		1		



## HOLE SAW SYSTEM



## HOT TAPPING TOOL

for drilling of pipes under pressure

The hot tapping tool (Art. no. 50890) is used for drilling pipes for branch connections in the dimensions 40 and 63 mm.

The PP-main pipes aquatherm green pipe and blue pipe with the **pipe structure S and MF UV** from 75 mm to 630 mm can be drilled under **medium pressure (water) of maximum 6 bar** and a **medium temperature of 10 – 60 °C**.

**Notice:** do not use with aquatherm blue pipe OT

## HOT TAPPING TOOL

for weld-on saddle set with ball valve

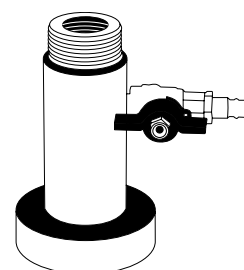
Art. no.	Dimension	PU	Box unit	Price € pc
<b>50890</b>	for dimension 40 + 63mm	1		



## ADAPTER FOR WELD-ON SADDLE SET WITH BALL VALVE 40 MM

for installation under pressure

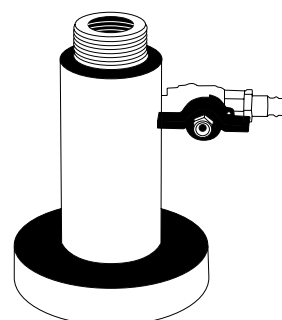
Art. no.	Dimension [mm]	PU	Box unit	Price € pc
<b>50891</b>	40	1		



## ADAPTER FOR WELD-ON SADDLE SET WITH BALL VALVE 63 MM

for installation under pressure

Art. no.	Dimension [mm]	PU	Box unit	Price € pc
<b>50892</b>	63	1		

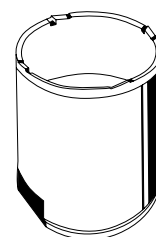


## PP-MILLING CUTTER FOR WELD-ON SADDLE SET WITH BALL VALVE 40 MM

for installation under pressure

for Art. no. 50891

Art. no.	Dimension [mm]	PU	Box unit	Price € pc
<b>50893</b>	40	1		

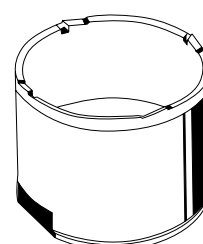


## PP-MILLING CUTTER FOR WELD-ON SADDLE SET WITH BALL VALVE 63 MM

for installation under pressure

for Art. no. 50892

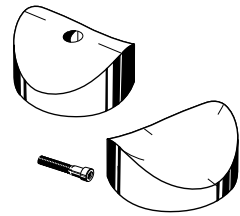
Art. no.	Dimension [mm]	PU	Box unit	Price € pc
<b>50894</b>	63	1		



## aquatherm WELD-ON SADDLE TOOL

for weld-on saddle set with ball valve for installation under pressure for hot tapping tool Art. no. 50890  
Not suitable for aquatherm blue pipe OT!

Art. no.	Dimension	PU	Box unit	Price € pc
50760	75x40mm	1		
50761	90x40mm	1		
50762	110x40mm	1		
50763	125x40mm	1		
50764	125x63mm	1		
50765	160x40mm	1		
50766	160x63mm	1		
50767	200x40mm	1		
50768	200x63mm	1		
50769	250x40mm	1		
50770	250x63mm	1		
50771	315x63mm	1		
50772	355x63mm	1		
50773	400-630x63mm	1		



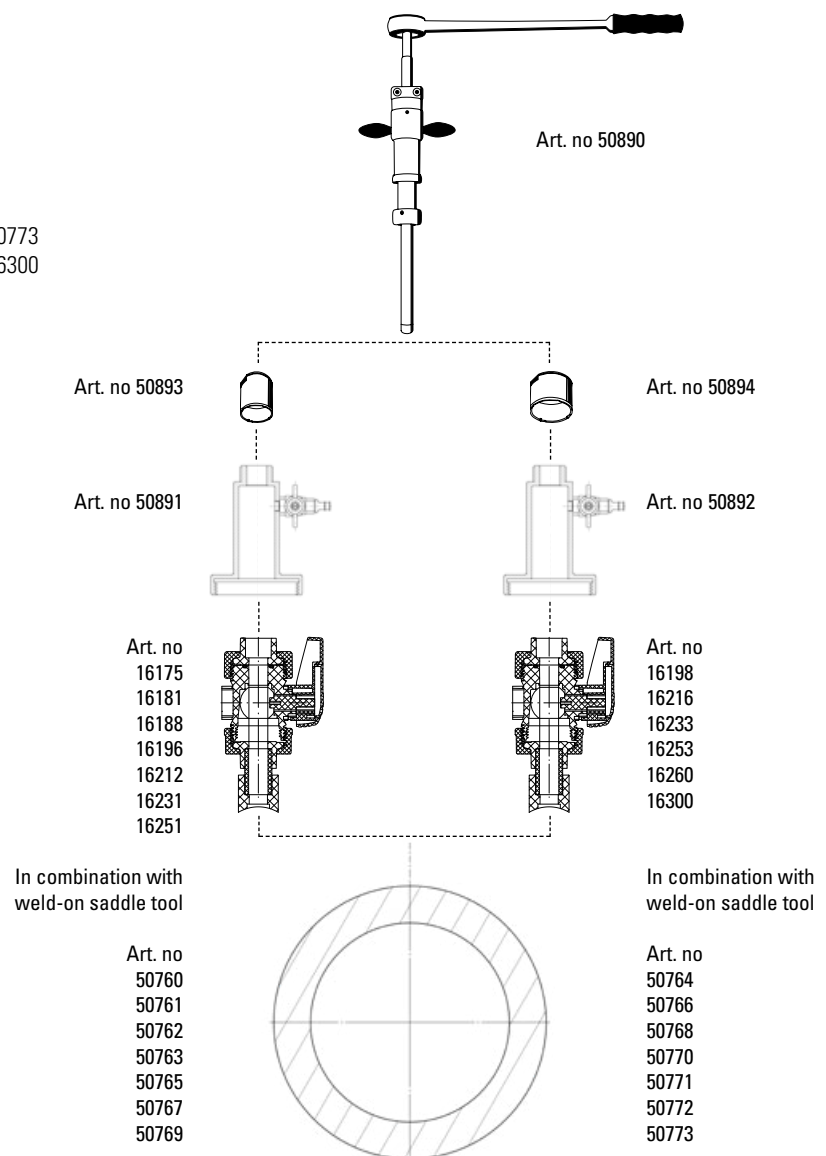
## HOT TAPPING TOOL

for drilling pipes under pressure

The hot tapping tool (Art. no. 50890) is for drilling of pipelines. PP-main pipes from 75 mm to 630 mm can be drilled under pressure.

The following accessories are required for processing:

adapter for ball valve 40 mm	Art. no. 50891
adapter for ball valve 63 mm	Art. no. 50892
PP-milling cutter 40 mm	Art. no. 50893
PP-milling cutter 63 mm	Art. no. 50894
aquatherm weld-on saddle tool	Art. no. 50760 – 50773
aquatherm weld-on saddle set with ball valve	Art. no. 16175 – 16300





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## TERMS AND CONDITIONS

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**Important note regarding our sales, warranty and delivery conditions:**

**Our sales and delivery conditions (issue: 2014) as well as the contact details of our technical sales department and our representatives can be found on our website [www.aquatherm.de](http://www.aquatherm.de).**

Errors, misprints and technical modifications reserved. With the appearance of this catalogue all previous issues become void.



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