aquatherm green pipe ti

aquatherm blue pipe ti

Pre-insulated pipe systems made of polypropylene
for district heating

aquatherm

state of the pipe

Our sales and delivery conditions (January 2012) and the contacts of our technical sales and distribution see on our homepage www.aquatherm.de.

Subject to technical alterations, errors and misprints excepted. With the edition of this catalogue, all former ones become void.

CONTENTS

SERVICE

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Field staff

In addition to the regular training service at Attendorn and Radeberg aquatherm field staff are available to assist customers, on site, throughout Germany.

Training service

In addition to training service through the merchant network aquatherm offers its customers training, free of charge, at its training centres at Attendorn and Radeberg.

Fair

aquatherm is represented on all important fairs relevant for the sanitary and heating sector in Germany or abroad with its own exhibition booth. For more information regarding fairs near to you, please visit internet page: www.aquatherm.de.

CERTIFICATIONS IN ACCORDANCE WITH ISO 9001, 14001 & 50001

Since 1996 aquatherm has been meeting the requirements of the certifiable 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 a great contribution and represents a further step to strengthen our competitive position and to meet the high requirements and the responsiblity for our customers, partners and the environment.

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Management System
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Laboratory

The aquatherm laboratory: from the testing of granulate through to the finished product the customer can be assured of only the highest quality products.

Software-Service

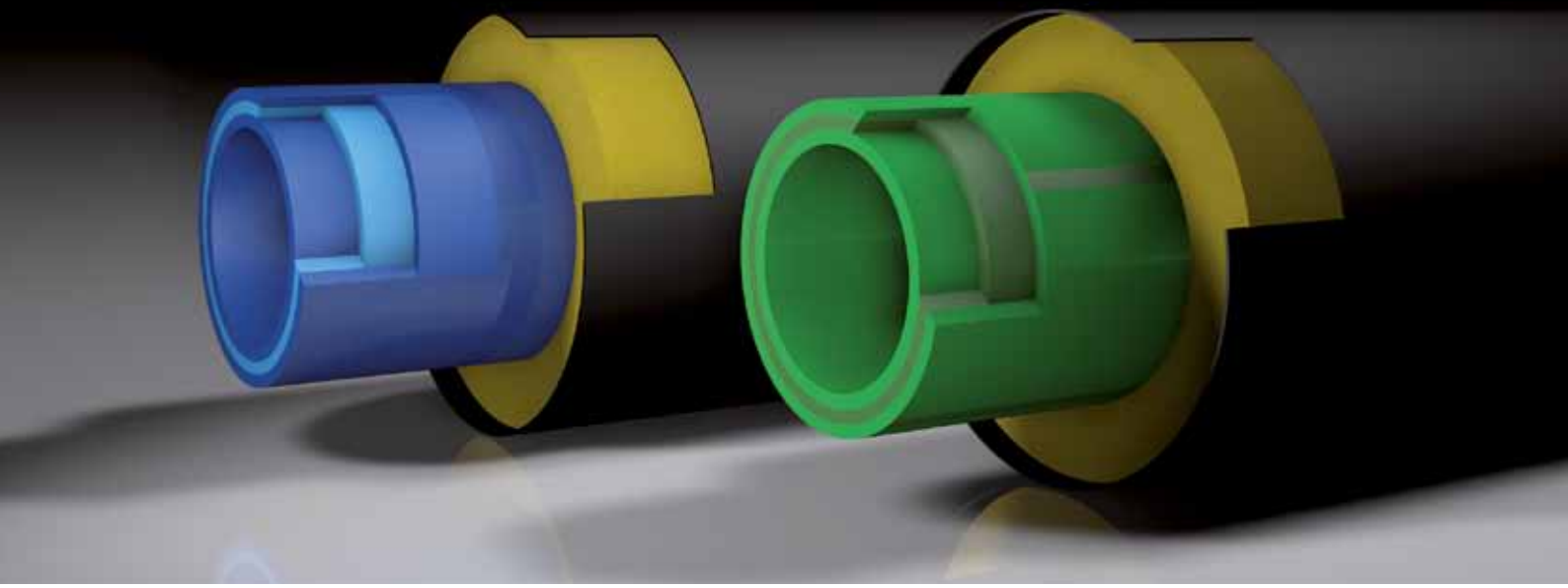
The aquatherm-software service provides Datanorm-files, an independent graphical program (liNear), and the appropriate training.

Miscellaneous

Different aquatherm-CD`s, prospects, catalogues, poster, leaflets, mailings,calen-dars, a.s.m. are investigated and produced from the internal advertising department. All information regarding the company, the technology, the products, the various trainings and fairs as well as all catalogues in pdf-form can be called and downloaded from the aquatherm-website: www.aquatherm.de.

SERVICE

aquatherm green pipe ti
aquatherm blue pipe ti



aquatherm ti - PRE-INSULATED PIPE SYSTEMS
for district heating

One of the most energy-efficient methods of transporting hot potable water as well as heating or cooling water covering long distances is the application of underground piping. To achieve the necessary insulating characteristics for this type of application, aquatherm offers the factory-made pre-insulated ti pipe system with different medium pipes.

The aquatherm ti pipe systems are insulated with PUR rigid foam and coated with a casing pipe made of PEHD.

All medium pipes are plastic-fibre composite pipes.

- **aquatherm green pipe ti**
  faser composite pipe system SDR 7,4/9/11
  pipe system for potable water
  in dimensions DN25 – DN200

- **aquatherm blue pipe ti -**
  faser composite pipe system SDR 7,4/11/17,6
  pipe system for heating, cooling and waste water
  in dimensions DN25 – DN300

- **aquatherm blue pipe ot ti -**
  faser composite pipe system SDR 7,4/11
  oxygen-tight pipe system for heating- and industrial water in dimensions DN25 – DN100

Medium pipes

Fields of application

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

	aquatherm green pipe ti	aquatherm blue pipe ti	aquatherm blue pipe ot ti
Potable water application	●		
Climate technology	❍	●	●
Chilled water technology	❍	●	●
Swimming pool technology	●	●	
Rainwater application	●	●	
Irrigation	●	●	
Disctrict heating		●	●
Application in the field of ship building	●	●	●
Industrial liquids considering the material resistance	●	●	●

MEDIUM PIPES

Material
The medium pipes, integrated in the aquatherm ti pipe system, are made of fusiolen® PP-R.

Special heat and extraction stability are only two of the features of this material. Its physical and chemical properties are well-suited to the transfer of potable water and to the heating field. Above all, the good welding properties and fusion, resulting in a permanent connection, have made the aquatherm PP-R pipe systems and the raw material fusiolen® PP-R well known worldwide.

Environment
The environmentally friendly material polypropylen fusiolen® PP-R 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 either in its processing or in its disposal.

Fusiolen® PP-R – for the benefit of our environment!

Use of metal deactivators

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

Higher long-term heat stabilization

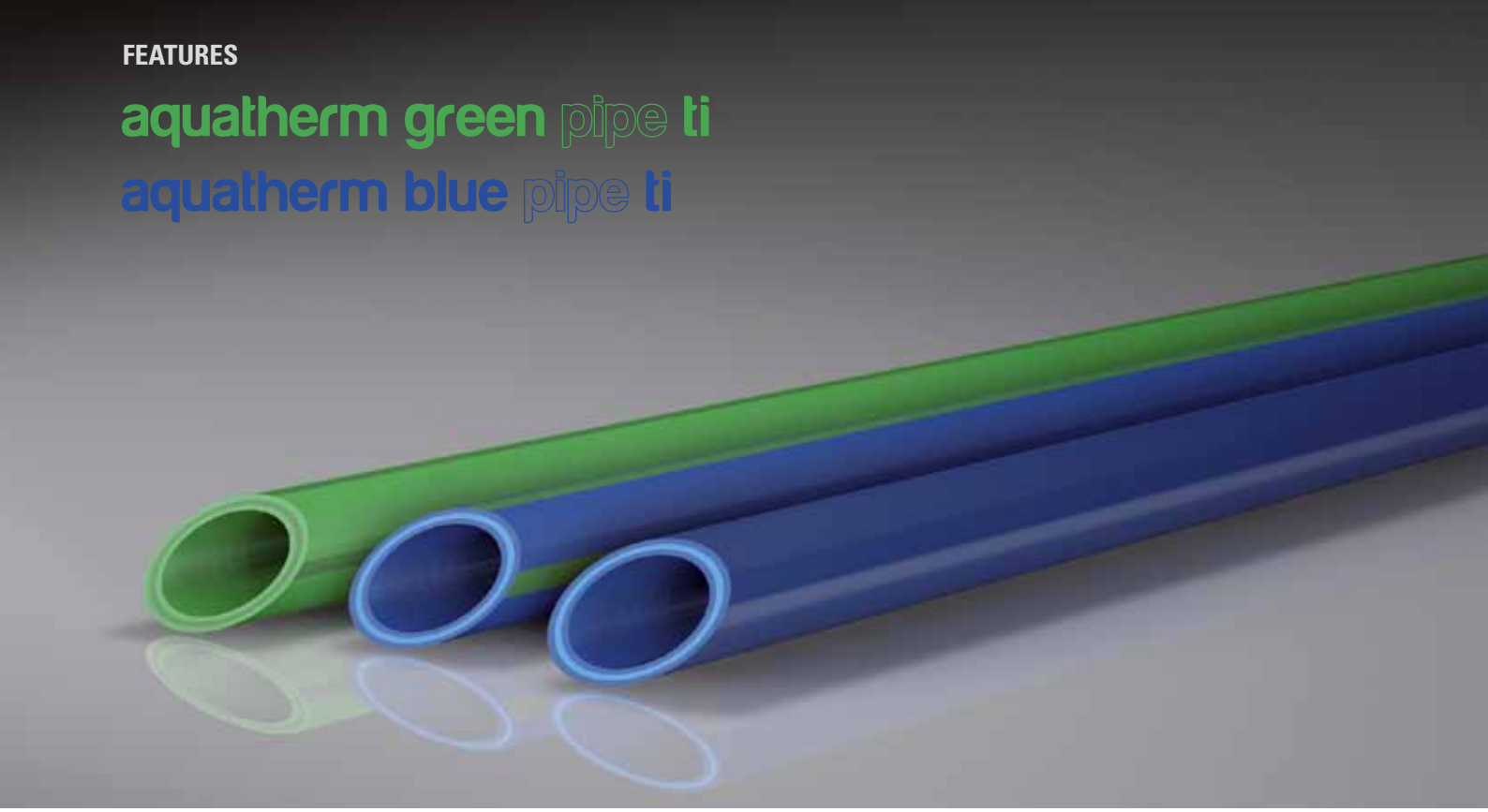
The long-term heat stabilization has been increased to resist to the potential effects of peak temperatures within higher safety parameters.

System advantages

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

	aquatherm green pipe ti	aquatherm blue pipe ti	aquatherm blue pipe ot ti
Low expansion	●	●	●
Odorless	●		
Corrosionresistant	●	●	●
Very good welding properties	●	●	●
Less pipe friction	●	●	●
High impact resistance	●	●	●
Heat-stability	❍	●	●
Metal deactivation	●	●	●
Recyclable	●	●	❍
Sound- and heat insulation	●	●	●
Low weight	●	●	●
Self-compensating	●	●	●

aquatherm green pipe ti
aquatherm blue pipe ti



MEDIUM PIPES

aquatherm green pipe ti-faser composite pipe system SDR 7,4

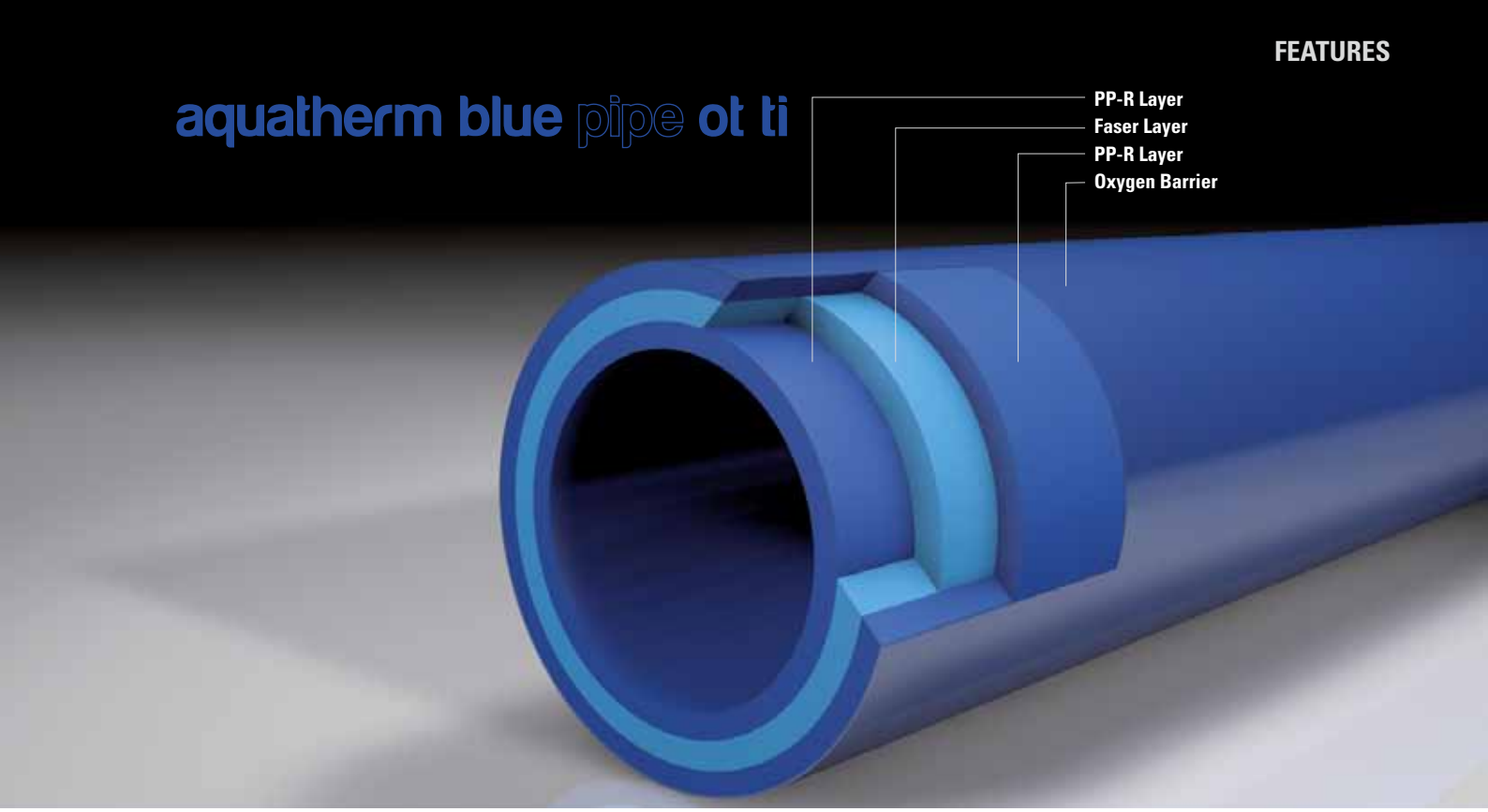
This pipe system made of fusiolen® PP-R and a special fibre filling, which is in the middle layer of the PP-R, is especially suitable for the installation of potable water pipes.

The favourable, resistant and innovative pipe technology has proven itself **worldwide in 80 countries**.

aquatherm blue pipe ti-faser composite pipe system SDR 11/17,6

The aquatherm blue pipe- system has been developed especially for applications outside the potable water installation.

In addition to the general advantages of the PP-R pipe system aquatherm blue pipe in comparison with the aquatherm green pipe-system offers higher volumetric current values due to smaller thickness.



MEDIUM PIPES

aquatherm blue pipe ot ti-faser composite pipe system SDR 11

With the newly developed aquatherm blue pipe ot faser composite pipe, aquatherm launches an oxgen-tight pipe, which is equipped with an oxygen barrier and thus corresponds to the requirements of DIN 4726.

The aquatherm blue pipe ot faser composite pipe in combination with the aquatherm green pipe system includes all elements for the pipe installation of chilled, hot fluid and various industrial applications.

Easy and quick installation technology

aquatherm blue pipe ot faser composite pipes also convinces by easy but effective installation- and connection technology. By heating of pipe and fitting the plastic melts after joining the elements into a permanent connection. aquatherm blue pipe ot faser composite pipes up to 125 mm have to be peeled with peeling tools Art.-No. 50507-505025 before processing.

Dimensions

medium pipe	aquatherm green pipe ti faser composite pipe SDR 7,4	aquatherm blue pipe ti faser composite pipe SDR 11	aquatherm blue pipe ot ti faser composite pipe SDR 11	aquatherm blue pipe ti faser composite pipe SDR 17,6	casing pipe
external diameter	dimension	dimension	dimension	dimension	external diameter
32 mm	DN 25	DN 25	DN 25	-	90 mm
40 mm	DN 32	DN 32	DN 32	-	110 mm
50 mm	DN 40	DN 40	DN 40	-	110 mm
63 mm	DN 40/50	DN 50	DN 50	-	125 mm
75 mm	DN 50	DN 65	DN 65	-	140 mm
90 mm	DN 65	DN 80	DN 80	-	160 mm
110 mm	DN 80	DN 80/100	DN 80/100	-	200 mm
125 mm	DN 80/100	DN 100	DN 100	-	225 mm
160 mm	DN 125	DN 125	DN 125	DN 150	250 mm
200 mm	DN 150	DN 150	DN 150	DN 200	315 mm
250 mm	DN 175	DN 200	DN 200	DN 250	400 mm
315 mm	-	DN 250	-	DN 300	450 mm

* larger dimensions on request

MEDIUM PIPES

Permissible working pressure

for potable water installations (fluid transported: water acc. to DIN 2000)

Temperature	Service life	aquatherm green pipe SDR 7,4 MF	
		Permissible working pressure in	
		bar	(psi)
20 °C	1	28,6	(415)
	5	26,8	(389)
	10	26,1	(379)
	25	25,3	(367)
	50	24,5	(356)
30 °C	1	24,3	(353)
	5	22,8	(331)
	10	22,0	(319)
	25	21,3	(309)
	50	20,7	(300)
40 °C	1	20,5	(298)
	5	19,2	(279)
	10	18,7	(271)
	25	18,0	(261)
	50	17,5	(254)
50 °C	1	17,5	(254)
	5	16,2	(235)
	10	15,7	(228)
	25	15,2	(221)
	50	14,7	(213)
60 °C	1	14,7	(213)
	5	13,7	(199)
	10	13,2	(192)
	25	12,6	(183)
	50	12,1	(176)
65 °C	1	13,9	(202)
	5	12,9	(187)
	10	12,5	(181)
	25	12,0	(174)
	50	10,6	(154)
70 °C	1	12,4	(180)
	5	11,4	(165)
	10	11,1	(161)
	25	9,6	(139)
	30	9,3	(135)
	50	8,1	(118)

Potable water (cold)

Potable water (hot)

SDR = Standard Dimension Ratio
(Dimension/Wall thickness Ratio)
SDR = 2 x S + 1 ≈ d / s
(S= Pipe series number of TI 4065)

Permissible working pressure

for general pressure pipe applications outside the fields of application on the adjoining diagram

Temperature	Service life	aquatherm blue pipe SDR 11 MF & MF OT		aquatherm green pipe SDR 7,4 MF		aquatherm blue pipe SDR 17,6 MF	
		Permissible working pressure in					
		bar	psi	bar	psi	bar	psi
10 °C	1	27,8	(403)	30,2	(438)	12,8	(186)
	5	26,2	(380)	28,2	(438)	12,0	(186)
	10	25,6	(372)	27,7	(402)	11,7	(170)
	25	24,7	(358)	26,9	(390)	11,4	(165)
	50	24,1	(350)	26,1	(379)	11,1	(161)
15 °C	1	25,7	(373)	29,4	(426)	11,8	(171)
	5	24,2	(351)	27,4	(397)	11,1	(161)
	10	23,6	(343)	26,9	(390)	10,8	(157)
	25	22,8	(331)	26,1	(379)	10,5	(152)
	50	22,2	(322)	25,3	(367)	10,2	(148)
20 °C	1	23,8	(345)	28,6	(415)	10,9	(158)
	5	22,3	(324)	26,8	(389)	10,3	(149)
	10	21,7	(315)	26,1	(379)	10,0	(145)
	25	21,0	(305)	25,3	(367)	9,6	(139)
	50	20,4	(296)	24,5	(355)	9,4	(136)
30 °C	1	20,2	(293)	24,3	(352)	9,3	(135)
	5	18,9	(274)	22,8	(331)	8,7	(126)
	10	18,4	(267)	22,0	(319)	8,5	(123)
	25	17,8	(258)	21,3	(309)	8,2	(119)
	50	17,3	(251)	20,7	(300)	7,9	(115)
40 °C	1	17,1	(248)	20,5	(297)	7,9	(115)
	5	16,0	(232)	19,2	(278)	7,4	(107)
	10	15,6	(226)	18,7	(271)	7,2	(104)
	25	15,0	(218)	18,0	(261)	6,9	(100)
	50	14,6	(212)	17,5	(254)	6,7	(097)
50 °C	1	14,5	(210)	17,5	(254)	6,7	(097)
	5	13,5	(196)	16,2	(235)	6,2	(090)
	10	13,1	(190)	15,7	(228)	6,0	(087)
	25	12,6	(183)	15,2	(220)	5,8	(084)
	50	12,2	(177)	14,7	(213)	5,6	(081)
60 °C	1	12,2	(177)	14,7	(213)	5,6	(081)
	5	11,4	(165)	13,7	(199)	5,2	(075)
	10	11,0	(160)	13,2	(191)	5,1	(074)
	25	10,6	(154)	12,6	(183)	4,9	(071)
	50	10,3	(149)	12,1	(175)	4,7	(068)
70 °C	1	10,3	(149)	12,4	(180)	4,7	(068)
	5	9,6	(139)	11,4	(165)	4,4	(064)
	10	9,2	(134)	11,1	(161)	4,2	(061)
	25	8,0	(116)	9,6	(139)	3,7	(054)
	50	6,8	(99)	8,1	(117)	3,1	(045)
75 °C	1	9,4	(136)	11,7	(170)	4,3	(062)
	5	8,7	(126)	10,8	(157)	4,0	(058)
	10	8,0	(116)	10,0	(145)	3,7	(054)
	25	6,4	(93)	8,0	(116)	3,0	(044)
	50	5,4	(78)	6,7	(97)	2,5	(036)
80 °C	1	8,6	(125)	10,4	(151)	4,0	(058)
	5	7,7	(112)	9,2	(133)	3,5	(051)
	10	6,5	(94)	7,8	(113)	3,0	(044)
	25	5,2	(75)	6,2	(090)	2,4	(035)
90 °C	1	7,2	(104)	8,7	(126)	3,3	(048)
	5	5,1	(74)	6,0	(087)	2,3	(033)
	10	4,3	(62)	5,1	(074)	2,0	(029)

Material parameters

Technical data	PE 80
Density, g/cm³, 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/m², DIN EN ISO 179	without break
Impact strength, kJ/m², 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	$1.8 \cdot 10^{-4}$
Thermal conductivity, W/m · K, DIN 52612	0.38
Electric strength, kV/mm, VDE 0303-21	47
Surface resistance, Ohm, DIN IEC 167	10^{14}
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

Support intervals

aquatherm green pipe ti - aquatherm blue pipe ti **SDR 11**
Table to determine support intervals in conjunction with temperature and outside diameter.

Difference in temperature Δ T [K]	Pipe diameter d (mm)													
	20	25	32	40	50	63	75	90	110	125	160	200	250	315
	Support intervals in cm													
0	120	140	160	180	205	230	245	260	290	320	330	335	345	355
20	90	105	120	135	155	175	185	195	215	240	240	2755	260	265
30	90	105	120	135	155	175	185	195	210	225	230	240	245	255
40	85	95	110	125	145	165	175	185	200	215	220	230	240	240
50	85	95	110	125	145	165	175	185	190	195	205	220	230	235
60	80	90	105	120	135	155	165	175	180	185	195	205	215	220
70	70	80	95	110	130	145	165	165	170	175	185	195	200	215

Spaces of pipe clamp of vertical pipes can be increased by 20% to the values in the tabel, that means to multiply the tabel values with 1.2.

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^3
Closed cell	> 88 %
Water absorption	< 10 % (Vol)
Compression strength 10 % deformation	> 0.3 N/mm^2
Shearing resistance	> 0.12 N/mm^2
Tangent shearing resistance	> 0.20 N/mm^2
Thermal conductivity at 50° C	< 0.03 W/mK

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
aquatherm blue pipe SDR 7,4/11			
32 mm	6.86	8.57	11.14
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
aquatherm blue pipe ot SDR 7,4/11			
32 mm	6.86	8.57	11.14
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
aquatherm green pipe SDR 7,4 faser			
32 mm	6.71	8.38	10.90
40 mm	6.77	8.47	11.01
50 mm	8.62	10.78	14.01
63 mm	9.79	12.24	15.92
75 mm	10.61	13.27	17.25
90 mm	11.38	14.22	18.49
110 mm	10.88	13.59	17.67
125 mm	11.03	13.79	17.93
160 mm	14.17	17.71	23.03
200 mm	13.96	17.44	22.68
250 mm	13.55	16.93	22.02

Type of pipe	Cooling engergy loss at average temperature 8 °C in W/m	Cooling engergy loss at average temperature 15 °C in W/m	Cooling engergy loss at average temperature 21 °C in W/m
aquatherm blue pipe and blue pipe ot SDR 7,4/11			
32 mm	1.29	2.57	3.60
40 mm	1.30	2.59	3.63
50 mm	1.66	3.33	4.66
63 mm	1.89	3.79	5.30
75 mm	20.60	4.12	5.77
90 mm	2.21	4.42	6.19
110 mm	2.11	4.13	5.92
125 mm	2.14	4.29	6.00
160 mm	2.78	5.56	7.79
200 mm	2.74	5.48	7.67
250 mm	2.65	5.31	7.43
315 mm	3.43	6.86	9.61
aquatherm blue pipe SDR 17,6			
160 mm	2.78	5.74	8.04
200 mm	2.82	5.65	7.91
250 mm	2.74	5.47	7.66
315 mm	3.57	7.14	10.0

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:

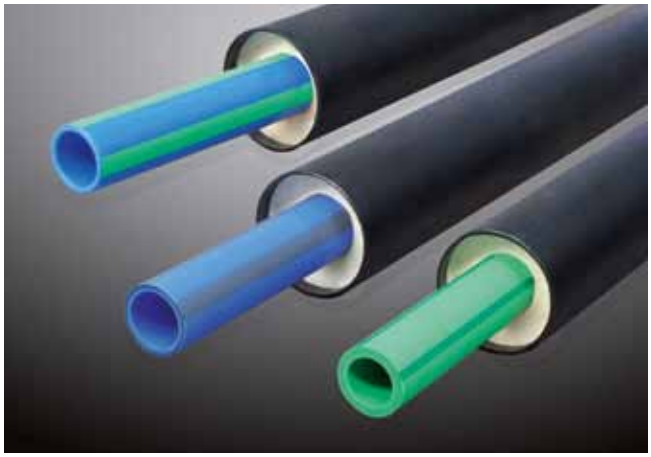
Material parameters

Technical data	PE 80
Density, g/cm^3, 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^2, DIN EN ISO 179	without break
Impact strength, kJ/m^2, 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	$1.8 \cdot 10^{-4}$
Thermal conductivity, W/m · K, DIN 52612	0.38
Electric strength, kV/mm, VDE 0303-21	47
Surface resistance, Ohm, DIN IEC 167	10^{14}
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

AQUATHERM TI DATA SHEET

Dimensions

Medium pipe	Casing pipe	PUR-rigid foam
external diameter	external diameter	thickness
32 mm	90 mm	26.00 mm
40 mm	110 mm	32.00 mm
50 mm	110 mm	27.00 mm
63 mm	125 mm	28.00 mm
75 mm	140 mm	29.50 mm
90 mm	160 mm	32.00 mm
110 mm	200 mm	41.80 mm
125 mm	225 mm	46.50 mm
160 mm	250 mm	41.10 mm
200 mm	315 mm	52.60 mm
250 mm	400 mm	68.70 mm
315 mm	450 mm	60.50 mm



Pipe data

Pipe dimension		Weight			Water content		
Medium pipe (D_a)	Casing pipe (D_a)	aquatherm green pipe ti SDR 7,4	aquatherm blue pipe ti SDR 11	aquatherm blue pipe ti SDR 17,6	aquatherm green pipe ti SDR 7,4	aquatherm blue pipe ti SDR 11	aquatherm blue pipe ti SDR 17,6
32 mm	90 mm	1.6 kg/m	1.5 kg/m	-	0.423 l/m	0.539 l/m	-
40 mm	110 mm	2.2 kg/m	2.0 kg/m	-	0.660 l/m	0.834 l/m	-
50 mm	110 mm	2.5 kg/m	2.2 kg/m	-	1.029 l/m	1.307 l/m	-
63 mm	125 mm	3.2 kg/m	2.8 kg/m	-	1.647 l/m	2.074 l/m	-
75 mm	140 mm	4.1 kg/m	3.5 kg/m	-	2.323 l/m	2.959 l/m	-
90 mm	160 mm	5.4 kg/m	4.5 kg/m	-	3.358 l/m	4.252 l/m	-
110 mm	200 mm	7.8 kg/m	6.5 kg/m	-	4.999 l/m	6.359 l/m	-
125 mm	225 mm	9.9 kg/m	8.2 kg/m	-	6.472 l/m	8.199 l/m	-
160 mm	250 mm	14.2 kg/m	11.4 kg/m	9.03 kg/m	10.599 l/m	13.430 l/m	4.67 l/m
200 mm	315 mm	22.3 kg/m	17.9 kg/m	14.22 kg/m	16.558 l/m	21.010 l/m	7.42 l/m
250 mm	400 mm	35.4 kg/m	28.5 kg/m	22.77 kg/m	25.901 l/m	32.861 l/m	12.2 l/m
315 mm	450 mm	-	40.0 kg/m	31.04 kg/m	-	52.172 l/m	14.3 l/m

ASSEMBLY OF WELDING TOOLS

The professional processing of aquatherm green pipe ti- and aquatherm blue pipe ti- 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 devices and aquatherm welding tools, 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 32 – 63 mm

2. aquatherm - manual welding device (1400W)
   without welding tools (Art.-No. 50341)
   for medium pipes of dimension 32 – 125 mm

3. aquatherm - welding tools
   for manual welding devices

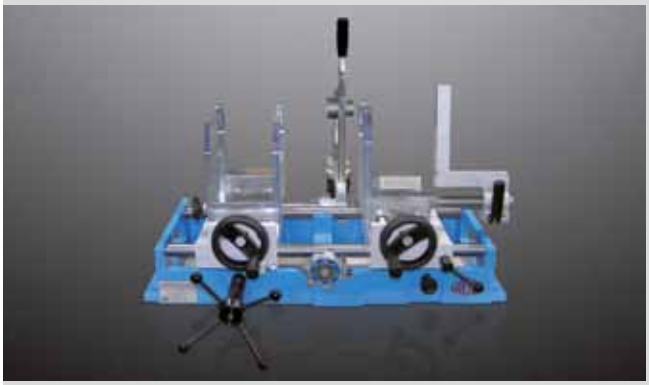
Art.-No. 50212	32 mm
Art.-No. 50214	40 mm
Art.-No. 50216	50 mm
Art.-No. 50218	63 mm
Art.-No. 50220	75 mm
Art.-No. 50222	90 mm
Art.-No. 50224	110 mm
Art.-No. 50226	125 mm

4. aquatherm - welding machine (1400W)
   and welding tools 50 – 125 mm (Art.-No. 50347)
   for medium pipes of dimension 50 – 125 mm

5. aquatherm - butt-welding-machines
   for medium pipes of dimension 160 – 630 mm

Manual welding device 800W with welding tools 32 – 63 mm

Manual welding device 1400W with welding tools 32 – 125 mm



Welding machine

Butt-welding machine type Light and accessories

6. aquatherm - electrical welding jig Art.-No. 50159
   for medium pipes of dimension 63 -125 mm

NOTE:

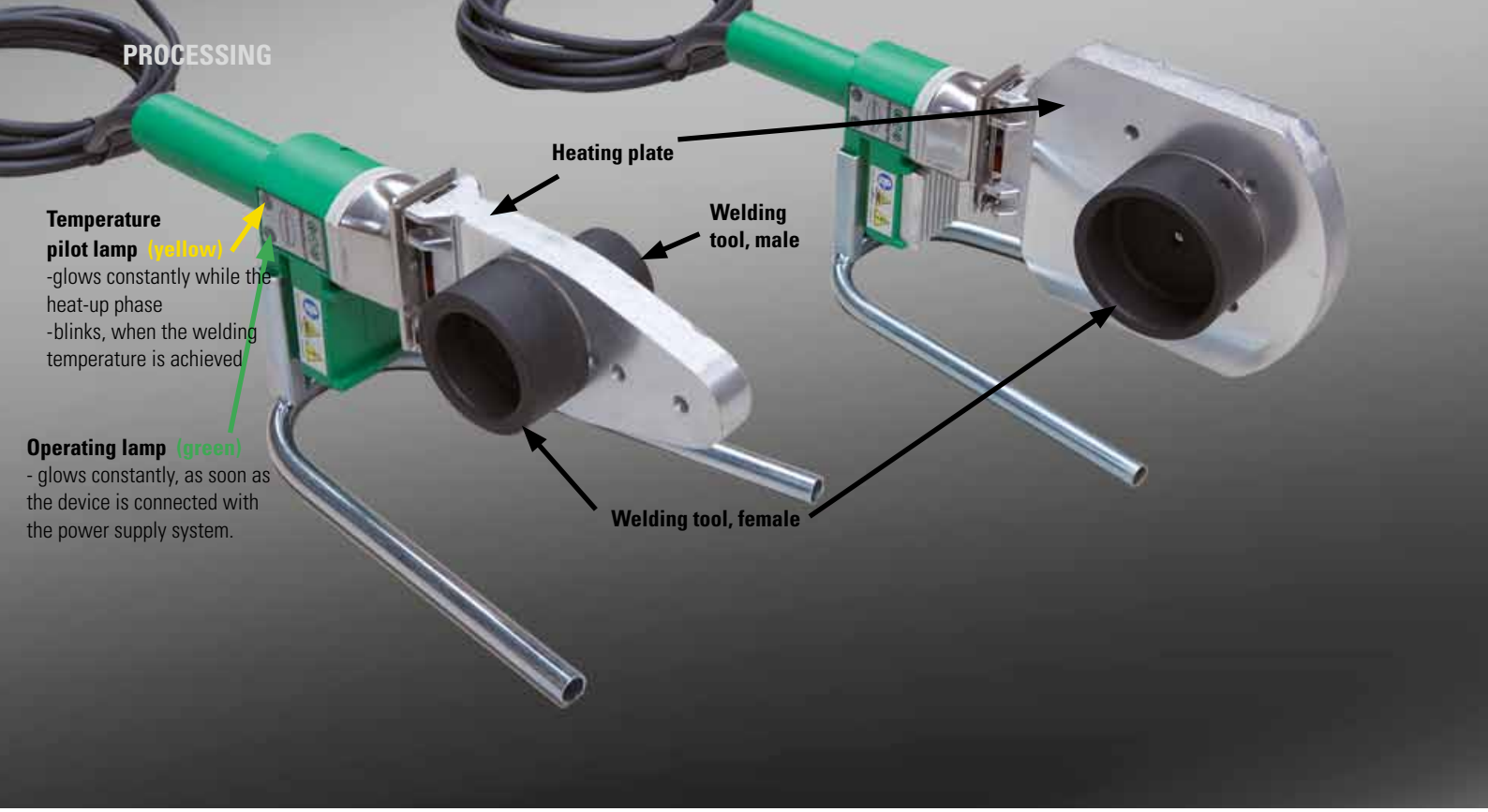
Just for the processing of aquatherm blue pipe ot ti- medium pipes of dimension 32-125 mm, which are connected by socket welding, the following tools must be applied in addition. Before welding, the oxygen barrier layer at the pipe ends must be removed with these tools, as described on page 22.

7. aquatherm- peeling tool as double peeling tool

Art.-No. 50512	32 & 40 mm
Art.-No. 50514	40 & 50 mm
Art.-No. 50518	63 & 75 mm
Art.-No. 50524	90 & 110 mm
Art.-No. 50526	110 & 125 mm

Instructions for the assembly of welding tools!

- The heating plate of the welding device must be in good order and condition.
- External damages like scratches or grooves and impurities must be removed.
- The welding tools, consisting of 2 elements (male and female), must be free from damages and must be checked for cleanliness before processing.
- If required, both parts of the tools must be cleaned with a non fibrous, coarse tissue and optionally with spirit.
- Damaged tools generally must not be used. They must be exchanged.
- Screw on the cold welding tools manually and tighten the screw hand-tight with the Allan key.
- Welding tools must fully touch the welding plate and must not overlap the edge.



HEATING-UP PHASE / HANDLING

Part A: Heating-up phase

1.
Plug the welding device and control if the yellow pilot lamp glows.

2.
Dependent on the size of the welding tools and the ambient temperature the heating up of the tools takes between 10 and 30 minutes.

3.
During the heating up phase the tools must be tightened close by turning the screw with an Allan key.

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

4.
A temperature of 260° C is required for welding the aquatherm ti medium pipes. According to DVS- Welding Guidelines the welding temperature must be checked at the tools before welding. The temperature control is made by a fast indicating surface thermometer.

ATTENTION:

First welding: 5 minutes after achieving the welding temperature!

Part A: Handling

5.
A tool change at a heated device requires another check of the welding temperature at the new tool after its heating up

6.
If the device has been unplugged, e. g. during longer breaks, the heating up process must be restarted (from item 1)

7.
After finishing the welding works unplug the welding device and let it cool down.

Never use water or other liquids to cool the welding device as this destroys the heating resistances! Never open the welding devices or repair them by yourself. Return the defective devices for repair to aquatherm.

8.
Welding devices and welding tools must be protected from moisture and impurities. Burnt particles may cause an incorrect fusion. The application of damaged and dirty tools is not allowed.

9.
Before and after the welding do not lay the welding device on the welding tools as the Teflon coating of the tools may be damaged. Always put the device in the included stand.

TECHNICAL REGULATIONS AND DATA

Part A: Technical regulations

For the correct handling of welding machines the General Regulations for Protection of Labour and Prevention of Accidents must be observed. 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) are effective.

For the handling of aquatherm green pipe-welding machines, devices and tools please the General Regulations DVS 2208, part 1 are still valid.

For the appropriate and professional handling with the tools and accessories the manufacturer´s instructions must be observed.

Part A: Fusion data

Pipe external-Ø	Welding depth	Heating time		Welding time	Cooling time
mm	mm	sec. DVS	sec. AQE*	sec.	min.
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

On the basis of the DVS 2207, Part 11 the heating time should be increased by 50% if the ambient temperature is below + 5° C

*heating times recommended by aquatherm

Dimension 160 - 315 mm:

These dimensions are joined by butt-welding.

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

Advice regarding butt-welding of medium pipes of dimensions 160 – 315 mm

The standard data concerning butt-welding depend on the pipe dimensions and devices. They are available in the processing description enclosed to the machines or they can be required directly at aquatherm.

NOTES FOR PREPARATION

Control of welding temperature

The welding temperature must be checked at all welding devices and machines with a fast indicating thermometer. The measurement is made directly at the tools.

The temperature measurement is always made in the beginning of each welding. If the required welding temperature is not achieved, the welding connection may be incorrect.

Welding temperatures for aquatherm ti

Heating element socket welding: 260°C for medium pipes of dimension 32 - 125 mm

Heating element butt-welding: 210°C for medium pipes of dimension 160 - 315 mm

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

Measurement of temperature at the aquatherm- manual welding device (1400W)

Measurement of temperature at the aquatherm- welding machine

Measurement of temperature at the aquatherm- butt-welding machine

Cutting and skinning of pipes

Measure the pipe length and mark on the casing pipe.

Mark the cutting line with an adhesive tape around the pipe.

Cut the pipe with a customary handsaw with a saw blade for plastic along the cutting line.

Mark the skinning length of 22.5 cm from the pipe end on the casing pipe.

Cut the casing pipe with the pipe cutter up to the PUR-insulation layer around the whole pipe.

Slit the casing up to the PUR-insulation layer with a customary handsaw for plastic.

Detach the end of the casing pipe and then remove the PUR-insulation layer mechanically on the full skinning length.

Clean the skinned medium pipe and deburr the pipe ends inside and outside.

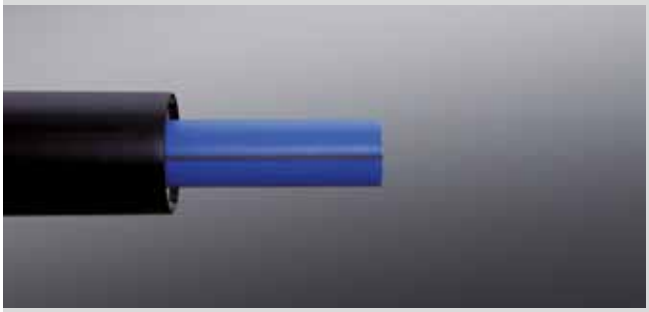
NOTES FOR PREPARATION

Removal of oxygen barrier layer of aquatherm blue pipe ot ti for dimensions 32 – 250 mm

Attention – Do not forget the shrink sleeve!

For pipe and/or fitting connections, which should be insulated with an aquatherm ti socket or reduced socket, take note that the shrink sleeve must be pushed over one side of the connection before the welding process.

But do not remove the release liner protecting the shrink sleeve. The subsequent application of the shrink sleeve is not possible.



aquatherm blue pipe ot ti is coated with an oxygen barrier, which must be removed before the fusion.

Push the aquatherm- peeling tool on the pipe end and turn it clockwise with pressure.

Pre-turn the peeling tool as far as it will go. The circumferential material abrasion is conveyed at one side of the tool.

At the stop of the peeling tool the barrier layer is removed up to the welding depth. Now the tool can be pulled off.

HEATING-ELEMENT SOCKET WELDING WITH THE MANUAL WELDING DEVICE

Welding process without mechanical support

Remove dirt and impurities at the pipe ends. (Note: for the processing of aquatherm blue pipe ot ti, also see description on page 22)

Mark welding depth with the attached blue template and a pencil.

Take the aquatherm-socket out of the packing. Loose fittings must be cleaned.

Press the aquatherm-socket on the male welding tool and at the same time push the pipe end up to the marked welding depth in the female welding tool.

After the heating time pull off the welding socket and the pipe end from the welding tools.

Directly after the removal of the welding device push the socket on the pipe end.

Within the processing time press the welding socket on the pipe end up to the end of the welding depth.

Align and momentary fix the welding socket. Further processing is carried out after the specified cooling time.

HEATING-ELEMENT SOCKET WELDING WITH MANUAL WELDING DEVICE AND ELECTRIC WELDING JIG

Welding process with mechanical support

Adjust pipe slide in the back guide rail to the required pipe dimension and fix with locking bow.

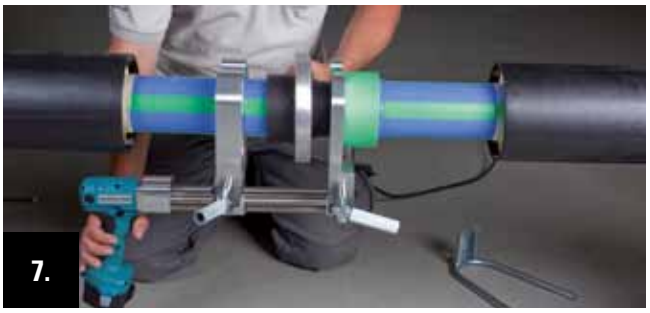
Adjust fitting slide in the front guide rail to the required pipe dimension and fix with locking bow.

Push clamping jaws against the face side of the fitting up to the stop and tighten them with a fixing screw.

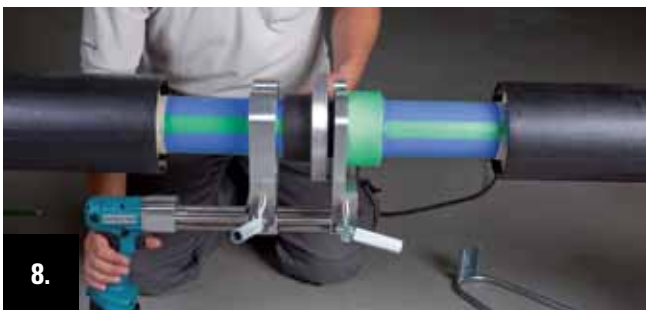
The welding depth and the clamping distance are marked by the aquatherm-clamping template (blue) in one work.

Pull the pipe end up to the end of the clamping mark into the welding jig and tighten the clamping jaws with the fixing screw.

Remove dirt and impurities from the pipe end and from the inside of the fitting.

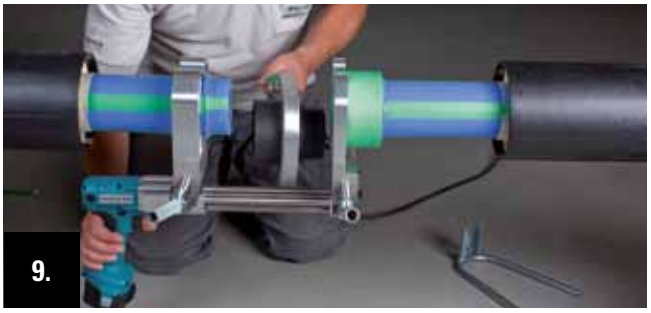


Position the manual welding device in the center of fitting and pipe end and drive together the welding jig slowly.

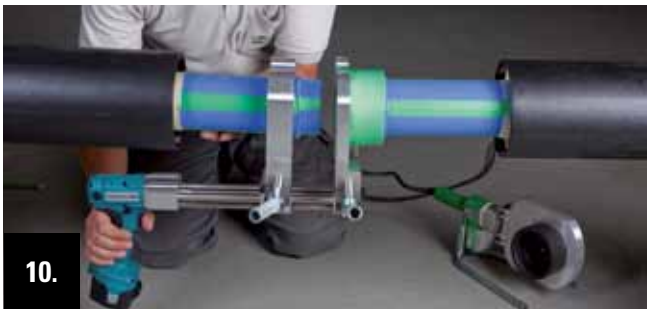


The male welding tool is pressed in the welding socket with the welding jig and at the same time the pipe end is pushed up to the marked welding depth in the female socket.

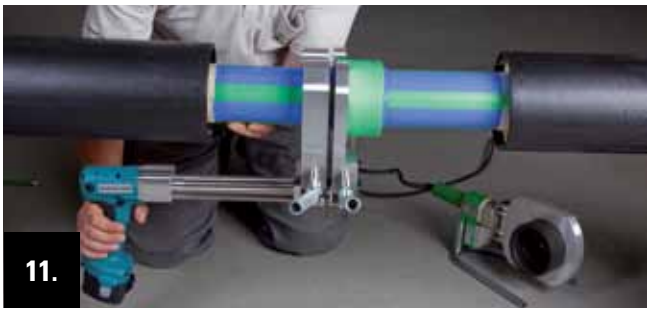
Welding process with mechanical support



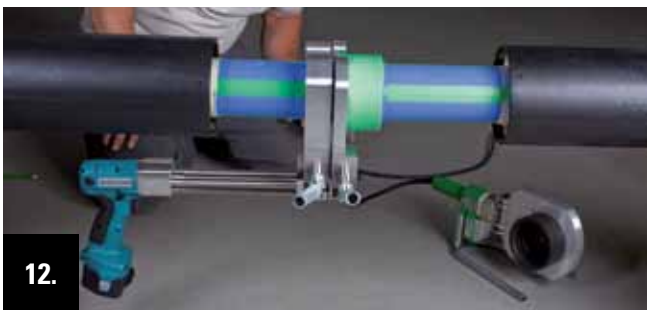
After the end of the heating period drive the welding jig apart and remove the welding device between pipe end and fitting.



Immediate after removal of the welding device the welding jig is driven together slowly and evenly.

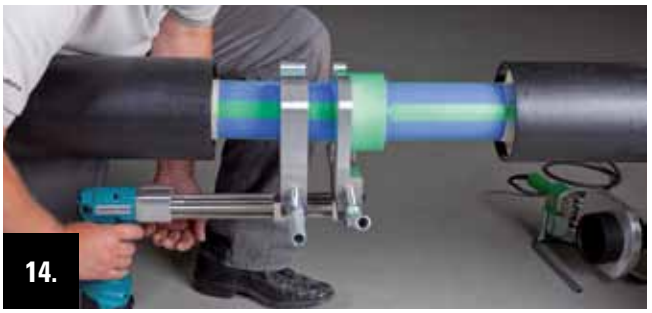


Press the pipe end, within the processing time, with the welding jig up to the end of the welding depth in the welding socket.



Align the welding connection with the welding jig and fix it shortly. The further processing is proceeded after the specified cooling time.

After the cooling time release the clamping jaws on the pipe side by unscrewing the fixing screw.



Drive the welding jig apart to release the fixing screw of the fitting clamping jaw.

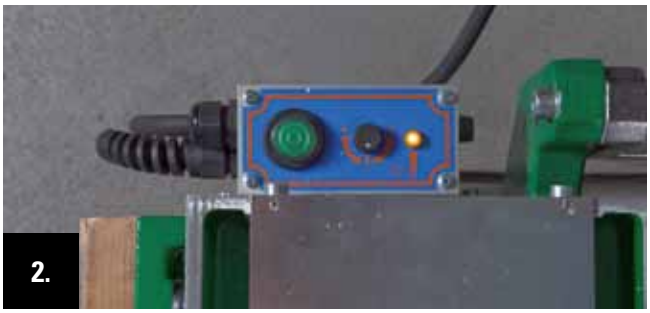
Release the clamping jaws on the fitting side by unscrewing the fixing jaw.

Open the clamping jaws of the welding jig as far that the welding jig can be removed sidewise or downward from the connection.

HEATING-ELEMENT SOCKET WELDING WITH THE WELDING MACHINE

Preparing and welding process

Position and align the welding machine. Regard the required place! (Consider that the machine must be removed below the pipeline after finishing the welding works.)



Plug the machine and check, if the yellow operation lamp is on.

The welding depth of the required pipe dimension is adjusted by the turning button, which is at the left face side of the machine frame.

For pipe fixing push the back pair of clamping jaws at the front pair of clamping jaws and fix it by tightening of the fixing screws.

Hold the welding socket between the fitting clamping jaws and press it against the stops at the face side.

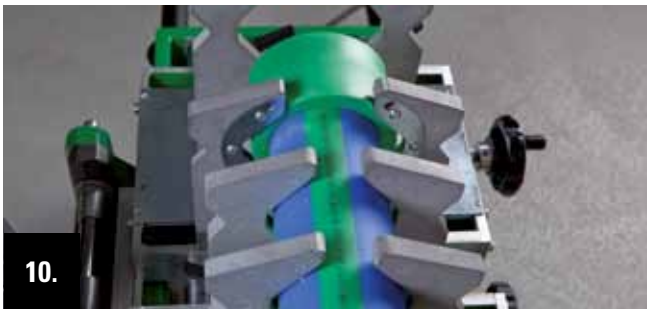
Fix the socket close to the stop und tighten the clamping jaws with the crank handle.

Push the pipe end between the clamping jaws and center it by turning the crank handle, but do not screw firmly.

For adjustment of the welding depth press the calibration button in the middle of the machine frame up to the stop.

Preparing and welding process

Drive the welding machine slide with the crank handle together and press the pipe end against the welding socket.



Align the pipe end circumferentially at the welding socket and center the position exactly.

Fix the pipe end with the clamping jaws by turning the crank handle.

Drive apart the slide of the welding machine with the crank handle and pull out the calibration button for adjusting the welding depth.

Fold down the welding device and drive together the slide of the welding machine with the crank handle.

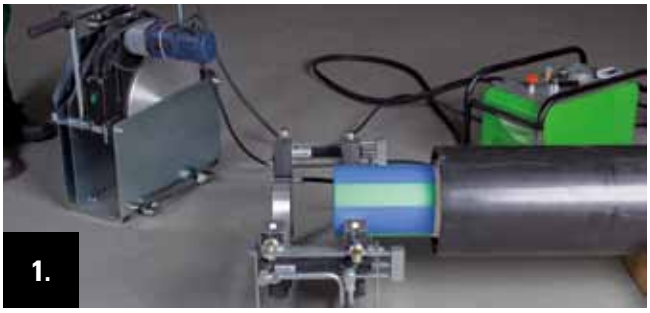
After the heating time drive apart the welding machine slide with the crank handle and raise the welding device.

Drive together the welding machine slide with the crank handle up to the stop.

After the cooling time release the clamping jaws at the fitting and at the pipe end and turn the welding machine by 180°.

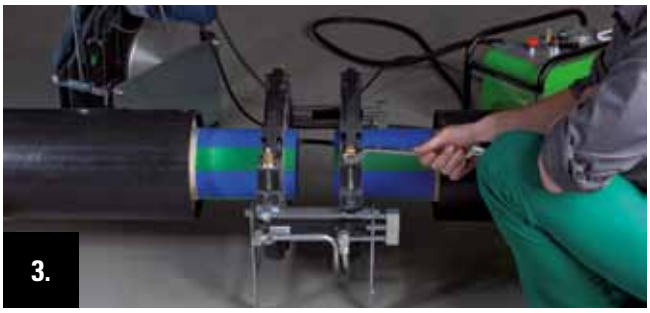
HEATING-ELEMENT BUTT-WELDING WITH THE BUTT-WELDING MACHINE TYPE: LIGHT

Preparation of pipe ends and fusion

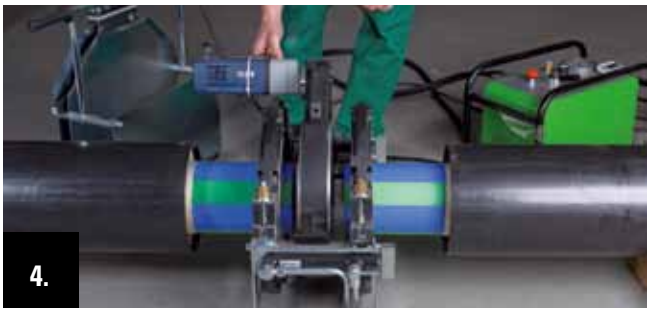


Arrange and align the welding machine, plug in the hose of the hydraulics and energize the welding device and milling cutter.

Place the first pipe end in the in the mounting clamps. Align it with the upper mounting clamp and fix it.



Place the other pipe end in the same way in the mounting clamps, align and fix it with the mounting clamp.



Insert the milling cutter between the pipe ends and fix it with the locking at the frame of the machine slide. The power-on of the tool only works with correct locking.

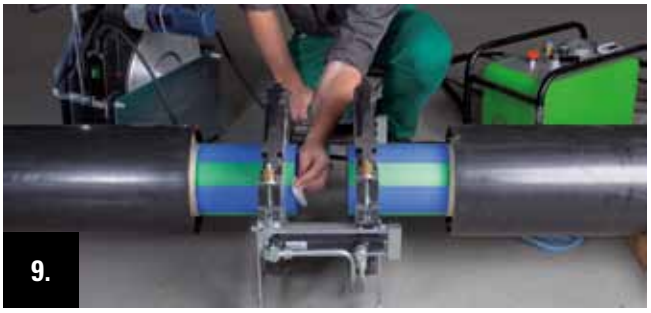
Switch on the milling cutter and drive up the pipe ends slowly in the machine slide to the milling cutter by operating the hydraulic system.

By using the hydraulic system the pipe ends are milled plane at the face side with light pressure to the milling cutter.

If the milling flake is circumferentially, drive apart the machine slide, take the milling cutter away and remove the debris.

Drive the machine slide slowly together again. The pipe ends must fit planar. Control clearance and then adjust the pressure at the hydraulic system in accordance with the data sheet.

Preparation of pipe ends and fusion



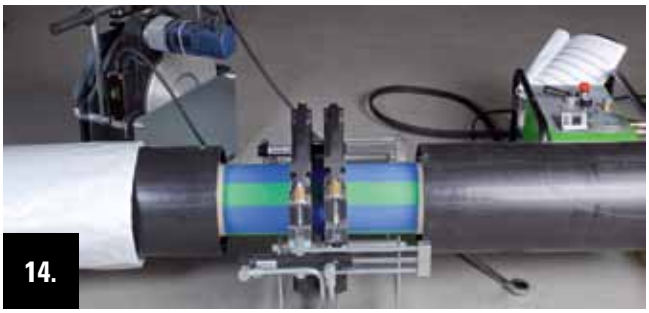
Clean the pipe ends at the face sides.

Insert the welding device between the pipe ends. Check, if the welding plate is clean and measure the welding temperature.

Drive the machine slide, by operating the hydraulic system, slowly against the welding plate. Then press the pipe ends until the predetermined adjustment pressure is achieved against the welding plate.

After the bead has achieved the preset height the pressure is reduced at the hydraulic system. Then the heating up phase starts. Now the face sides in which the face sides of the pipe ends are heated up to the required welding temperature.

After the end of the heating period drive apart the machine slide speedily by using the hydraulic system. Then remove the welding plate.



By using the hydraulic system the pipe ends are joined slowly until the required welding pressure is achieved.

The adjusted welding pressure remains on the machine slide up to the end of the cooling period.

After the end of the cooling period the pressure is released at the hydraulic system. Then the mounting clamps are disconnected and the clamping device is removed.

The winder shown below is not necessarily required for the processing of the MONO TOP 40 corrosion protective tape.

MONO TOP 40 FOR POST ENVELOPING

without and with winder

The MONO TOP 40 is an especially strong self-welding corrosion protective tape with a very flexible plastic layer outside.

The following material is required for the post enveloping of the aquatherm ti insulation-socket set with MONO TOP 40 corrosion protective tape:

1. Adhesive tape for fixing the PUR-half shell elements
2. Emery cloth of graining 40 or 60
3. Winder for MONO TOP 40 corrosion protective tape (not necessarily required)
4. MONO TOP 40 corrosion protective tape (see on the winder)
5. Primer for etching the KM-pipe surface.
6. Cutter knife for cutting the MONO TOP 40 corrosion protective tape after finishing the winding process.
7. Flat curved brush (distributes the primer well and can be used horizontally – also good for narrow lines and corners).

For the pre-arrangement, please execute the steps 1 – 16 on page 24 -29 (depending on application) and the steps 1.2 – 2.3 on page 39/40.

After finishing these processing steps follow the below described processing guidelines.

1.

Fixing of the PUR-half shell elements

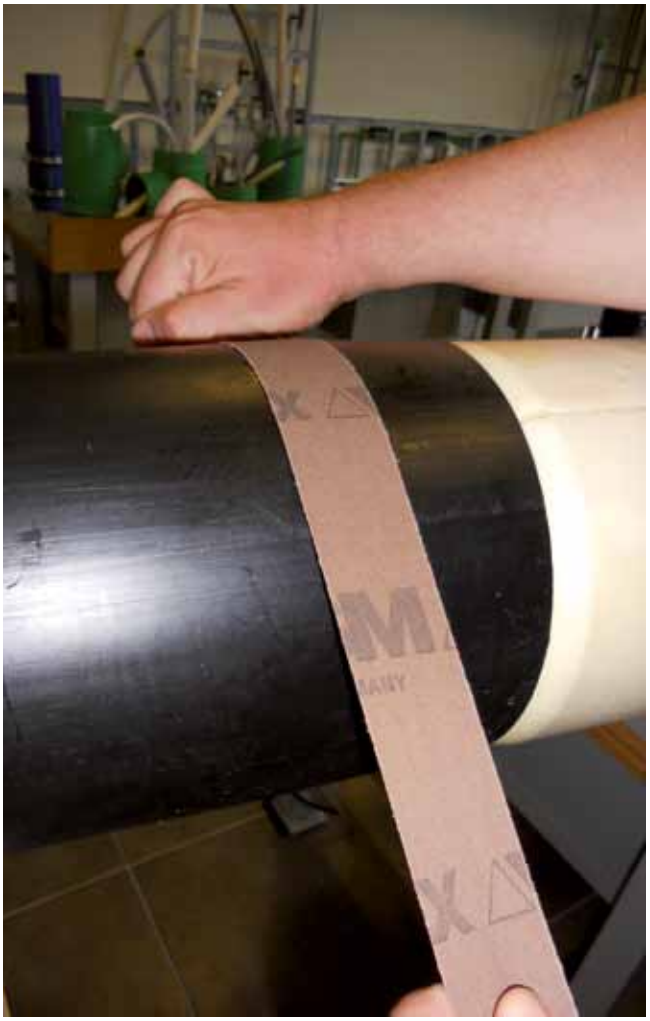
The PUR-half shell elements are placed around the medium pipe by key and slot technique (insulation shells are numbered on the surface) and fixed with adhesive tape.

2.
Marking of the enveloping KM-pipe

Max. distance for locating the first winding of the MONO TOP 40 corrosion protective taoe from the end of the KM-pipe: 100 mm.

Min. distance for locating the first winding of the MONO TOP 40 corrosion protective taoe from the end of the KM-pipe: 50 mm.

A white felt-tip pen is especially suitable.



3.
Roughen of the enveloping surface of the KM-pipe

The roughening of the KM-pipe surface is for a better bonding of the MONO TOP 40 tape at the KM-pipe and for the removal of little impurities. For roughening the surface of the KM-pipe an emery cloth of graining 40 or 60 should be applied. This working process must be repeated at the opposite end of the KM-pipe.

4.
Cleaning of the sealing surface

Please clean the KM-pipe ends, roughened with emery cloths on both sides, with Tangit-cleaning cloths or with ethanol/spirit (min. 99,9 %) and a white, dry, grease-and lint free cloth.

5.
Brushing of the primer

Brush the dry area, which has to be enveloped (KM-pipe and PUR-half shell elements) with primer evenly thin and completely (see step 6). Here a curved flat brush is used.
When decanting the primer in a suitable bin, it can also be applied with a small paint roller.
Before processing the primer installation guidelines are to be read on the back of the packing and followed.

6.
Brushing of the primer

7.
Brushing of the primer
Upon completion of this step, the primer must be allowed to evaporate for at least 10 min. Then necessarily determine by touching, whether the primer has dried.
If the airing time is more than 4 hours, the KM-pipe and the PUR-rigid foam elements must again be coated with primer.

8.
Attaching of the MONO TOP 40 corrosion protection tape

Prior to attaching the MONO TOP 40 corrosion protection tape, the release film is to be removed at the bottom. Attach the MONO TOP 40 corrosion protective tape to the marking, in the position of 3 or 9 o`clock.

9.
Fixing of the MONO TOP 40 corrosion protection tape

Wrap the first winding of the MONO TOP 40 corrosion protection tape with an equal ly strong tension around the KM-pipe.

10.
Fixing of the MONO TOP 40 corrosion protection tape

11.
Fixing of the MONO TOP 40 corrosion protection pipe

The second winding of the MONO TOP 40 corrosion protective tape is wound spirally around the KM pipe with a minimum 50% overlap. It is important to ensure that the release film is removed evenly.

12.
Fixing of the MONO TOP 40 corrosion protection pipe

13.
Finished winding

After completion of the enveloping the MONO Top 40 corrosion protection tape is cut with a sharp knife, and firmly pressed with the palm.

1.
Processing with the winding machine

Insertion of the MONO TOP 40 corrosion protection tape.
Here, the corrosion protection tape MONO TOP 40 is pushed onto the central roll and the release film is laced onto the outer small roll in the designated slot.

Then the winding machine is adjusted.
The large adjusting screw in the center of the winding machine is used to adjust the tension compression. The small lower screw is used to adjust the winding radius.
The following setting calculation can be taken as a basis:

1. Loosen the screw
2. All 4 wheels must touch the base evenly
3. Now the diameter of the KM-pipe is divided by 20, for example 160 mm KM-pipe / 20 = 8 mm
4. The distance between base and one of the wheels should be about 8 mm.
5. Now the screw is hand-tightened.

Then step 9 – 19 are repeated.

a

b

c

d

e

f

g

CORROSION PROTECTIVE TAPES

Corrosion protective tapes are specially designed for high-quality post enveloping of pipes. The material is easy, quick and safe to process at the welding seams bows and fittings. The systems meet the requirements of the DIN 30672 resp. EN 12068 and are DVGW approved.

MonoTop40 One tape system	Load class acc. to EN 12068/DIN 30672 B/30	DVGW-Reg.-No: NV-5180BQ0144
MonoTop40, 1 x 50% overlapping **Primer P27** Total thickness 2,03 mm	System for post enveloping of welding seams, complete pipelines, but especially for bows and fittings up to DN 600. Due to the high flexibility best suitable for manual handling without winder. Mono Top40 is an especially strong self-welding corrosion protection tape with a very flexible plastic outside layer.	
Supporting material		
Adhesive		

Technical Data
Corrosion protection pipe Mono Top 40

Adhesive base	butyl rubber mixture
Base of carrying tape	Polyolefins
Colour	black
Total thickness	1,016 mm
Adhesive thickness inside	0,610 mm
Carrier thickness	0,406 mm
	test method DIN EN 12068
Tensile strength	7 N/mm
Elongation of break	400%
Core diameter	76 mm
Adhesion	**test method** DIN EN 12068
to primer coated steel at 23° C	20 N/10 mm
to primer coated steel at 50° C	3 N/10 mm
to itself	20 N/10 mm
Enveloping resistance	40 KV/mm
Water absorption*	0,60%
Processing temperature**	-35 bis 70°C
Permanent operating temperature	-35 bis 85°C

*measurement with on steel adhesive tape
** temperature of tape minim. 10°C

Demand Mono Top 40
for aquatherm-district heating pipes

Pipe DN (SDR 11)	Casing pipe DA in mm	Width of envelopin-gin mm	Recomm. width MonoTop40	per m MonoTop40	Area for priming in sqm
DN 25	90	650	50	7,35	0,184
DN 32	110	650	50	8,98	0,225
DN 40	110	650	50	8,98	0,225
DN 50	125	650	50	10,21	0,255
DN 65	140	650	50	11,44	0,286
DN 80	160	650	50	13,07	0,327
DN 80 / 100	200	650	50	16,34	0,408
DN 100	225	650	50	18,38	0,459
DN 125	250	650	100	10,21	0,510
DN 150	315	650	100	12,86	0,643
DN 200	400	650	100	16,34	0,816
DN 250	450	650	100	18,38	0,918

Technical data
Primer

Features	Test method	Unit	Typ PSI P27
Colour			black
Density	ASTM 1298	g/cm^3	0,83
Solvent content	ISO 1515	%	27
Viscosity (4 mm needle)	ASTM D 1200	sec.	35
Burning point	ABEL IP 170	°C	-12
Consumption		l/m^3	approx. 0,2 ℓ
Operating temperature		°C	-30 up to 60

AQUATHERM TI-SOCKET

Product specification

The aquatherm ti-socket is a cross-linked heat shrinkable casing system for half-shell joint protection of pre-insulated pipes. This socket is full length shrinkable and is mainly applied in combination with PUR-half-shell technology. The aquatherm ti-socket consists of the following articles which are supplied in a set as one packing unit:

- 1 pc shrink sleeve
- 1 pc casing shrink film
- 1 pc casing shrink film
- 2 pcs PUR –rigid foam insulation element type 1
- 2 pcs PUR – rigid foam insulation element type 2
- 1 pc PP-R welding socket
  (for medium-pipes of dimension 32-125 mm only)
- 2 pcs tension tape
  (only for casing pipes of the dimension 300 mm and more)

The aquatherm ti-socket PLA consists of the following articles, which are supplied as a set in one packing unit:

- 1 Pc shrink sleeve
- 2 Pcs PUR ridgid foam insulation element type 1
- 2 Pcs PUR ridgid foam insulation element type 2
- 1 Pc PP-R-welding socket
  (only for medium pipes of dimension 32 - 125 mm)

All components must be protected from impurities and humidity before and during the processing.

aquatherm ti-socket CSC-X

aquatherm ti-socket PLA

Storage and safety

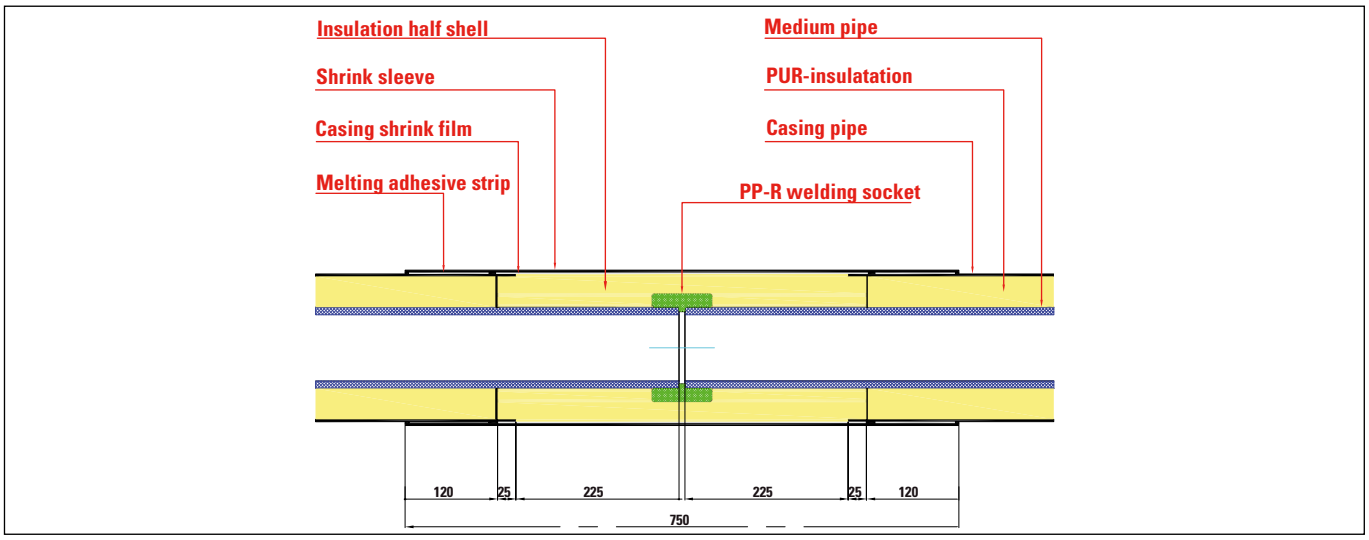
To ensure maximum performance, store aquatherm ISO socket in a dry, ventilated area. Keep products sealed in original cartons and avoid exposure to direct sunlight, rain, snow, dust or other adverse environmental conditions. Avoid storage at temperatures above 80° C or below – 20 °C. Product installation should be made in accordance with local health and safety regulations.

Equipment list for processing

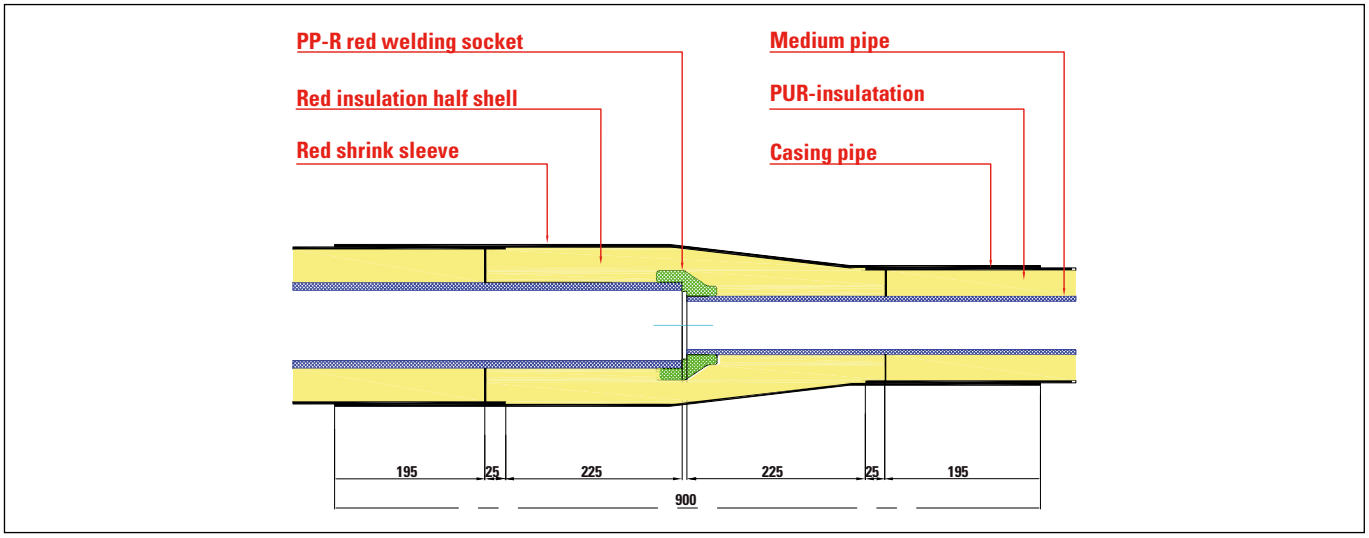
Tools, required for the further processing of the aquatherm ti socket:

- Propane tank with hose, torch and regulator
- Grease and lint-free rag
- Marking pen free from grease
- Ethanol /Spirit (mind. 99,9 %)
- Sandpaper (40-60 grade)
- Measuring tape, knife, cutter, press roll, hard hat, triangular scraper, concave rasp
- Temperature measuring device with contact sensor
- Wooden wedges
- Assembly carrier truck

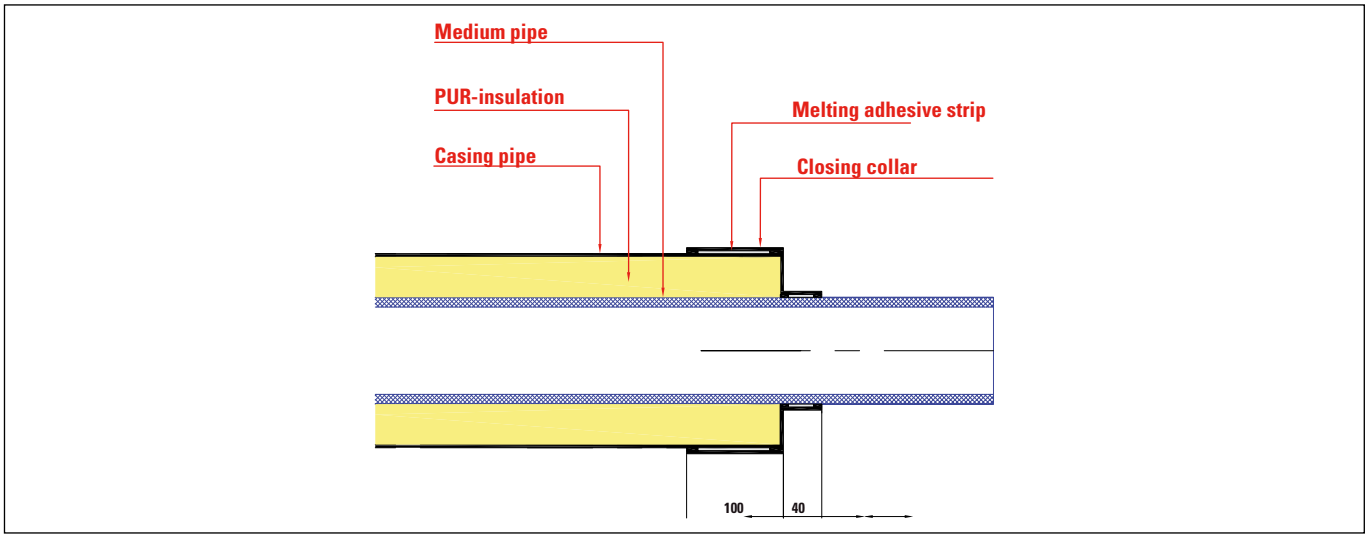
SHRINK SLEEVE SYSTEM



aquatherm ti-socket



aquatherm ti-red-socket

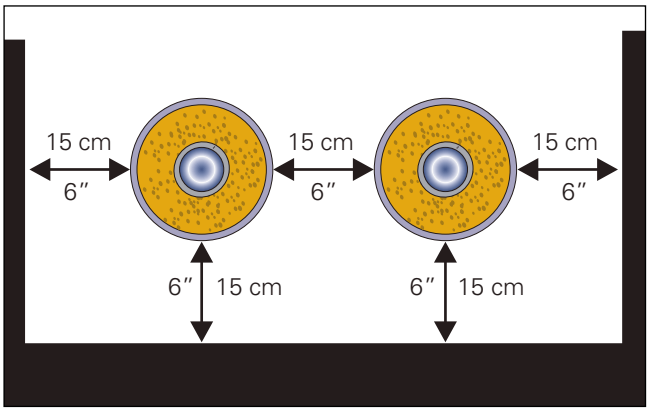


aquatherm ti-closing collar

AQUATHERM TI-SOCKET

Backfilling trench

Correct conditions of the trench must be checked before starting the installation of the district pipeline. The digging of the excavation works must be placed in a way that the installation is not obstructed.
For a professional installation of the aquatherm ti-sockets in the trench, ensure that there is adequate work space area around the pipe in the backfilling trench. The trenchbottem must be free from water and sludge. The pipe laying must meet the requirements.



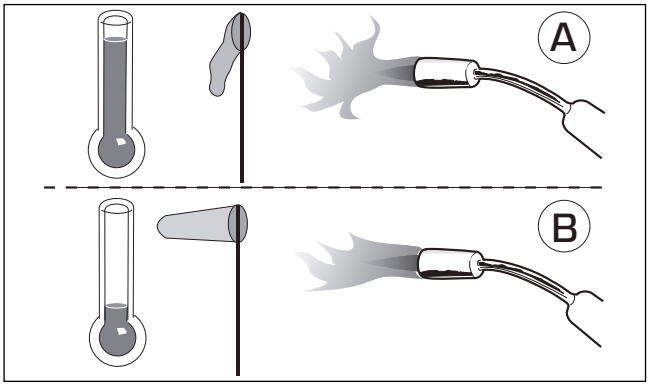
Place requirement

Flame intensity

Adjust the flame according to the outside conditions.

- Use weak yellow flame for thin-walled casing pipe and shrink products, at still air, high outside temperatures and less space in the trench (A)
- Use moderate blue flame for thick-walled casing pipes and shrink products for high wind and low temperatures (B)

Always aim the torch perpendicular to the casing shrink film and shrink sleeve. Move in circumferential direction quickly around the jacket pipe. Do not overheat the casing pipe because there is a risk of burning the PE-casing pipe.



Advices for handling with propane gas torch

1. Casing preparation

1.1 Before connecting the medium pipe and the socket by socket welding respectively by butt-welding, the shrink sleeve must be pulled over one of the both pipe ends. The white protective foil must not be removed yet! During the welding of the medium pipe the shrink sleeve must be protected from burning.

1.2 Dry and clean the whole socket area and all sealing areas from loose impurities with a propane torch and a dry grease and lint-free rag.

1.3 Remove any wet PUR foam from the end of the pre-insulated pipe. The cut should be made with a suitable saw - planar-vertical as possible – to ease the later adjustment of the insulation half shells.

1.4 Remove any burrs and dirt from **all** sealing areas with a triangular scraper or a concave rasp.

AQUATHERM TI-SOCKET

2. Insulation half-shell installation
The insulation half-shells must be adjusted as possible without gaps and without pressing.

2.1 Each with number 1 and 2 marked insulation half-shells is mutually pushed into the cavity at the face sides of the casing pipes. Then they are joined parallel in direction of the medium pipe and turned to the bottom side of the medium pipe.

2.2 Now the other both insulation half-shells marked with number 1 and 2 are inserted as described under 2.1. The key and slot joint of all elements allows a gap-free and custom-fit joining of all shell-elements.

2.3 An additional fixing of the insulation half-shells is made by a customary adhesive tape in the middle.

2.4 Clean the surface of all sealing areas with a rag to remove dirt and degrease the areas with ethanol (min. 99,9 %) by using a grease and lint-free rag.

3. Marking of shrink sleeve position

3.1 For determination of the same overlap on both sides of the casing pipes, the shrink sleeve must be pushed to one end of the casing pipe. Then the end of the shrink sleeve is marked on the other side of the casing pipe.

3.2 Push back the shrink sleeve so far in direction of the starting position that the marking of step 3.1 becomes visible. Meter the distance between marking and leading edge of the casing pipe and mark center distance.

3.3 Pass the dimension of center distance on the casing pipe on the opposite side and mark it also.

AQUATHERM TI-SOCKET

4. Preparation of the seal areas

4.1 Roughen the surface of the casing pipe end complete circumferentially up to the marking by using sandpaper (40 to 60 grade).

4.2 Repeat the working process of step 4.1 also at the other end of the casing pipe.

4.3 Use a dry, grease and lint-free rag with ethanol/spirit (min. 99,9 %) or Tangit cleaning wipes to clean the roughened surface of the casing pipe ends.

5. Assembly of melting adhesive strips

5.1 Heat the cleaned pipe end with a low flame on each side of the pipe up to approximately 80 °C.

5.2 Remove the thinner release liner at the underlap of the melting adhesive strip.

5.3 Attach the melting adhesive strip at the end of the casing pipe in a distance of approx. 30 mm to the marking of the center distance in a 90 °C angle to the pipe axis and wrap around closely.

5.4 Remove the thick release liner on the top side of the melting adhesive strip only in the overlapping area at the beginning of the melting adhesive strip. Gently heat the end of the melting adhesive strip at the bottom side. Then tightly wrap the heated film around the pipe and press it close in the overlapping area.

AQUATHERM TI-SOCKET

5.5 Repeat the described work process of step 5.1 to 5.4 at the other end of the casing pipe.

5.6 Wrap outwards the upper release liner on both sides in a 45 ° angle that the beginning of the film of both melting adhesive strips protrudes over the marking of the center distance.

6. Assembly of casing shrink film

6.1 Remove the release liner at the bottom of the casing shrink film. Center the film over the PUR- insulation sleeve in a 90 °C angle to the pipe axis and wrap closely around the PUR –insulation sleeves. A sufficient overlap of the shrink film of at least 10 cm is important. On both ends the shrink film must overlap the casing pipes with at least 2.5 cm.

6.2 Gently heat the end of the shrink film at the bottom side – like the melting adhesive strips. Then wrap the heated part around the pipe and press it tight in the overlap area.

Before installation check the following:

- film is in full contact with the PUR insulation sleeves and the casing pipe ends
- casing shrink film conforms to the PUR insulation sleeves
- no cracks or holes in film backing

In general the casing shrink film will shrink during the shrink sleeve application, however, the film can be heated gently in advance to remove any wrinkling or to improve profile conformance.

AQUATHERM TI-SOCKET

7. Positioning of the shrink sleeve

7.1 Push the shrink sleeve as far to the marking of the center distance on the other side of the casing pipe until the marking is visible on both sides of the center distance.

7.2 Cut the release liner with a knife from the outside in a way that the release liner in the inside of the shrink sleeve can also be pulled out from one side.

7.3 Pull out the release liner from one side and remove it completely. Position the shrink sleeve in a way that the quality-control number is in the area between "10 and 14 o´clock position".

7.4 Pull off the release liner of the melting adhesive strip and remove it.

7.5 Pull off the release liner of the melting adhesive strip on the other side and remove it. Check the position of the shrink sleeve according to the markings of the center distance on both sides of the casing pipes.

8. Shrinking sequence

8.1 - 8.5 Check the position of the shrink sleeve and the cleanliness in the whole processing area again.

For the processing of the ISO-socket of dimension 315 mm and higher it is advisable for economic and mounting reasons to work with two assemblers and two propane gas torches.

The shrinking process starts at one side of the shrink sleeve. Consider that the shrink sleeve is heated up with a weak propane gas flame (see page 39). The burner head must be swayed slowly around the pipe. **Especially regard the area between "5 and 7 o-clock position".**

The shrinking process must be continued by controlled, spiral forward motions of the burner head around the pipe –form a funnel to avoid air bubbles - and is completed at the other end of the shrink sleeve.

Quality control – "finger test"

During the shrinking process check the "weakness" of the shrink sleeve base and the liquefaction of the hot-melt adhesive in the sealing area by a "finger test". Still existing cold zones can be reheated without any difficulty.

When the shrink sleeve lays evenly tight and without gaps completely around the PUR-insulation jacket respectively around the casing pipes the shrinking process can be finished.


8.1


8.4


8.2


8.5


8.3

9. Processing of the tension tape

The ends of the shrink sleeves for casing pipes with a diameter of 300 mm and more must be fixed with the tension tape (in the installation kit) directly after finishing the shrinking process.

10. Quality control by "finger tip test"

Upon completion of the shrinking process a simple **"finger tip test"** can ensure that the ends of the shrink sleeve do not bent up at any point of the sealing area. If so this area can be reheated.

11. Final control

Upon completion of the above specified work processes the following must be assured:

- The shrink sleeve lays evenly tight and completely around the PUR-insulation jackets and the PE-casing pipes on the whole length.
- The hot-melt adhesive is visible at the outline.
- No cold areas or damages at the shrink sleeve base.

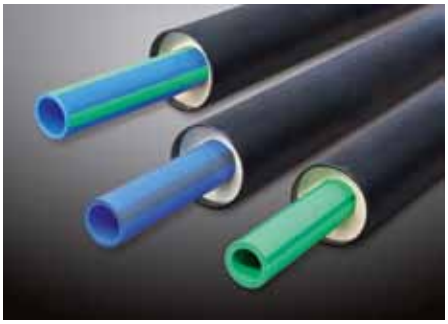
Recommendations

The time between the end of the aquatherm ti-socket processing and the start of the sand back-filling of the pre-insulated aquatherm ti-system elements should be at least 0.5 – 1.0 hour.
The shrinkable base material and the hot-melt adhesive must be cooled down sufficiently and hardened so that the required protection and the peel strength are achieved and a permanent tightness is guaranteed.

Elements / System review

For all aquatherm ti pipe systems the following system elements are available:

- pipes (6 m and 12 m lengths)
- bows 45°
- bows 90°
- branches
- reduces branches
- cross-over branches
- reduced cross-over branches
- ISO shrink sleeve
- ISO reduced shrink sleeve
- ISO closing collar
- special fittings on request
- Compact seals



aquatherm ti - FASER COMPOSITE PIPES

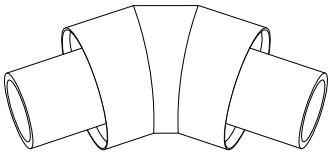
faser composite pipe , length á 5,8 m with PUR rigid foam and coated with a casing pipe made of PEHD

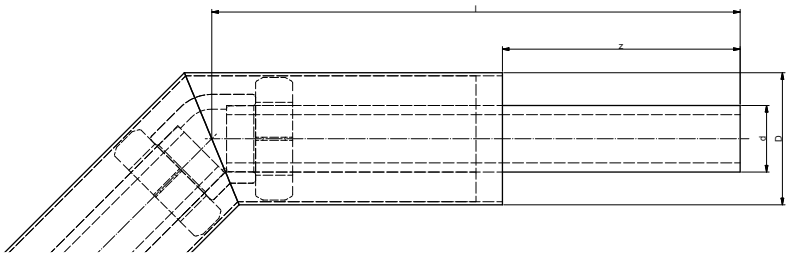
Outside diameter		System								PU	Box unit
		aquatherm green pipe ti SDR 7,4		aquatherm blue pipe ti SDR 11		aquatherm blue pipe ot ti SDR 11		aquatherm blue pipe ti SDR 17,6			
Medium pipe	Casing pipe	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	m/St	
32 mm	90 mm	**1270711**		**2270111**		**2470711**				5,8	
40 mm	110 mm	**1270713**		**2270113**		**2470113**				5,8	
50 mm	110 mm	**1270715**		**2270115**		**2470115**				5,8	
63 mm	125 mm	**1270717**		**2270117**		**2470117**				5,8	
75 mm	140 mm	**1270719**		**2270119**		**2470119**				5,8	
90 mm	160 mm	**1270721**		**2270121**		**2470121**				5,8	
110 mm	200 mm	**1270723**		**2270123**		**2470123**				5,8	
125 mm	225 mm	**1270725**		**2270125**		**2470125**				5,8	10
160 mm	250 mm	**1270729**		**2270129**		**2470129**		**2770129**		5,8	10
200 mm	315 mm	**1270733**		**2270133**		**2470133**		**2770133**		5,8	10
250 mm	400 mm	**1270737**		**2270137**		**2470137**		**2770137**		5,8	10
315 mm	450 mm			**2270141**				**2770141**		5,8	10

aquatherm ti - FASER COMPOSITE PIPES

faser composite pipe , length á 11,6 m with PUR rigid foam and coated with a casing pipe made of PEHD

Outside diameter		System								PU	Box unit
		aquatherm green pipe ti SDR 7,4		aquatherm blue pipe ti SDR 11		aquatherm blue pipe ot ti SDR 11		aquatherm blue pipe ti SDR 17,6			
Medium pipe	Casing pipe	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	m/St	
32 mm	90 mm	**1270712**		**2270112**		**2470712**				11,6	
40 mm	110 mm	**1270714**		**2270114**		**2470114**				11,6	
50 mm	110 mm	**1270716**		**2270116**		**2470116**				11,6	
63 mm	125 mm	**1270718**		**2270118**		**2470118**				11,6	
75 mm	140 mm	**1270720**		**2270120**		**2470120**				11,6	
90 mm	160 mm	**1270722**		**2270122**		**2470122**				11,6	
110 mm	200 mm	**1270724**		**2270124**		**2470124**				11,6	
125 mm	225 mm	**1270726**		**2270126**		**2470126**				11,6	
160 mm	250 mm	**1270730**		**2270130**		**2470130**		**2770130**		11,6	10
200 mm	315 mm	**1270734**		**2270134**		**2470134**		**2770134**		11,6	10
250 mm	400 mm	**1270738**		**2270138**		**2470138**		**2770138**		11,6	10
315 mm	450 mm			**2270142**				**2770142**		11,6	10



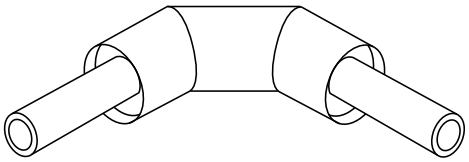


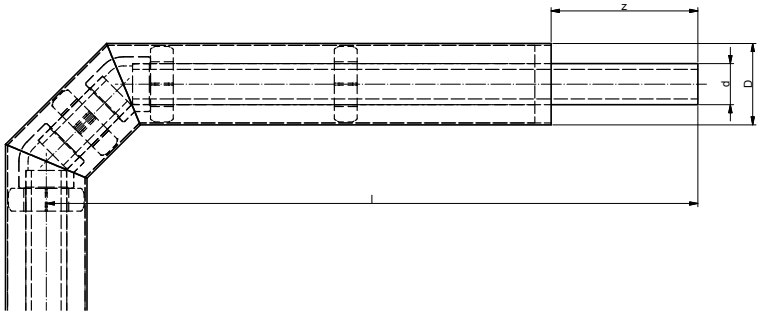
aquatherm ti - ELBOW 45° SL 500

with PUR rigid foam and coated with a casing pipe made of PEHD

Outside diameter				System								PU	Box unit
				aquatherm green pipe ti SDR 7,4		aquatherm blue pipe ti SDR 11		aquatherm blue pipe ot ti SDR 11		aquatherm blue pipe ti SDR 17,6			
d Medium pipe	D Casing pipe	z	l	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	m/St	
32	90	225	500	**1212512**		**2212512**		**2412512**				1	
40	110	225	500	**1212514**		**2212514**		**2412514**				1	
50	110	225	500	**1212516**		**2212516**		**2412516**				1	
63	125	225	500	**1212518**		**2212518**		**2412518**				1	
75	140	225	500	**1212520**		**2212520**		**2412520**				1	
90	160	225	500	**1212522**		**2212522**		**2412522**				1	
110	200	225	500	**1212524**		**2212524**		**2412524**				1	
125	225	225	500	**1212526**		**2212526**		**2412526**				1	
160	250	225	500	**1212530**		**2212531**		**2412531**		**2712530**		1	
200	315	225	500	**1212534**		**2212535**		**2412535**		**2712534**		1	
250	400	225	500	**1212538**		**2212539**		**2412539**		**2712538**		1	
315	450	225	500			**2212543**				**2712542**		1	

Also available in design 15° and 30°.



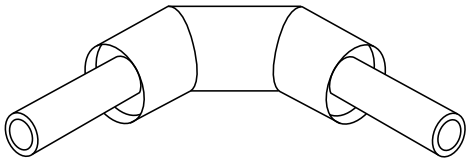


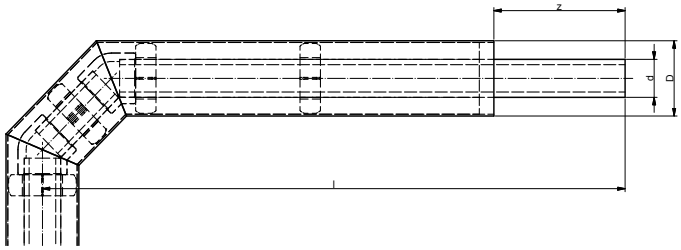
aquatherm ti - ELBOW 90° SL 500

with PUR rigid foam and coated with a casing pipe made of PEHD

Outside diameter				System						PU	Box unit
				aquatherm green pipe ti SDR 7,4		aquatherm blue pipe ti SDR 11		aquatherm blue pipe ti SDR 11			
d Medium pipe	D Casing pipe	z	l	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	m/St	
32	90	225	500	**1212212**		**2212212**		**2412212**		1	
40	110	225	500	**1212214**		**2212214**		**2412214**		1	
50	110	225	500	**1212216**		**2212216**		**2412216**		1	
63	125	225	500	**1212218**		**2212218**		**2412218**		1	
75	140	225	500	**1212220**		**2212220**		**2412220**		1	

Also available in design 60° and 75°.



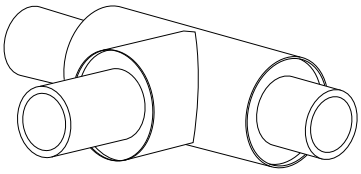


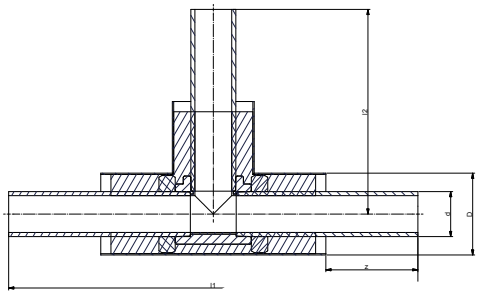
aquatherm ti - ELBOW 90° SL 1000

with PUR rigid foam and coated with a casing pipe made of PEHD

Outside diameter				System								PU	Box unit
				aquatherm green pipe ti SDR 7,4		aquatherm blue pipe ti SDR 11		aquatherm blue pipe ot ti SDR 11		aquatherm blue pipe ti SDR 17,6			
d Medium pipe	D Casing pipe	z	l	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	m/St	
32	90	225	1000	**1212112**		**2212112**		**2412112**				1	
40	110	225	1000	**1212114**		**2212114**		**2412114**				1	
50	110	225	1000	**1212116**		**2212116**		**2412116**				1	
63	125	225	1000	**1212118**		**2212118**		**2412118**				1	
75	140	225	1000	**1212120**		**2212120**		**2412120**				1	
90	160	225	1000	**1212122**		**2212122**		**2412122**				1	
110	200	225	1000	**1212124**		**2212124**		**2412124**				1	
125	225	225	1000	**1212126**		**2212126**		**2412126**				1	
160	250	225	1000	**1212130**		**2212131**		**2412131**		**2712130**		1	10
200	315	225	1000	**1212134**		**2212135**		**2412135**		**2712134**		1	10
250	400	225	1000	**1212138**		**2212139**		**2412139**		**2712138**		1	10
315	450	225	1000			**2212143**				**2712142**		1	10

Also available in design 60° and 75°.

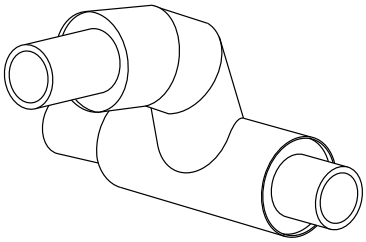


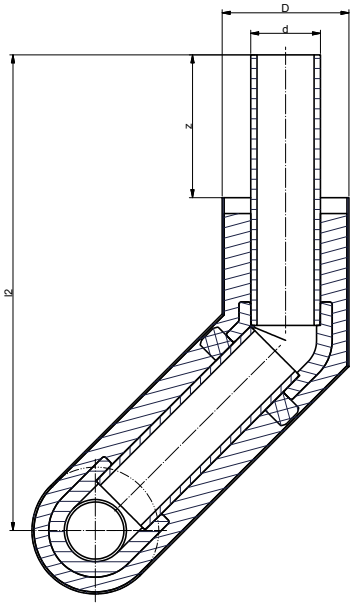


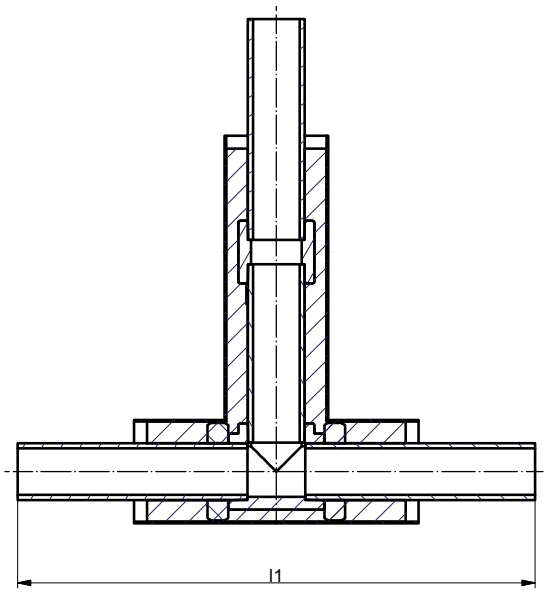
aquatherm ti - BRANCH

with PUR rigid foam and coated with a casing pipe made of PEHD

Outside diameter					System								PU	Box unit
					aquatherm green pipe ti SDR 7,4		aquatherm blue pipe ti SDR 11		aquatherm blue pipe ot ti SDR 11		aquatherm blue pipe ti SDR 17,6			
d Medium pipe	D Casing pipe	z	l1	l2	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	m/St	
32	90	225	1000	500	**1213112**		**2213112**		**2413112**				1	
40	110	225	1000	500	**1213114**		**2213114**		**2413114**				1	
50	110	225	1000	500	**1213116**		**2213116**		**2413116**				1	
63	125	225	1000	500	**1213118**		**2213118**		**2413118**				1	
75	140	225	1000	500	**1213120**		**2213120**		**2413120**				1	
90	160	225	1000	500	**1213122**		**2213122**		**2413122**				1	
110	200	225	1000	500	**1213124**		**2213124**		**2413124**				1	
125	225	225	1000	500	**1213126**		**2213126**		**2413126**				1	
160	250	225	1000	500	**1213130**		**2213131**		**2413131**		**2713130**		1	10
200	315	225	1500	750	**1213134**		**2213135**		**2413135**		**2713134**		1	10
250	400	225	1500	750	**1213138**		**2213139**		**2413139**		**2713138**		1	10
315	450	225	1500	750			**2213143**				**2713142**		1	10



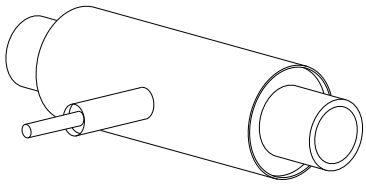


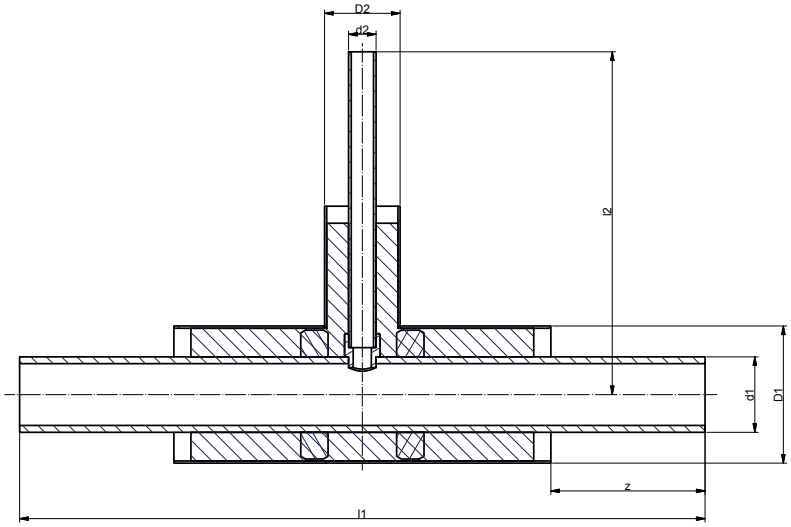


aquatherm ti - CROSS-OVER BRANCH

with PUR rigid foam and coated with a casing pipe made of PEHD

Outside diameter					System								PU	Box unit
					aquatherm green pipe ti SDR 7,4		**aquatherm blue pipe ti** SDR 11		**aquatherm blue pipe ot ti** SDR 11		**aquatherm blue pipe ti** SDR 17,6			
d Medium pipe	D Casing pipe	z	l1	l2	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	m/St	
32	90	225	1000	750	**1218112**		**2218112**		**2418112**				1	
40	110	225	1000	750	**1218114**		**2218114**		**2418114**				1	
50	110	225	1000	750	**1218116**		**2218116**		**2418116**				1	
63	125	225	1000	750	**1218118**		**2218118**		**2418118**				1	
75	140	225	1000	750	**1218120**		**2218120**		**2418120**				1	
90	160	225	1000	750	**1218122**		**2218122**		**2418122**				1	
110	200	225	1000	750	**1218124**		**2218124**		**2418124**				1	
125	225	225	1000	750	**1218126**		**2218126**		**2418126**				1	
160	250	225	1000	1000	**1218130**		**2218131**		**2418131**		**2718130**		1	10
200	315	225	1500	1000	**1218134**		**2218135**		**2418135**		**2718134**		1	10
250	400	225	1500	1000	**1218138**		**2218139**		**2418139**		**2718138**		1	10
315	450	225	1500	1250			**2218143**				**2718142**		1	10

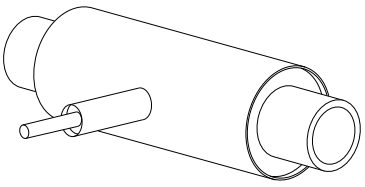


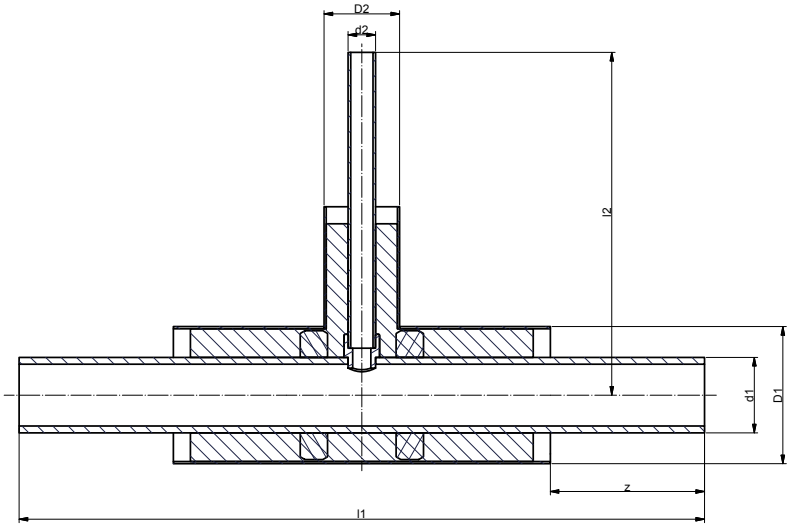


aquatherm ti - RED.-BRANCH SL 500

with PUR rigid foam and coated with a casing pipe made of PEHD

Outside diameter							System								PU	Box unit
							aquatherm green pipe ti SDR 7,4		**aquatherm blue pipe ti** SDR 11		**aquatherm blue pipe ot ti** SDR 11		**aquatherm blue pipe ti** SDR 17,6			
d1 Medium pipe	d2 Medium pipe	D1 Casing pipe	D2 Casing pipe	z	l1	l2	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc		
40	32	110	90	225	1000	500	**1213202**		**2213202**		**2413202**				1	
50	32	110	90	225	1000	500	**1213206**		**2213206**		**2413206**				1	
50	40	110	110	225	1000	500	**1213208**		**2213208**		**2413208**				1	
63	32	125	90	225	1000	500	**1213212**		**2213212**		**2413212**				1	
63	40	125	110	225	1000	500	**1213214**		**2213214**		**2413214**				1	
63	50	125	110	225	1000	500	**1213216**		**2213216**		**2413216**				1	
75	32	140	90	225	1000	500	**1213220**		**2213220**		**2413220**				1	
75	40	140	110	225	1000	500	**1213222**		**2213222**		**2413222**				1	
75	50	140	110	225	1000	500	**1213224**		**2213224**		**2413224**				1	
75	63	140	125	225	1000	500	**1213226**		**2213226**		**2413226**				1	
90	32	160	90	225	1000	500	**1213230**		**2213230**		**2413230**				1	
90	40	160	110	225	1000	500	**1213232**		**2213232**		**2413232**				1	
90	50	160	110	225	1000	500	**1213234**		**2213234**		**2413234**				1	
90	63	160	125	225	1000	500	**1213236**		**2213236**		**2413236**				1	
90	75	160	140	225	1000	500	**1213238**		**2213238**		**2413238**				1	
110	32	200	90	225	1000	500	**1213242**		**2213242**		**2413242**				1	
110	40	200	110	225	1000	500	**1213244**		**2213244**		**2413244**				1	
110	50	200	110	225	1000	500	**1213246**		**2213246**		**2413246**				1	
110	63	200	125	225	1000	500	**1213248**		**2213248**		**2413248**				1	
110	75	200	140	225	1000	500	**1213250**		**2213250**		**2413250**				1	
110	90	200	160	225	1000	500	**1213252**		**2213252**		**2413252**				1	
125	32	225	90	225	1000	500	**1213256**		**2213256**		**2413256**				1	
125	40	225	110	225	1000	500	**1213258**		**2213258**		**2413258**				1	
125	50	225	110	225	1000	500	**1213260**		**2213260**		**2413260**				1	
125	63	225	125	225	1000	500	**1213262**		**2213262**		**2413262**				1	
125	75	225	140	225	1000	500	**1213264**		**2213264**		**2413264**				1	
125	90	225	160	225	1000	500	**1213266**		**2213266**		**2413266**				1	
125	110	225	200	225	1000	500	**1213268**		**2213268**		**2413268**				1	
160	32	250	90	225	1000	500	**1213290**		**2213291**		**2413291**		**2713290**		1	
160	40	250	110	225	1000	500	**1213292**		**2213293**		**2413293**		**2713292**		1	
160	50	250	110	225	1000	500	**1213294**		**2213295**		**2413295**		**2713294**		1	
160	63	250	125	225	1000	500	**1213296**		**2213297**		**2413297**		**2713296**		1	
160	75	250	140	225	1000	500	**1213298**		**2213299**		**2413299**		**2713298**		1	
160	90	250	160	225	1000	500	**1213300**		**2213301**		**2413301**		**2713300**		1	
160	110						**1213302**		**2213303**		**2413303**		**2713302**		1	10
160	125								**2213305**		**2413305**		**2713304**		1	10

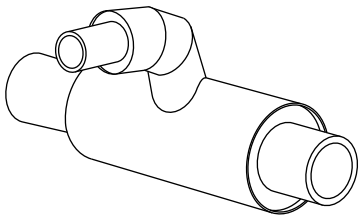


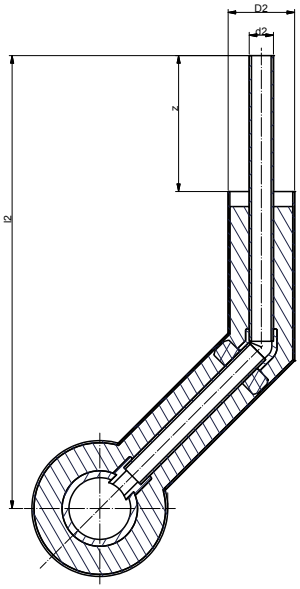


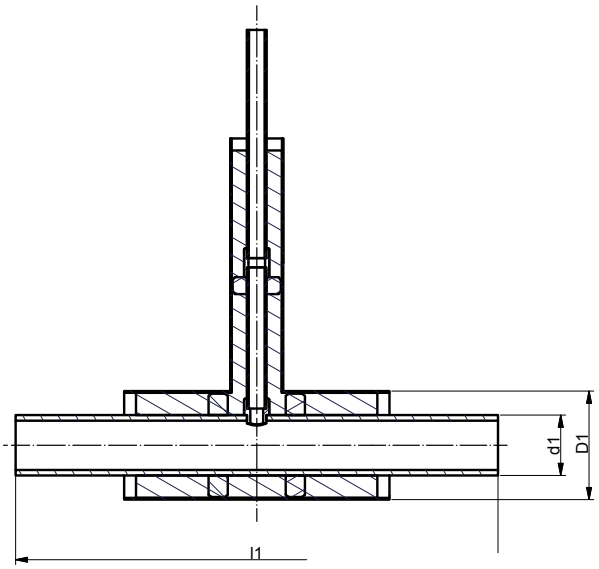
aquatherm ti - RED.-BRANCH SL 750

with PUR rigid foam and coated with a casing pipe made of PEHD

Outside diameter							System								PU	Box unit
							aquatherm green pipe ti SDR 7,4		aquatherm blue pipe ti SDR 11		aquatherm blue pipe ot ti SDR 11		aquatherm blue pipe ti SDR 17,6			
d1 Medium pipe	d2 Medium pipe	D1 Casing pipe	D2 Casing pipe	z	l1	l2	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc		
200	32	315	90	225	1500	750	**1213332**		**2213333**		**2413333**		**2713332**		1	10
200	40	315	110	225	1500	750	**1213334**		**2213335**		**2413335**		**2713334**		1	10
200	50	315	110	225	1500	750	**1213336**		**2213337**		**2413337**		**2713336**		1	10
200	63	315	125	225	1500	750	**1213338**		**2213339**		**2413339**		**2713338**		1	10
200	75	315	140	225	1500	750	**1213340**		**2213341**		**2413341**		**2713340**		1	10
200	90	315	160	225	1500	750	**1213342**		**2213343**		**2413343**		**2713342**		1	10
200	110	315	200	225	1500	750	**1213344**		**2213345**		**2413345**		**2713344**		1	10
200	125	315	225	225	1500	750	**1213346**		**2213347**		**2413347**		**2713346**		1	10
200	160	315	250	225	1500	750	**1213350**		**2213351**		**2413351**		**2713350**		1	10
250	32	400	90	225	1500	750	**1213382**		**2213383**		**2413383**		**2713382**		1	10
250	40	400	110	225	1500	750	**1213384**		**2213385**		**2413385**		**2713384**		1	10
250	50	400	110	225	1500	750	**1213386**		**2213387**		**2413387**		**2713386**		1	10
250	63	400	125	225	1500	750	**1213388**		**2213389**		**2413389**		**2713388**		1	10
250	75	400	140	225	1500	750	**1213390**		**2213391**		**2413391**		**2713390**		1	10
250	90	400	160	225	1500	750	**1213392**		**2213393**		**2413393**		**2713392**		1	10
250	110	400	200	225	1500	750	**1213394**		**2213395**		**2413395**		**2713394**		1	10
250	125	400	225	225	1500	750	**1213396**		**2213397**		**2413397**		**2713396**		1	10
250	160						**1213400**		**2213401**		**2413401**		**2713400**		1	10
250	200						**1213402**		**2213403**		**2413403**		**2713402**		1	10
315	32	450	90	225	1500	750			**2213407**				**2713406**		1	10
315	40	450	110	225	1500	750			**2213409**				**2713408**		1	10
315	50	450	110	225	1500	750			**2213411**				**2713410**		1	10
315	63	450	125	225	1500	750			**2213413**				**2713412**		1	10
315	75	450	140	225	1500	750			**2213415**				**2713414**		1	10
315	90	450	160	225	1500	750			**2213417**				**2713416**		1	10
315	110	450	200	225	1500	750			**2213419**				**2713418**		1	10
315	125	450	225	225	1500	750			**2213421**				**2713420**		1	10
315	160	450	250	225	1500	750			**2213425**				**2713424**		1	10
315	200								**2213429**				**2713428**		1	10
315	250								**2213433**				**2713432**		1	10



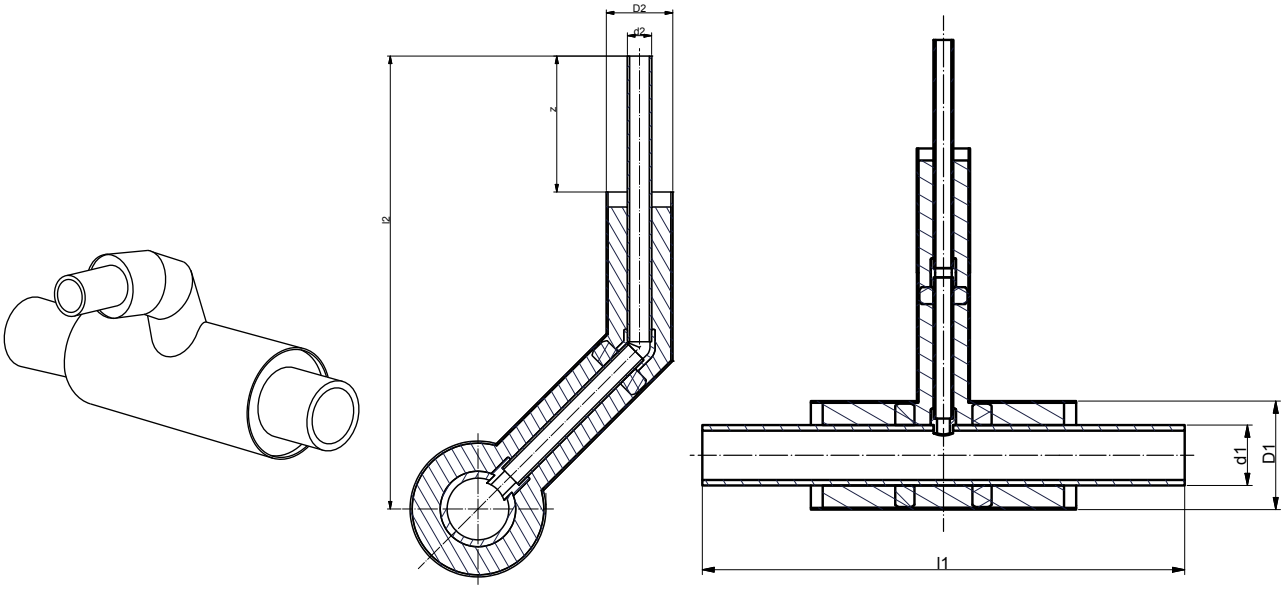




aquatherm ti - RED. CROSS-OVER BRANCH SL 500/750

with PUR rigid foam and coated with a casing pipe made of PEHD

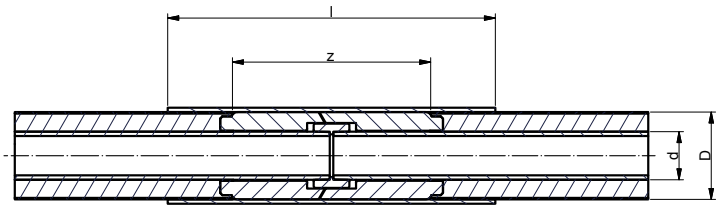
Outside diameter							System								PU	Box unit
							aquatherm green pipe ti SDR 7,4		aquatherm blue pipe ti SDR 11		aquatherm blue pipe ot ti SDR 11		aquatherm blue pipe ti SDR 17,6			
d1 Medium pipe	d2 Medium pipe	D1 Casing pipe	D2 Casing pipe	z	l1	l2	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc				
40	32	110	90	225	1000	750	**1218202**		**2218202**		**2418202**				1	
50	32	110	90	225	1000	750	**1218206**		**2218206**		**2418206**				1	
50	40	110	110	225	1000	750	**1218208**		**2218208**		**2418208**				1	
63	32	125	90	225	1000	750	**1218212**		**2218212**		**2418212**				1	
63	40	125	110	225	1000	750	**1218214**		**2218214**		**2418214**				1	
63	50	125	110	225	1000	750	**1218216**		**2218216**		**2418216**				1	
75	32	140	90	225	1000	750	**1218220**		**2218220**		**2418220**				1	
75	40	140	110	225	1000	750	**1218222**		**2218222**		**2418222**				1	
75	50	140	110	225	1000	750	**1218224**		**2218224**		**2418224**				1	
75	63	140	125	225	1000	750	**1218226**		**2218226**		**2418226**				1	
90	32	160	90	225	1000	750	**1218230**		**2218230**		**2418230**				1	
90	40	160	110	225	1000	750	**1218232**		**2218232**		**2418232**				1	
90	50	160	110	225	1000	750	**1218234**		**2218234**		**2418234**				1	
90	63	160	125	225	1000	750	**1218236**		**2218236**		**2418236**				1	
90	75	160	140	225	1000	750	**1218238**		**2218238**		**2418238**				1	
110	32	200	90	225	1000	750	**1218242**		**2218242**		**2418242**				1	
110	40	200	110	225	1000	750	**1218244**		**2218244**		**2418244**				1	
110	50	200	110	225	1000	750	**1218246**		**2218246**		**2418246**				1	
110	63	200	125	225	1000	750	**1218248**		**2218248**		**2418248**				1	
110	75	200	140	225	1000	750	**1218250**		**2218250**		**2418250**				1	
110	90	200	160	225	1000	750	**1218252**		**2218252**		**2418252**				1	
125	32	225	90	225	1000	750	**1218256**		**2218256**		**2418256**				1	
125	40	225	110	225	1000	750	**1218258**		**2218258**		**2418258**				1	
125	50	225	110	225	1000	750	**1218260**		**2218260**		**2418260**				1	
125	63	225	125	225	1000	750	**1218262**		**2218262**		**2418262**				1	
125	75	225	140	225	1000	750	**1218264**		**2218264**		**2418264**				1	
125	90	225	160	225	1000	750	**1218266**		**2218266**		**2418266**				1	
125	110	225	200	225	1000	750	**1218268**		**2218268**		**2418268**				1	
160	32	250	90	225	1000	750	**1218290**		**2218291**		**2418291**		**2718290**		1	10
160	40	250	110	225	1000	750	**1218292**		**2218293**		**2418293**		**2718292**		1	10
160	50	250	110	225	1000	750	**1218294**		**2218295**		**2418295**		**2718294**		1	10
160	63	250	125	225	1000	750	**1218296**		**2218297**		**2418297**		**2718296**		1	10
160	75	250	140	225	1000	750	**1218298**		**2218299**		**2418299**		**2718298**		1	10
160	90	250	160	225	1000	750	**1218300**		**2218301**		**2418301**		**2718300**		1	10
160	110	250	200	225	1000	750	**1218302**		**2218303**		**2418303**		**2718302**		1	10
160	125	250	225	225	1000	1000	**1218304**		**2218305**		**2418305**		**2718304**		1	10



aquatherm ti - RED. CROSS-OVER BRANCH SL 500/750

with PUR rigid foam and coated with a casing pipe made of PEHD

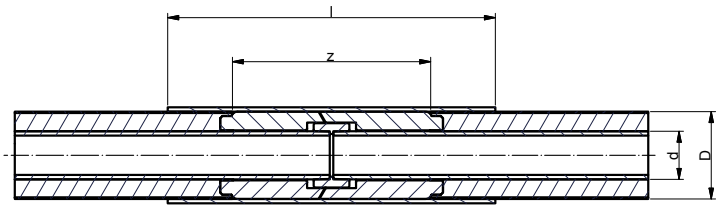
Outside diameter							System								PU	Box unit
							aquatherm green pipe ti SDR 7,4		**aquatherm blue pipe ti** SDR 11		**aquatherm blue pipe ot ti** SDR 11		**aquatherm blue pipe ti** SDR 17,6			
d1 Medium pipe	d2 Medium pipe	D1 Casing pipe	D2 Casing pipe	z	l1	l2	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc		
200	32	315	90	225	1000	750	**1218332**		**2218333**		**2418333**		**2718332**		1	10
200	40	315	110	225	1000	1000	**1218334**		**2218335**		**2418335**		**2718334**		1	10
200	50	315	110	225	1000	1000	**1218336**		**2218337**		**2418337**		**2718336**		1	10
200	63	315	125	225	1000	1000	**1218338**		**2218339**		**2418339**		**2718338**		1	10
200	75	315	140	225	1000	1000	**1218340**		**2218341**		**2418341**		**2718340**		1	10
200	90	315	160	225	1000	1000	**1218342**		**2218343**		**2418343**		**2718342**		1	10
200	110	315	200	225	1000	1000	**1218344**		**2218345**		**2418345**		**2718344**		1	10
200	125	315	225	225	1500	1000	**1218346**		**2218347**		**2418347**		**2718346**		1	10
200	160	315	250	225	1500	1000	**1218350**		**2218351**		**2418351**		**2718350**		1	10
250	32	400	90	225	1000	1000	**1218382**		**2218383**		**2418383**		**2718382**		1	10
250	40	400	110	225	1000	1000	**1218384**		**2218385**		**2418385**		**2718384**		1	10
250	50	400	110	225	1000	1000	**1218386**		**2218387**		**2418387**		**2718386**		1	10
250	63	400	125	225	1000	1000	**1218388**		**2218389**		**2418389**		**2718388**		1	10
250	75	400	140	225	1000	1000	**1218390**		**2218391**		**2418391**		**2718390**		1	10
250	90	400	160	225	1000	1000	**1218392**		**2218393**		**2418393**		**2718392**		1	10
250	110	400	200	225	1000	1000	**1218394**		**2218395**		**2418395**		**2718394**		1	10
250	125	400	225	225	1000	1000	**1218396**		**2218397**		**2418397**		**2718396**		1	10
250	160	400	250	225	1500	1000	**1218400**		**2218401**		**2418401**		**2718400**		1	10
250	200	400	315	225	1500	1000	**1218402**		**2218403**		**2418403**		**2718402**		1	10
315	32	450	90	225	1000	1000			**2218407**				**2718406**		1	10
315	40	450	110	225	1000	1000			**2218409**				**2718408**		1	10
315	50	450	110	225	1000	1000			**2218411**				**2718410**		1	10
315	63	450	125	225	1000	1000			**2218413**				**2718412**		1	10
315	75	450	140	225	1000	1000			**2218415**				**2718414**		1	10
315	90	450	160	225	1000	1000			**2218417**				**2718416**		1	10
315	110	450	200	225	1000	1000			**2218419**				**2718418**		1	10
315	125	450	225	225	1000	1000			**2218421**				**2718420**		1	10
315	160	450	250	225	1000	1000			**2218425**				**2718424**		1	10
315	200	450	315	225	1500	1000			**2218429**				**2718428**		1	10
315	250								**2218433**				**2718432**		1	10



aquatherm ti - SOCKET CSC-X

consists of shrink sleeve with PUR-rigid foam insulation elements and accessories, 750 mm total lengths

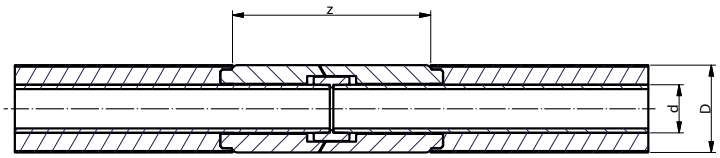
Outside diameter				System aquatherm ti		PU	Box unit
Medium pipe d	Casing pipe D	z	l	Art.-No.	Price € m/pc		
Socket welding: the fitting for the connection of the medium pipes is included in delivery.							
32	90	454,5	750	**1211012**		1	
40	110	456,5	750	**1211014**		1	
50	110	456	750	**1211016**		1	
63	125	455,5	750	**1211018**		1	
75	140	456,5	750	**1211020**		1	70
90	160	456,5	750	**1211022**		1	
110	200	458	750	**1211024**		1	
125	225	460	750	**1211026**		1	
Butt welding: no fitting is required for the connection of the medium pipes							
160	250	445	750	**1211030**		1	
200	315	444	750	**1211034**		1	
250	400	444	750	**1211038**		1	
315	450	444	750	**1211042**		1	



aquatherm ti - SOCKET PLA

consists of shrink sleeve with PUR-rigid foam insulation elements and accessories, 650 mm total lengths

Outside diameter				System aquatherm ti		PU	Box unit
Medium pipe d	Casing pipe D	z	l	Art.-No.	Price € m/pc		
Socket welding: the fitting for the connection of the medium pipes is included in delivery.							
32	90	454,5	650	**2211012**		1	
40	110	456,5	650	**2211014**		1	
50	110	456	650	**2211016**		1	
63	125	455,5	650	**2211018**		1	
75	140	456,5	650	**2211020**		1	70
90	160	456,5	650	**2211022**		1	
110	200	458	650	**2211024**		1	
125	225	460	650	**2211026**		1	
Butt welding: no fitting is required for the connection of the medium pipes							
160	250	445	650	**2211030**		1	
200	315	444	650	**2211034**		1	
250	400	444	650	**2211038**		1	

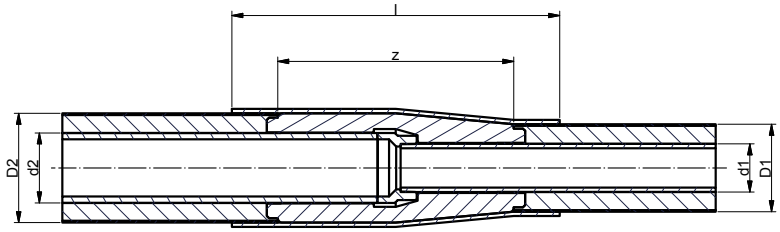


aquatherm ti - INSULATION-SOCKET-SET

Consists of PUR-rigid foam elements and a fitting (socket up to 125 mm) depending on the dimension.

Required accessories for the installation: insulating tape and primer (P. 79)

Outside diameter			System aquatherm ti		PU	Box unit
Medium pipe d	Casing pipe D	z	Art.-No.	Price € m/pc		
Socket welding: the fitting for the connection of the medium pipes is included in delivery.						
32	90	454,5	**2411012**		1	
40	110	456,5	**2411014**		1	
50	110	456	**2411016**		1	
63	125	455,5	**2411018**		1	
75	140	456,5	**2411020**		1	
90	160	456,5	**2411022**		1	
110	200	458	**2411024**		1	
125	225	460	**2411026**		1	
Butt welding: no fitting is required for the connection of the medium pipes						
160	250	445	**2411030**		1	
200	315	444	**2411034**		1	
250	400	444	**2411038**		1	
315	450	444	**2411042**		1	

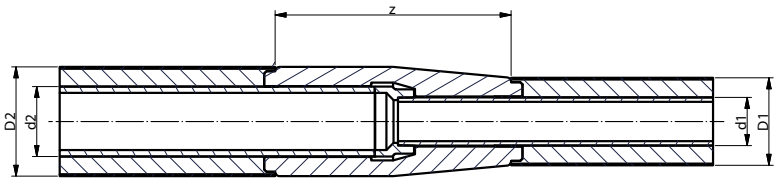


aquatherm ti - REDUCING SOCKET

consists of shrink sleeve with PUR-rigid foam insulation elements, fitting depending on dimension and accessories, 900 mm total lengths

Outside diameter						System aquatherm green pipe ti SDR 7,4 aquatherm blue pipe ti SDR 11		PU	Box unit
d1 Medium pipe	d2 Medium pipe	D1 Casing pipe	D2 Casing pipe	z	l	Art.-No.	Price € m/pc		
Socket welding: up to 125 x 110 mm, than onesided socket- and onesided butt welding									
40	32	90	110	456	750	**1211222**		1	10
50	32	90	110	456	750	**1211228**		1	10
50	40	110	125	456	750	**1211230**		1	10
63	40	110	125	455,5	750	**1211236**		1	10
63	50	110	140	455,5	750	**1211238**		1	10
75	50	110	140	456,5	750	**1211240**		1	10
75	63	125	160	456,5	750	**1211242**		1	10
90	63	125	160	456,5	750	**1211252**		1	10
90	75	140	200	456,5	750	**1211253**		1	10
110	75	140	200	458	750	**1211257**		1	10
110	90	160	225	458	750	**1211259**		1	10
125	90	160	225	458	750	**1211263**		1	10
125	110	200	250	460	750	**1211265**		1	10

Outside diameter						aquatherm green pipe ti SDR 7,4		aquatherm blue pipe ti SDR 11			
d1 Medium pipe	d2 Medium pipe	D1 Casing pipe	D2 Casing pipe	z	l	Art.-No.	Price € m/pc	Art.-No.	Price € m/pc		
160	110	200	250	540	750	**1211274**		**2211275**		1	10
160	125	225	315	540	750	**1211276**		**2211277**		1	10
200	125	225	315	585	750	**1211282**		**2211283**		1	10
Double-sided butt welding											
200	160	250	400	585	750	**1211284**		**2211285**		1	10
250	160	250	400	622	750	**1211288**		**2211289**		1	10
250	200	315	400	622	750	**1211290**		**2211291**		1	10
315	200	315	450,00					**2211297**		1	10
315	250	400	450,00					**2211299**		1	10



aquatherm ti - INSULATION-REDUCING SOCKET-SET

consists of PUR-rigid foam elements and fitting. Required accessories: insulating tape and primer

Outside diameter						System aquatherm ti		PU	Box unit
d2	d1	D1	D2	z	l	Art.-No.	Price € m/pc		
Socket welding: up to 125 x 110 mm, than onesided socket- and onesided butt welding									
40	32	90	110	456	750	**2411222**		1	
50	32	90	110	456	750	**2411228**		1	
50	40	110	125	456	750	**2411230**		1	
63	40	110	125	455,5	750	**2411236**		1	
63	50	110	140	455,5	750	**2411238**		1	
75	50	110	140	456,5	750	**2411240**		1	
75	63	125	160	456,5	750	**2411242**		1	
90	63	125	160	456,5	750	**2411252**		1	
90	75	140	200	456,5	750	**2411253**		1	
110	75	140	200	458	750	**2411257**		1	
110	90	160	225	458	750	**2411259**		1	
125	90	160	225	458	750	**2411263**		1	
125	110	200	250	460	750	**2411265**		1	
160	110	200	250	540	750	**2411274**		1	
160	125	225	315	540	750	**2411276**		1	
200	125	225	315	585	750	**2411282**		1	
Double-sided butt welding									
200	160	250	400	585	750	**2411284**		1	
250	160	250	400	622	750	**2411288**		1	
250	200	315	400	622	750	**2411290**		1	
315	200	315	450,00			**2411296**		1	
315	250	400	450,00			**2411298**		1	

aquatherm ti - MONO TOP 40 INSULATION TAPE

for post-insulation of connections with the aquatherm-insulation-socket set

Art.-No.	Wide	Length	Price € m/pc	PU	Box unit
2411000	50 mm	15 m		1	
2411001	100 mm	15 m		1	

aquatherm ti - PRIMER

Art.-No.	Amount	Price € m/pc	PU	Box unit
2411002	1 Liter		1	

aquatherm ti - CLOSING COLLAR

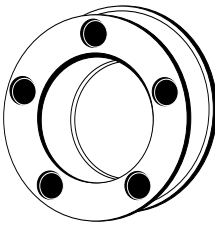
Collar for closing the PUR-insulating layer from casing pipe to medium

Outside diameter		System aquatherm ti		PU	Box unit
Medium pipe	Casing pipe	Art.-No.	Price € m/pc		
32 mm	90 mm	**1214112**		1	
40-50 mm	110 mm	**1214114**		1	
63-75 mm	125-140 mm	**1214118**		1	
90 mm	160 mm	**1214122**		1	
110 mm	200 mm	**1214124**		1	
125 mm	225 mm	**1214126**		1	
160 mm	250 mm	**1214130**		1	
200 mm	315 mm	**1214134**		1	
250 mm	400 mm	**1214138**		1	
315 mm	450 mm	**1214142**		1	

aquatherm ti - COMPACT SEALS

Pipe collar for wall duct.

Outside diameter			System aquatherm ti		PU	Box unit
Core drill hole	Medium pipe	Casing pipe	Art.-No.	Price € m/pc		
150	32	90	**1214212**		1	
200	40-50	110	**1214214**		1	
200	63	125	**1214218**		1	
200	75	140	**1214220**		1	
200	90	160	**1214222**		1	
250	110	200	**1214224**		1	
300	125	225	**1214226**		1	
350	160	250	**1214230**		1	
350	200	315	**1214234**		1	



aquatherm ti - WARNING TAPE

Art.-No.	Wide	Price € m/pc	PU	Box unit
50191	40 mm		250m	10

Colour: yellow
Printing in black:"Attention district heating pipeline"

APPLICATIONS

Management System
ISO 9001:2008
ISO 14001:2004
ISO 50001:2011

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