

BRUGG

Pipes

SPIRAMANT

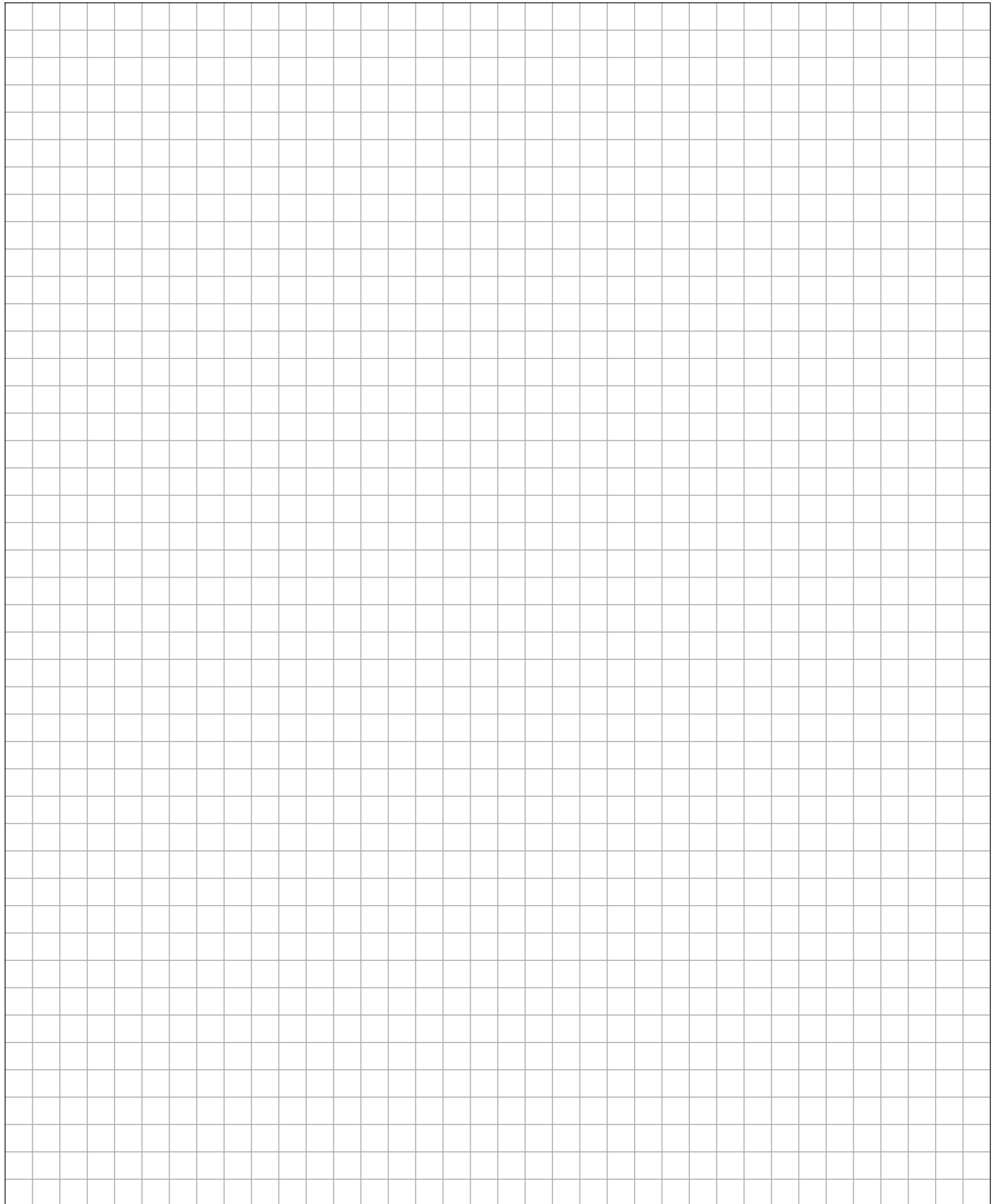
Pre-insulated pipe systems for industrial applications
Technics



**PIONEERS IN
INFRASTRUCTURE**

SPIRAMANT industrial pipes

Notes



SPIRAMANT industrial pipes

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SPIRAMANT industrial pipes

System description

General

Pre-insulated pipelines for industrial applications refer to joint casing pipes and form pieces with a medium pipe made of steel, stainless steel, PE, PP, etc. in a fixed connection with a PUR rigid foam insulation and a casing pipe made of galvanized sheet steel, AZ 185, AlMg and stainless steel (folded spiral-seam pipe with internal or external seam).

A consistently high quality is achieved through fabricated, computer operated production of the pipes with the latest high-pressure foam molding plants.

Spiramant pipes are used for installations inside and outside of buildings, in canals and on pipe bridges.

Industrial applications are for instance:

- Drinking water, effluents, tap water
- Tunnel extinguishing lines
- Bridge lines
- Lines in biogas plants
- Oil- and gas supply
- Transport of chemical media
- Cooling lines in the food industry
- Overground installed lines
- Underground lines with little coverage
- Cooling lines in the automotive industry etc.

The application of a certified quality management system according to DIN EN ISO 9001:2000 guarantees the adherence of the norms, guidelines and quality control measures in every sector of the company.

The production is both environmentally friendly and characterized by an efficient use of energy. It is ensured through certified environmental management systems acc. to DIN EN ISO 14001:2005.

The use of our BRUGG industrial pipes has several advantages in comparison to conventional insulation with mineral wool, including:

- Assembly time shortens significantly
- Energy conservation due to significantly reduced loss of heat
- Reduction of outside- diameter due to use of PUR foam insulation
- No pervasion of the protective shell or insulation layer due to pipe support, thereby avoidance of resulting corrosion damage on the medium pipe due to invading humidity
- Avoidance of thermal bridges through direct attachment of the pipes on the protective shell of the joint casing pipe
- Ability to walk the pipelines due to high resistance to pressure of the joint insulation
- Staging only required on joint pipes

BRUGG Pipes produces customized pipe systems which are assembled to problem solving systems acc. to special customer requests.

Applications

Maximum operating temperature:	144 °C
Maximum accepted operating pressure:	25 bar

SPIRAMANT industrial pipes

System description

Medium pipe – bars, form pieces

Bars:**Welded steel pipes**

Longitudinal welded or spiral welded steel pipes

Quality: $\varnothing \leq 323.9$ mm P235GH/P215 NL
EN 10217/10216 $\varnothing > 323.9$ mm P235GH/P215 NL
EN 10220/EN 10217/10216

Standard: EN 253

Test certificate: EN 10204 – 3.1

Welding bevel: wall thickness > 3.2 mm acc. to
DIN 2559-1, index 21 and 22**Galvanized steel**

Standard: threaded pipe acc. to DIN 2440

Black steels

Standard: quality L235 GA, L290 GA (DIN 10208)

Stainless steel pipe for the food and beverage industryLongitudinal seam- welded stainless-steel pipes acc. to
EN ISO1127, DIN 11850Inspection scope acc. to DIN 17457 PK1, welding seam factor
 $V = 1.0$, inspection certificate acc. to EN 10204/3.1B, otherwise
acc. to customers specification, in standard length 6 m**Welded stainless steel pipe**Acc. to DIN EN 10357:2014-03 acc. to customers specification,
with inspection certificate EN 10204-3.1, inspection scope acc.
to DIN 17457.Special inspection scope acc. to AD 2000 information sheet
W2 necessarily specify, measurements are deliverable acc.
to ASME/ ASTM standard, delivery length 6 m. Other lengths
on request.Preferential material: 1.4301, 1.4307 and 1.4404 acc. to DIN EN
ISO 11127 (DIN 2462) acc. to customers specifications. With
inspection certificate EN 10204-3.1, inspection scope acc. to
DIN 17456 and 17458, measurement also deliverable acc. to
ASME/ ASTM standard, delivery length 6 m. Other lengths on
request.

Preferential material: 1.4301, 1.4404 ... 1.4571

Thin-walled, welded stainless steel pipe

Geberit - Mapress, Viega – Sanpress, NiRoSta

Standard material: 1.4404

Copper pipe

Cu – DHP for gas-, drinking water and heating systems

Copper pipe acc. to EN 1057 for use in gas-, drinking water and
heating installations, in delivery lengths of 5 m.

Copper pipe for cooling systems:

Copper pipe (SF-Cu) acc. to EN 1057 and 12735-1 (former
DIN 8905) respectively, for transport of media in cooling
and air conditioning systems, ends covered with cap, in 5 m
lengths.**Form pieces:****T-pieces**Flued opening achieved from longitudinal seam welded steel
pipes, with welded T- piece acc. to EN 10253 (formerly DIN
2615) or with swaged socket. Material and quality correspond
with the straight, welded or seamless pipes.

Standard: based on EN 448

Inspection certificate: EN 10204 – 3.1

Welding bevel: from wall thickness > 3.2 mm acc. to
DIN 2559-1, index number 21 and 22**Bends**are made of welding arches acc. to EN 10253 (formerly
DIN 2605) with welded-on pipe ends, from cold-bend (seam-
less or welded) steel pipes or with swaged socket. Material
and quality correspond with the straight, welded or seamless
pipes.

Standard: based on EN 448

Test report: EN 10204 – 2.2

Inspection certificate: EN 10204 – 3.1

Welding bevel: from wall thickness > 3.2 mm acc. to
DIN 2559-1, index 21 and 22**Reductions**consist of weld reduction acc. to EN 10253-2 type B (formerly
DIN 2616-2) with welded on pipe ends or from swaged socket
with pipe cylinder. Material and quality correspond with the
straight, welded or seamless pipes.

Standard: based an EN 448

Test report: EN 10204-2.2

Inspection certificate: EN 10204-3.1

Welding bevel: from wall thickness > 3.2 mm acc. to
DIN 2559-1 index 21 and 22

SPIRAMANT industrial pipes

System description

Medium pipe – cooling lines

Cooling lines:

In order to meet the increased requirements on corrosion prevention for cooling lines, the technical rules for corrosion prevention in the steel hydraulics construction must be followed, which includes high-quality underground preliminaries for varnish systems that are constantly exposed to condensate in sufficient coating thickness and high workmanship

Coating C-steel

Pipes are treated acc. to AGI 151 (revised version 01/2003), surface prepared acc. to DIN EN ISO 12944-4, with a standard degree of purity SA 2,5, coating acc. to AGI 151 table 1.3.

Coating stainless steel

Pipes are treated acc. to AGI 151 (revised version 01/2003), surface prepared acc. to DIN EN ISO 12944-4, sweep-rays with roughness depth Rz > 20µm, coating acc. to AGI 151 table 2.1.

Priming coat with 2K-EP-zinc phosphate 80 µm
1st top coat with 2K-EP-micaceous iron ore 80 µm

Total coat thickness 160 µm

Respectively:

Priming coat with 2K-EP-zinc phosphate 80 µm
1st top coat with 2K-EP-micaceous iron ore 80 µm
2nd top coat with 2K-EP-micaceous iron ore 80 µm

Total coat thickness 240 µm

SPIRAMANT industrial pipes

System description

Heat insulation, supplementary insulation

Heat insulation:

Material: Polyurethane foam (pentane-driven), made of the 3 components polyol, isocyanate, cyclopentane.

The mixture and dosing are carried out in high-pressure processors.

PUR insulation	reference temperature	value SPIRAMANT	test standard
compression thickness		≥ 0.3 MPa	EN 253
heat conductivity	50 °C	≤ 0.026 W/mK	DIN 52612
closed-cellness		≥ 96 %	DIN ISO 4590
water absorption after 24 h		≤ 10 %	DIN EN 12087

Fire protection pipe

For pipelines with requirements on fire protection, insulations of building material rating B1 acc. to DIN 4102/2 are available. For this kind of joint casing pipes, a B2-PUR rigid foam is used. The license for flame-resistant building materials was granted by an independent testing institute with the certification report number P-2006-6-1252.

Supplementary insulation:

Standard: EN489

Implementation:

- Performed by trained assembly personnel
- Foaming and sealing of the connection sleeve with polyurethane foam
- Sealing of the sleeve area with dampproof foil
- Connection of the surveillance wires
- Insulation of the montage components by the local penal-beater

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System description

Casing pipe, areas of application and delivery lengths

Casing pipe

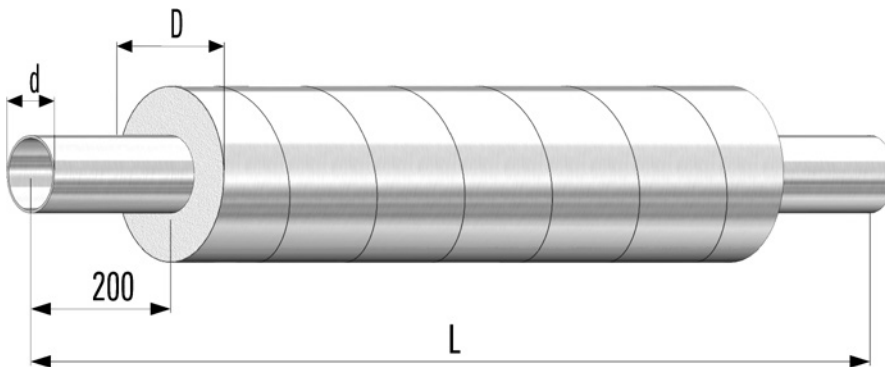
Interior seam as standard acc. to DIN 24145

Outside-diameter d_a mm	thickness of casing pipe type of material				Outside-diameter d_a mm	thickness of casing pipe type of material			
	AlMg ³ Aluminium mm	st. galv. steel galvanized mm	AZ 185 aluminum galvanized mm	V2A stainless steel mm		AlMg ³ Aluminium mm	st. galv. steel galvanized mm	AZ 185 aluminum galvanized mm	V2A stainless steel mm
112	0.6	0.6	0.6	0.6	315	0.6/0.8	0.6/0.8	0.6/0.8	0.6
125	0.6	0.6	0.6	0.6	355	0.6/0.8	0.6/0.8	0.6/0.8	0.6
140	0.6	0.6	0.6	0.6	400	0.6/0.8	0.6/0.8	0.6/0.8	0.6
160	0.6	0.6	0.6	0.6	450	0.6/0.8	0.6/0.8	0.6/0.8	0.6
168	0.6	0.6	0.6	0.6	500	0.6/0.8	0.6/0.8	0.6/0.8	0.6
180	0.6	0.6	0.6	0.6	560	0.6/0.8	0.6/0.8	0.6/0.8	0.6
200	0.6	0.6	0.6	0.6	630	0.6/0.8	0.6/0.8	0.6/0.8	0.6
225	0.6	0.6	0.6	0.6	710	0.6/0.8	0.6/0.8	0.6/0.8	0.6
250	0.6	0.6	0.6	0.6	800	0.6/0.8	0.6/0.8	0.6/0.8	0.6
280	0.6	0.6	0.6	0.6					

Areas of application and delivery lengths

Medium pipe	dimension mm	delivery lengths			casing pipe Spiro	temperature °C
		5 m	6 m	12/16 m		
P235GH	15 - 20 25 - 1000	- -	x x	- x	x	≤ 144
stainless steel	4.0 - 406.4	-	x	on request	x	≤ 144
1.4301						
1.4404						
1.4462						
1.4539						
1.4541						
1.4571						
stainless steel	12 - 108	-	x	on request	x	≤ 100
Mapress					on request	≤ 140
Sanpress						
C-steel	12 - 108	-	x	on request	x	≤ 100
Mapress					on request	≤ 120
Sanpress						
Copper pipe	12 - 108	x	-	-	x	≤ 100
					x	≤ 120

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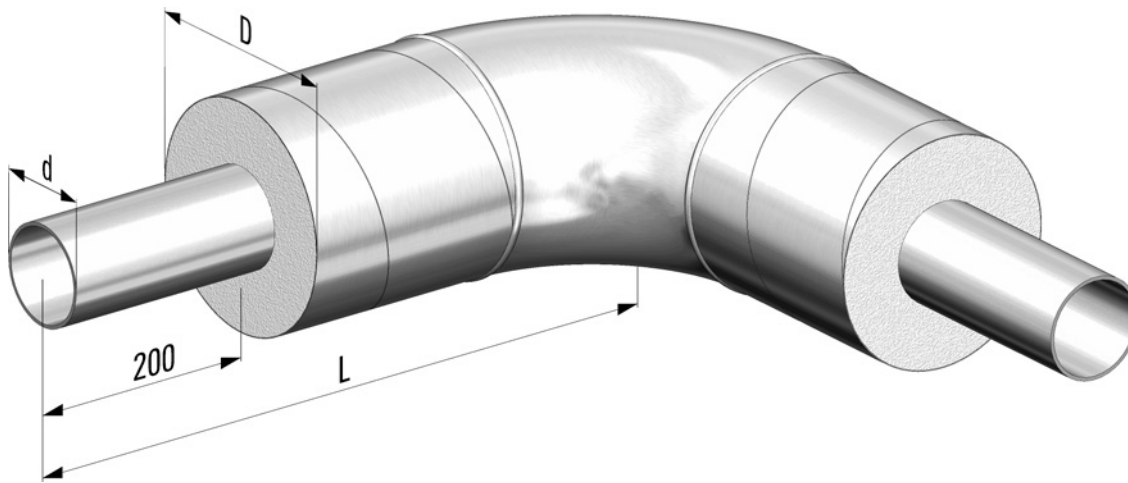
Folded spiral-seam pipe

Nominal width DN	insulation thickness 1 D mm	insulation thickness 2 D mm	insulation thickness 3 D mm	Enev 100 % D mm	Enev 200 % D mm
15	90	112	125	90	90
20	90	112	125	90	112
25	90	112	140	90	112
32	112	125	140	112	160
40	112	125	140	125	180
50	125	140	160	140	224
65	140	160	180	180	280
80	160	180	200	224	315
100	200	224	250	250	355
125	224	250	280	280	400
150	250	280	315	315	450
200	315	355	400	400	500
250	400	450	500	450	560
300	450	500	560	500	630
350	500	560	630	500	630
400	560	630	710	560	710
450	630	710	800	630	800
500	710	800	-	710	800
600	800	-	-	800	-

In Germany wiring systems in heating-, cooling- and ventilation and air conditioning systems are subjects of the Energy-Saving Enactment (Energiesparverordnung, EnEV). It calls for an insulation thickness of 200 % for outside installations.

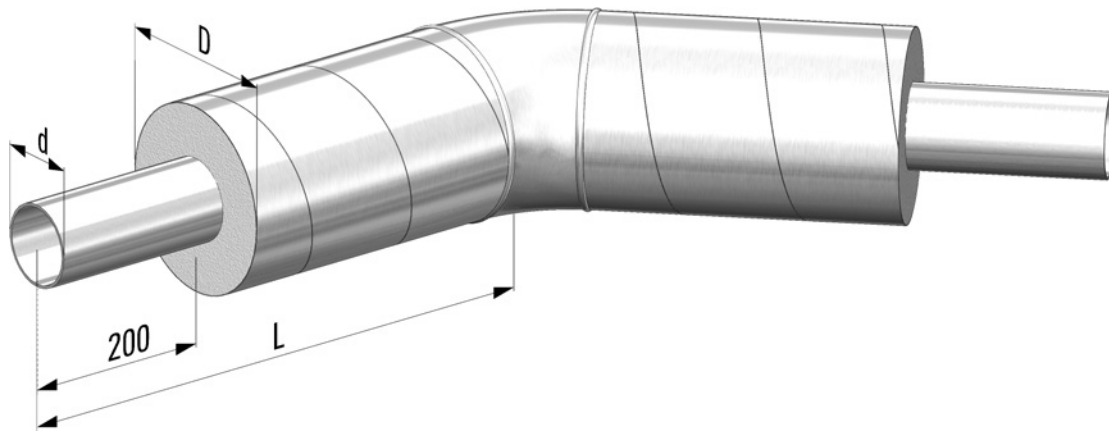
This thickness is based on a heat conductivity of $\lambda = 0.035 \text{ W}/(\text{mK})$. The SPIRAMANT PUR- insulation has a heat conductivity of $\lambda = 0.026 \text{ W}/(\text{mK})$. Therefore, the necessary thickness and the resulting outside diameter can be reduced whilst achieving the same insulation effect.

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Bends, isosceles 90°, 60°

Nominal width	insulation thickness 1	insulation thickness 2	insulation thickness 3	insulation thickness 1	insulation thickness 2	insulation thickness 3
DN	Leg length L	Leg length L	Leg length L	D	D	D
	mm	mm	mm	mm	mm	mm
15	500	500	500	90	112	125
20	500	500	500	90	112	125
25	500	500	500	90	112	140
32	500	500	500	112	125	140
40	500	500	500	112	125	140
50	500	500	500	125	140	160
65	500	500	600	140	160	180
80	500	600	600	160	180	200
100	600	600	600	200	224	250
125	600	600	650	224	250	280
150	600	650	650	250	280	315
200	650	700	750	315	355	400
250	750	800	850	400	450	500
300	800	850	900	450	500	560
350	850	900	1000	500	560	630
400	900	1000	1100	560	630	710
450	1000	1100	1200	630	710	800
500	1100	1200	-	710	800	-
600	1200	-	-	800	-	-

SPIRAMANT industrial pipes

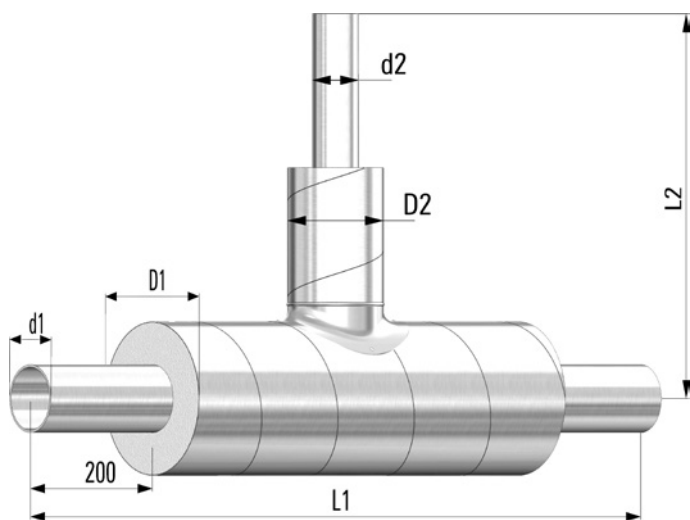
Bends, isosceles 45°, 30°, 15°

Nominal width	insulation thickness 1	insulation thickness 2	insulation thickness 3	insulation thickness 1	insulation thickness 2	insulation thickness 3
DN	Leg length L	Leg length L	Leg length L	D	D	D
	mm	mm	mm	mm	mm	mm
15	400	400	400	90	112	125
20	400	400	400	90	112	125
25	400	400	400	90	112	140
32	400	400	400	112	125	140
40	400	400	400	112	125	140
50	400	400	400	125	140	160
65	400	400	400	140	160	180
80	400	400	500	160	180	200
100	450	500	500	200	224	250
125	450	500	500	224	250	280
150	450	500	500	250	280	315
200	500	500	500	315	355	400
250	500	600	600	400	450	500
300	600	600	600	450	500	560
350	600	600	600	500	560	630
400	600	600	700	560	630	710
450	600	700	700	630	710	800
500	700	700	-	710	800	-
600	700	-	-	800	-	-

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T-piece 90°

Insulation size 1

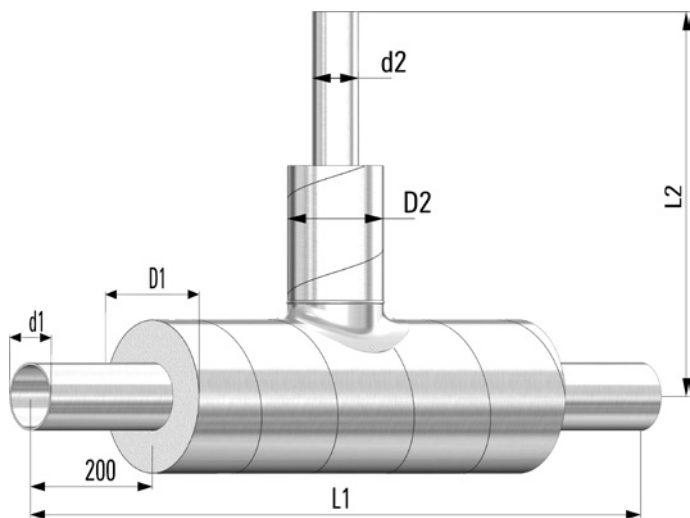


main line		branch line																	
		d2	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	
		D2	90	90	90	112	112	125	140	160	200	224	250	315	400	450	500	560	
d1	D1																		
15	90	L2	500																
		L1	1000																
20	90	L2	500	500															
		L1	1000	1000															
25	90	L2	500	500	500														
		L1	1000	1000	1000														
32	112	L2	600	600	600	600													
		L1	1000	1000	1000	1000													
40	112	L2	600	600	600	600	600												
		L1	1000	1000	1000	1000	1000												
50	125	L2	600	600	600	600	600	700											
		L1	1000	1000	1000	1000	1000	1000											
65	140	L2	600	600	600	600	600	700	700										
		L1	1000	1000	1000	1000	1000	1000	1000										
80	160	L2	600	600	600	600	600	700	700	700									
		L1	1000	1000	1000	1000	1000	1000	1000	1000									
100	200	L2	600	600	600	600	600	700	700	700	700								
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1000								
125	224	L2	600	600	600	600	600	700	700	700	700	700							
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1000	1200							
150	250	L2	700	700	700	700	700	700	700	700	700	700	700						
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1200	1200					
200	315	L2	700	700	700	700	700	700	700	700	700	700	700	700					
		L1	1000	1000	1000	1000	1000	1200	1200	1200	1200	1200	1200	1200	1200				
250	400	L2	700	700	700	700	700	700	700	700	700	700	700	700	700				
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1000	1200	1200	1200	1200	1400			
300	450	L2	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800		
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1200	1200	1200	1400	1500		
350	500	L2	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1000	1200	1200	1200	1400	1500	1600		
400	560	L2	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1000	1200	1200	1200	1400	1500	1600	1600	
450	630	L2	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1000	1200	1200	1200	1400	1500	1600	1600	

SPIRAMANT industrial pipes

T-piece 90°

Insulation size 2

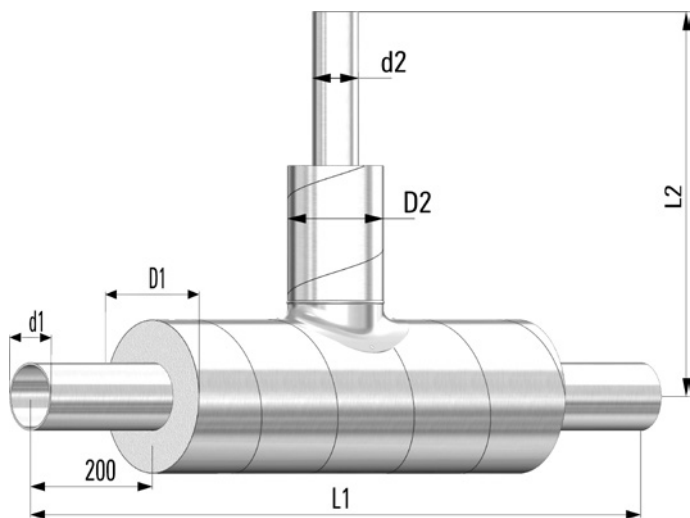


main line		branch line																	
		d2	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	
		D2	112	112	112	125	125	140	160	180	224	250	280	355	450	500	560	630	
d1	D1																		
15	112	L2	600																
		L1	1000																
20	112	L2	600	600															
		L1	1000	1000															
25	112	L2	600	600	600														
		L1	1000	1000	1000														
32	125	L2	600	600	600	700													
		L1	1000	1000	1000	1000													
40	125	L2	600	600	600	700	700												
		L1	1000	1000	1000	1000	1000												
50	140	L2	600	600	600	700	700	700											
		L1	1000	1000	1000	1000	1000	1000											
65	160	L2	600	600	600	700	700	700	700										
		L1	1000	1000	1000	1000	1000	1000	1000										
80	180	L2	600	600	600	700	700	700	700	700									
		L1	1000	1000	1000	1000	1000	1000	1000	1000									
100	224	L2	600	600	600	700	700	700	700	700	700								
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1100								
125	250	L2	700	700	700	700	700	700	700	700	700	700							
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1100	1200							
150	280	L2	700	700	700	700	700	700	700	700	700	700	700						
		L1	1000	1000	1000	1000	1200	1200	1200	1000	1100	1200	1200						
200	355	L2	700	700	700	700	700	700	700	700	700	700	700	700					
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1100	1200	1200	1200					
250	450	L2	800	800	800	800	800	800	800	800	800	800	800	800	800				
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1100	1200	1200	1200	1400				
300	500	L2	800	800	800	800	800	800	800	800	800	800	800	800	800	800			
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1100	1200	1200	1200	1400	1500			
350	560	L2	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800		
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1100	1200	1200	1200	1400	1500	1600		
400	630	L2	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1100	1200	1200	1200	1400	1500	1600	1600	

SPIRAMANT industrial pipes

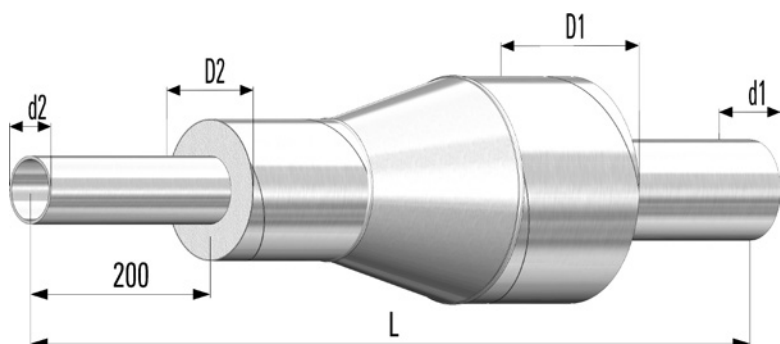
T-piece 90°

Insulation size 3



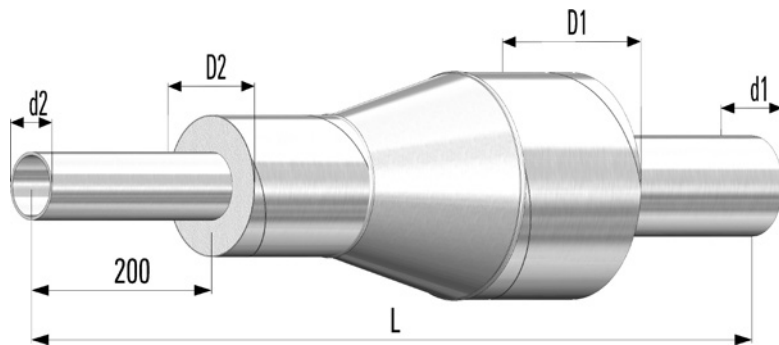
main line		branch line															
		d2	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350
		D2	125	125	125	140	140	160	180	200	250	280	315	400	500	560	630
d1	D1																
15	125	L2	700														
		L1	1000														
20	125	L2	700	700													
		L1	1000	1000													
25	125	L2	700	700	700												
		L1	1000	1000	1000												
32	140	L2	700	700	700	700											
		L1	1000	1000	1000	1000											
40	140	L2	700	700	700	700	700										
		L1	1000	1000	1000	1000	1000										
50	160	L2	700	700	700	700	700	700									
		L1	1000	1000	1000	1000	1000	1000									
65	180	L2	700	700	700	700	700	700	700								
		L1	1000	1000	1000	1000	1000	1000	1000								
80	200	L2	700	700	700	700	700	700	700	700							
		L1	1000	1000	1000	1000	1000	1000	1000	1000							
100	250	L2	700	700	700	700	700	700	700	700	700						
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1100						
125	280	L2	700	700	700	700	700	700	700	700	700	700					
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1000	1100	1200				
150	315	L2	700	700	700	700	700	700	700	700	700	700	700				
		L1	1000	1000	1000	1000	1200	1200	1200	1000	1100	1200	1200				
200	400	L2	700	700	700	700	700	700	700	700	700	700	700	700			
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1100	1200	1200	1200			
250	500	L2	800	800	800	800	800	800	800	800	800	800	800	800	800		
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1100	1200	1200	1200	1400		
300	560	L2	800	800	800	800	800	800	800	800	800	800	800	800	800	800	
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1100	1200	1200	1200	1400	1500	
350	630	L2	800	800	900	800	800	800	800	800	800	800	800	800	800	800	800
		L1	1000	1000	1000	1000	1000	1000	1000	1000	1100	1200	1200	1200	1400	1500	1600

SPIRAMANT industrial pipes

Reduction

Measurement	insulation series			Measurement	insulation series			length
d1	D1	D1	D1	d2	D2	D2	D2	
	DS1	DS2	DS3		DS1	DS2	DS3	
	mm	mm	mm		mm	mm	mm	mm
32	112	125	140	15	90	112	125	750
				20	90	112	125	
				25	90	112	125	
40	112	125	140	15	90	112	125	750
				20	90	112	125	
				25	90	112	125	
				32	112	125	140	
50	125	140	160	20	90	112	125	750
				25	90	112	125	
				32	112	125	140	
				40	112	125	140	
65	140	160	180	25	90	112	125	800
				32	112	125	140	
				40	112	125	140	
				50	125	140	160	
				65	140	160	180	
80	160	180	200	32	112	125	140	800
				40	112	125	140	
				50	125	140	160	
				65	140	160	180	
				80	160	180	200	
100	200	224	250	40	112	125	140	900
				50	125	140	160	
				65	140	160	180	
				80	160	180	200	
125	224	250	280	50	125	140	160	900
				65	140	160	180	
				80	160	180	200	
				100	200	224	250	
				125	224	250	280	
150	250	280	315	65	140	160	180	950
				80	160	180	200	
				100	200	224	250	
				125	224	250	280	
				150	250	280	315	
200	315	355	400	80	160	180	200	1000
				100	200	224	250	
				125	224	250	280	
				150	250	280	315	

SPIRAMANT industrial pipes

Reduction

Measurement	insulation series			Measurement	insulation series			length
d1	D1	D1	D1	d2	D2	D2	D2	
	DS1	DS2	DS3		DS1	DS2	DS3	
	mm	mm	mm		mm	mm	mm	mm
250	400	450	500	100	200	224	250	1100
				125	224	250	280	
				150	250	280	315	
				200	315	355	400	
300	450	500	560	125	224	250	280	1100
				150	250	280	315	
				200	315	355	400	
				250	400	450	500	
350	500	560	630	150	250	280	315	1200
				200	315	355	400	
				250	400	450	500	
				300	450	500	560	
400	560	630	710	200	315	355	400	1200
				250	400	450	500	
				300	450	500	560	
				350	500	560	630	
450	630	710	800	250	400	450	500	1200
				300	450	500	560	
				350	500	560	630	
				400	560	630	710	
500	710	800		300	450	500	560	1200
				350	500	560	630	
				400	560	630	710	
				450	630	710	-	
600	800	-	-	350	500	560	630	1200
				400	560	630	-	
				450	630	-	710	
				500	710	-	-	

SPIRAMANT industrial pipes

Sleeve joint

System description



The final sealing on the outside is carried out after the foaming process in this technology. The result and the quality of the PUR foam can be examined reliably at each sleeve.

Components of the sleeve system:

- PUR foam, made of the liquid components polyol and isocyanate (see SPI 6.410)
- Sealing damp proof foil
- Aluminum tape
- SPIRAMANT sleeve frame made of steel sheet

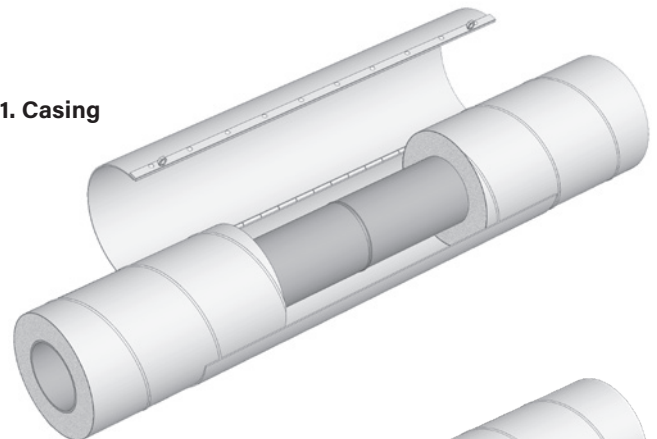
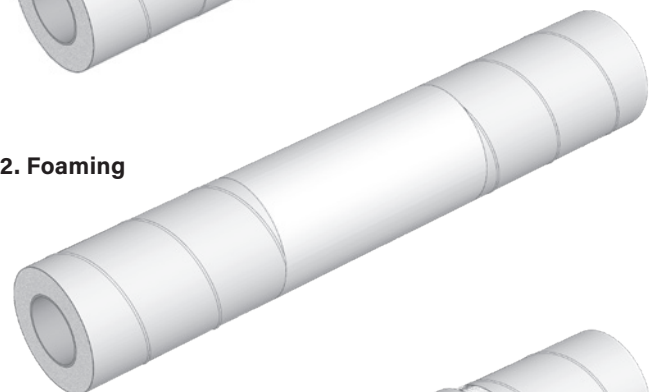
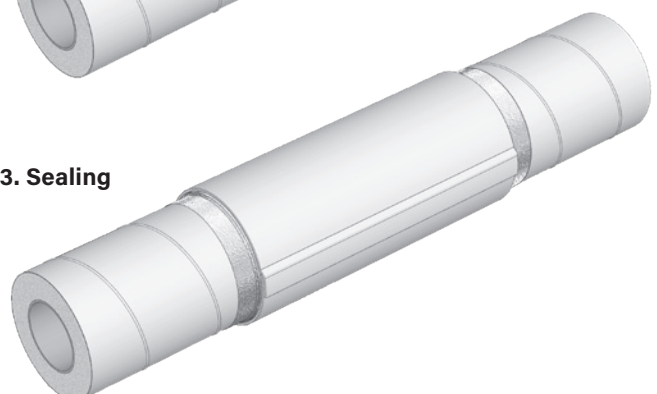
For the montage, a cylindric VISUCON case is used which is removed after the PUR foam has hardened. Subsequently the sealing system is installed. Due to the system foam holes are not necessary, which is why the step of closing the foam holes is not applied.

Closing of the steel sheet sleeve up to and including DA 224 mm via blind rivet. Starting at DA 250 mm a closing with fastener is applied.

Nominal width: 90 ... 710 mm
Length: 600 mm

BRUGG VISUCON is a connection technology which fundamentally differs from other sleeve systems regarding the processing.

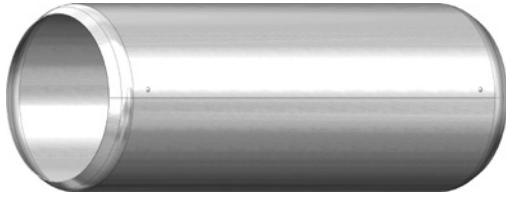
VISUCON enables a visual examination of the PUR foam. Thereby it is not necessary to destroy the sleeve or the foam. For the VISUCON connection sleeve the annulus space for the foaming is not restricted by a sheet steel sleeve but by reusable shaping cases.

1. Casing**2. Foaming****3. Sealing**

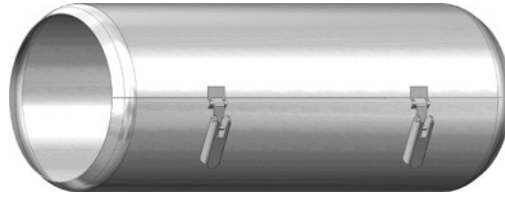
SPIRAMANT industrial pipes

Sleeve joint

Dimensions



DA 90 – DA 224 mm



DA 250 – DA 710 mm

The BRUGG SPIRAMANT sleeve is only deliverable as a straight sleeve joint.

PUR half shells

The SPIRAMANT sleeve joint can be installed for hot fluid lines combined with prefabricated PUR half shells. Thereby shaping VISUCON shells are not necessary. The remaining assembly is identical.

		Nominal width DA																	
		90	112	125	140	160	180	200	224	250	280	315	355	400	450	500	560	630	710
Installation length	L mm	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600	600
Damp proof foil	L mm	700	800	900	1000	1100	1200	1400	1500	1700	1900	2100	2300	2600	3000	3200	3600	4100	4600
Aluminum tape	L mm	700	800	900	1000	1100	1200	1400	1500	1700	1900	2100	2300	2600	3000	3200	3600	4100	4600
Blind rivet		x	x	x	x	x	x	x	x										
Fasteners										x	x	x	x	x	x	x	x	x	x

SPIRAMANT industrial pipes

Accessories**Bearing**

Pipe supports are to be built that the weight (consisting of pipe weight, medium filling and potential snow weight) is spread across the casing pipe to avoid an exceeding of the acceptable compressive stress on the PUR foam. In many cases forces that result from detained thermal expansion, reactions due to redirections and other causes must be removed.

The size of abutments depends on:

- Dimensions of the medium pipe
- Insulation size
- Type of outer sheath
- Medium filling
- Width between supports

Thereby the minimum size L of the bearing shell is determined, which must enclose the joint pipe at 120°.

Possible storage type:

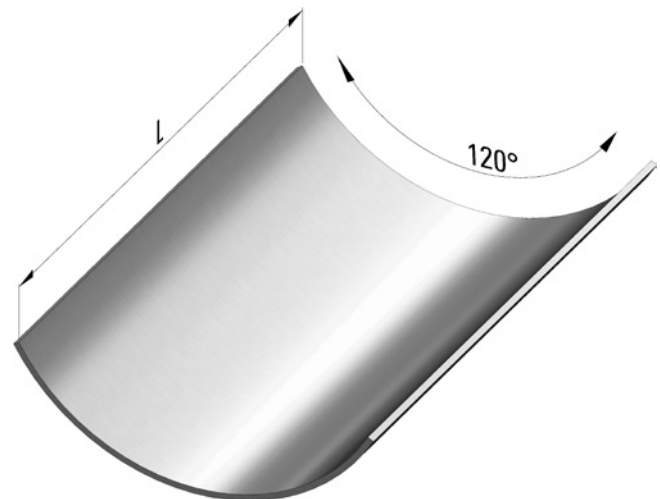
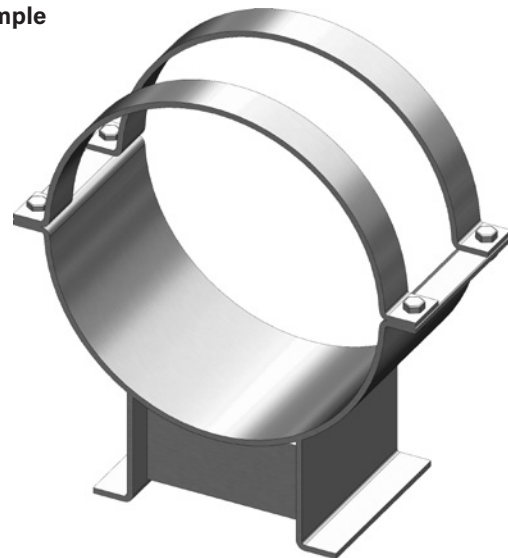
- Friction bearing: pipeline guidance with lift protection
- Restrained guides friction bearing: direction giving at turning points
- Anchor point: division of axial and lateral movements

Widths between supports

The impact of mass forces on the acceptable bending and the acceptable tension/stress is restricted through the determination of the tolerable widths between pipe supports.

Important parameters for the calculation of widths between supports:

- Acceptable axial stress medium pipe
- Acceptable bending of the joint pipe

Types of bearing shells**Example**

SPIRAMANT industrial pipes

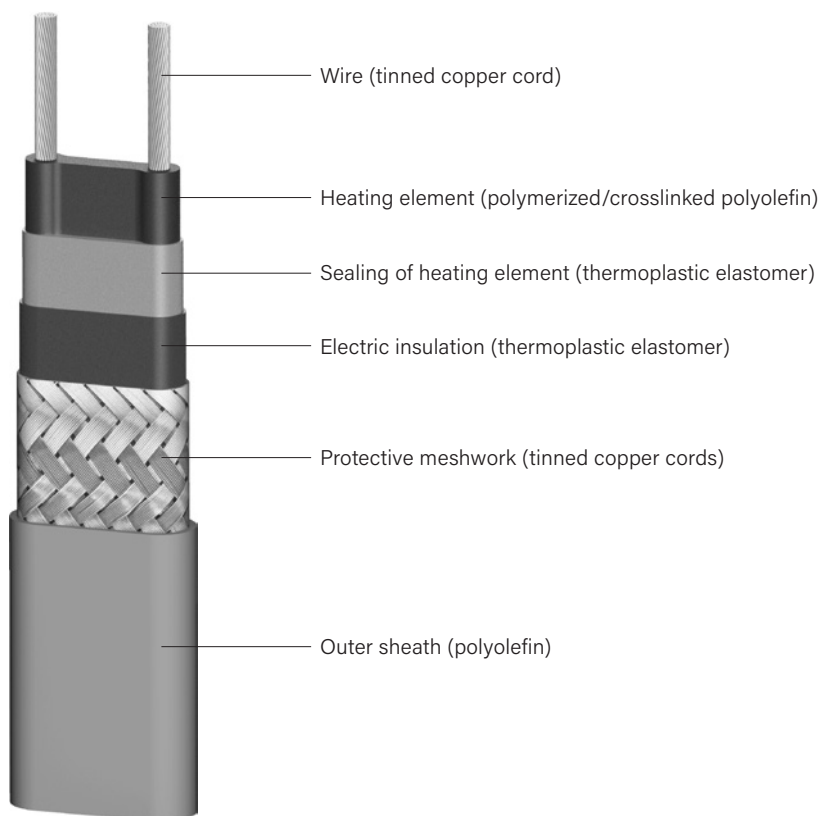
Heat tracing

Self-restricted heater bands

The self-restricted parallel heating element consists of a special synthetic material with embedded carbon particles which form the current path between the two parallel copper wires. With an increasing temperature, the synthetic material expands, the space between the carbon particles increases. As a result, the current paths are interrupted and the heating line does not heat anymore. When the temperature decreases and the heating line cools down, the carbon particles tighten and the current paths are restored (the heating lines produces heat). The heating line reacts to temperature fluctuations at any point of the wiring system due to the self-restriction.

A danger of freezing does not occur in lines with running media. The common insulation thicknesses are adequate for preventing a decrease of the temperature below the freezing point even with low velocities of flow.

In lines with static media a heat insulation can prolong the time before the formation of ice. Nevertheless, it will not fully prevent freezing for an unlimited amount of time.

**Self-limited parallel heater band**

Output	10 – 90 W/m
Supply voltage	120 – 230 V

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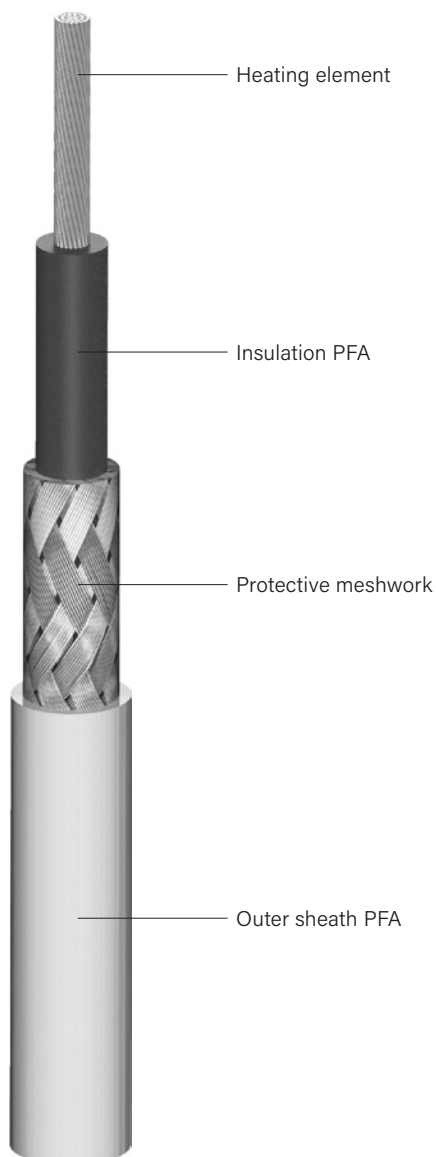
Heat tracing

Heater bands with fixed resistor

These heating lines are made for applications in industrial and commercial areas. They are adequate for frost control applications, keeping steady temperatures at pipelines and containers and are very flexible. Therefore, they are suited for installation at irregular forms such as pumps, valves and flanges. Due to their outer protective cover, they have a high chemical and mechanical consistency, even with high temperatures.

Heater bands with fixed resistors form an alternative if the maximum length of heating circuit for self-limited heater bands is exceeded.

The exact length of wires and the needed power per meter are important for the dimensioning. Based on these parameters heater band types as well as the power remonstrance of the control unit can be calculated.



SPIRAMANT industrial pipes

Heat tracing

Empty conduit, dimensioning

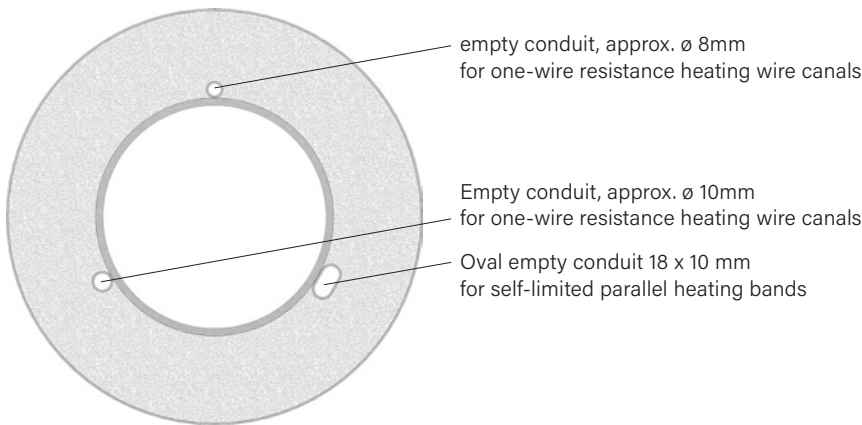
Empty conduit

Electric heat tracing is applied in both the industrial pipeline construction and municipal areas (i.e. frost control of water and sewerage, keeping steady temperatures on product lines etc.).

Self- limited parallel heater bands and one-wire resistance heating wires are mainly applied. Pre-insulated pipe systems with heat tracing are predominantly executed with empty conduits that are directly attached to the medium pipe.

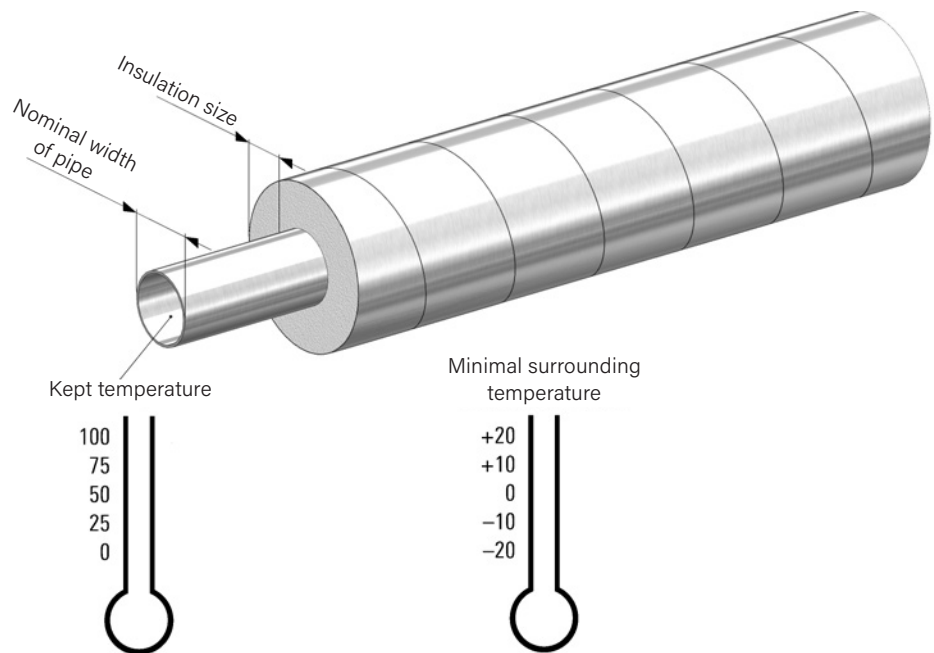
The shape of the empty conduit depends on the type of heating band. Benefits of this implementation in comparison to directly foamed heating bands:

- The heating band can be threaded by the building contractor in the maximum acceptable length by the producer
- Saving on costs due to little amount of heating band joint
- Reduction of risks that arise from mistakes in assembly of the joints
- The replacement of damaged segments is theoretically possible



Dimensioning

The layout of the heating bands depends on different factors:



SPIRAMANT industrial pipes

Heat tracing

Regulation

The controller GP-R001 was developed for the control of heating bands. The main component is a two-position controller which measures the temperature of the pipe or the surrounding air and controls the heating band in its dependence.

In the controller following data is deposited:

- Starting temperature ≤ 5 °C
- Ending temperature ≥ 7 °C
- Alarm temperature ≤ 3 °C

The data of the controller can be changed. The exact approach is to be extracted from the instructions of the controller.

The collective regulation is constructed ready-for-use and solely requires the pin of the wires. It can be arranged outside and inside. It should be protected from rain and direct solar radiation as far as possible. The substrate must be appropriate for assembly.

All connections reach in the case from below. The power supply is provided through a PG screw joint at the bottom of the case. The contacts of the clamping strip are made for the reception of wires up to 2.5 mm². The connection of the supply line to the heating band is provided through a PG screw joint

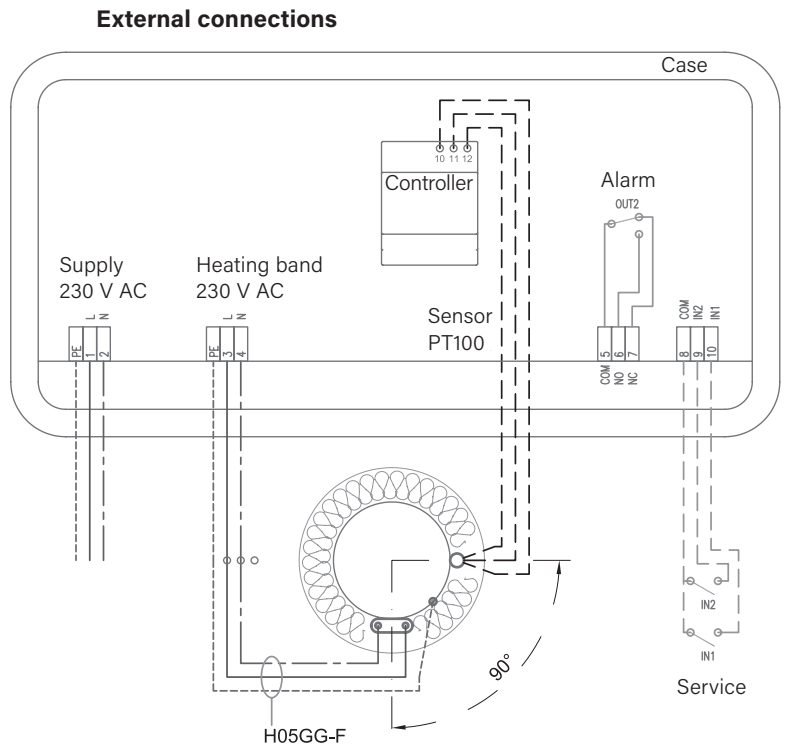
at the bottom of the case as well. The contacts of the clamping strip are made for the reception of wires up to 2.5 mm².

The heating band must not directly rest on the clamps. A heat resistant line is usually used for the connection to the heating band. The connection of the sensor is provided directly on the clamps R10 – R11 – R12 of the controller. A use of additional clamps was renounced in order to keep the monitoring resistances low.

The sensor (PT100) is already connected and located inside the control box when delivered. In case the distance to the control point is greater than the available line, it can be extended by a suitable cable (2 x 2 x 0.6 mm²).

In case of an undercut of the alarm value, the contact "OUT2" will be operated.

Contact load: max. AC 250 V / 8 A (Ohm resistive load)



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