

# The right choice makes the difference

## LOGSTOR PertFlextra



# LOGSTOR PertFlextra 25 – 63 mm service pipe

PertFlextra is a complete range of diffusion tight, flexible pre-insulated pipe systems for community- and district heating according to prEN17878-1/2

The service pipe in PertFlextra is made of very flexible polyethylene PE-RT type II, featuring an aluminium diffusion barrier that prevents the diffusion of oxygen into the water and water vapor from the water into the insulation ensuring dry insulation over lifetime.

The service pipe is insulated with a soft polyurethane foam (PUR).

The PUR foam is protected by a corrugated outer casing of PE-HD with built in EVOH diffusion barrier that will ensure that heat loss property will not deteriorate over lifetime.

The properties of the materials and long length make it easy to install PertFlextra even in difficult terrain.

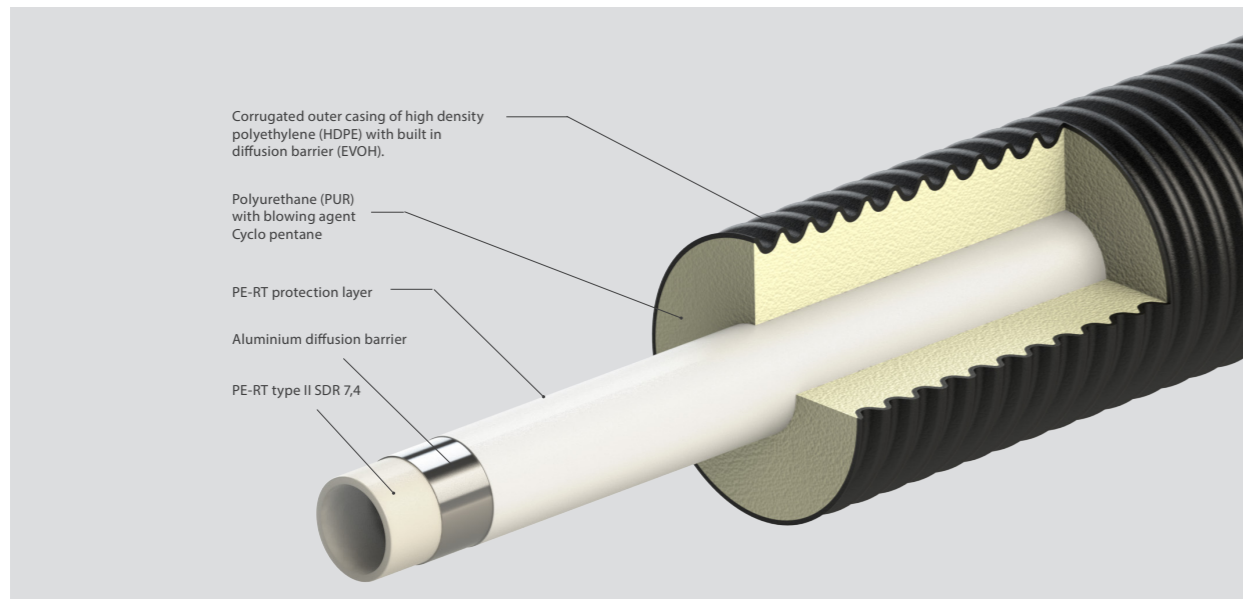
PertFlextra is available as single- and TwinPipe systems and includes all couplings, joints, fittings, and tools needed to establish a complete pre-insulated piping network.



LOGSTOR PertFlextra single



LOGSTOR PertFlextra twin



## Technical data

LOGSTOR PertFlextra is a recommended solution for the following temperature and pressure applications:

50 years lifetime

- 70 °C for 49 years
- 80 °C for 1 year
- Malfunction: 95 °C for 100 hours
- Pressure 10 bar

30 years lifetime

- 80 °C for 29 years
- 90 °C for 7760 hours
- 95 °C for 1000 hours
- Malfunction: 100 °C for 100 hours
- Pressure 8 bar

Lifetime can be calculated for other temperature and pressure profiles by using Miners rules according to EN15632-2 and prEN17878-2.

### Service pipe:

Material	PE-RT type II, SDR 7,4 (SDR = diameter/wall thickness ratio)
	Aluminium diffusion barrier
	PE-RT protection layer

### Insulation:

Material	Polyurethane (PUR)
	Blowing agent cyclopentane
	Thermal conductivity (50 °C) lambda 0,022 W/mK

### Outer casing:

Material	Polyethylene (PE-HD)
	Corrugated casing with built in diffusion barrier of EVOH

### Other:

Press couplings	Press couplings are made of brass or red brass. Weld ends for transition to steel is made of S235JR
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Compression couplings	Compression couplings are made of brass
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Coil length	100 meters Customized length is possible
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# Value propositions

## Easy installation/Work environment

- Corrugated casing and soft foam
  - Easy to bend and install while complying with the requirement to linear water tightness in the standard
  - Easy pass of vegetation and obstacles and to lay in hilly areas
  - Installed from a coil in long length results in fewer couplings

## Long lifetime

- The flexible pipe and the service pipe are tested according to the requirements in EN15632 and/or 15878
  - Complying with the requirements in the standards and fulfilling the test requirements provides a security of having the long and expected lifetime of the pre-insulated flexible pipe system
  - PE-RTtype II SDR 7,4 has a longer lifetime than SDR 11 PEX systems at the same temperature and pressure

## Sustainability

- PE-RT can be recycled at end of lifetime
- No need for radiation/cross linking of the service pipe
  - PE-RT type II is a service pipe where radiation/cross linking is not needed

## An alternative to pre-insulated bonded steel pipe system

- High speed of installation
- No dependency of steel welders
- No water vapor diffusion from the service pipe into the PUR foam due to the aluminium diffusion barrier on the service pipe

## Low heat loss cost over lifetime (diffusion barrier on the service pipe)

- The service pipe is with an aluminium diffusion barrier that will secure water vapor diffusion from the service pipe will not result in wet PUR foam over lifetime
  - The aluminium diffusion barrier on the service pipe secures that the PUR foam remains dry over lifetime
  - Heat loss property of the PUR foam will not get worse over lifetime due to moisture in the foam
  - As the flexible pipes include a diffusion barrier for water vapor diffusion from the media into the insulation material, the lambda value used for the heat loss calculation shall not be multiplied with a factor 1,1 according to EN15632-1 Annex C
  - An aluminium foil is wrapped around couplings

## Low heat loss cost over lifetime (diffusion barrier in the casing)

- Low lambda value and an EVOH diffusion barrier co-Extruded into the casing
  - Low heat loss over lifetime of the flexible pipe system as the lambda value will remain the same over lifetime due to the diffusion barrier. The diffusion barrier will secure that the insulation gasses in the PUR foam (CP and CO<sub>2</sub>) will not diffuse out and be replaced by atmospheric air
  - As the flexible pipes include a diffusion barrier for the insulation gasses in the PUR foam, the lambda value used for the heat loss calculation shall not be multiplied with a factor 1,25 according to EN15632-1 Annex C

## Robustness

- No cracks in foam when bending the pipe
- Self-compensating design eliminates any need for expansion fittings
- Strong enough for installation using guided directional drilling as service pipelines

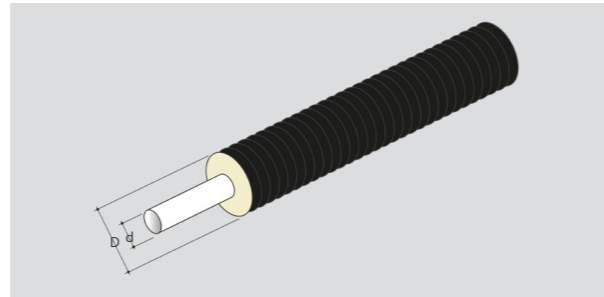
# Longer lifetime through innovative design



# Product portfolio

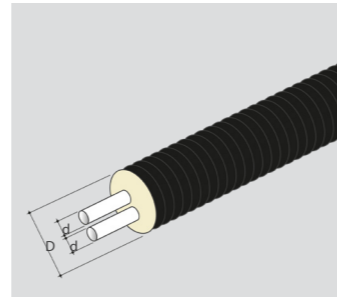
## PertFlextra single pipe Component no. 2100

PE-RT service pipe		Volume l/m	Series 2		
d mm	Wall thk mm		Outer casing		
			D mm	Wall thk mm	Weight kg/m
25	3,5	0,260	90	1,5	1,2
32	4,4	0,423	90	1,5	1,3
40	5,5	0,661	110	1,5	1,8
50	6,9	1,029	125	1,5	2,3
63	8,6	1,647	140	1,5	3,1



## PertFlextra TwinPipe Component no. 2190

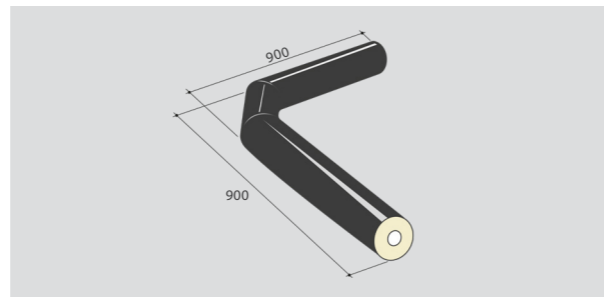
PE-RT service pipe		Volume l/m	Series 1			Series 2		
d mm	Wall thk mm		Outer casing			Outer casing		
			D mm	Wall thk mm	Weight kg/m	D mm	Wall thk mm	Weight kg/m
25/25	3,5	0,260				125	1,5	2,1
32/32	4,4	0,423				125	1,5	2,2
40/40	5,5	0,661				140	1,5	3,0
50/50	6,9	1,029				180	1,5	4,4
63/63	8,6	1,647	180	1,5	5,0			



Note: Distance between service pipes: 12 mm

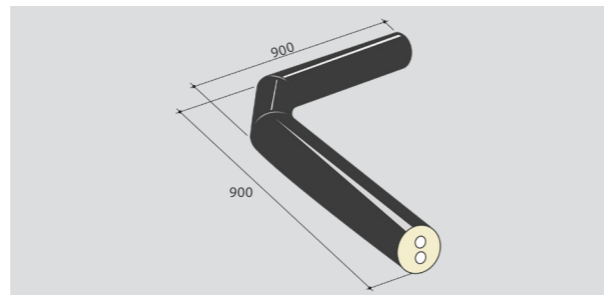
## 90 ° bend single pipe Component no. 2500

d mm	D mm Series 2
25	90
32	90
40	110
50	125
63	140



## 90 ° bend TwinPipe Component no. 2590

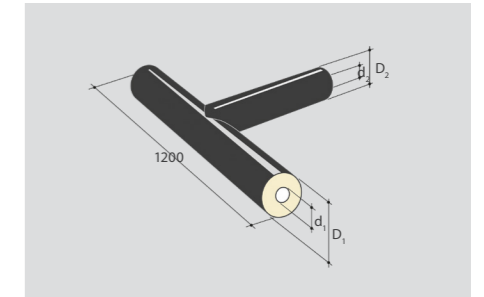
d mm	D mm	
	Series 1	Series 2
25/25		125
32/32		125
40/40		140
50/50		180
63/63	180	



# Product portfolio

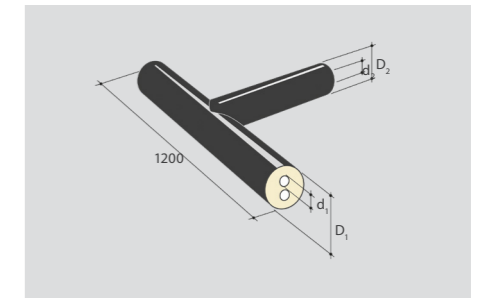
## T-piece straight single pipe Component no. 3400

Main pipe mm		Branch pipe mm					
d1	D1	d2	25	32	40	50	63
		D2	90	90	110	125	140
25	90		x				
32	90		x	x			
40	110		x	x	x		
50	125		x	x	x	x	
63	140		x	x	x	x	x



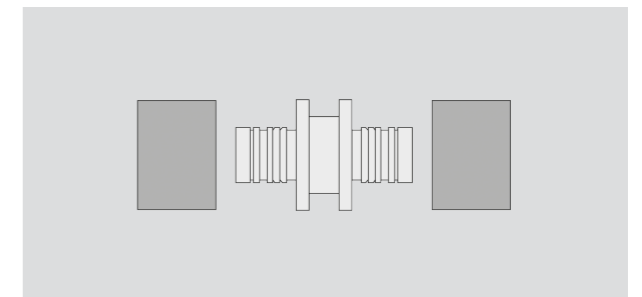
## T-piece straight TwinPipe Component no. 3490

Main pipe mm		Branch pipe mm					
d1	D1	d2	25x25	32x32	40x40	50x50	63x63
		D2	125	125	140	180	180
25x25	125		x				
32x32	125		x	x			
40x40	140		x	x	x		
50x50	180		x	x	x	x	
63x63	180		x	x	x	x	x



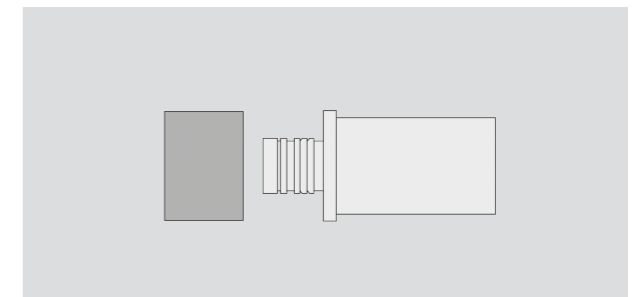
## Press coupling, straight Component no. 6006

Coupling end 1	Coupling end 2				
	25	32	40	50	63
25	x				
32	x	x			
40		x	x		
50		x	x	x	
63			x	x	x



## Press coupling, weld Component no. 6006

Steel	PE-RT				
	25	32	40	50	63
26.9	x				
33.7	x	x			
42.4			x		
48.3				x	
60.3					x

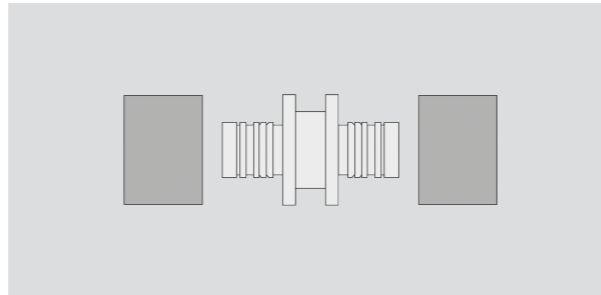


Note: Available in a closed version dimension for dimension 25 and 32 mm PE-RT

# Product portfolio

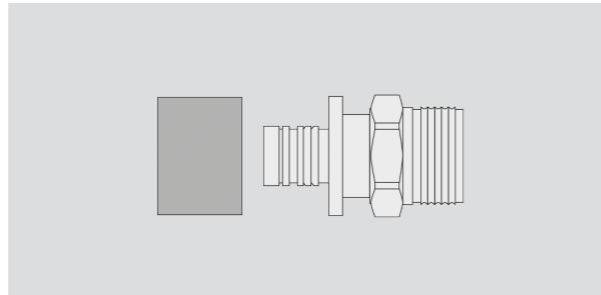
## Press coupling closed Component no. 6006

Steel	PE-RT	
	25	32
25	x	
32	x	x



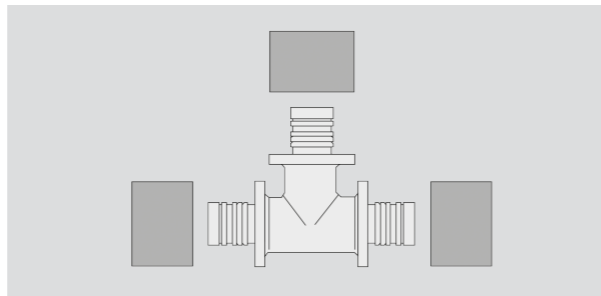
## Press coupling, male Component no. 6006

Steel	PE-RT				
	25	32	40	50	63
26.9	x				
33.7		x			
42.4			x	x	
48.3				x	
60.3					x



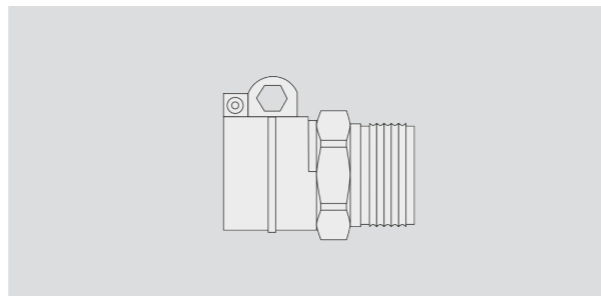
## Press coupling T Component no. 6066

Coupling end 1	Coupling end 2				
	25	32	40	50	63
25-25	x				
32-32	x	x			
40-40	x	x	x		
50-50	x	x	x	x	
63-63	x	x	x	x	x



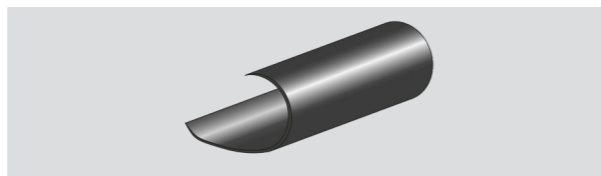
## Compression coupling, male Component no. 6101

Thread	PE-RT				
	25	32	40	50	63
3/4"	x				
1"		x			
1 1/4"			x		
1 1/2"				x	
2"					x



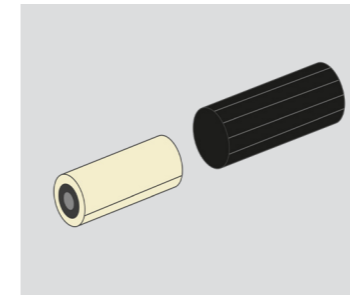
## Diffusion barrier, aluwrap w/mastic Component no. 5500

170 x 585 mm  
25 pcs in a box



# Joint solutions

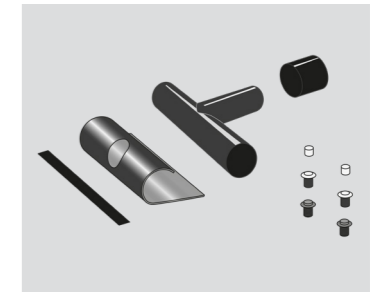
FXJoint



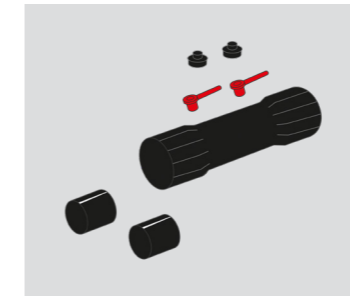
TXJoint + 1 x Collar



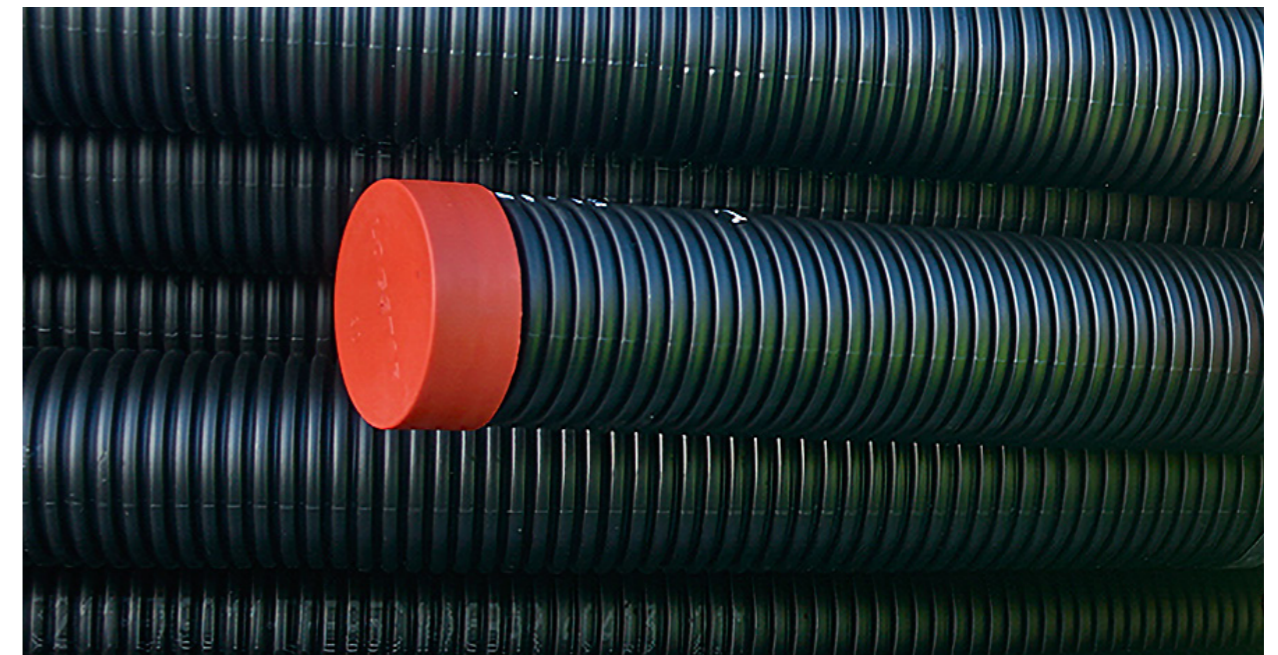
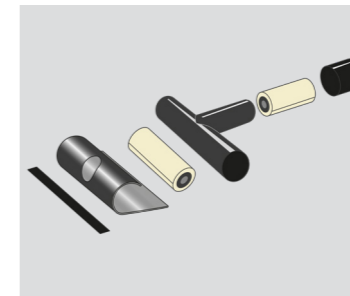
T-joint straight for foaming



SX-WPJoint + 2 x Collars



T-joint straight with insulation shells



# Accessories

Inlet pipes



\* 100% recycled HDPE

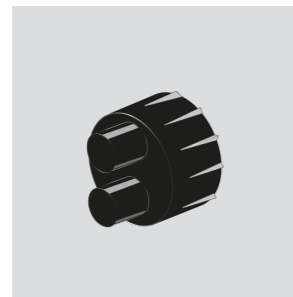
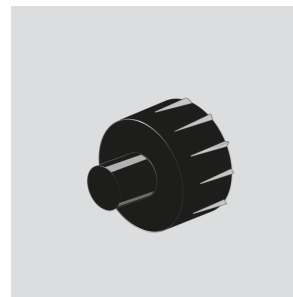


\* 100% recycled HDPE

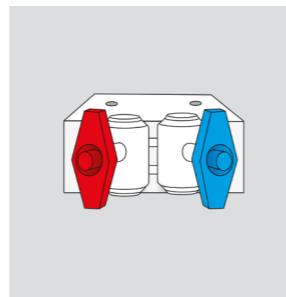
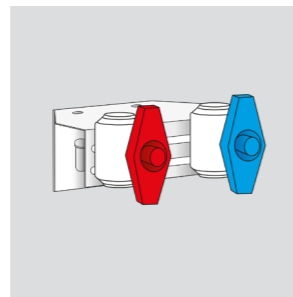
End fittings



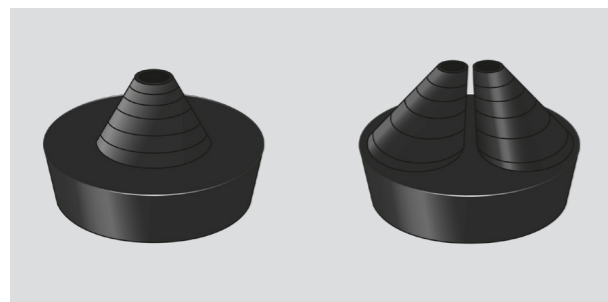
End caps



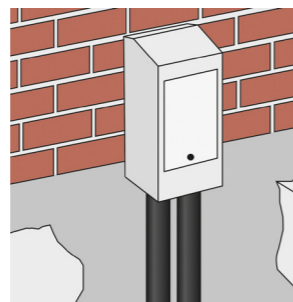
Twin valves



Protetive caps



Inlet box



Seal ring



# Heat loss

The following conditions apply to the tables in this section, so the tables are only guiding:

- Flow temperature 70 °C
- Return temperature 40 °C
- Soil temperature 10 °C
- Soil cover 0,6 m
- Distance between pipes (single pipe) 0,1 m
- Lambda value soil 1,2 W/mK  
(The lambda value of the soil depend on the installation site:  
Dry sand = 1,0 W/mK and moist sand is 1,5 – 2,0 W/mK)
- Lambda value of PUR insulation 0,022 W/mK

For exact calculations with other conditions go to LOGSTOR Calculator on [www.logstor.com](http://www.logstor.com).

The heat loss is the total heat loss for flow/return.

Single pipes Series 2			
Service pipe mm	Outer casing mm	U-value W/mK	Heat loss W/m
25	90	0,1029	10,29
32	90	0,1260	12,60
40	110	0,1301	13,01
50	125	0,1425	14,25
63	140	0,1621	16,21

TwinPipes Series 1			
Service pipe mm	Outer casing mm	U-value W/mK	Heat loss W/m
63/63	180	0,1434	14,34

TwinPipes Series 2			
Service pipe mm	Outer casing mm	U-value W/mK	Heat loss W/m
25/25	125	0,0684	6,84
32/32	125	0,0883	8,83
40/40	140	0,1001	10,01
50/50	180	0,0947	9,47

# Pressure loss chart

To establish the correct pipe dimension, it is necessary to know the water flow and the maximum allowable pressure loss.

For flexible pipes, it is advisable to maintain a speed not exceeding 2 m/s in couplings and 1 m/s in house connections to minimize the risk of noise.

It is recommended to dimension the system based on the available pressure difference. If this information is unavailable, a common practice is to use a value equivalent to 150 Pa/m.

To help with dimensioning, utilize the LOGSTOR Calculator, accessible on [www.logstor.com](http://www.logstor.com). Otherwise, use the graphs below as an alternative to manual calculations.

The graphs display interrelated values between output (kW), cooling, and flow (kg/h). The required output is found with the interrelated cooling, or the water flow can be found after the formula:

$$q = \frac{Q \cdot 860}{\Delta T}$$

Q = Mass flow (kg/h)

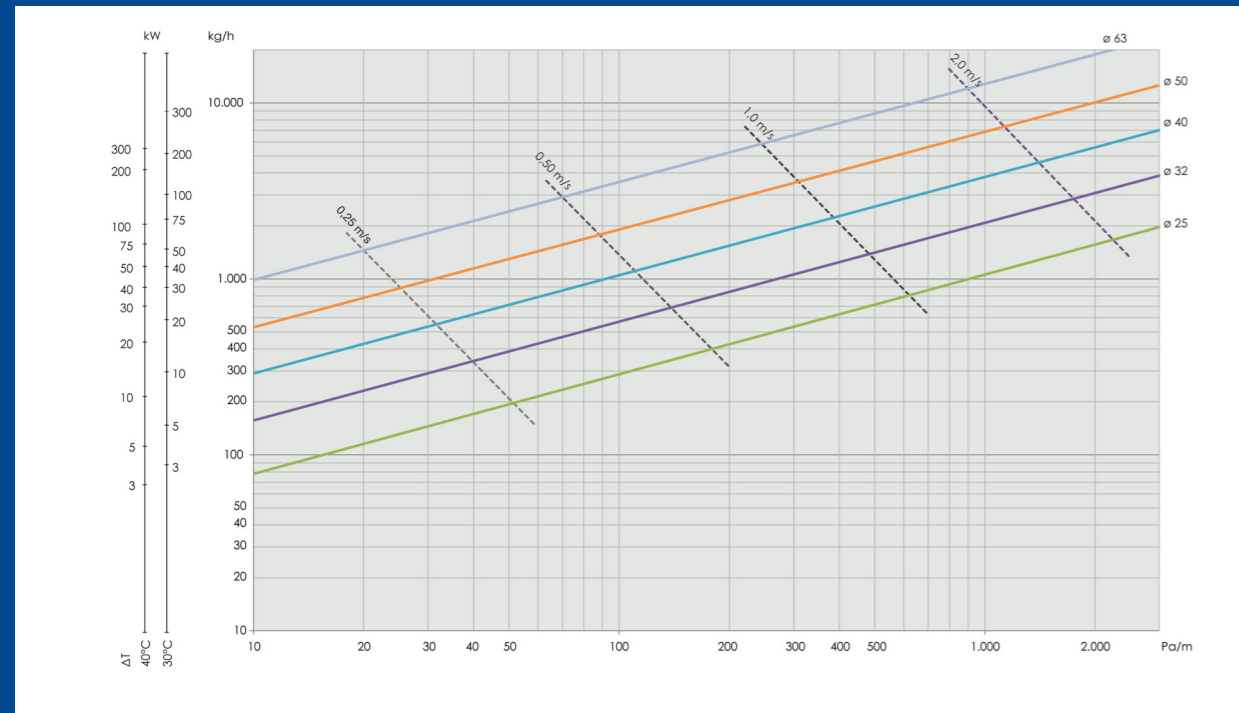
Q = Output (kW)

ΔT = Cooling

The following graphs are based on:

Water temperature of 70 °C for flow pipes.

Absolute PE-RT roughness = 0,01 mm



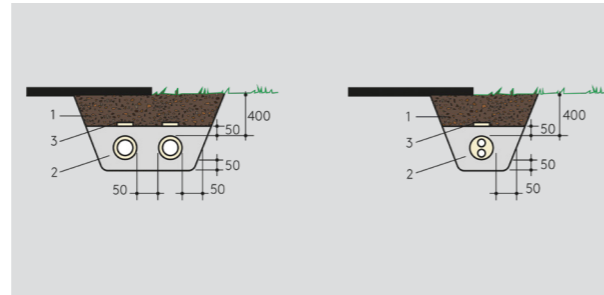
# Handling & Installation

## Trench

PertFlextra is installed in excavated trenches or by means of tunnelling.

In connection with installation in trench minimum 50 mm compressed friction material must encircle the pipes all the way round.

The trench is filled up with minimum 400 mm backfill material measured from the top of the pipe to the underside of the asphalt/concrete or to unpaved area.

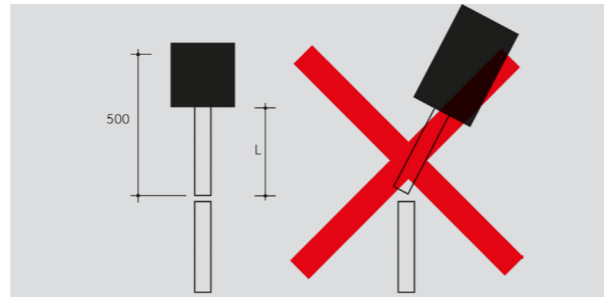


## Straightening

Straighten the pipe end, so that min. 500 mm of it is straight and parallel with the opposite pipe end.

This adaptation is important and necessary to ensure that subsequent installation of the casing joint can be carried out according to instructions.

Please keep the bounce effect of the free pipe ends in mind, when cutting.



## Bending radius

At directional changes PertFlextra can be bent on site to the minimum bending radius R.

The flexibility of the PertFlextra depends on the temperature of the pipe.

At temperatures below 10 °C heat the outer casing to lukewarm with a gas torch prior to uncoiling or bending the pipe.

On installation it may be necessary to ensure the position of the pipes e.g. by means of partial backfilling.

Outercasing out. mm	Min. bending radius, R m
90	0,7
110	0,9
125	1,0
140	1,4
160	1,6
180	1,8

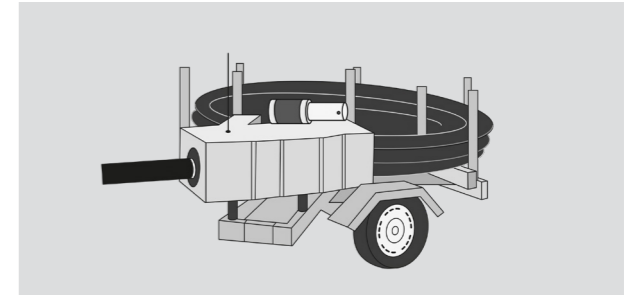
# Handling & Installation

## Uncoiling machine

It is advantageous to use a waggon with motorized straightener. LOGSTOR can refer to relevant suppliers.

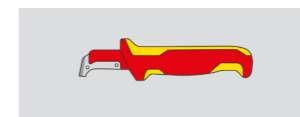
At temperatures below 10 °C the outer casing must be preheated to lukewarm, immediately before it is inserted in the straightener head (soft gas flame during the entire straightening process).

It is recommended to store the coils in a heated room at least 24 hours before use.



## Removal of protection layer and aluminium layer

Material No. 90000000007005



For more details, please see LOGSTOR Handling & Installation Manual on our home page

<https://www.logstor.com/catalogues-and-documentation>

For installation of joints, couplings and aluminium layer on couplings please see installation videos as well on our home page

<https://www.logstor.com/service-support/kingspan-academy/installation-videos>





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# Contact details

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