

Typical outputs - steel pipes - double

6.1

Typical outputs - steel pipes - double						
at 100 Pa/m (10 mm water column/m) and medium temp. of 80°C						
Carrier pipe		Velocity	Mass flow	Output at Dt=30°C	Output at Dt=40°C	Output at Dt=50°C
DN	d outside mm	(m/s)	(m ³ /h)	(kW)	(kW)	(kW)
20+20	26,9+26,9	0,35	0,47	15,8	21,1	26,4
25+25	33,7+33,7	0,41	0,86	29,3	39,1	48,8
32+32	42,4+42,4	0,50	1,97	67,0	89,3	112,0
40+40	48,3+48,3	0,56	2,92	99,2	132,0	165,0
50+50	60,3+60,3	0,65	5,45	185,0	247,0	309,0
65+65	76,1+76,1	0,77	10,70	364,0	485,0	606,0
80+80	88,9+88,9	0,85	16,34	555,0	740,0	925,0
100+100	114,3+114,3	0,97	27,73	1106,0	1475,0	1843,0
125+125	139,7+139,7	1,15	57,00	1937,0	2583,0	3229,0
150+150	168,3+168,3	1,29	94,07	3197,0	4263,0	5329,0
200+200	219,1+219,1	1,59	193,32	6700,0	9000,0	11200,0

See section 1 on design calculations.

Assumptions - heat loss

When comparing heat loss data, it is important to know the assumptions used in their calculation.

Several factors other than the properties of the pre-insulated pipe are of fundamental importance for heat loss.

The following parameters must be equal if a valid comparison of heat loss is to be made:

- Dimensions of carrier and jacket pipes
- Carrier pipe temperatures
- Soil lambda value
- Soil temperature
- Surface resistance
- Laying depth

As it is in effect the lambda value of the insulation material that is compared, it is of course important that the correct lambda value be used. The given lambda values below are average values.

The following pages contain heat loss tables for pre-insulated pipes. Heat loss calculations are based on the following assumptions.

Depending on the mechanical properties of the foam, pipes can be produced with a variety of lambda values down to 0,0225 W/m°C.

Lambda _{soil}	1.2000	W/m°C	Thermal conductivity - soil / sand Values of 1.5-2.0 W/m°C are typical for moist soils. Dry sand has a thermal conductivity of approx. 1.0 W/m°C.
Lambda continuous production	0.024	W/m°C	
Lambda discontinuous production	0.026	W/m°C	Surface resistance According to the EuHP District Heating Handbook, a value of 0.0685 m ² °C/W is usually suitable.
R ₀	0.0685	m ² °C/W	
Laying depth H	800	mm	Laying depth Should be stated in mm from upper edge of jacket pipe to soil surface (unpaved areas) or lower surface of paving.
t _{flow}	80.0	°C	
t _{return}	40.0	°C	
t _{soil}	8.0	°C	

Heat loss - steel pipes - double

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Heat loss - steel pipes - double - series 1

Steel pipe		Jacket pipe		Heat loss	
DN	d outside mm	Wall thickness mm	d outside mm	Wall thickness mm	W/m Φ_{total}
20+20*	26,9+26,9	2,6	125	3,0	9,1
25+25*	33,7+33,7	3,2	140	3,0	9,3
32+32*	42,4+42,4	3,2	160	3,0	10,0
40+40*	48,3+48,3	3,2	160	3,0	11,9
50+50*	60,3+60,3	3,2	200	3,2	11,8
65+65*	76,1+76,1	3,2	225	3,4	14,1
80+80*	88,9+88,9	3,2	250	3,6	16,0
100+100*	114,3+114,3	3,6	315	4,1	15,9
125+125	139,7+139,7	3,6	400	4,8	15,6
150+150	168,3+168,3	4,0	450	5,2	18,8
200+200	219,1+219,1	4,5	560	6,0	20,9

Heat loss is specified per metre trench.

*Continuously produced

Diffusion barrier

isoplus can produce pipes with jacket pipes in jacket pipe dimensions of $< \varnothing 355$ mm as energy-saving, continuously produced pipes with a diffusion barrier inserted between the jacket pipe and the polyurethane foam, starting from dimension $\varnothing 33,7$ mm.

For pipes with jacket pipes in dimension of $> \varnothing 355$ mm, the jacket pipe functions as a diffusion barrier due to its thickness. The diffusion barrier secures isoplus pre-insulated pipes against ageing, and the heat loss is therefore constant throughout the pipe's technical service life.

Series 1 pipes are normally supplied as traditionally produced pipes without an inserted diffusion barrier. However, dimensions with jacket pipes $< \varnothing 355$ mm can be supplied as continuously produced special deliveries – therefore the heat losses for these dimensions are indicated for energy-saving continuously produced pipes.



Heat loss - steel pipes - double - series 2

Steel pipe		Jacket pipe		Heat loss	
DN	d outside mm	Wall thickness mm	d outside mm	Wall thickness mm	W/m Φ_{total}
20+20	26,9+26,9	2,6	140	3,0	8,1
25+25*	33,7+33,7	3,2	160	3,0	7,9
32+32*	42,4+42,4	3,2	180	3,0	8,6
40+40*	48,3+48,3	3,2	180	3,0	9,9
50+50 *	60,3+60,3	3,2	225	3,4	9,9
65+65*	76,1+76,1	3,2	250	3,6	11,5
80+80*	88,9+88,9	3,2	280	3,9	12,5
100+100*	114,3+114,3	3,6	355	4,5	12,4
125+125	139,7+139,7	3,6	450	5,2	12,5
150+150	168,3+168,3	4,0	500	5,6	14,7
200+200	219,1+219,1	4,5	630	6,6	15,4

Heat loss is specified per metre trench.

*Continuously produced

Diffusion barrier

Isoplus can produce pipes with jacket pipes in jacket pipe dimensions of $< \varnothing 355$ mm as energy-saving, continuously produced pipes with a diffusion barrier inserted between the jacket pipe and the polyurethane foam, starting from dimension $\varnothing 33,7$ mm.

For pipes with jacket pipes in dimension of $> \varnothing 355$ mm, the jacket pipe functions as a diffusion barrier due to its thickness. The diffusion barrier secures isoplus pre-insulated pipes against ageing, and the heat loss is therefore constant throughout the pipe's technical service life.

Heat loss - steel pipes - double

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Heat loss - steel pipes - double - series 3

Steel pipe		Jacket pipe		Heat loss	
DN	d outside mm	Wall thickness mm	d outside mm	Wall thickness mm	W/m Φ total
20+20	26,9+26,9	2,6	160	3,0	7,1
25+25*	33,7+33,7	3,2	180	3,0	7,0
32+32*	42,4+42,4	3,2	200	3,2	7,8
40+40*	48,3+48,3	3,2	200	3,2	8,9
50+50*	60,3+60,3	3,2	250	3,6	8,6
65+65*	76,1+76,1	3,2	280	3,9	9,7
80+80*	88,9+88,9	3,2	315	4,1	10,3
100+100	114,3+114,3	3,6	400	4,8	11,1
125+125	139,7+139,7	3,6	500	5,6	10,7
150+150	168,3+168,3	4,0	560	6,0	12,0
200+200	219,1+219,1	4,5	710	7,2	12,4

Heat loss is specified per metre trench.

*Continuously produced

Diffusion barrier

isoplus can produce pipes with jacket pipes in jacket pipe dimensions of $< \varnothing 355$ mm as energy-saving, continuously produced pipes with a diffusion barrier inserted between the jacket pipe and the polyurethane foam, starting from dimension $\varnothing 33,7$ mm.

For pipes with jacket pipes in dimension of $> \varnothing 355$ mm, the jacket pipe functions as a diffusion barrier due to its thickness. The diffusion barrier secures isoplus pre-insulated pipes against ageing, and the heat loss is therefore constant throughout the pipe's technical service life.