

HEAT LOSS

- λ Insulation material: 0.036 W/m.K @ 10°C
0.040 W/m.K @ 40°C
- λ PE-Xa pipe: 0.35 W/m.K
- λ Ground: 1 W/m.K
- Pipe-laying depth: 0.80 m

The heat loss of a pre-insulated piping system is determined by the driving temperature difference Δt between the operating temperature of the heating medium inside the carrier tube(s), and the ground temperature in the immediate neighbourhood of the buried pipe.

Depending on the selected pipe configuration, the Δt can be calculated as following:

for **Single Heating** $\Delta t = t_{\text{flow}} - t_{\text{ground}}$

for **Double Heating** $\Delta t = [(t_{\text{flow}} + t_{\text{return}}) / 2] - t_{\text{ground}}$

U-values enable easy heat loss determination, as a function of the driving temperature difference Δt .

By multiplying the U-value of the subject pre-insulated pipe system with the applicable Δt , you become the corresponding heat loss per meter pipe length [W/m].

The below tables allow direct reading of the heat loss for a range of standard temperature differences.

Attention: For a configuration with flow and return, each in their own pre-insulated Single heating pipe, the heat loss is to be calculated for both pre-insulated Single pipes, and added up to become the overall heat loss of the system. Whereas for a Double heating pipe, the indicated heat loss only has to be multiplied by the length of the pre-insulated Double pipe to become its overall heat loss.

Single Heating

U-value [W/(mK)]	Pipe Type Art. No.	Heat Loss [W/m] for indicated Δt , per meter length of pre-insulated Single pipe								
		10°	20°	30°	40°	50°	60°	70°	80°	90°
0.227	H7525	2.27	4.54	6.81	9.08	11.35	13.62	15.89	18.16	20.43
0.245	H9032	2.45	4.90	7.35	9.80	12.25	14.70	17.15	19.60	22.05
0.171	H11025	1.71	3.42	5.13	6.84	8.55	10.26	11.97	13.68	15.39
0.206	H11032	2.06	4.12	6.18	8.24	10.30	12.36	14.42	16.48	18.54
0.252	H11040	2.52	5.04	7.56	10.08	12.60	15.12	17.64	20.16	22.68
0.206	H14040	2.06	4.12	6.18	8.24	10.30	12.36	14.42	16.48	18.54
0.252	H14050	2.52	5.04	7.56	10.08	12.60	15.12	17.64	20.16	22.68
0.328	H14063	3.28	6.56	9.84	13.12	16.40	19.68	22.96	26.24	29.52
0.216	H16050	2.16	4.32	6.48	8.64	10.80	12.96	15.12	17.28	19.44
0.269	H16063	2.69	5.38	8.07	10.76	13.45	16.14	18.83	21.52	24.21
0.331	H16075	3.31	6.62	9.93	13.24	16.55	19.86	23.17	26.48	29.79
0.436	H16090	4.36	8.72	13.08	17.44	21.80	26.16	30.52	34.88	39.24
0.265	H20075	2.65	5.30	7.95	10.60	13.25	15.90	18.55	21.20	23.85
0.328	H20090	3.28	6.56	9.84	13.12	16.40	19.68	22.96	26.24	29.52
0.445	H200110	4.45	8.90	13.35	17.80	22.25	26.70	31.15	35.60	40.05
0.269	H22590	2.69	5.38	8.07	10.76	13.45	16.14	18.83	21.52	24.21
0.342	H225110	3.42	6.84	10.26	13.68	17.10	20.52	23.94	27.36	30.78
0.414	H225125	4.14	8.28	12.42	16.56	20.70	24.84	28.98	33.12	37.26

Double Heating

U-value [W/(mK)]	Pipe Type Art. No.	Heat Loss [W/m] for indicated Δt , per meter length of pre-insulated Double pipe								
		10°	20°	30°	40°	50°	60°	70°	80°	90°
0.243	HD14025	2.43	4.86	7.29	9.72	12.15	14.58	17.01	19.44	21.87
0.306	HD14032	3.06	6.12	9.18	12.24	15.30	18.36	21.42	24.48	27.54
0.210	HD16025	2.10	4.20	6.30	8.40	10.50	12.60	14.70	16.80	18.90
0.253	HD16032	2.53	5.06	7.59	10.12	12.65	15.18	17.71	20.24	22.77
0.316	HD16040	3.16	6.32	9.48	12.64	15.80	18.96	22.12	25.28	28.44
0.442	HD16050	4.42	8.84	13.26	17.68	22.10	26.52	30.94	35.36	39.78
0.320	HD20050	3.20	6.40	9.60	12.80	16.00	19.20	22.40	25.60	28.80
0.481	HD20063	4.81	9.62	14.43	19.24	24.05	28.86	33.67	38.48	43.29
0.420	HD22563	4.20	8.40	12.60	16.80	21.00	25.20	29.40	33.60	37.80



For pipe systems, heat loss is expressed in Watts per unit length of pipe. For our pre-insulated pipe systems, this is the heat flowing from the hotter inner medium-carrying PE-Xa pipes to the colder earth surrounding the outer protective HDPE jacket, and this at a rate determined by the temperature difference (Δt).

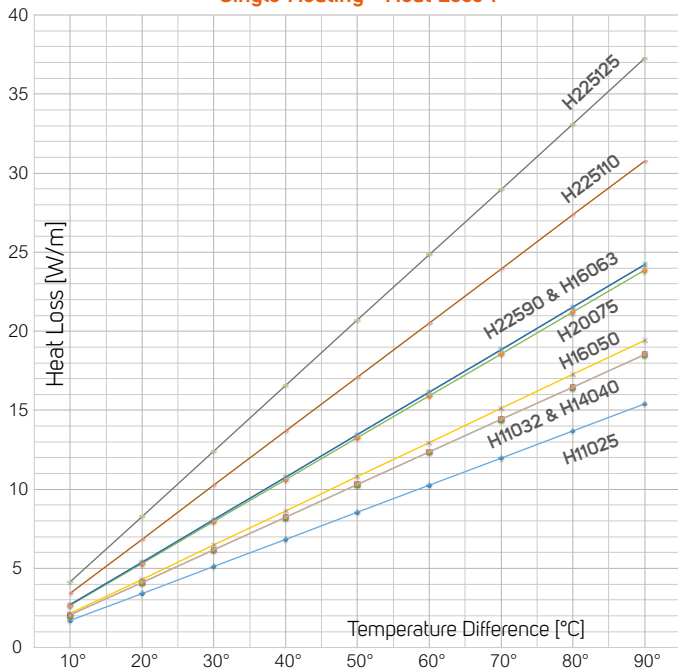
The thermal performance of a pre-insulated pipe system is, for equivalent materials and under comparable operating conditions, primarily a function of the insulation thickness:

Operating at a 110 kW capacity in a classic 80°C/60°C (flow/return) temperature regime, at 1 m placement depth, 100 m of our HD20050 pipe has an approximate heat loss of 1.92 kW and an average heating temperature drop of 0.18°C.

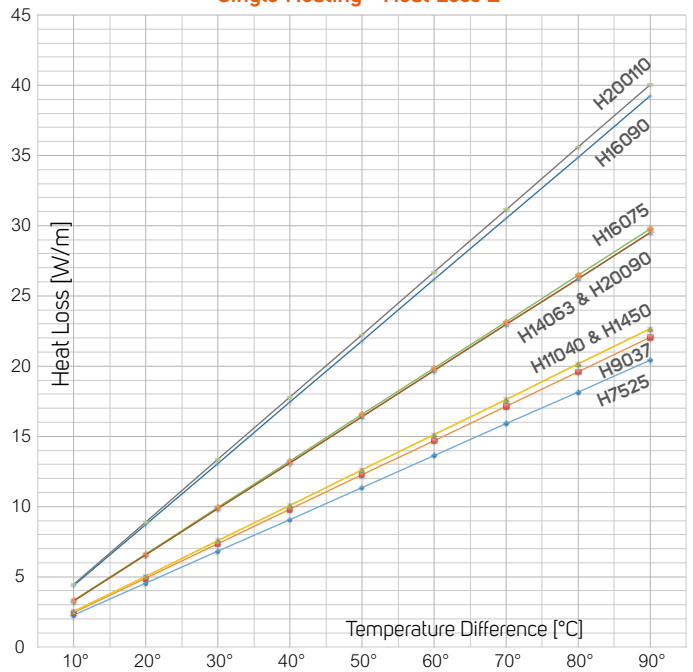
Under exactly the same circumstances, our HD16050 pipe has an approximate heat loss of 2.65 kW and an average heating temperature drop of 0.25°C.

Using the calculated driving temperature difference Δt as an entrance, the heat loss per meter of pre-insulated pipe can be read from the corresponding line in the graphs. Calculation method for the driving temperature difference Δt : see previous page

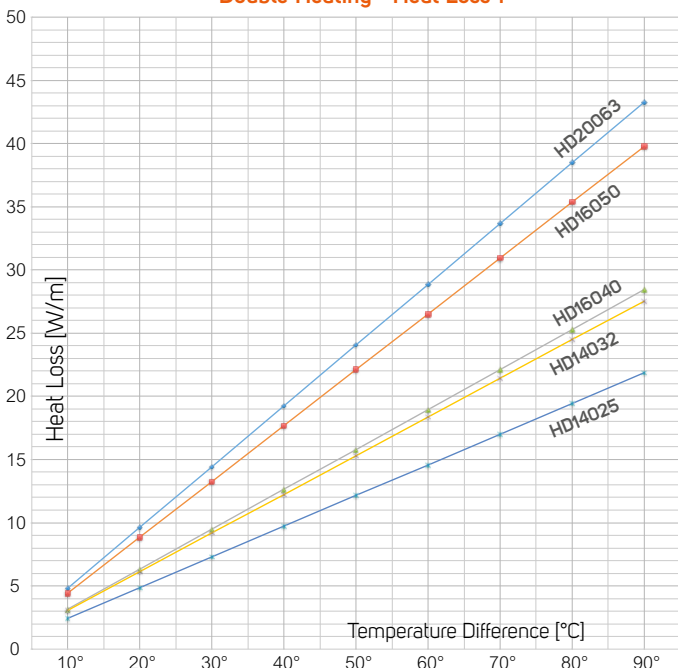
Single Heating - Heat Loss 1



Single Heating - Heat Loss 2



Double Heating - Heat Loss 1



Double Heating - Heat Loss 2

