

PE-RT 5-layer-pipes
for underfloorheating





Demands on the heating pipe:

The most important component of a heating system is the heating pipe. Therefore, demands on heating pipes are made which guarantee a minimum 50-year service life with high safety reserves. The heating pipe PE-RT Type I is an excellently suitable quality product for special applications. Underfloor heating at medium flow temperatures is the main field of application

- high resistance to ageing
- protection against oxygen diffusion
- quality assurance through internal and external monitoring
- good resistance to stress cracking

All of these features has the Becker Plastics PE-RT heating pipe.

The PE-RT 5-layer pipe provides the following benefits:

- very high flexibility of the pipe even at low ambient temperatures
- high impact strength

The requirements of EN ISO 22391-2 and DIN 4726 for heating pipes are met and even surpassed.

Classification of operating conditions according to EN ISO 22391-1

Application class	calculated temperature T_D [°C]	operating life at T_D [years]	T_{max} [°C]	operating life at T_{max} [years]	T_{mal} [°C]	operating life at T_{mal} [h]	typical application
4b	20	2,5	70	2,5	100	100	floorheating and low temperature radiator connection
	plus cumulative						
	40	20					
	plus cumulative						
	60	25					
	plus cumulative						
	(see next column)						
5b	20	14	90	1	100	100	high temperature radiator connection
	plus cumulative						
	60	25					
	plus cumulative						
	80	10					
	plus cumulative						
	(see next column)						

If more than one calculated temperature is generated per application class the associated line with regard to operating life should be added e.g. the temperature combination for a 50-year duration for class 5 comprises:

- 20°C for 14 years followed by
- 60°C for 25 years followed by
- 80°C for 10 years followed by
- 90°C for 1 years followed by
- 100°C for 100h

Please note: This standard does not apply, if base values exist for T_D , T_{max} and T_{mal} higher than those listed in this table.



Standard PE-RT pipes:

Application area heating							
PE-RT pipe measurement dimension				operating conditions according to DIN EN ISO 22391-1			
				class 4		class 5	
d _n [mm]	e _n [mm]	S-Value	SDR-Value	T _{max} [°C]	pressure [bar]	d _n [mm]	pressure [bar]
10,5	1,25	4,3	8,4	70	6	90	4
12	2	2,7	6	70	10	90	8
14	2	3,3	7	70	10	90	6
16	2	3,8	8	70	8	90	6
17	2	4,1	8,5	70	6	90	4
18	2	4,4	9	70	6	90	4
20	2	4,9	10	70	6	90	4
25	2,3 (2,5)	4,9	10	70	6	90	4

d_n = outer diameter
e_n = wall thickness
S = nominal pipe serial number according to ISO 4065
SDR = standard dimension ratio, allocation of SDR values according to DIN EN ISO 22391-2

Raw material:

This heating pipe is made of a high-grade polyethylene with increased resistance to temperature supplied by a renowned raw material producer. This pipe version has an excellent ageing stability.

Pipe production:

The pipe is extruded on our state-of-the-art extrusion units with minimal tolerances. A barrier of EVOH avoids oxygen diffusion into the heating medium. The oxygen barrier effect is in accordance with DIN 4726. The outer protective layer of this special 5-layer-pipe keeps the oxygen barrier safe from mechanical influences.

Technical properties of the Becker Plastics PE-RT pipes:

Properties	Value	Standard
Density	0,933g/cm ³	ISO 1872
tensile strength	16,5 N/mm ²	ISO DIS 6259
percentage of elongation	>800%	ISO DIS 6259
thermal conductivity	0,4W/(m*K)	DIN 52612
coefficient of linear thermal expansion	1,8*10 ⁻⁴ m/K	DIN 53752
oxygen tightness (with EVOH oxygen barrier)	< 0,1mg/(l*d)	DIN 4726

Data are partly taken from the technical datasheets of the material manufacturer

Quality assurance by internal control:

During production the PE-RT 5-layer pipe of Becker Plastics has to undergo strict controls according to the relevant product standards such as EN ISO 22391 and DIN 4726.

Among other investigations, the following tests are made:

- preprocessing control of the raw material charges
- dimensional continuity and accuracy of the pipes
- mechanical-technological tests according to standard, eg. internal pressure test

Quality assurance by external control:

The most important characteristics are constantly tested within the scope of supervision contracts. Depending on the country and the type of pipe, the pipes are supervised through: IMA-D, TGM-A, KIWA-NL.

Further monitoring contracts and certificates on demand.



As a leading manufacturer of plastic and composite material pipes for the transport of liquid and gas media, Becker Plastics offers major customers and system providers everything from one source: together with our partners, we develop innovative solutions for special applications on a customer specific basis. Our technical know-how ensures the production of premium products – from small batches through to the production of large quantities.

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