

**PE-Xc/AL/PE-RT  
multilayer pipe**

for underfloorheating and -cooling,  
radiator connection  
and drinking water installation





## Demands on the pipe:

The most important component of a heating system or a potable water installation is the pipe.

The PE-Xc/AL/PE multilayer pipe provides the following benefits:

- minimized linear expansion
- dimensionally stable after installation and operation
- pressure and temperature-stable
- high reliability of assembly under site conditions
- no harassment by flow noise at constant flow rates
- impermeable to oxygen (according to DIN 4726)

- high resistance to aggressive water or additives
- resistant to corrosion and incrustation due to smooth inner surfaces
- maximum safety due to laser-welded seam
- optimum bonding of the layers by polymeric adhesive layer

These properties fulfill the Becker Plastics PE-Xc / Al / PE pipe.

The requirements of EN ISO 21003-2 for multilayer pipes and DIN 4726 for heating pipes are met and exceeded in many points.

## Specifications of PE-XcAL/PE-RT pipes (informative)

pipe dimension [mm]	14 x 2,0	16 x 2,0	18 x 2,0	20 x 2,0	25 x 2,5	26 x 3,0	32 x 3,0	40 x 3,5	50 x 4,0	63 x 4,5
Outer diameter, nominal size in mm	14	16	18	20	25	26	32	40	50	63
Wall thickness, nominal size in mm	2	2	2	2	2,5	3	3	3,5	4	4,5
Inner diameter, nominal size in mm	10	12	14	16	20	20	26	33	42	54
Pipe weight in g/m	105	125	140	170	252	300	390	600	860	1320
Internal volume in l/m	0,079	0,113	0,154	0,201	0,314	0,314	0,531	0,855	1,385	2,29
Heat conductivity in W/m·K <sup>1)</sup>	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43	0,43
Expansion coefficient in mm/m·K	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03
Surface roughness (inner pipe) in mm	0,007	0,007	0,007	0,007	0,007	0,007	0,007	0,007	0,007	0,007
Oxygen diffusion in mg/l·d	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1	<0,1
Max. operating temperature in °C <sup>1)</sup>	70	70	70	70	70	70	70	70	70	70
Max. operating pressure (at 70°C) in bar	10	10	10	10	10	10	10	10	10	10
Short time pressure (bei 70°C) in bar	15	15	15	15	15	15	15	15	15	15
Bending radius, freely bent	≥5 x D	≥5 x D	≥5 x D	≥5 x D	≥5 x D	≥5 x D	≥5 x D	≥5 x D	≥5 x D	≥5 x D
Bending radius, with bending tools*	≥3,5 x D	≥3,5 x D	≥3,5 x D	≥3,5 x D	≥3,5 x D	≥3,5 x D	≥3,5 x D	≥3,5 x D	≥3,5 x D	≥3,5 x D

<sup>1)</sup> average

All values are typical values; further pipe dimensions on request



## Raw material:

The tube is made of an electron beam cross-linked polyethylene (PE-Xc) with butt TIG laser welded aluminum sheet and an outer layer of polyethylene with raised temperature resistance (PE-RT type II).

The basic pipe is made of a special polyethylene quality which has excellent compressive strength and ageing properties due to appropriate modifications. This material is also protected against degradation by heavy metal ions using a metal deactivation.

Examinations according to ISO 9080 carried out through independent institutes have attested the conformity of the basic material to the product standard and have proven this material to be a PE-Xc (polyethylene of raised temperature resistance).

Owing to the minimised creep tendency of the basic material this system is particularly suitable for the use with pressure fitting systems.

The aluminium foil used is an alloy that has been developed for this application and that has been optimised for the use of expanding tools.

The protective layer is also made of a high stability polyethylene. Due to a stabiliser packet it is protected against ageing. It is also possible to equip the protective layer with a consumer-specific finish.

## Pipe production and crosslinking:

The production of the tubes pipe place in a 3-step-process:

- Extrusion of polyethylene pipes on modern extrusion lines with minimal tolerance.
- Crosslinking of the basic pipe is continuously done after extrusion by fast high-energy electrons on Europe's most modern and efficient electron accelerators.

- Sheathing of the cross-linked basic pipe on our laser / TIG welding units. In this process the aluminum sheet with a thickness of 200-800 µm is butt laser or TIG welded and durably joined to the basic pipe by means of an adhesive layer. Then, the pipe is equipped with a cover sheet of polyethelene (PE-RT type II), which serves as a protection against corrosion and gives the pipe a consumer-specific finish.

## Quality assurance by internal control:

During production the PE-Xc/AL/PE-RT pipe of Becker Plastics has to undergo strict controls according to the relevant product standards such as DIN EN ISO 21003 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 supervision contracts or certificates on request.



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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