

## Multilayer Pipes: PE-RT/AL/PE-RT

PE-RT/AL/PE-RT is a flexible five-layer composite pipe, ideal for use in the creation of floor, wall and ceiling radiant heating as well as cooling systems.

Thanks to its excellent capabilities, this pipe can also be used for convector and radiator heating systems, in industrial plants as well as compressed air distribution systems.

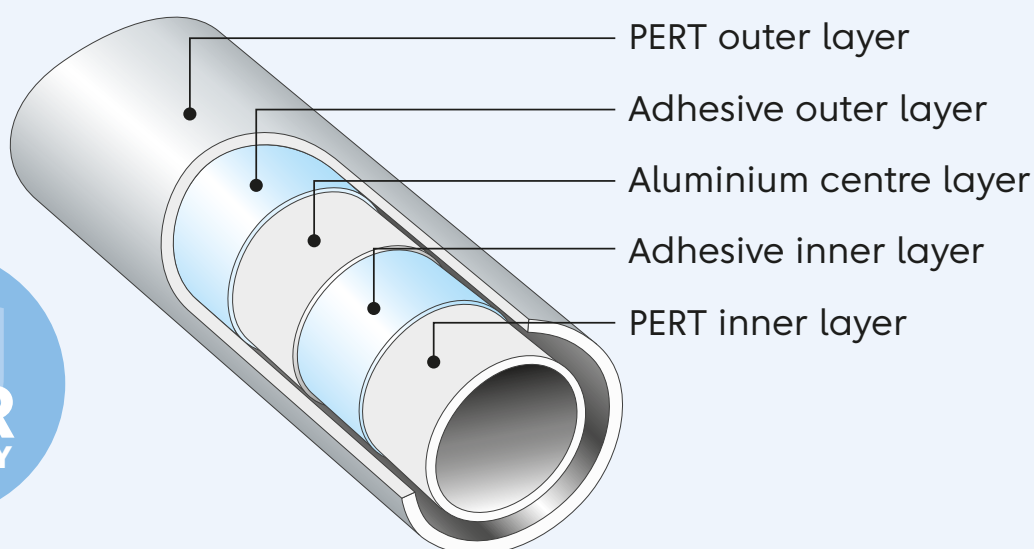
PE-RT/AL/PE-RT combines the advantages of synthetic materials (polyethylene raised temperature) – such as resistance to abrasion and corrosion, chemical resistance and hygiene – with those of aluminium, which possesses resistance to high temperatures and pressures, dimensional stability, impermeability to oxygen and light, and low thermal expansion.

These exceptional properties are only possible because PE-RT/AL/PE-RT pipes are constructed from layers of different materials. Pipes made from a single material might be cheaper but they're lower quality and can't achieve anywhere near the high levels of resistance and longevity.



PE-RT/AL/PE-RT is a highly reliable pipe and extremely easy to install.

### PE-RT/AL/PE-RT pipe construction



### Durability and mechanical strength

The system has a durability of at least 50 years, guaranteed by the product standards at pressures of 10 bar and temperatures up to 95°C. For operating temperatures lower than 95°C, the pipes can withstand pressures above 10 bar while maintaining a high degree of reliability over time.

### Resistance to corrosion

The total resistance to corrosion, to building materials and to the main chemical compounds allows these pipes to be used for various applications even industrial ones.

### Smoothness and resistance to limescale formation

The extreme smoothness of the inner surface prevents the formation of limescale and also ensures low pressure drops over time.

### Dilatazione termica (thermal expansion)

Thermal expansion is about eight times lower than that of plastic pipes and is comparable to that of metal pipes.

### Lightweight

The pipes are extremely lightweight compared to metal pipes:

- Third less weight compared to a corresponding copper pipe
- Tenth of the weight compared to a corresponding steel pipe

### Resistance to abrasion

PE-RT is abrasion resistant. This means the pipes are incredibly durable since they are not affected by the abrasive action of impurities carried by the water at high speed.

### Flexibility and shape stability

The combination of polyethylene raised temperature and aluminium guarantees excellent flexibility during the bending phase (manual bending also). The PE-RT/AL/PE-RT pipe can be bent manually or mechanically with bending radii of up to 2.5 times its diameter.

Once bent and installed, PE-RT/AL/PE-RT maintains its configuration over an extended period, reducing the number of anchoring clips needed. When surface mounted there is a 40% reduction of clips needed for plastic pipes such as PE-X, PE-RT, PP-R, PB, PVC-C etc.

### Oxygen and light barrier

By maintaining a permanent oxygen and light barrier, the butt-welded aluminium layer prevents the two main causes of algae formation and corrosion in plastic pipes.

### Thermal conductivity

The pipe's thermal conductivity is 0.42–0.52 W/m·K (in relation to the diameter), approximately 900 times lower than that of copper, which is essential to safeguard against reduced temperature losses.

Features	Values	Test method
Material	PERT/AL/PERT	–
Colour	RAL white 9003	–
Dimensions	16 mm	–
Application	Distribution radiator and convector heating systems, radiant heating and cooling systems.	–
Minimum operating temperature [1]	–60°C	–
Maximum temperature [2]	+95°C/+100°C	EN ISO 21003-1
Maximum pressure	+10 bar	EN ISO 21003-1
Density at 23°C	> 0,940 g/cm <sup>3</sup> (PE-RT)	–
Softening temperature	125°C	–
Thermal expansion coefficient	0,026mm/m·K	–
Thermal conductivity	0,42 W/m·K	–
Internal roughness	0,007 mm	–
Oxygen permeability	0 mg/l	–
UV Resistance	Yes – when protected with UV-resistant paint	–
Halogen levels	Halogen-free	–

[1] At any rate above the freezing temperature of the transported fluid [2] For more details see the **Application fields** section

## Application fields

The conditions of use of PE-RT/AL/PE-RT pipes are shown in the technical data tables on the previous page, however, according to the International Standard EN ISO 21003-1 there are four application classes that need to be laboratory tested in combination with the operating pressure pD chosen by the producer, which can be 4, 6, 8 or 10 bar.

PE-RT/AL/PE-RT pipes are certified for third and fourth class of application for pressures up to 10 bar, shown in the table below.

### Application fields & operating conditions in compliance with EN ISO 21003-1

Application class	Operating temperature T <sup>P</sup>	Duration of T <sup>P</sup>	Maximum operating temperature T <sup>MAX</sup>	Duration of T <sup>MAX</sup>	Malfunctioning temperature T <sup>MAL</sup>	Duration of T <sup>MAL</sup>	Typical application
	°C	Years	°C	Years	°C	Hours	
4a	20 + 40 + 60	2.5 + 40 + 60	70	2.5	100	100	Floor heating & low temperature systems
5a	20 + 60 + 60	14 + 25 + 10	90	1	100	100	High temperature heating systems

### PE-RT/AL/PE-RT pipe features

PE-RT/AL/PE-RT pipes without insulation are used mainly for the construction of floor heating and cooling systems. If necessary, they can be insulated after the installation.

The pipe has a 50-year warranty. This covers the pipework for complete replacement against defective equipment for the lifetime of the floor covering.

### Connection systems

PE-RT/AL/PE-RT pipes can be combined with the different types of Valsir fittings.

- **Tubo PE-RT/AL/PE-RT:** 16x2

External diameter	16 mm
Thickness	2 mm
Internal diameter	12 mm
Water volume	0,113 l/m
Weight	97 g/m
Weight with water	210 g/m
Operating temperature	0+80 °C
Maximum operating temperature	90 °C
Malfunctioning temperature	100 °C
Oxygen permeability	0 mg/l

1) In accordance with EN ISO 21003, for details, see the *Application Fields* table above

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Harmoni Pro Series



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