

Product News

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Comparison of standard light grey PP-R and new Beta-PPR pipes in green and steel grey



Beta-PPR™ – The innovative raw material for hot and cold water systems

The challenge

Plastic pipes made from Polypropylene Random Copolymer (PP-R) were introduced more than 20 years ago. Since then, they have been used mainly for hot and cold water pipe systems and have significantly contributed to the growth and acceptance of plastic pipes for plumbing and heating systems.

While system components have been gradually improved over time, no resin improvement of particular significance has happened in the last 20 years.

The solution

Borealis has developed a new generation of PP-R material, under the trade name Beta-PPR, that sets a milestone for the advancement of PP pressure piping systems. This new generation of raw material opens the way for a new material class: Polypropylene Random Copolymer with modified crystalline structure and enhanced Temperature performance (PP-RCT) (designation according to ISO 1043-1).

PP-RCT pressure piping systems made from Beta-PPR are even more competitive versus conventional materials like copper and steel. Beta-PPR is characterised by improved long-term properties while maintaining good processing characteristics.

Converters, distributors and installers will benefit from the higher value delivered by this new PP-RCT material class.

Benefits of Beta-PPR RA7050

- Beta-PPR offers higher hydraulic capacity with same outer diameter
- PP-RCT pipe systems allow use of a higher percentage of smaller pipes in actual installations (percentage depends upon specific design)
- The Dendrit design program incorporates Beta-PPR and optimises the pipe sizes in any design
- Cost efficient system due to beneficial dimensioning
- Easier installation
- Existing extrusion and injection moulding equipment can be utilised without major changes

- Thinner wall pipes allow higher extrusion speed – lower production costs
- Less material (typically 13 %) used for Beta-PPR in pipe production versus regular PP-R

The innovative characteristics of Beta-PPR RA7050

- Improved design strength: 5.0 MPa at 70°C/50 years, which is >50 % higher than old PP-R at 3.2 MPa (refer to figure 1)
- Dimensioning with the DVGW (German association of companies for the gas and water industry) W544 design basis (70°C/50 years and Sf = 1.5) allows SDR 7.4 (S 3.2) instead of SDR 6 (S 2.5) pipes
- Higher hydraulic capacity or higher pressure can be utilised
- Excellent oxidation resistance due to state-of-the-art additive package
- Produced on multiple reactor technology
- PP-RCT is a new material class in German standards DIN8077/DIN8078 and Austrian ÖNORM B 5174
- Beta-PPR is weldable with known PP welding procedures
- Several Quality Systems for inspection, testing and approval for PP-RCT already exist:
 - SKZ - guideline HR3.34 (Jan 2006) (Germany)
 - IIP specifica tecnica IIP 'RP1.1/CM' (Italy)
 - AENOR Reglamento Particular RP1.58 (Spain)
 - TS-ITC-292/2007 (Czech Republic)

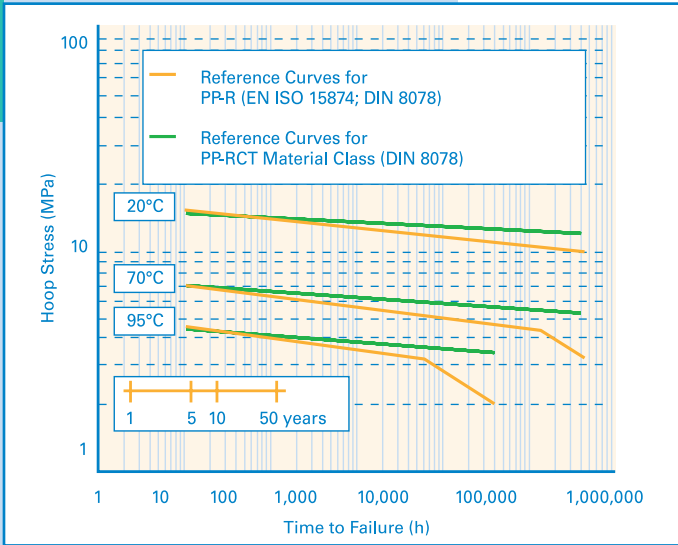


Figure 1: Pressure performance of PP-RCT versus today's PP-R reference curves

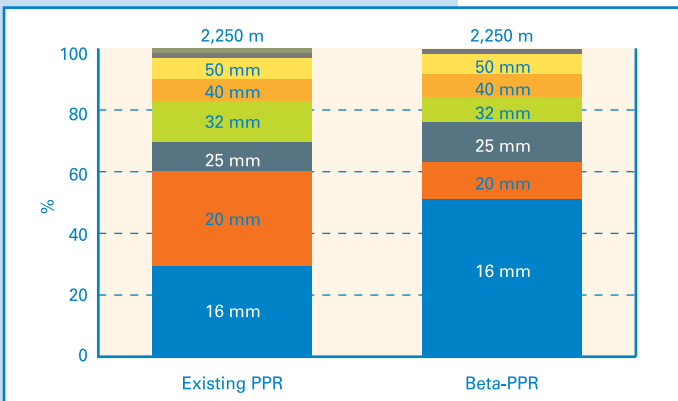


Figure 2: Percentage (metre basis) of pipes at each pipe size for a domestic hot and cold water distribution system calculated with Dendrit program for a model house

Table 1: Beta-PPR RA7050 - Grades

	Beta-PPR RA7050	Beta-PPR RA7050-GN
Colour	Steel grey	Green
Ral colour code	7042	6024
CRS at 70°C/50 years	5.0 MPa	5.0 MPa
MFR (230/2.16)	0.3 g/10 min	0.3 g/10 min
Modulus of Elasticity	900 MPa	900 MPa

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centres and service centres work with customers in more than 170 countries to provide materials that make an essential contribution to society and sustainable development. We are committed to the principles of Responsible Care® and to leading the way in 'Shaping the Future with Plastics'™.

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