

Borealis and Borouge are leading providers of innovative plastics solutions that create value for society. Building on the unique Borstar® and Borlink™ technologies and 50 years of experience in polyolefins, Borealis and Borouge support key industries including **infrastructure, automotive and advanced packaging**. Their manufacturing capacity reaches over 5.4 million tonnes of polyethylene and polypropylene per year.

Borealis is headquartered in Vienna, Austria, and operates in over 120 countries with around 6,200 employees worldwide. **Borouge**, its joint venture with the Abu Dhabi National Oil Company (ADNOC), employs approximately 1,700 people, has customers in more than 50 countries and its headquarters are in Abu Dhabi in the UAE and Singapore. Together, both companies provide services and products to customers around the world.

Borealis offers a wide range of base chemicals, including melamine, phenol, acetone, ethylene and propylene servicing a wide range of industries. Together with Borouge the two companies will produce approximately 6 million tonnes of Base Chemicals in 2014.

Borealis also creates real value for the agricultural industry with a large portfolio of fertilizers. The company distributes approximately 2.1 million tonnes per year. This volume will increase to around 5 million tonnes by the end of 2014.

Borealis and Borouge proactively benefit society by taking on today's challenges and are working to drive ideas forward. Both companies are committed to the principles of Responsible Care®, driving improved safety performance within the chemical industry and contributing to addressing the world's water and sanitation challenges through product innovation and their Water for the World™ programme.

For more information visit:

www.borealisgroup.com

www.borouge.com

www.waterfortheworld.net

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For more information:

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PP-RCT: The innovative solution for higher competitiveness and performance



The industry is calling for innovation

Plastic pipes made from Polypropylene Random Copolymer (PP-R) were introduced more than 30 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.

PP-RCT is a fully established pipe class on the market

PP-RCT (PolyPropylene-Random Crystallinity Temperature) is a material classification used to describe the second-generation class of PP-R materials. Introduced by Borealis in 2004 through its RA7050 range materials, it sets a milestone in the advancement of PP pressure piping systems. The pipe class has recently been included in EN ISO 15874, the global standard for plastics piping systems for hot and cold water pipe installations.

PP-RCT is a polypropylene-random-copolymer with a special crystallinity which provides an improved pressure resistance, especially at elevated temperatures. Pressure tests according to ISO 9080 on pipes manufactured from PP-RCT materials demonstrate 50 years service life at 70C of 5 MPa, compared to the 3.2 MPa for standard PP-R materials. These very capabilities allow PP-RCT to increase performance and competitiveness for PP-R producers, and offer advantages for building designers and end-users alike.

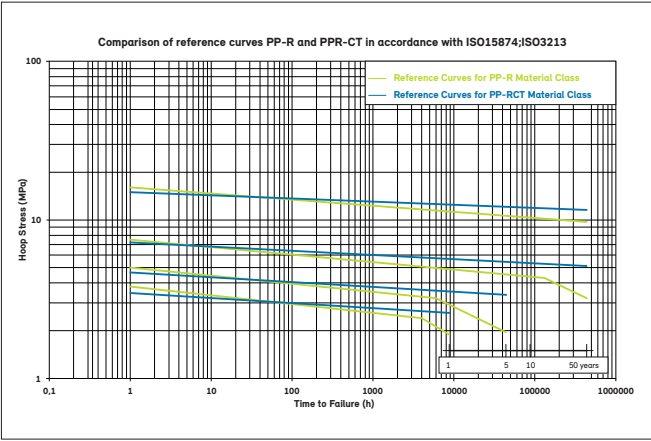
Close to 10 years' track record with PP-RCT; over 30 years experience with beta-nucleation

Borealis RA7050-range is the well-established choice of PP-RCT solutions on the market:

- Close to 10-year track record on the market
- Fully PP-RCT classified materials with CRS at 70°C/50 years of above 5 MPa
- Produced using a special multiple-reactor technology
- Contain a high level of beta-nucleated crystals enabling excellent slow crack growth properties (no brittle failures with ISO9080 at any temperature)
- The beta-nucleation technology is well-proven with some 30 years, successful track record in demanding industrial and chemical applications
- State-of-the-art stabilisation package for excellent thermal and chemical resistance
- Ready compounded for maximum quality control
- Available in distinctive green (RA7050-GN) and steel grey (RA7050) color shades
- Established in a wide range of applications, including large diameters for skyrise airconditioning systems and re-enforced multi-layer heating pipes

Using PP-RCT in your pipe design will allow for increased performance vs. standard PP-R such as:

- Increased pressure class with the same dimensioning
- Higher hydraulic capacity with same outer diameter
- Weight reduction (from 14% up to 25%) in pipe production versus regular PP-R
- Higher percentage of smaller pipes in actual installations (percentage depends upon specific design)
- Cost efficient system due to beneficial dimensioning
- Easier installation
- Existing extrusion and injection moulding equipment can be utilised without major changes
- Optimised pipe dimensioning allow higher extrusion speed – lower production costs
- Greater possibilities to tailor your heating PP-R pipe design
- Opening up for special applications such as larger diameter mains for skyrise airconditioning systems
- Weldable with known PP welding procedures
- Fully established in domestic- as well as global standards incl. ISO and DIN



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

Table 1: Borealis RA7050-range of materials



Picture courtesy of Bänninger