

CASE STUDY

Still going strong after 15+ years

Borealis beta-nucleated PP-H pipes stand the test of time

In partnership with

SANGIR



HINDUSTAN ZINC



BOREALIS

بروج

Borouge



Challenge

In the mid-2000s, one of the world's largest integrated zinc producers, Hindustan Zinc Limited (HZL), faced a serious challenge. The steel pipes and steel-based process vessels in the leaching and electrolysis sections used to transport and handle diluted H₂SO₄ (sulphuric acid) at temperatures of 50° to 95°C, were prone to corrosion and leakage. This resulted in an excessive amount of downtime as well as ongoing – and costly – maintenance and repair.

After unsuccessfully experimenting with non-metallic replacement materials, Hindustan Zinc commissioned a study so as to identify the optimal material solution for corrosion resistant and leak-tight pipes. The study evaluated the respective strengths of plastic-based pipe solutions such as fibreglass-reinforced polyester (FRP), high density polyethylene (HDPE), chlorinated polyvinyl chloride (CPVC), and polypropylene homopolymer (PP-H). Results indicated that beta-nucleated PP-H would best serve the company's needs, as it demonstrated the highest potential for cost efficiency and an extended operational life.



Solution

Borealis' beta nucleation technology yields a PP with a fine crystalline structure and a complete PP-H pipe solution with a series of advantages:

- Excellent resistance to high temperatures, as well as fluctuating temperatures (from ambient to 90°C)
- Resistance to corrosive chemicals, acids, and alkalis;
- Outstanding toughness;
- High flexural modulus and good dimensional stability;
- Easy jointing and welding properties resulting in permanent leak-proof joints, which are strong fusion-welded joints, with removable welding beads;
- Smooth inside pipe surface for excellent flow and minimal deposits;
- Combined high impact strength and abrasion resistance for better pipe protection when cleaning.

Sangir Plastics Pvt. Ltd. a Borouge customer, used Borealis beta-nucleated PP-H BE60-7032 to manufacture pipes for Hindustan Zinc. Pipes with an OD (outside diameter) ranging from 20 mm to 500mm, with a Pressure Nominal rating of PN 10 were produced, supplied and installed at the project location in Chanderiya, India in 2006 and 2007.




“Our partners Borouge and Borealis have enabled us to fulfil an important aim: to offer our customer Hindustan Zinc a tough and robust piping solution which delivers excellent chemical resistance over many years in the toughest of environments. The significantly lower needs for maintenance and repair makes this piping solution the preferred and more cost-efficient solution when compared to other non-metallic alternatives.”

Sushil Mandhana
Director, Sangir Plastics Pvt. Ltd.

Result

Over 15 years after installation, the pipes manufactured by Sangir, produced from Borealis beta-nucleated PP-H BE60-7032 have stood the test of time. For Hindustan Zinc, the decision to use these corrosion-resistant and leak-tight pipes has resulted in significant cost savings thanks to minimised downtimes and significantly reduced maintenance costs, for both pipes and their plant.



“Borouge is committed to working with our value chain partners to identify market needs, then develop the best possible material solutions to meet and even exceed them. Durable pipe solutions help eliminate leakage, save energy, and thus better serve their communities. We are proud of the outstanding track record of this PP-H pipe solution and the concrete benefits it has provided to both Sangir and Hindustan Zinc.”

Abdullah Saber
Global Head of Marketing Infrastructure, Borouge

“Our polyolefins-based solutions are helping tackle the world’s most pressing infrastructure challenges, from ensuring the reliable supply of potable water, to accelerating the energy transition to renewables. On a local level, supplying pipe solutions with longer service lifetimes and less leakage plays a key role in helping our customers make their operations more sustainable. At Borealis, this is one part of our mission to enable life’s essentials.”

John Webster

Global Commercial Director Infrastructure, Borealis

Borealis and Borouge polyolefin solutions for pipes and fittings are enabling life’s essentials

date of issue: April 2023

Borealis is one of the world’s leading providers of advanced and circular polyolefin solutions and a European market leader in base chemicals, fertilizers and the mechanical recycling of plastics. We leverage our polymers expertise and decades of experience to offer value adding, innovative and circular material solutions for key industries. In re-inventing for more sustainable living, we build on our commitment to safety, our people and excellence as we accelerate the transformation to a circular economy and expand our geographical footprint.

With head offices in Vienna, Austria, Borealis employs 6,900 employees and operates in over 120 countries. In 2021, Borealis generated total sales and other income of EUR 10,153 million and a net profit of EUR 1,396 million. OMV, the Austria-based international oil and gas company, owns 75% of Borealis, while the remaining 25% is owned by a holding company of the Abu-Dhabi based Mubadala. We supply services and products to customers around the globe through Borealis and two important joint ventures: Borouge (with the Abu Dhabi National Oil Company, or ADNOC, based in UAE); and Baystar™ (with TotalEnergies, based in the US).

borealisgroup.com • borealiseverminds.com

Disclaimer The information contained herein is to our knowledge accurate and reliable as of the date of publication. Borealis and Borouge extend no warranties and make no representations as to the accuracy or completeness of the information contained herein, and assume no responsibility regarding the consequences of its use or for any errors. It is the customer’s responsibility to inspect and test our products in order to satisfy himself as to the suitability of the products for the customer’s particular purpose. The customer is also responsible for the appropriate, safe and legal use, processing and handling of our products. Nothing herein shall constitute any warranty (express or implied, of merchantability, fitness for a particular purpose, compliance with performance indicators, conformity to samples or models, non-infringement or otherwise), nor is protection from any law or patent to be inferred. Insofar as products supplied by Borealis and Borouge are used in conjunction with third-party materials, it is the responsibility of the customer to obtain all necessary information relating to the third-party materials and ensure that Borealis and Borouge products, when used together with these materials, are suitable for the customer’s particular purpose. No liability can be accepted in respect of the use of Borealis and Borouge products in conjunction with other materials. The information contained herein relates exclusively to our products when not used in conjunction with any third-party materials. Borlink™ is a trademark of the Borealis Group.

Borealis AG

Trabrennstr. 6-8, 1020 Vienna, Austria
Tel +43 1 22 400 000 • Fax +43 1 22 400 333
borealisgroup.com

Borouge Pte Ltd Sales and Marketing Head Office
1 George Street 18-01, Singapore 049145
borouge.com

