Borouge is a leading provider of innovative plastics solutions. Combining the most advanced technologies with world-class production facilities, Borouge is a unique company that brings together the very best of Europe and the Middle East.

With a heritage of reliable customer partnerships and value creation through innovation, Borouge provides plastics solutions that make a real difference to everyday life.

Established in 1998 as a joint venture between the Abu Dhabi National Oil Company (ADNOC), one of the world’s major oil companies, and Borealis, a leading European plastics provider, Borouge is a ground-breaking international partnership at the forefront of next-generation plastics innovation.

Together, Borouge and Borealis employ unique Borstar® technology to produce innovative plastics solutions in end-use plastics applications throughout the Middle East, Asia Pacific, and Africa. Borouge’s state-of-the-art petrochemical complex is located in Ruwais, Abu Dhabi in the United Arab Emirates.

Borouge provides a range of differentiated products for high-value infrastructure applications, including water, gas and industrial pipe systems, power and communication cable, advanced packaging and automotive components. The advantages of Borstar® are well recognised in the industry and are central to Borouge’s success – the technology facilitates the manufacture of high performance, high-value plastic products that are vital to modern living. Borouge’s presence in strategic locations throughout the Middle East, Asia Pacific and Africa facilitate speed to market, on-time delivery and customer support.

To meet ever-increasing market demand, Borouge plans a multi-billion dollar expansion at Ruwais. The project, ‘Borouge 2’, is due to commence production in 2010. This world-scale project will triple production capacity to two million tonnes per annum, including, for the first time, polypropylene.

At the forefront of one of the world’s most exciting industries, Borouge empowers its customers to create products that are vital to global development and has a vision of ‘Shaping the Future with Plastics’.

About Borouge
Why has PE 100 pipe been so successful in Europe?

In Europe, PE100 material was first introduced for gas and water pipes and fittings in 1990. Since that time it has made remarkable progress and now accounts for over half of the PE pipe materials used. In the European water industry, now well over 400,000 tons of PE are used each year and PE now accounts for over 70% of the market in sizes up to 300mm.

This growth in PE usage in Europe could only have occurred if the gas and water engineers had confidence in the quality of the raw material and pipe systems and are convinced that PE would provide a durable solution – this confidence has been justified by the recently published UK Water Industry failure data which is shown in the chart.

These results show that PE has by far the lowest failure rate compared to other pipe materials. Lower failure mean lower maintenance and repair costs, which reduces the overall cost of ownership of the system.

In Europe, the European success of PE in gas and water in the Middle East and Asia. In Ruwais, Abu Dhabi we follow the same procedures to produce PE100 pipe and growing through the pipe wall with propagation can also occur in plastic when there is sufficient energy available to overcome the materials resistance to crack growth. This is particularly important for gas pipes and it can be measured in the laboratory using the SEB test equipment. As shown in the test data there can be considerable variation in the test data.

The Notched Pipe Test measures the materials resistance to the growth of small cracks in a pipe, usually in a pipe before it is put into service at 6 – 8 bar pressure (i.e. well below the rated pressure) – a demanding task not usually carried out!

Unfortunately, there have been a number of incidents where poor quality PE pipes have failed prematurely. This is usually due to the use of poor quality raw materials rather than fully characterised compounds. On some occasions this has led to a complete loss of confidence and a turn on the further use of PE pipes (examples are some parts of India in the mid 90’s and in some Malay states today).

A recent incident in a water project in Asia highlights this problem as shown in the attached photographs.

A total of 76m of 125mm PE 100+ bar water pipe was installed in the narrow city streets (right). The pipe was placed on the road and put into service at 6 – 8 bar pressure (i.e. well below the rated pressure). In a few weeks, the pipes started to fail and over a 7 month period, a total of 15 failures occurred. All the failures were from cracks initiating on the bore of the pipe and growing through the pipe wall (left). Eventually the complete line had to be replaced, greatly adding to the cost of the project and the disruption to the residents.

What can go wrong if fully characterised compounds are not used?

To maintain PE100 Association listing, the manufacturer must meet the higher performance requirements (i.e. above existing specifications) of the Association and samples are regularly and independently tested by to demonstrate continued compliance.

PE100 material is accepted only after extensive laboratory testing and independently tested by to demonstrate continued compliance.

How do raw material suppliers ensure high quality compounds?

Classification of PE pipe materials are based upon ISO 9080 as shown in the chart.

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