Sinosteel mining developments in Western Australia

The Sinosteel Corporation is one of the world giants in the mining and metals processing industry and supplies materials to the many of the major steel mills in China. In 2009 the company had a turnover of 164 billion RMB (US$26 billion) and comprised of 86 subsidiary companies including 23 outside of China.

In Western Australia the company has recently heavily invested in the development of the “Cape Preston Sino Iron Project” for Citic Pacific Mining, 100 km south west of Karratha, which will employ 1,000 additional people and is expected to yield 22 million tonnes of iron ore each year. These large projects require the development of a huge amount of infrastructure including many kilometres of pipe which are used in each mine to transport water and slurries to different parts of the site.

The background

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The challenge

How to ensure the lining pipe provides the best protection to the steel slurry transportation pipes

Of all the commonly used pipeline materials polyethylene has the highest abrasion resistance which makes it ideal for transporting ore slurries and other materials. Where higher pressures are required steel pipes are used but these are often lined with polyethylene to extend their operational life. During installation and operation considerable surface damage can occur to the polyethylene lining pipe and it is important to ensure that this damage does not develop into cracks that can grow through the wall of the lining pipe.

The solution

Lining the large diameter steel pipes with High Stress Crack Resistant (HSCR) PE100 pipes

Borouge customer Kingston Bridge Engineering in Perth received an order from United Pipelines, a US based specialist pipe lining company, for two 30 km special sized PE100 pipelines, to be used for close fit lining of a 30 and 32 inch steel slurry transportation and return water pipeline. Since close fit lining techniques can cause damage to the external surface of the pipe HSCR BorSafe™ HE3490-LS-H material was recommended to ensure that the pipe would provide the expected life. Kingston Bridge specialise in large diameter PE pipes and supply pipes up to 2,000 mm in diameter to projects all over the world.

The pipes were extruded by Kingston Bridge and delivered to site where they were butt welded together and then inserted into the steel pipes by United Pipelines using their “Tite Liner” technology. Before insertion the PE pipes are drawn through a hydraulically powered roller reduction box which reduces the outside diameter of the BorSafe PE100 pipe by passing it through the roller reduction box.
Summary table

<table>
<thead>
<tr>
<th>Customer Name</th>
<th>Kingston Bridge Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application/Product</td>
<td>Lining large diameter steel pipe for slurry transportation</td>
</tr>
<tr>
<td>Grade(s) Used</td>
<td>BorSafe™ HE3490-LS-H</td>
</tr>
</tbody>
</table>
| Functional Requirements | • High resistance to abrasion and corrosion  
• High resistance to stress cracking due to surface damage |
| Benefits | • Welded joints to resist installation loads  
• Corrosion resistant  
• Abrasion resistant  
• Resist cracking due to surface damage during installation  
• Lowest “Whole Life Cost” |

The benefits

The polyethylene liner will not corrode and has a high resistance to abrasion, therefore protecting the steel pipe in operation. The liner was inserted using a close fit insertion technique and to ensure that the optimum lifetime was achieved the PE100 pipes were produced from BorSafe HE3490-LS-H high stress crack resistant material. This specially designed polymer resists the growth of cracks that can be initiated by damage to the outside of the liner during its installation.

Inserting the reduced diameter BorSafe PE100 pipe into the steel host pipe

Borouge and Borouge are leading providers of innovative, value creating plastics solutions. With more than 40 years of experience in polyolefins and using our unique Borstar® technology, we focus on the infrastructure, automotive and advanced packaging markets across Europe, the Middle East and Asia. Our production facilities, innovation 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”™.

For more information contact:
info@borealisgroup.com | info@borouge.com
www.borealisgroup.com | www.borouge.com
+43 1 22 400 000 | +65 6275 4100

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