

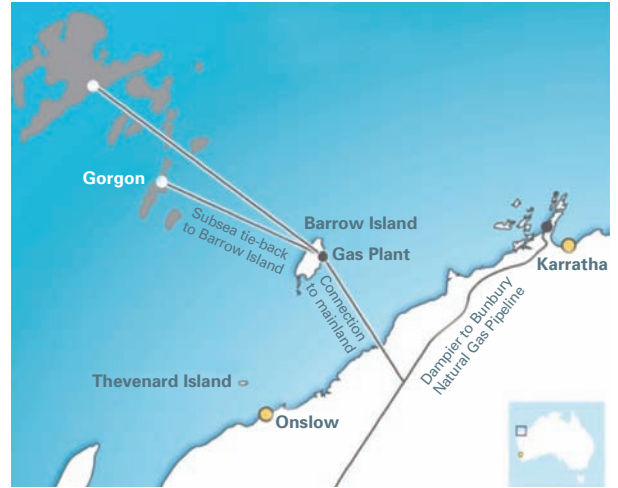
Borcoat™ Polypropylene (PP) coatings for Gorgon field offshore pipes

The background

The Gorgon Gas Field, Western Australia

The Gorgon Gas Field, 130 kilometres off the coast of Western Australia is the largest single resource project in Australia's history and will require around AU\$43 billion (US\$46 billion) of investment to achieve its full potential. This will include the construction of a Liquefied Natural Gas (LNG) plant on Barrow Island from which LNG will be exported to Japan, China and SE Asia and a separate domestic gas supply for Western Australia.

Overall the project which will be operated by a consortium led by Chevron is expected to boost Australia's Gross Domestic Product (GDP) by some AU\$64 billion (US\$67 billion) and at the peak of construction it will employ around 10,000 people.



Location of the Gorgon Gas Field off the coast of Western Australia

The challenge

Protecting the subsea LNG pipelines

Connecting the well to the LNG plant and the other onshore facilities will require over 850 km of high pressure steel piping. Since these sub-sea pipelines

are particularly vulnerable to corrosion they will require a durable coating able to withstand the high external pressures 200 m below the surface of the ocean.

The solution

Borcoat PP systems selected for pipeline protection

Based on previous experience the engineers designing the pipe network for the Gorgon Gas Field selected a three layer polypropylene (3LPP) system to provide the pipe protection in these tough sub-sea conditions. The overall design will include a PP corrosion protection coating for the external surface, covered by an external PP rough coat followed by a concrete weight coating. Whilst this composite system will provide the necessary protection to the pipeline over its operating life due to the excellent mechanical properties of the components it is equally important that they are formulated to enable fast and stable processing in production.

The coating company assigned for the Gorgon Project was WASCO Coatings in Kuantan, Malaysia. WASCO have considerable experience and are operating in 14

different locations around the world, including Malaysia, Singapore, Indonesia, Australia, China, India, the U.A.E., Nigeria and the U.S.A. The WASCO Kuantan site is capable of coating pipes from 4 inch to 60 inch in diameter and lengths up to 24 m. For the Gorgon Gas Field a total of 850 km of 6 inch to 34 inch diameter steel pipeline is required over the period 2010-2012. The system will comprise of an epoxy primer, Borcoat BB127E grafted powder adhesive and Borcoat BB108E-1199, followed by a rough coat of Borcoat BB108E-1199 powder.

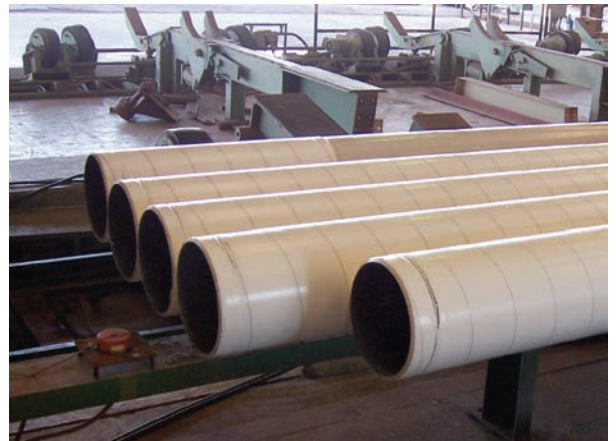
The extrusion coating process progressed very well thanks to the excellent processing properties of the component materials. There followed rigorous testing on the coated pipes including peel tests at temperatures of 25°C and 100°C.



The benefits

The Borcoat 3LPP coating system was readily applied to the steel pipes for the Gorgon Gas Field and met all the mechanical test requirements of the specification. This system will provide excellent protection from corrosion and external damage across a broad temperature range from -10°C up to +115°C whilst withstanding the high deep sea pressures.

Using the Borcoat PP coating systems for the Gorgon Gas Project pipelines will ensure that they will have a long trouble free lifetime transporting the gas efficiently to the different parts of the field. The product range is backed by over 20 years of success in some of the world's most important offshore projects providing corrosion protection in some of the toughest environments.



Summary table

Customer Name	WASCO Coatings, Malaysia
Application/Product	Offshore LNG pipeline protection
Grades Used	<ul style="list-style-type: none"> • White PP top coat Borcoat BB108E-1199 • Grafted PP adhesive Borcoat BB127E • PP powder rough coat Borcoat BB108E-1199
Functional Requirements	<ul style="list-style-type: none"> • Corrosion protection at high temperature • Corrosion protection at high water pressure
Benefits	<ul style="list-style-type: none"> • High peel strength from 25 to 100°C • Cohesive peel test failure mode • Good surface roughness for adhesion to concrete • Good resistance to impact

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