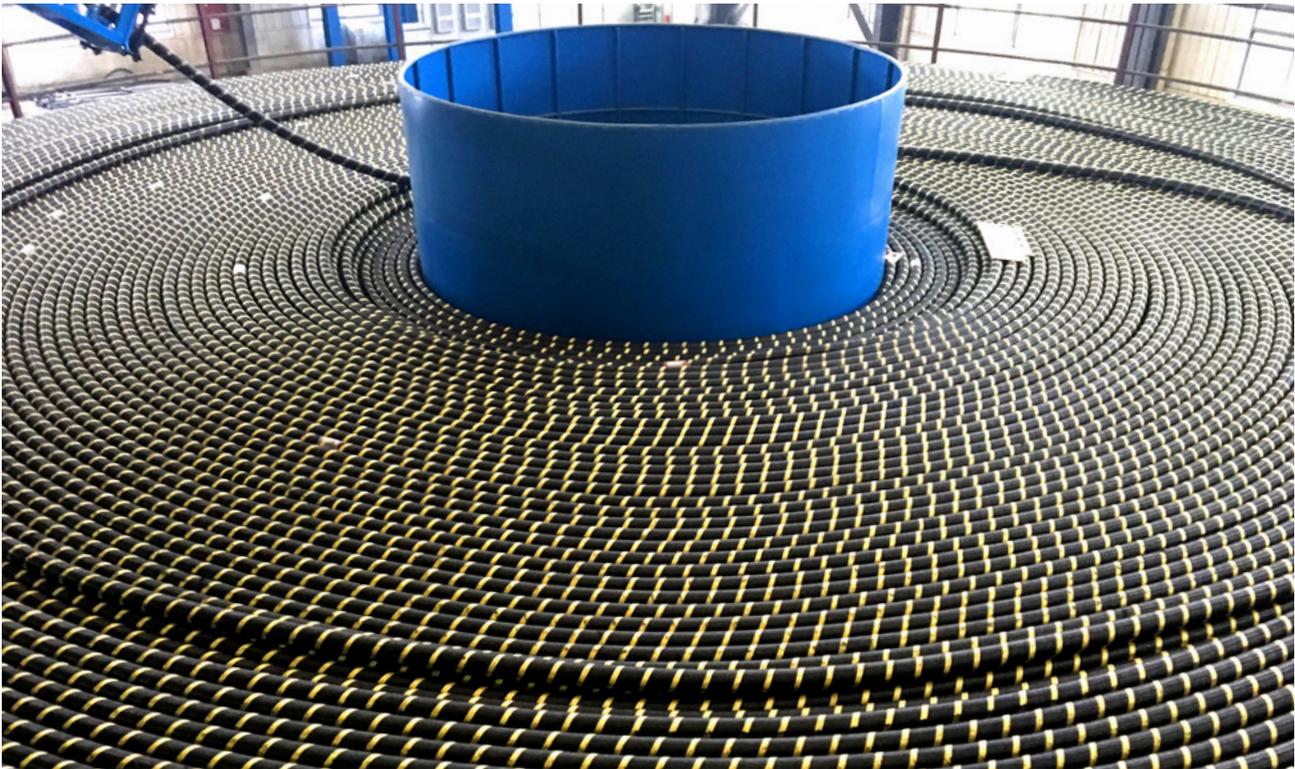


CASE STUDY

BORLINK™ LOW SCORCH XLPE SYSTEM ENABLES PRODUCTION OF THE WORLD'S LONGEST SEAMLESS SUBMARINE CABLE



The 30km 220kV AC submarine cable at the Hengtong production facility. (Courtesy of Hengtong Group)

THE BACKGROUND

Situated in the East China Sea 34km off the coast of Jiangsu province, the Longyuan Dafeng Offshore Wind Park, which has a design capacity of 200MW, was commissioned to provide clean energy to over 140,000 homes in the province. This would effectively reduce carbon emissions by 280,000 tonnes per year.

A tender for the supply, installation and commissioning of a three-phase 220kV AC export cable system connecting the park to the mainland grid was issued by China Guodian Corporation subsidiary Longyuan Dafeng Offshore Wind Power Co. Ltd in August 2016. Hengtong Submarine Power Cable Co., a leading global producer of subsea power cable systems was awarded the USD 41 million contract for the project in January 2017.

THE CHALLENGE

The project required the production of three cable lengths of 29.8km, with a contractual limitation of a single factory joint for each length. This presented a significant challenge for Hengtong, who were required to produce, degas, load and ship the completed cables in six months.

In order to meet the tight deadline, the company decided to execute the production in three campaigns, eliminating the need for the use of factory joints. Due to the sheer length of the cables however, the process would involve a 25 day non-stop extrusion run using 165 tonnes of XLPE for each of the cable lengths – a new world record for the longest ever single extrusion campaign.

In addition to these significant challenges, Hengtong was also tasked with producing a 220kV cable system that could perform without interruption for the full duration of the park's 30-year design life, ensuring the continuous delivery of clean energy to consumers.

THE SOLUTION

Hengtong selected a Borlink™ low scorch XLPE system from Borouge as their preferred solution because of its proven track in the most demanding of high voltage AC land and subsea applications. The system comprised a LS4201S insulation layer, LE0500 inner screen (at its most critical high stress interface) and LE0592S outer screen for optimal value and performance.

With its industry leading cleanliness standards and excellent electrical properties, LS4201S is suitable for rated voltages of up to 230kV. The material's low scorch base resin minimises the generation of oxidised contaminants throughout the production campaign, effectively maintaining high levels of cleanliness in the insulation compound and the long term reliability and robustness of the cable. When paired with Borlink™ semi-conducting screens, LS4201S delivers first in class processability for a super-smooth XLPE interface – a critical element in ensuring long term performance.



The cable being lowered onto a barge for transportation to the offshore installation site at the harbour dock of the Hengtong (Changshu) High Voltage Sea Cable Industry Park. (Courtesy of Hengtong Group)

All three cables were completed and passed the required factory tests by June 2017. They were then loaded onto an installation vessel and delivered to the site for subsea installation. The cables went into service in November 2017, less than 12 months after the contract was awarded – a significant industry milestone for Borealis, Borouge and Hengtong, and testament to the unrivalled value of our low scorch XLPE technology.

SUMMARY

Project name	Longyuan Dafeng Offshore Wind Park
Customer/Developer	Longyuan Dafeng Offshore Wind Power Co. Ltd
Cable producer	Hengtong Submarine Power Cable Co. Ltd
Application	AC Subsea Cable Voltage: 220kV Conductor size: 1 x 1600mm ² Circuit length: 29.8km Capacity: 200MW Operational Date: 9 Nov 2017
XLPE materials used	Borlink™ LS4201S Borlink™ LE0500 (conductor screen) Borlink™ LE0592S (insulation screen)
Functional requirements	<ul style="list-style-type: none"> Low scorch, long runtime compound 29.8km continuous cable lengths (no joints) Long cable lifetime with reliable performance
Benefits	<ul style="list-style-type: none"> Enhanced scorch resistance Super clean XLPE insulation and super smooth semicon High breakdown strength and reliability Lower degassing burden Proven track record in AC applications

About Borouge and Borealis 2018 Borealis is a leading provider of innovative solutions in the fields of polyolefins, base chemicals and fertilizers. With its head office in Vienna, Austria, the company currently has around 6,600 employees and operates in over 120 countries. Borealis generated EUR 7.5 billion in sales revenue and a net profit of EUR 1,095 million in 2017. Mubadala, through its holding company, owns 64% of the company, with the remaining 36% belonging to Austria-based OMV, an integrated, international oil and gas company. Borealis provides services and products to customers around the world in collaboration with Borouge, a joint venture with the Abu Dhabi National Oil Company (ADNOC). Borealis and Borouge aim to proactively benefit society by taking on real societal challenges and offering real solutions. Both companies are committed to the principles of Responsible Care®, an initiative to improve safety performance within the chemical industry, and work to solve the world's water and sanitation challenges through product innovation and their Water for the World programme.

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