



**Type of work:**

Offshore installation

**Location:**

Offshore Binhai County,  
Jiangsu province, China

**Materials:**

NaX® Q140-E

**Grouting operation:**

30 hours

**BINHAI NORTH H2#400MW  
OFFSHORE WINDFARM SUBSTA-  
TION INSTALLATION**

**DISCIPLINES:**

- Renewable Energy
- Subsea Jacket Installation
- Offshore Grouting Services

In April 2017 Nautech carried out its first offshore grouting operation for the renewable sector in China using NaX® Q140-E UHPC grout.

The Binhai North Phase 2 is being developed by the State Power Investment Corporation (SPIC) of China. The wind farm comprises 100 units of 4MW wind turbines and a 400MW substation, which will be installed some 22 kilometres off the coast.

The newly installed jacket structure will be supporting the 400MW substation, which weighs 3200 tons, the largest of its kind in Asia.

Danish engineering, design and consultancy company Ramboll are designing the wind farm, which when completed, will rank among the top five largest offshore power generation capacities in the world.

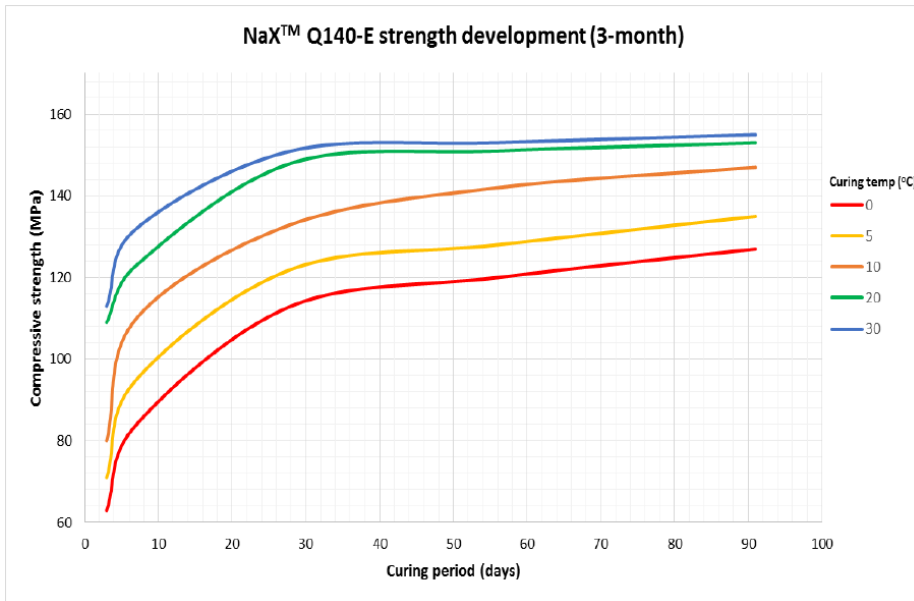


**SCOPE**

- Supply of grouting materials
- Supply of technical expertise and manpower for grouting operation in cooperation with Chinese local company, Nantong Jubo Offshore Company.

**SERVICES**

- Provision of qualified and experienced offshore grouting personnel
- Provision of equipment i.e. mixers, pumps, downhole camera etc. for executing the work scope



UHPC, or Ultra High Performance Concrete and Composites are our business. We develop and produce UHPC products and we offer UHPC based solutions for multiple industries including the Renewable, Civil Construction, Ports, Offshore and Energy Industries.

We have documented the technical performance of our UHPC products through a large test program at MPA (Germany) which included creep and fatigue testing and we have carried out large-scale trials at low (European conditions) and high temperatures (Tropical conditions) to demonstrate the performance of our materials under severe weather conditions.

Our NaX® Premix Grouts are a portfolio of ultra high performance concrete and composites with strength and durability 10 times

- Subsea grouting operation at approximate water depth of -15m

### CHALLENGES

- The team was faced with challenging weather and strong winds but completed the grouting operation without any technical or operational difficulties.
- A very high grout compressive strength of 120 MPa was required before the subsequent installation of the topside module onto the jacket structure could take place.
- The grouting of the pile-sleeve connections with internal shear keys design, using NaX® Q140-E UHPC grout, ensured high early-age compressive strength to support the subsequent stage of the topside module installation within a relatively short time period, even with low sea temperature of 13°C.
- The long-term grout strength requirement is minimum 140 MPa.

### CLIENT BENEFITS

- The professionalism and the operational knowledge of the grouting team won praise from the client as the grouting operation was completed ahead of schedule despite bad weather conditions.
- NaX® Q140 is the ideal material for offshore wind turbine foundations and ensures a long-term solution that is state of the art within the industry.
- NaX® Q140-E has been verified by DNV GL, as well as tested and certified by MPA BAU under the DAfStb Guideline (Germany) and CE marked to EN1504-6.
- The product exhibits high early-age strength as illustrated in the above strength development chart.

