

Project:

Gemini Offshore Wind Park

Location:

*North Sea, The Netherlands
Europe*

Project completed:

2015

Owner/s:

*Northland Power in JV with
Siemens, Van Oord and HVC*

Applicator/Contractor:

FoundOcean Ltd.

Main Contractor:

Van Oord

Market sector:

Offshore wind energy

Products used & amounts:

MasterFlow 9800

3,048 tons

Gemini Offshore Wind Park

MasterFlow 9800 for a 600 MW offshore windfarm



Our reference in the Dutch part of the North Sea: Gemini Offshore Wind Park

The background

In early 2015 MasterFlow 9800, the new revolutionary bulk supplied grout, was selected for the grouting works at the Gemini Offshore Wind Park, one of the largest offshore wind projects in the world. This challenging project consists of the installation of 150 - 4 MW Siemens wind turbines, which will supply a total of 600 MW of renewable energy to 785,000 households by 2017. The Gemini Offshore Wind Park is situated 85 kilometers north of Groningen in the Dutch part of the North Sea.

The challenge

The Gemini Wind Park involved one of the biggest offshore grouting contracts in Dutch territorial waters built to date. The foundation installation contract was carried out by Dutch-based contractors Van Oord. The 150 turbines are housed on monopile foundations that required specialist grouting works to fill the annular gaps between the monopile and transition pieces. The installation of the foundations and grouting of the annuli was done under difficult offshore conditions, with short weather windows, and without interfering with the critical path of the installation vessels.

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Gemini Offshore Wind Park

MasterFlow 9800 for a 600 MW offshore windfarm



Our reference in the Dutch part of the North Sea: Gemini Offshore Wind Park

Our solution

MasterFlow 9800 is the new, revolutionary offshore grout with mechanical properties that meet the toughest requirements of wind turbine installations, and which overcomes the typical problems associated with offshore grouting. MasterFlow 9800 is especially formulated for large scale applications with void filling from 20 mm to 600 mm, where bulk grout supply and continuous mixing and pumping are a major benefit. MasterFlow 9800 is specially designed for foundations where a design strength in the range of 60 to 90 MPa is required. MasterFlow 9800 exhibits long term durability and guarantees the fastest, secure and most cost-effective installation of the wind farm.

The customer's benefit

MasterFlow 9800 can be shipped and stored in silos rather than bags, facilitating quayside storage in all weathers as well as more flexibility in deck layout and omitting the requirement for bag or container lifting during grouting operations and dockside resupplies.

MasterFlow 9800 offers a number of superior properties, including extremely low autogenous shrinkage and excellent early strength development, even at cold temperatures, and high fatigue resistance. When combined with its operational advantages, these properties have the potential to provide significant reductions in grouting time cost optimization for the foundation's installation, whilst ensuring the durability of the grouted connection.

The delivery rates when using specialized grouting equipment are upwards of 20 cubic meters per hour and as such faster grouting of the annulus can be achieved, saving valuable offshore operating days. The closed circuit between the silo and Recirculating Jet Mixer, along with the continuous mixing process, also minimizes overage, as well as reducing dust. The combination of MasterFlow 9800 and the use of the Recirculating Jet Mixer technology gave the client considerable cost saving and improved site safety due to fewer crane movements.

Projects facts at a glance

- Number of turbines: 150 x Siemens SWT-4.0-130
- Windfarm total capacity: 600 MW
- Homes equivalent: 785,000 Dutch homes
- CO2 reduced per year 1,25 million tons
- Turbine hub height: 88,5 meter above sea level
- Area of the windfarm: 70 km²
- Construction period: 2015
- Foundation type: Grounded Monopile foundation with bolted connection and skirt backfill
- Typical water depths: 28 – 36 meters
- MasterFlow 9800: 3,048 tons

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