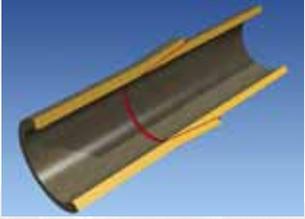




Quick-Lock® adhesive-bonded Joint



Taper/Taper adhesive-bonded Joint



## Re-gasification using Bondstrand® 7000M conductive GRE pipe

Three of the Exmar LNG carriers have been converted into LNGRVs (Liquefied Natural Gas Regasification Vessels). This enables the vessels to connect directly to the gas distribution network and discharge its cargo in the gas phase.

Bondstrand Glassfiber Reinforced Epoxy (GRE) was used for the seawater lines on the re-gasification plant. The seawater supply was established by making a tie-in to the main ballast system. The system is designed to recover waste heat from the main condenser.

The system was designed by owner, EXMAR, but measured and installed by D. van de Wetering BV, with engineering support and material supply provided by NOV Fiber Glass Systems. The complete system was installed in-situ during the vessels stay at anchorage and during vessel's sea voyage. Completion of the system took place during the vessels stay in drydock.

### Scope of Supply

Bondstrand 7000M conductive pipe series was used with Quick-Lock and Taper/Taper adhesive-bonded joints in diameter range: 12-20 inch (300-500 mm). Total length per vessel: 120 meter. Also, 230 standard fittings were supplied. Some fittings were custom-made in-situ.

Since GRE is easy to handle, even larger diameters can be installed during voyage or at anchorage. This means that the vessel can remain operational and no gas-free certificate is required as could be the case when installing at a shipyard.

The amount of hot work (open fire) is reduced significantly due to the absence of welding and (hot) cutting operations as would be the case when using steel.

### Project

LNGRV carriers "Excelerate", "Excelsior" and "Excellence"

### Location

At sea – anchorage

### Owner

Exmar N.V. – Antwerp, Belgium

### Pipe system

Bondstrand 7000M with Quick-Lock and Taper/Taper adhesive-bonded joints.

Application: Re-gasification through heat recovery

Fluid : Seawater

Diameter: 12-20 inch (300-500 mm)

Quantity: Approx. 120 meter per vessel

### Operating conditions

Operating pressure: 5 bar

Test pressure 10 bar

Operating temperature: Ambient

Design temperature: 93°C

Design life 40 years

### Installation date

2007



*Installation in progress*



*In-situ custom tee*



*Bondstrand connection to front plate box cooler*



*On-board retrofit installed*