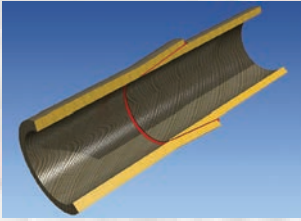


Quick-Lock adhesive-bonded joint



Taper/Taper adhesive-bonded joint

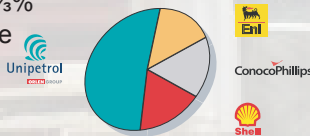


## Litvinov Refinery used Bondstrand® GRE pipe for oily water, waste water, fire water and chemical sewerage retrofits

ČESKÁ RAFINÉRSKÁ a.s. is a joint venture of four shareholders.

Equity interest:

- Eni International BV – 16⅓%
- SHELL Overseas Investments BV – 16⅓%
- ConocoPhillips Central & Eastern Europe Holdings BV – 16⅓%
- Unipetrol a.s. – 51%



ČESKÁ RAFINÉRSKÁ a.s. (CRC) is a multi-national joint-venture crude oil refining company, emerging in 1995 from the Czech Republic's evolution into a free market economy. Per 2007, CRC is the Czech Republic's largest crude oil refinery and supplier of refined petroleum products, with operations based in Kralupy and Vltavou and Litvínov.

Based on experience with NOV Fiber Glass Systems' products for oil water application in 2000, Litvinov Refinery decided to replace the existing steel piping with Bondstrand GRE pipe for the transport of oily water.

The medium, for which this system is used, may cause build-up of static electricity. This has to be eliminated. To avoid sparks in explosion hazardous areas, Bondstrand conductive GRE pipe was used combining conductivity for safety reasons with corrosion resistance. Suspended lines are insulated due to corrosion problems and preheated by means of cable tracing. After the proven performance of Bondstrand 3440 and 7000 Conductive systems, Litvinov decided again in 2008 to continue replacements of steel pipe systems. On this occasion, the chemical drainage and fire water mains, fire foam and cooling water systems were replaced for two shifts (16 hours) on Sunday. Only during this shut-down period a pre-assembled string could be lowered and installed in the shaft.

### Project

Litvinov Refinery – Czech Republic

### Client

Ceská Rafinérská a.s, Litvinov - Czech Republic

### Pipe system

Bondstrand 2000, Bondstrand 3400 and 7000 (Conductive) with Quick-Lock and Taper/Taper adhesive-bonded joints  
 Diameter 1-16 inch (25-400 m)  
 Operating Pressure: 16 bar (Bondstrand 2000, 7000) and 40 bar (Bondstrand 3400)

### Operating conditions

<u>oily water</u>	Fluid: Oily water Operating temp: Ambient Design temp: 40°C Test pressure: 24 bar
<u>Chemical drainage</u>	Fluid: waste water Operating temp: Ambient Design temp: Ambient Test pressure: 1 bar
<u>Fire water</u>	Fluid: fire water Operating temp: Ambient Design temp: Ambient Test pressure: 24 bar

### Installation date

2000, 2006, 2007 and 2008

## Scope of supply

Medium	Diameter	Product	Year
Water (fire, oily)	3, 4, 6, 8, 12	2000, 3410	2000
Water (oily)	3, 4	3440	2006
Water (oily)	2, 3, 4, 6, 8	7000	2006
Water (waste)	6, 8, 10, 12	2000	2007
Water (fire mains)	2, 3, 8, 10	2000	2008
Chemical (sewage)	1, 6	2000	2008
Water (waste)	4, 6, 8, 12, 16	2000	2008



*Bondstrand 2000 with Quick-Lock adhesive-bonded joints is used for various firewater, sewerage and cooling water lines.*