



Quick-Lock® adhesive-bonded Joint



Bondstrand® GRE for Chevron platforms (formerly Unocal 76)

In the early 1980's, Unocal, located in The Netherlands, built three oil production platforms to be placed on the Dutch Continental Shelf: 'Helm', 'Helder' and 'Hoorn'. For all these platforms, built at the Heerema yard in Zwijndrecht, Bondstrand piping was specified for a series of seawater services. The trend to use Glassfiber Reinforced Epoxy (GRE) piping was set a number of years before by Shell Expro and the Nederlandse Aardolie Maatschappij (NAM), but at that time, most piping systems were executed in conventional steel such as CS-steel, Cunifer, Duplex, 6MO, etc.

Scope

A study in 2002 proved that on Helder, Helm & Hoorn during 20 years of operations, pumps, vessels, equipment but also parts of the living quarters and kitchen blocks were replaced, repaired or renewed. The Bondstrand piping however, was still in operation and will probably survive the lifetime of these platforms.

Platform	Sewer	Open & closed drains	Cooling water	Oil water skimmers	Riser pipe	Potable water
Helder	1	1	1	1	1	1
Helm	1	1	1	1	1	
Hoorn	1	1	1	1	1	
A&B-blocks	1	1	1			



Cooling water



Project

Helder, Helm, Hoorn Horizon, Haven, Halfweg Sand A&B-blocks platforms at the Dutch Continental Shelf in the North Sea

Client

Amerplastics Europa B.V. for Heerema, Zwijndrecht – The Netherlands

Pipe system

Bondstrand 2000M in 1, 1½, 2, 3, 4, 6, 8 and 10 inch (25-250 mm) diameter with Quick-Lock adhesive-bonded joints

Operating Conditions

Operating pressure: 2-10 bar
 Operating temp: Various
 Design pressure: 16 bar
 Design temp: 121°C
 Test pressure: 24 bar

Installation date

1980 - 2007

Advantages

Unocal's decision to specify Bondstrand was taken for a number of reasons:

- Light-weight compared to steel, resulting in cheaper secondary structures
- Absolute chemical and corrosion resistance against hydrocarbons and seawater
- Reliable and long-time performance of the material
- Lower installation costs because of the light weight
- Avoiding of welding and 'hot work' procedures for extensions or modifications offshore (Amerplastics even executed so called 'hot-tap' procedures on GRE)
- Lower initial building costs, together with remarkably lower 'cost of ownership'.

Weight saving aspect

For the Bondstrand piping on the AB-Block platform (load-out Spring 2007), Amerplastics submitted a weight analysis showing a significant difference in weight between Glassfiber Reinforced Epoxy (GRE) and equivalent steel concept where Bondstrand compared to CS steel schedule 40 as 1:4.

The difference in weight concerns the difference in piping, excluding a lighter concept for steel supports and secondary structures. Total profit weight will be even higher. *(Detailed comparison calculations are available from Amerplastics on request).*

