

Pure Polyurea, Corrosion Protection & Offshore Oil Rigs

Both abrasive and corrosive, the marine environment is unforgiving of maritime structures such as offshore platforms, rigs, and ocean-going vessels—all of which are major investments for the companies operating them. All activities in a marine environment are impacted by corrosion; the prevention, control and remediation of which costs industry billions of dollars each year. One way to minimise and mitigate the effect of some types of corrosion is through the use of surface coatings that are flexible and resistant to chemical attack from salts and petroleum products. Polyurea based coatings have the necessary durability and flexibility to operate in this hostile environment.

The operating conditions experienced on an offshore structure are also harsh on surface coatings, both in terms of how they wear and also how they are applied. The areas most affected are the decks, superstructure, ballast tanks and

anchor or chain wells. These are exposed to salt and other chemical agents as well as to abrasion and impact. To enhance safety for personnel moving around an offshore structure or vessel, spray-applied surface coatings with anti-slip properties can easily be applied to decks to provide safe walkways.

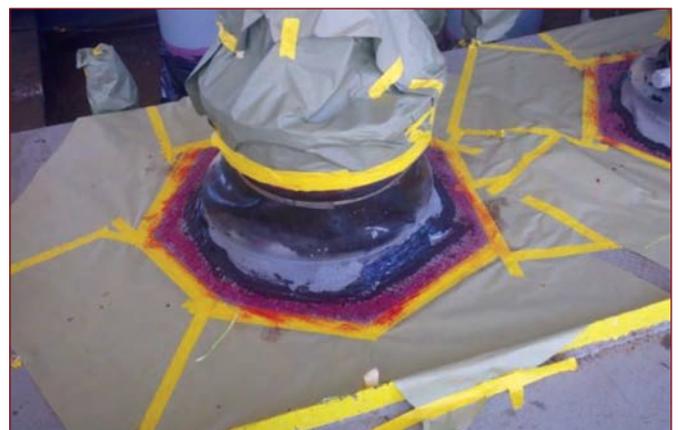
Corrosion Protection for Off-Shore Oil Rig Skid Deck

Applicator PickWest Enterprises, Inc., California created a non-slip, weather resistant and high impact surface with long term durability demanded by this industry

On an offshore oil production rig, the top deck (rig skid) of the oil platform is the main area where 14-metre lengths of drill pipe are laid out. The drill pipe is dragged across the deck as they are pulled up for drilling operations. The

pipes damage any coating put on the steel deck and then the abraded steel is exposed to corrosion.

To prepare these working areas for treatment the platform deck was abrasive blasted to a Sa 2 ½, 50 to 70 micron profile to clean off any existing coatings and also profile the surface for optimal adhesion of a primer and the Rhino Linings protective coating. A zinc-rich primer was applied to the prepared metal surface @ 20-25 micron, over which a Rhino Pure Polyurea was applied to a nominal thickness of 3000 microns on the deck surface. Rhino Linings Pure Polyurea was chosen for its resistance to weather extremes, excellent flexibility and high impact strength. Masking of fittings before application of the coating system is shown in the four figures below. Further, the ability to walk on the spray applied, fast cure surface in a matter of minutes





after application meant that the facility was back on line sooner. A major consideration in applying any surface treatment to a structure is the requirement to minimise downtime. Spray coating enables quicker application and less disruption to a client's operations.

Off-Shore Oil Platform Deck Penetration Boots

PickWest Enterprises, Inc., California created a watertight, weather-resistant, flexible interface for long term durability on all deck penetrations 6" in diameter and greater.

Where pipes and other equipment penetrate the deck areas of offshore structures, it is important that operational liquids do not run down the pipes to the ocean below. Most offshore rigs cover these penetrations with a butyl rubber 'boot' that is taped to the pipe and deck. However, the rubber of the boot and the adhesive can be degraded by UV and salt exposure in a matter of months. To extend the operational life of the deck penetration boots, the butyl rubber and the adjacent steel surfaces were scuffed (rotary plastic cup brush for rubber and bristle brush for steel, followed by solvent cleaning) before the appropriate primers (Rubber

15-20 microns, Steel 20-50 microns) was applied. It is important to note that all loose coatings, oils and dirt are thoroughly removed before applying any new flexible membrane. Similarly, the surrounding equipment, piping and deck surfaces must be masked off to protect against overspray. The coatings applicators recommended Rhino Linings Pure Polyurea to use with the boots. The product, was applied at a thickness of 2000 microns or greater, and extended 50 mm up the pipe and 100 mm onto the deck, creating a liquid tight, weather resistant, flexible interface on all deck penetrations.

About Pure Polyurea

Pure polyureas are formed when a liquid isocyanate is mixed under high pressure and high temperatures with an amine-based resin solution. Isocyanates are reactive because the double covalent bond attaching the carbon atom to nitrogen and oxygen atoms which are easily broken to form single bonds in the more stable tetrahedral configuration around the carbon atom.

When applied to the substrate, the excellent chemical cross-linking produces a dense but flexible surface. The high density makes the coating almost impervious to abrasion, water and chemicals.

Pure Polyurea coatings 'snap cure' to form a solid surface in a few seconds and can be walked on without damage in less than a minute. Another advantage is the ability for it to be sprayed up to 6000 microns thick (and greater) on a sloping or vertical surface without sagging or running. The resulting surface is easy to maintain, clean and recoat if necessary. The ease of touch-up contrasts markedly with epoxies and most other paints which form a solid, rigid shell. The flexibility of pure polyurea coatings allows them to move with the expansion and contraction of the underlying structure as temperatures change.

About Rhino Linings Australasia Pty Ltd (RLA).

RLA was formed in 2001 and established manufacturing and distribution capabilities for the Australasian region. RLA manufactures its spray applied coatings at a facility on Australia's Gold Coast and can draw on the more than 30 years' experience of its American parent. The company sources all its materials from local suppliers except for some very specialised chemicals which are imported from the United States of America.

