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Hydrex's underwater repairs keep vessels on schedule

Mobdock repairs demand speed and efficiency, as the Belgian company demonstrated with a recent cruiseship thruster refit

Head-quartered in Antwerp, Belgium, Hydrex has been a leading name in underwater repairs and maintenance since its beginnings in 1974. With decades of experience, the company is able to carry out a variety of repairs, of differing degrees of complexity, without the damaged vessels having to drydock, saving shipowners both time and money.

Using a mobdock – a structure that is used to create a dry, water-tight environment below the water line – highly-trained divers can perform repairs as though they were working on dry land.

Boud Van Rompay, founder and CEO of Hydrex, comments on the way in which mobdocks, or 'cofferdams' and 'habitats' as they are also known, have changed the very nature of shiprepair: "The first prefabricated cofferdam went into the water in 1979 on a Chinese vessel, but it only really took off in the 90s. Now, there's not a single shipowner in the world who, when he has a crack in the hull, thinks he is going to have to go to drydock. He thinks cofferdam first – get a cofferdam and a diver and fix it underwater."

Traditional cofferdams made from steel are tailor-made to fit exactly to the outside of the hull of a ship via suction and bolts, so that divers can work from the inside of the vessel and cut away sections of the ship that need to be replaced (see Figure 1). Dave Bleyenbergh, Hydrex's production executive, says: "This is the real beauty of the mobdock concept. We can modify or build custom-made solutions on site to suit any shaped hull or appendage in very little time.

"Of course, there are occasions where damage does not allow a permanent repair, but we can install a temporary doubler plate over the damaged areas, allowing vessels to keep sailing until their next scheduled drydock."

Hydrex also pioneered an award-winning, flexible mobdock in 2002



Figure 1: Large repairs are able to be carried out underwater thanks to Hydrex's tailored cofferdams



Figure 2: Hydrex's flexible mobdock is ideal for repairing stern tube seals

for use when ease of transportation is a must and for repairs where time is of the essence. The flexible but durable sheets create the same watertight environment as traditional cofferdams by increasing the air pressure inside the habitat so that it is higher than the water pressure, causing the water level to drop. They are often used for repair or replacement of bow thrusters and stern tube seal repairs (See Figure 2).

Recently, Hydrex was tasked with repairing a bow thruster that had malfunctioned on a cruiseship sailing off the Caribbean. It was paramount that the ship's schedule was not interrupted and so the team had to work to a strict timetable, as Bleyenbergh explains: "The repair itself was one our teams had done on many occasions, but the ship's timetable was the tricky part. Its cruise itinerary included several short port stays so we had to devise an effective repair plan that would allow us to carry out the thruster replacement in eight-hour stages, across several different ports. It was a logistical challenge."

Divers removed the bow thruster unit and blades at the ship's next stop, then the Hydrex team was ready at the next port call to fit the flexible habitat and close off the thruster tunnel, so that the new bow thruster could be installed in a dry environment to avoid water ingress.

The company prides itself on intensively training its divers to ensure they are as safe as possible when carrying out sometimes challenging underwater repairs. In almost 45 years, Van Rompay claims that there have been no incidents where divers have been seriously injured. With up to 110 divers in the water performing repairs on any given day, it's an impressive safety

record, which the company attributes to its stringent recruitment and training process.

As well as carrying out underwater repairs, Hydrex has also developed a technique known as 'propeller buffing', which it claims, if done regularly, can save shipowners up to 10% in fuel costs. Using the company's specially-designed brushes, for which Hydrex released the patent last year, propellers can be buffed to a mirror-like shine in order to combat cavitation erosion (see Figure 3). Van Rompay explains: "If you have an ultra-smooth propeller, you don't have cavitation erosion. You still have cavitation, but you don't get the erosion."

The company recommends shipowners buff propellers three to four times a year, but Hydrex claims that the cost of doing this is more than covered by the savings made on fuel. **SR**



Figure 3: The company's buffing technique achieves a mirror-like shine, as shown on the left-hand blades of this propeller