



Product datasheet

WÄRTSILÄ UNDERWATER SERVICES SCRUBBER OVERBOARD REPAIRS

Cost-effective solutions to fix and prevent corrosion

Our skilled diver-engineers use tried and tested solutions to repair damage caused by acidic discharge from your scrubber system.

Understanding the problem

Exhaust gas cleaning systems, also known as scrubbers, are an effective way to deal with sulphur oxide emissions. As well as ensuring you meet the regulations set out by the International Maritime Organisation, they help you to avoid the high cost of using alternative fuels.

However, the high sulphur content of scrubber wash water can cause problems, particularly in open-loop systems. Although this acidic water is quickly neutralised by the much larger volume of seawater, it can still cause corrosion at the immediate point of outflow and for a short distance along the hull.

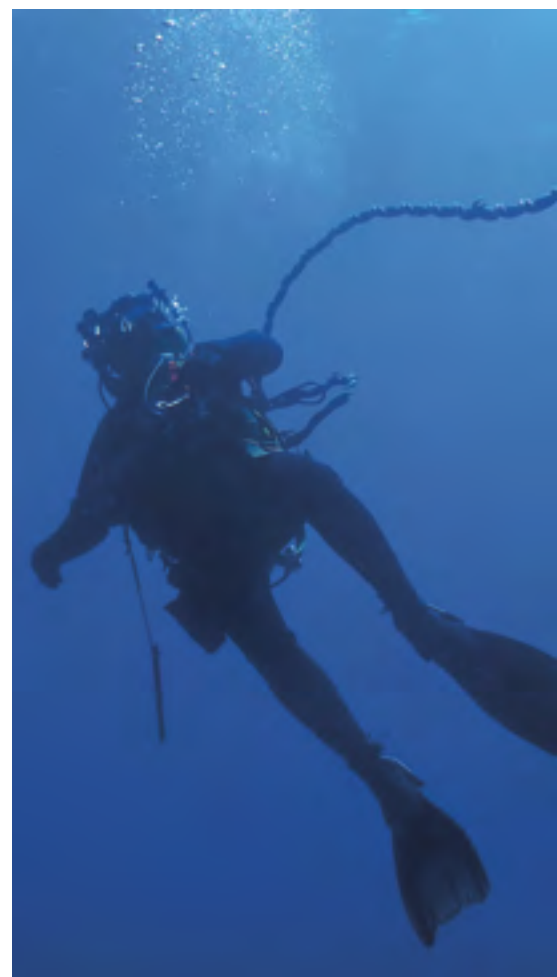
Scrubber systems are made to withstand these high pH levels, but the connection to the mild-steel hull may be compromised, particularly if it's uncoated or damaged.

Why it's important

If corrosion occurs in the overboard piping system, the wash water can leak into the ship in various places. Where the hull plating is damaged, it can mean ingress into cargo spaces, the engine room, ballast tanks and voids.

In the short term, you may need to stop using your scrubber. If that happens, you might need to switch to a cleaner, more expensive fuel to comply with the IMO 2020 sulphur cap - and your costs could rise significantly. The sooner you repair the damage, the sooner you can get your scrubber up and running again.

In severe cases, vessels have had to be put in drydock for repairs - an expensive and time-consuming process.



How we can help

Wärtsilä Underwater Services offers several Scrubber Overboard Repairs for damage caused by scrubber discharge. We've developed various methods of replacing and modifying affected elements of the overboard system.

Our underwater repairs are quick too. Our divers can complete underwater projects in as little as two days – over twice as fast as repairs done in drydock.

These services are also cost-effective. Many can be carried out in-situ, so they can be done anywhere, often during cargo operations.

Repairs can be significantly cheaper than drydocking, especially in consideration of other drydocking-related costs.

Our network of factory-trained, industry-certified diver technicians spans the globe, so we're never too far away. And our high standard of service and equipment means you can count on us to get the job done right.

These repair methods are also useful for dealing with damage caused by wash water from exhaust gas recirculation systems and substances in ballast water treatment systems.

A WIDE RANGE OF SOLUTIONS

Whatever your needs and your budget, we can find a suitable solution.

Replacement pipe and coating

With this solution, we weld a new mild-steel spool piece into the hull. We also strip off the old coating and apply a new corrosion-resistant coating to protect the hull from acidic water.

If the coating remains intact, it can provide protection for many years. In cases where damage may be likely to occur to the coating (for example, this can happen where diffusers are clamped into the pipe and break free under pressure), we would recommend one of our other solutions.

Laser-cladded mild-steel piping

This is basically the same as installing a new mild-steel pipe. But instead of applying new coating to the inner diameter of the pipe to protect it, we cover it in laser cladding.

When we weld the pipe into the hull, we have to be careful not to heat the cladded area to more than 250°C.

Once complete, the inside diameter of the pipe is protected for the rest of its operational life. There may still be a risk to the welded area just next to the overboard pipe, and we recommend applying a new coating there.

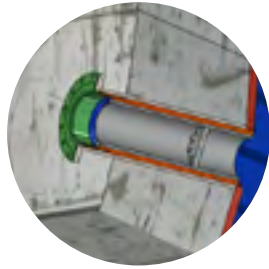




Prefabricated stainless steel inserts

This works by increasing the distance from the actual overboard towards the transition of SMO to mild steel on the hull. The SMO pipe is welded into an SMO plate, which in turn is welded into a mild-steel plate that can be fitted as a conventional insert plate.

It requires highly accurate 3D measuring on board, since there's little room for adjustments in-situ. Coating around the transition from SMO to mild steel is still important to avoid galvanic corrosion.



Pipe-in-pipe

Best for larger systems, this patented solution was developed together with Maersk and is deployed exclusively by Wärtsilä. With pipe-in-pipe, the original mild-steel overboard pipe remains in situ, and a glass-reinforced epoxy (GRE) pipe is inserted into it without cutting any metal away. Inside the ship, an SMO sleeve with a flange to connect to the internal piping is inserted between the GRE pipe and the steel pipe, and an adhesive is injected into the spaces between the pipes.

This is a long-term solution, which can be planned for at any time, even when no corrosion has yet occurred.

The component pipes can be prepared and stored either on board or at an engineering facility ready for fitting, either during a scheduled drydocking or, if necessary, using a cofferdam at a convenient time and location.

Our pipe-in-pipe solution is best suited for large systems, because while it solves the corrosion problem, it also has a slight impact on the internal diameter of the pipe. This isn't necessarily a problem, though, because most large systems have a baffle device that slows the discharge in order to meet the IMO dilution requirements.

Case study

Commercial container ship

This vessel was fitted with a third-party scrubber system. Damage to the coating around the overboard pipes had allowed erosion to occur to the mild-steel piping and hull plates. The merchant wanted to avoid the time and expense of drydocking, and was looking for a long-term fix, so we deployed our pipe-in-pipe solution.

- We used a mobile cofferdam to undertake the repair in-situ.
- Repairs were completed in less than 40 hours. Drydocking would have taken around five days.
- The company was able to continue operating.
- The vessel is now protected from acidic erosion long-term.



About Wärtsilä Underwater Services

Established in 1993, Wärtsilä Underwater Services is part of Wärtsilä Shaft Line Solutions. It specialises in repairing, overhauling and servicing seagoing vessels, marine installations and rigs. We have a worldwide network of factory-trained, certified diver technicians, delivering expertise and a high standard of service. Combined with industry-specific product training programmes and access to original equipment manufacturer (OEM) products and solutions, we can offer support and services when you need them most.



Areas of expertise

- **Machinery and equipment:** Our underwater factory-approved repairs are carried out by trained and certified technicians - safely, reliably and cost effectively.
- **Propulsion:** We use in-house and external training, giving our engineers the right skills to execute complex underwater propeller repairs.
- **Shaft sealing systems:** We offer a range of maintenance, cleaning and inspection services, working with global partners to exceed your expectations.
- **Shell plate repair:** We've been delivering underwater wet/dry and hyperbaric welding solutions since we were founded.
- **Ship husbandry:** Over the years, we've performed hundreds of seal repairs and overhauls on shafts - using solutions like our FLEX-DAM habitat.
- **Oil and gas:** Our underwater repair services have also been employed on offshore floating structures in the oil and gas industry.

Get in touch

For more information about Wärtsilä Underwater Services, including Scrubber Overboard Repairs, contact underwaterservices@wartsila.com or **+31 115 61 2872**.

An industry leader in shaft line components Wärtsilä Shaft Line Solutions delivers a portfolio of end-to-end services and integrated solutions for the marine markets that builds on our core values: lifecycle efficiency, risk reduction, environmental leadership and design excellence. As an original equipment manufacturer operating in 75 countries, we have the capabilities to support customers on a global scale, and remain committed to providing in-country and round-the-clock expertise.

