



MERMAID MARINE SERVICE Ltd.

## PROPELLER POLISHING & HULL CLEANING



## Underwater reparations and fuel-saving operations

**Mermaid Marine Services Ltd. offers a high quality underwater reparations and maintenance on ships and vessels, which are carried out on site to prevent costly unscheduled offhire time or a dry-dock visit.**

### **Mermaid Marine Service offers:**

- Reparations of all the ship's propulsion systems under water
- Maintenance of hull cleaning and propellers polishing
- Effective maintenance steps that save a large percentage of the fuel costs

### **We do this with:**

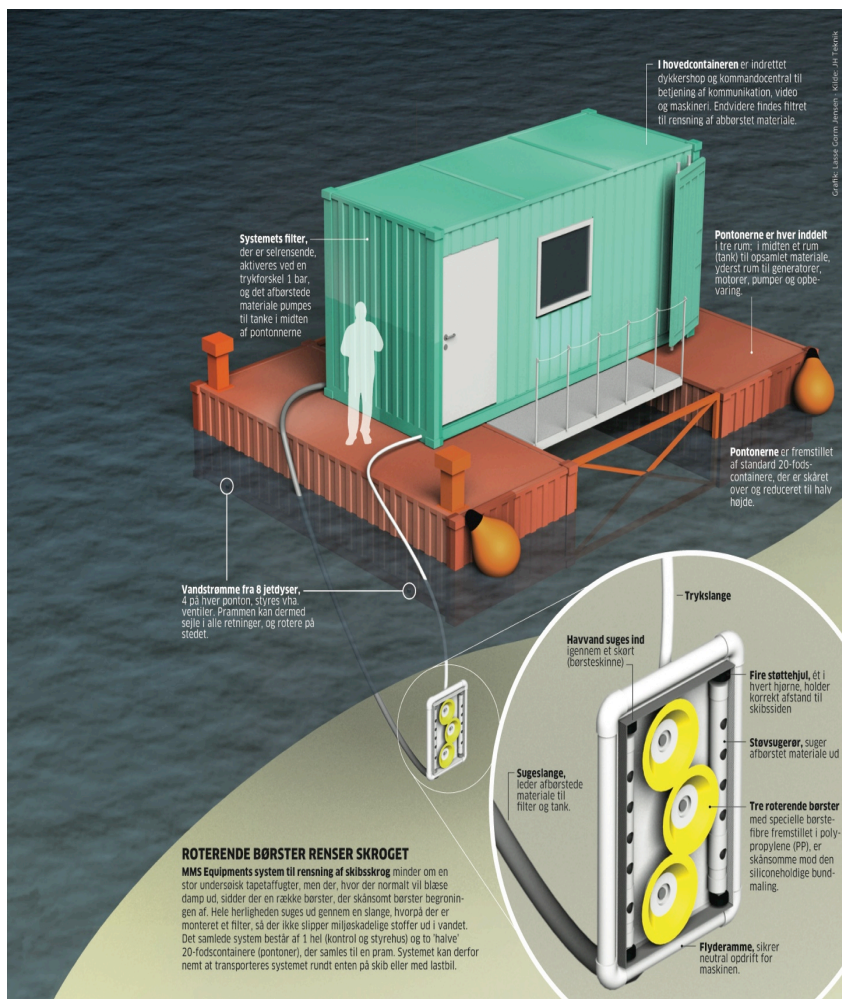
- Qualified and experienced divers
- Standby equipment for immediate deployment
- Advanced techniques providing dry-dock conditions under water

### **These operations are:**

- Permanent
- Class approved
- Always economically most favourable at any place
- Performed in port or at anchor
- Performed while commercial activities uninterrupted continues



## The benefits of Mermaid Marine Service's self-floating container system:



1. No cost for diving support vessel with crew
2. No mooring of a diving support vessel alongside the customer's ship
3. No extra work for the customer's crew associated with the arrival, (delay – forhalning) and departure of a diving support vessel
4. While diving, related to hull cleaning, all safety measures are taken into account. As the container system is not operated by means of screws, and the diver's work takes place in the immediate vicinity of the container system
5. The Danish Maritime Authority approves the container system
6. All safety regulations and conditions in accordance to the applicable legislation are met
7. We are following (The Diving Act – dykkerloven) and The Maritime Authority approved dive tables and instructions
8. The container system is very flexible for placement of a new working area in matter of reaching bunkers, water or supply ships for the customer
9. The container system is capable of acting as standby ship between ship calls, the vessel moored alongside the port or it can be onshore. This means that there is no cost to crew and fuel
10. Flexible container system
11. When the container system is not used for hull cleaning, it is suitable for all kinds of underwater work on ships, welding jobs, shutting off sea passages and in-water surveys as diving gear and video is a fixed part of the permanent equipment
12. There is a large power capacity for multiple tasks, as there is a large generator plant on board



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A guideline from the IMO (International Maritime Organisation) says that new ships through available technology such as new types of paint, are able to achieve environmental improvements (less CO<sup>2</sup> emissions) of between **12-23%**, while existing ships needs to be **5 -12%** more efficient through retrofit processes.

**New technology and new types of paint supplemented with hull cleaning and propeller polishing will obviously aid pushing these statistics up.**

Mermaid Marine Service Ltd. has also developed a mobile hull cleaning system that can be transported by plane or car and can perform hull cleaning from a smaller vessel







## **The benefits of Mermaid Marine Services hull cleaning equipment**

- The hull cleaning system is proven and used worldwide for several years
- The stable and proven system is modified with the most modern technology that currently is available for environmental protective hull cleaning of ships and vessels
- The newest technology is used for the manufacture of brushes, so each type of paint will be treated according to the supplier's recommendations
- This cleaning machine frees the ship hull's fouling and the cleaned fouling is then collected in a very simple and secure process

## **Completely environmental neutral**

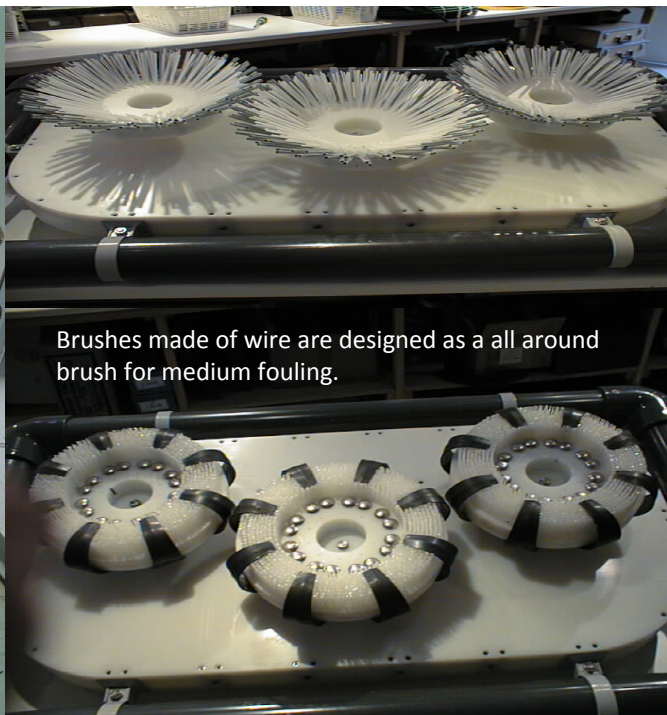
- The cleaned fouling is transported from the cleaning machine through a very unique filter system, specially designed to filter cleansed fouling, therefore the entire hull cleaning process is conducted
- As the hull cleaning system is very simple, and the diver has physical contact with the machine then both reliability and cleanse speed are very high
- The container system and the effective cleaning machine and hereby the cleaning work has up to date lived up to the shipping company's satisfaction
- The authorities and port environmental controls will be notified of all the work connected to hull cleaning

## Technical Environment

Mermaid Marine Service Ltd. has permission to offer hull cleaning in most Danish ports. Hull cleaning is part of a new cleaning machine for brushing of hulls, which collects the cleaned fouling. The purpose of the collection is to reduce pollution by hull cleaning of ships in the future.



This hull cleaner with a 'two knives' brush can clean up to 100 mm. fouling. It is mainly used for cleaning vessels that have been onshore for a long time or for offshore installations, which have to be on land for services or repairs as their fouling can be very influential and will pollute the marine environment in the port.



Brushes made of wire are designed as a all around brush for medium fouling.

Knife brushes is a type of brush used for very sturdy fouling of barnacles and shells up to 50 mm.



Polypropylene brushes are used for light fouling, silicone and acrylic antifouling painting and other paint types that cannot withstand a heavy touch.



## **The benefits of propeller polishing:**

The only way to keep propellers in shape is to ensure suitable and regular cleaning. The blades of propellers' surface need to be smooth and free from marine organisms.

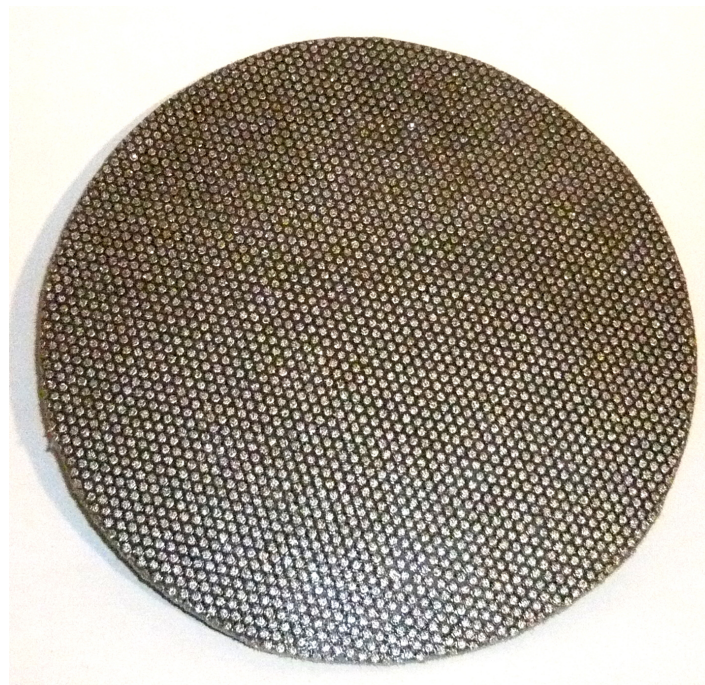
When the surface of the blades of propellers becomes uneven, the resistance in the water increases, which can end with the occurrence of cavitation that constantly is self-reinforcing, if one does not maintain the surface with propeller polishing - polishing with fine diamond discs.

**If you polish the blades of propellers with diamond discs in water, it is actually possible to gain a smoother surface, than the manufacturer delivers from start.**



## The Propellers Polishing Machine

1. Proven and stable special tool of a high standard
2. Several diamond discs with a selection of fineness are used for the polishing
3. The Rubert scale is used as a standard to evaluate the blades of propeller's surface before and after polishing
4. A report is giving with video and photos of any cavitation, deformations or damages on the propellers







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