UNDERWATER CLEANING OF SHIPS HULL. CLEANING AND POLISHING OF PROPELLERS
WHAT IS THE REASON FOR IN WATER CLEANING?

• Today the biochemical corrosion which causes great harm to the ships hull and other marine facilities gives a lot of anxiety to the shipowners.
BUT THERE ARE FACTS AS FOLLOWS,

• The hull bottom of the ship which returns from a long voyage looks like a huge "settlement", colony of algae and other marine organisms. In spite of the up-to-date means designed to protect the ship against fouling, the similar outgrowth can be 500 millimetres in thickness and sometimes even more. The speed loss is 30% of the rated one, herewith the fuel oil consumption increases by the same amount. The regular underwater cleaning of the ship makes it possible to restore the initial speed by 95-98% and respectively to decrease the fuel oil costs which, as a rule, account for almost half of the operating costs. It is also advisable to clean and polish the propellers: firstly, decrease of cavitation which destroys the surface of propellers, secondly, saving effect the same as while cleaning and sometimes even more. That's why the ship's hull underwater cleaning, cleaning of the sea valves gratings and other structural members are so demanded today all over the world.
WHAT’S THE BENEFITS?

• The *underwater cleaning of hull, cleaning of propeller, cleaning of sea valves gratings* and other structural members subjected to fouling do not require docking today. The scheduled underwater cleaning of the hull is very economically advantageous during the inter-docking period, for example, such measures can save up to 900 t fuel oil/year for a shipowner having tanker of 50 t displacement. Here is a brief list of efficiency of such procedure as the *underwater cleaning*.

• Ship's weight decreases, hence manoeuvrability and speed increase;
• Surfaces are ready for inspections or repair works;
• Fuel oil consumption decreases;
• Ship's total lifetime increases.
HOW TO AVOID THIS PROBLEM IN THE FUTURE?

The up-to-date underwater cleaning of the ship’s hull is carried out by new effective methods but without rejecting the old time-tested.

Method of the hydrodynamic cavitation removes the fouling from the ship’s surface maintaining its varnish-and-paint coating. This method makes it possible to carry out the underwater cleaning where it is impossible to do it by mechanical method. The hydrodynamic cavitation is effective where it is required the cleaning of the vent distribution ducts, sea chest gratings, sea chests, valves and so on. The hydro-cavitation as a technology goes back by its origins to ancient 1894 year, and a copyright belongs to Froude, an English engineer. As a simple example of cavitation, normal boiling water when the steam pressure is equalized with the environment pressure and there are bubbles which flow to the zone of more high pressure. With this motion the bubbles seem to slam creating a strong shock wave. The principle of operation of the plant for the hydro-cavitation cleaning is based on the strength of high impact jet which is delivered under certain pressure. Steam-gas bubbles, coming to the surface which should be cleaned, collapse. Arising from this the shock wave cleans the hull and other structures against rust and fouling. The underwater cleaning of hull by means of the hydro-cavitation plant removes all without exception types of fouling, rust, paint; and its another advantage is that hydro-cavitation equipment has its absolute environmental safety.
WHAT THE DIFFERENCE BETWEEN US AND ANY OTHER COMPANY?

- Other companies' Method of the mechanical cleaning by means of the hydraulic metals is indispensable in case of heavy degree of fouling as well as when the ship should be cleaned very quickly during the ship's stay at anchor or in port. The **underwater cleaning** by means of the hydraulic metals and by using the hydraulically-driven brush-machine is based on the action of the rotating machine equipped by a special brush, and the brush, in its turn, is driven by the hydraulic motor. Coaxial hose supplies the hydraulic liquid from the pump station arranged above water. Special design of the brush makes it possible to fit tightly like sticking to the surface being cleaned. Brush carts-brushes can clean both the horizontal and vertical surfaces and can also remove practically all existing types of fouling (shell molluscs, algae and others). The hull main coating is not subjected to risk of damages in spite of rather powerful effect onto the surface of machine. This is owing to the special materials of which the brushes are made. The level of brush hardness is also selected depending on the type of fouling, so the varnish-and-paint coating is not practically damaged.
BRUSH CART:

Brushes
WHAT DISTINGUISHES US FROM OTHERS?  
CAVIBLASTER 1228-G JETSTREAM WATER BLASTER

CAVIBLASTER IS THE LATEST ULTRA-CAVITATION FOR UNDERWATER CLEANING USING MUCH LOWER PRESSURES THAN CONVENTIONAL EQUIPMENT. THESE SYSTEM ARE SIGNIFICANTLY MORE EFFECTIVE, EFFICIENT AND ERGONOMIC THAN THE TRADITIONAL ONES SUCH AS PRESSURE-WASHERS/WATER-BLASTERS, AND THEY ELIMINATE THE DANGERS ASSOCIATED WITH THE USE OF HIGH-PRESSURE CLEANING EQUIPMENT.

THIS TECHNOLOGY IS BASED IN HYDRODYNAMIC CAVITATION, THE PROCESS OF VAPORIZATION BUBBLE GENERATION AND BUBBLE IMPLOSION.

THE IMPLOSION THAT TAKE PLACE DURING THE CAVITATION PROCESS OCCURS IN MILLISECONDS RAPIDLY COLLAPSING BUBBLES PRODUCE SHOCK-WAVES THAT RELEASE TREMENDOUS AMOUNTS OF ENERGY THAT SEPARATE MARINE GROWTH FROM THE SURFACES BEING CLEANED, THE SAFETY FEATURE OF THIS TECHNOLOGY IS THAT ELASTIC MATERIALS SUCH AS HUMAN SKIN EASILY ABSORB THESE SHOCK-WAVES, AT THE SAME TIME THE CAVITATING STREAM IS SIGNIFICANTLY LESS DENSE COMPARED TO A REGULAR PRESSURE JET THUS MAKING THE CAVIBLASTER MUCH SAFER FOR AN OPERATOR AND REMAINING VERY EFFECTIVE TOOL FOR REMOVING MARINE GROWTH.
Model – CaviDome 1222

Specifications

**DIMENSIONS**
- Diameter of Dome: 12.8" / 325 mm
- Wheel Base / Width: 15" / 381 mm
- Length (with handle): 16" / 406 mm
- Height (with handle): 8" / 203 mm
- Weight: 8 lb / 3.6 kg
- Number of Nozzles: Two (2)
- Clearance: 1.6 / 40 mm

**CAVIBLASTER UNIT**
- Caviblaster Model: 1222 (G, E50 or E60)
- Flow Rate: 12 gpm / 46 l/min
- Flow Rate per Nozzle: 6 gpm / 23 l/min
- Nozzle Pressure: 2800 psi / 193 bar
- Hose Diameter - Max. Length: 1/2" - 300 LF / 100m

**CLEANING WIDTH**
- Light growth (algae): 17" / 432 mm
- Medium growth (tubeworms): 16" / 406 mm
- Heavy growth (oysters): 15" / 381 mm

**AVERAGE CLEANING TIME**
- Light growth: 128 ft² / 12 m² per minute
- Medium growth: 50 ft² / 5 m² per minute
- Heavy growth: 25 ft² / 2.5 m³ per minute

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**SKID**
- Dimensions: 29" / 74 cm
- Height: 26" / 66 cm
- Length (without handle): 35" / 89 cm
- Length (with handle): 45" / 115 cm
- Weight: 250 Lbs / 115 kg
- Fuel/Oil Containment Pan: No
- Lifting Eyes / Fork Slots: No / No

**PUMP SYSTEM**
- Pressure Pump: General Pump Model TSF 2421
- Pump Type – Manifold Material: Triplex plunger - Brass
- Flow Rate: 12 gpm / 46 lpm
- Nozzle Pressure: 2800 psi / 193 bar
- Hose Diameter - Max. Length: 1/2" - 300 LF / 100m

**FEED SYSTEM**
- Feed Pump: Johnson Pump Model L2200
- Pump Material & Type: Thermoplastic 12 V submersible
- Flow Rate @ Maximum Lift: 16 gpm @ 12" / 3.6 m

**DRIVE SYSTEM**
- Engine: Honda GX690
- Engine Type: 2-cylinder air-cooled
- Intake System: Naturally aspirated
- Combustion System: Carburetor with digital CDI
- Power Output Maximum: 24 HP / 18 kW
- Power Output Continuous: 22 HP / 16 kW
- Clutch Type: None
- Starting System: Electric

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CaviBlaster® is manufactured by CaviDyne™, LLC. For additional products visit www.caviblaster.com.