

DESMI **Enviro-Care**

Clean-up Operations - Combating Marine Pollution & Protecting Waters

PROVEN TECHNOLOGY

DESMI

DESMI

- Proven Technology

DESMI is one of Denmark's oldest companies, founded in 1834. Despite of our age, we are known to be a modern and dynamic organization, which has constantly evolved to meet the needs of our customers and the changing business environment. We have a long history of supplying goods, reliable solutions, maintaining an innovative approach and utilizing the opportunities on the global market. We consider ourselves a dynamic company with a solution-oriented approach, be it pump solutions, environmental equipment for the recovery of oil spills, plastic & trash or contracting activities. DESMI systems are operating in more than 100 countries. It is recognized by businesses all over the world that we base our development and solutions on our customer's current and future needs.

the near shore, shoreline and beach environments, the equipment focus shifts to light weight, portable systems for ease of deployment and recovery. Our equipment is also used in water bodies to deflect and collect floating debris, municipal garbage and plastic articles. We pride ourselves on exceptionally long life cycle offered by our high performance and long lasting products.

Marine and aquatic debris is one of the most widespread pollution problems, plaguing oceans, rivers and lakes around the globe.

The efficient, safe and reliable operation of all DESMI equipment is a requirement of both DESMI and its customers. In this regard, we offer worldwide

DESMI delivers Proven Solutions delivering the lowest life cycle costs and life cycle support.

DESMI is the market leader for booms and recovery systems



Green technology and environmental consciousness are very important topics to us and all our products are manufactured in compliance with the present regulations. Consequently, environmental considerations play an important role when we choose materials for our products and optimize their operational efficiency. With focus on the individual needs of our customers, we are providing solutions based on proven technology. This is constantly taken care by improving our impact on the external environment and by developing products & concepts that support a reduction in energy consumption and thereby improving environmental health.

For offshore operations, DESMI can boast some of the largest booms, recovery systems and temporary storage tanks in the market today. For

comprehensive training and commissioning. DESMI Oil Spill Response is recognized for its wide and reliable product range, high level of quality and proven track record. This – in combination with dedicated relationship building with our customers and unique “top-of-the-line” products – has after 35 years of service to the industry led to a strong market position. As result, we are today one of the absolute leaders in the Oil Spill Response industry globally.

Our mission is to develop, manufacture, sell and service pumps and pumping systems, environmental equipment and special products related to these areas – meeting the needs of customers around the globe. With this in mind, we are pleased to serve you.

Helping you achieve debris free waterways

Each year approximately 8 million tons of plastic waste leaks into the oceans making it the most widespread pollution problems. The negative influence this pollution has on marine life, fishery resources, livelihood of coastal areas, basic nature values, tourism and the long-term threat against human health has led to a global call for prevention actions.

DESMI is applying its expert knowledge and lengthy record of accomplishment to tackle the issue. Successful management of the problem requires a comprehensive understanding of marine environment together with the necessary experience and the correct selection of proven equipment. Knowhow is key and dealing with DESMI brings many benefits.

After 40 years of safeguarding marine environment from oil spills and protecting waters around the globe, DESMI EnviRo-Care originated and provides unsurpassed containment and collection methods in water bodies to deflect and collect floating debris that includes but not limited to municipal garbage and plastic articles.

The purpose of DESMI EnviRo-Care is to reduce the pollution of plastics in the oceans. Therefore, we aim to tackle the problem as close to the source of pollution as possible. Moreover, DESMI is a world leader in solutions for combating oil pollution in the oceans and environmental solutions around the globe.

From clean-up operations in the deep Jungle of South America to open ocean water clean-up operations around the world, DESMI service provides the equipment & first step of any solid waste management chain. DESMI EnviRo-Care aims to eliminate plastic waste from waterways and thus supports waste reduction strategies. Finally, a safe disposal of waste to safeguard the public health, marine life and the environment.

DESMI EnviRo-Care offers various products combating plastic waste leakage comprises of Auto Trash Trap, Trash Trap, Trash Tube, Skimmers, Trash Cat, Debris Trawl and many other options in addition to the workboats for trash collection. Our product portfolio includes mobile and stationary units, which are designed to withstand heavy environmental diversities e.g. heavy rain, stormy weather and can easily be deployed in high and low tide without any manual surveillance required.



DESMI EnviRo-Care Business Operation

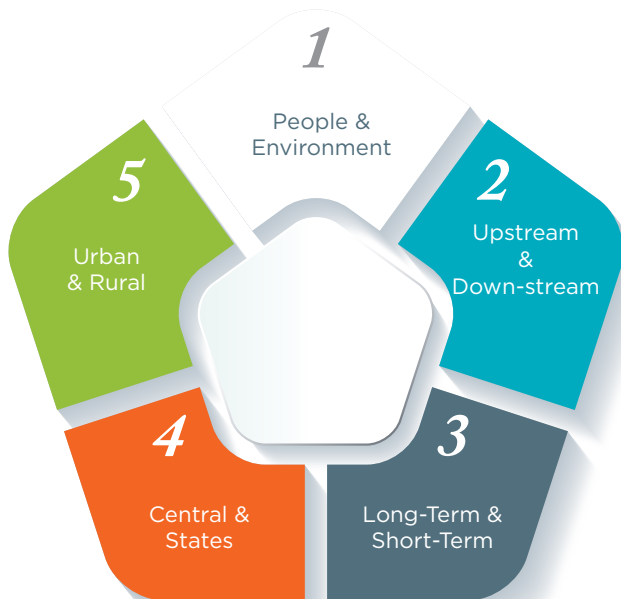
DESMI EnviRo-Care is capable of collecting all floating marine debris. The solution is designed to generate circular economy benefits both to DESMI EnviRo-Care & to its customers by converting collected waste into a resource (if responsible waste management practices are performed) besides contributing to UN's sustainable development goals.

We prevent the pollution to reach our oceans, contribute to safe marine life, healthy environment and mitigate waterborne diseases. In addition, we create a positive impact on UN Sustainable development goals 6, 12, 13 & 14.



No matter how small or large, the project is, our global presence and local knowledge makes us competitive

Business Interaction



Global Perspective with Local Action





Remote or on-site operated Floating Platform

A remote or on-site operated Floating Platform with an oval entrance opening placed at the water level ± 15 cm giving free flow for surface debris to enter the collection bag. The unit is mounted with four pontoons giving a high buoyancy. These pontoons can be filled with water in order to achieve the desired buoyancy. On each side, between the pontoons, an electrically driven outboard motor is placed.

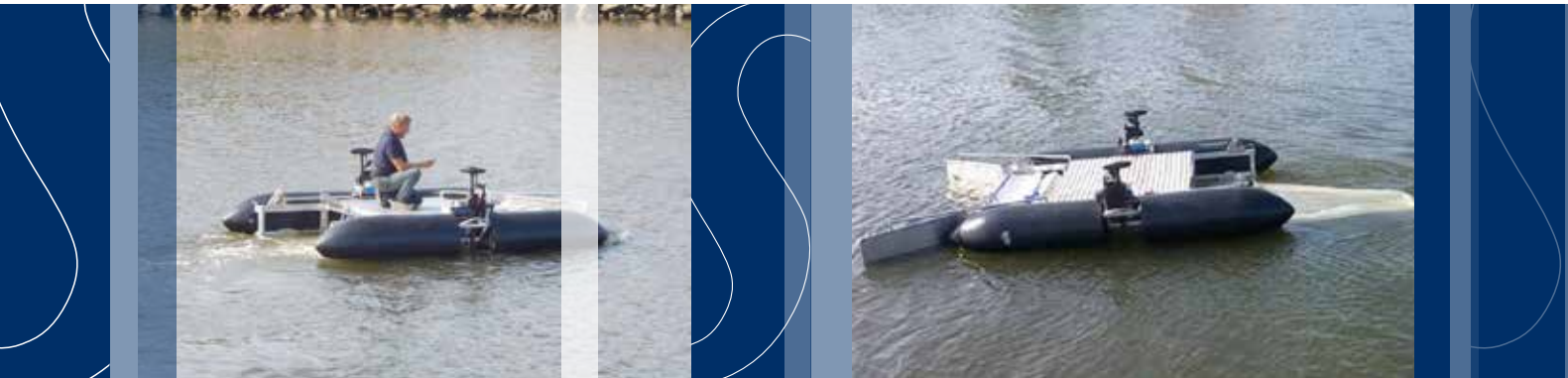
These motors have the possibility of being remotely operated. It should however, be noted that the distance from the control box to the engines should not exceed 30 meters in open area. The remote control can start/stop the engines, control the thruster level, forward/reverse and also steer the motors port/starboard.

The material used is seawater resistance aluminum due to weight, strength and seawater resistance.

The entrance bracket is lifted so the entrance points upwards. The bag material is placed on the approx. 60 cm long bracket. The end of the net is closed with a wire and the length is similar to the Floating Platform is dragged out from the bracket, locked with an approx. 50 mm wide steel belt, and the operation starts.

When the net is filled the entrance bracket is again lifted. With a hook, the net is strapped and closed with a wire again. Some 20 cm away from this closing the net is again closed with a wire. In between the two wires, the net is cut away from each other and the filled net is floating away from the Platform and the new net is put in position, and the operation starts again.

As the debris is floating, the filled net bags will also be floating on the water surface and can be pulled to the chosen land installation for further treatment whenever it is optimum for the crew.



Further, the concept is designed in a modular concept where the width of the deck can be 1.0 meter, 1.5 meters and 2.0 meters. In addition, the entrance bracket is made in a modular concept so the opening of the bracket correspond to the platform width. Further, the length of the floating platform can be elongated with modules of one set of pontoons. Depending upon the unit size, the waste collection capacity is ranging from 300 liters to 1100 liters before the bag has to be changed.

When having two electrical motors placed at either side of the Platform in a central position it is possible to maneuver the unit with equal thruster position giving straight direction, different thruster positions for having a port or starboard turn, or extreme having one motor going forward and the other going reverse making the Platform turning on a table.

Successful removal of floating debris, municipal trash and plastic articles

Floating debris, municipal trash and plastic articles are an ongoing blemish on the Environment. Much of this material finds its way into streams, rivers, canals and ultimately into our oceans. A simple solution to this is the DESMI EnviRo Enhancer.

It is designed to operate under a wide range of tidal conditions and water flow rates with minimal maintenance and longevity in mind.

DESMI trash systems utilize proven DESMI booms and tide compensation accessories as an integral part of the system. Performance, simplicity, and durability are the watchwords for the Enviro Enhancer. It serves to contain much of the floating surface debris while allowing smaller particles and most naturally occurring materials suspended in the water column to pass through.

The unit floats on the surface of the water, rising and falling with tides and runoff.

Maintenance consists of periodically lifting the debris basket out of the trap and dumping of its content for sorting or disposal.

Installation consists of placing the Enhancer on pilings, and securing the upstream end of the boom to pilings or simply to the shoreline or a mooring.

The framework of the EnviRo Enhancer is made from rugged steel construction and is hot dip galvanized for longevity in the marine and aquatic environments. Inflatable fenders or heavy PE pipes with foam filling provides the floatation. The basket is welded steel mesh available in a variety of mesh sizes.



Light weight, Low cost

The DESMI EnviRo Tube unit is a light weight, low cost, trash recovery unit, for use in areas with lower capacity demand and with eventual difficult access.

The unit is portable and could be brought in place for recovery, from even a small boat.

The unit requires a couple of guide booms, which could be at any convenient length and any boom style that can be connected to the unit by means of traditional oil boom connectors or the like. These guide booms could be floated into the recovery area and be connected to the recovery unit at site. The recovery unit will deliver the collected trash into bags on the downstream side of the unit.

These bags can be light, cheap and disposable bags, if this is most convenient. If there is no immediate access to the recovery from the river bank, the bags

can be released from the unit and then towed with a boat to a suitable place for lifting out of the water. The bag can immediately be replaced with a new one, with little manual work.

If there is good access the unit from the bank, the unit can have stronger, re-usable bags that can then be lifted out of the water and directly into a transport unit. These bags can have full drop bottoms and can then be reinstalled immediately after emptying.

The Enviro Tube only need anchoring by the guide booms, which can be anchored to a bank and/or by anchors to the bottom.



High Recovery & Efficiency Rates

The DESMI Impounder unit is the first of its kind combining high recovery and efficiency rates to collect municipal rubbish and plastic articles from the surface of water and from land.

The functional requirements of DESMI Impounder are based on some very specific demands including:

- Quick recovery
- Efficient loading of debris into containers.
- Reduction of labor costs and injuries.

The stationary solution is to be placed on a platform while the mobile solution comes with a four-wheel drive control power unit. Both solutions comes with telescopic conveyor extendable up to 24 meters.

The principal structure of the unit consists of a collecting head system, operated by hydraulic power.

The collecting head consists of three rotating drums covered with long flexible “rubber fingers” that lift the debris through the collector-head into the conveyor. Hydraulic power supplied through the control unit drive these drums.

Basic physical properties:

Collector head

Length: 1400mm

Width: 1350mm

Telescopic Conveyor

Length: 7025mm

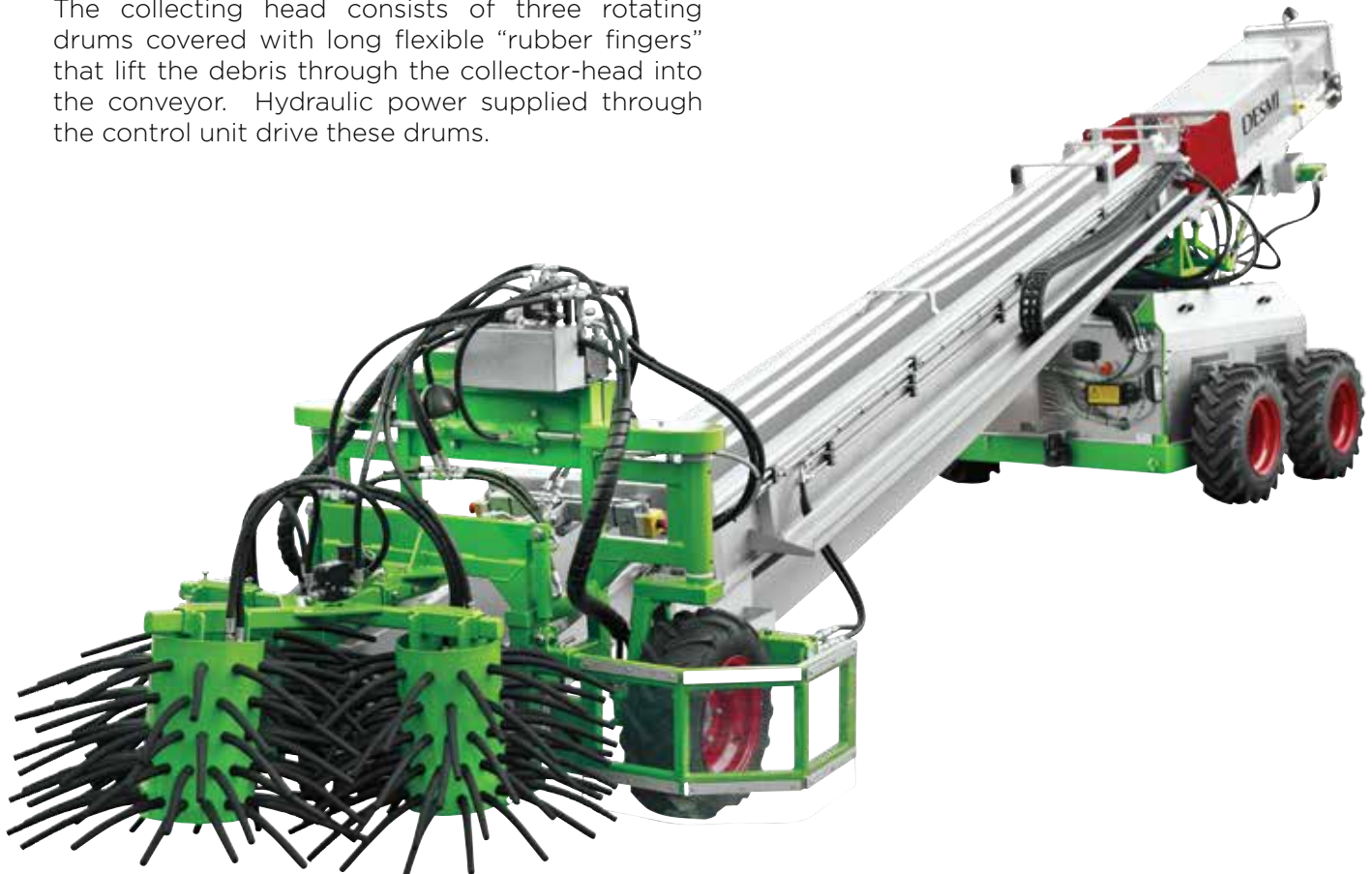
Width: 800mm

Main Power Unit

Length: 1800 mm

Width: 1550 mm

Total Length approx. 8.5 meters with a weight of approx. 2600 kg.



Ecological Solution

DESMI has managed to deliver an environmentally responsible answer to the marine growth challenges.

DESMI's ecological solutions for marine growth containment and removal from water was launched as a response to the massive Seaweed issue present at many shorelines today. The seaweed has invaded beautiful beaches around the North Atlantic region and the Caribbean – a huge problem for the local residents, the local wildlife and the thousands of annual tourists.

DESMI booms in permanent installations have good references like no one in the market. Booms will deflect the Marine growth to specific areas where with the help of DESMI skimmer, it can be transferred to containers or trucks for easy transportation.

- A pump which is insensitive to sand
- A relative lightweight construction which can be deployed by 2-3 persons
- Skimmer body equipped with wheels for easy handling, deployment and recovery
- Stainless steel open mesh conveyor belt feeding the skimmer pump



Easy recovery of heavy oil, tar lumps etc.

The DESMI River Sweep originates from DESMI's Oil Spill Segment. It is an innovative oil trawl design from the early 1980s to recover waxy oil residues. The trawl consists of sweeping wings and an entrance net – followed by up to 3 x collection socks, which can recover unwanted floating material.

The system is able to filter the water, trapping the debris into up to 3 x collection socks connected in series to the entrance net. Debris will be floating through entrance net, first sock, second sock, and into third sock (last sock). “Last” sock when filled will be disconnected by means of control lines attached to a pick-up buoy. After the last sock is disconnected, the next sock, will then automatically close and become “last” sock. The pick-up buoy will be taken by the vessel (dinghy) which can tow away for disposal of the released debris-filled sock.

The trawl bag can be filled up to 10 m³ and then disconnected from the main part of the trawl, and replaced easily by another bag.

The unit can be used to recover heavy oil, Tar lumps and other kinds of debris from the sea, rivers. It is prepared for use under a wide range of sea conditions. From calm in-harbour conditions up to waves of 2- 3 m in the open sea.

The trawl is able to collect oil and debris from the surface of the water down to a depth of approximately 1 m.

The photo shows the trawl entrance net mounted onto deflated boom sweeping wings and held by Ro-Kite for single vessel operation and maximum efficiency.



Range of DESMI Booms

Range of DESMI booms in permanent installations have good references like no-one in the market.

For Example, the GlobeBoom® design is unique in many ways. It can be used as a fast response boom, for everyday precautionary booming or, in some instances for permanent installations. It can be stored in boxes, on reels or even rafted up in the water when not in service.

Based on the debris behavior, sea and weather conditions, use of special designed floating booms made with ecofriendly materials and long term resistant to environmental conditions (like sunlight, UV, salt water) are essential. In general terms, DESMI booms are sustainable and will deflect the debris to a collection area where the selected collecting unit will be located.



“

Your Globe Boom has far exceeded our expectations. We have used it for over eight years. I can strongly recommend the use of Globe Boom. It's tough and can take a lot of rough handling and requires minimum maintenance.

-US Navy ”

Our customer & partners are important to us, together we create sustainable tomorrow

- ✓ DESMI Boom Range
- ✓ Net Bags
- ✓ Fenders
- ✓ Sorting bins
- ✓ Gloves
- ✓ Maintenances (Regular & Planned)



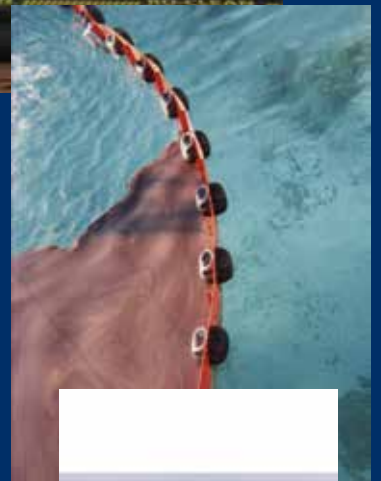
Before & After Sales

Let DESMI and our local representative assist you in determining the Marine and Aquatic Debris Clean-Up Equipment, which will serve you best, and will

tell you where it most efficiently can be deployed to deflect and collect floating materials.

- ✓ Equipment sales
- ✓ Partial project sale – 50% owned by DESMI EnviRo-Care and 50% owned by customer
- ✓ Service & maintenance of equipment
- ✓ Free consulting for customers
- ✓ Installation, commissioning & training
- ✓ Spare parts / replacement of parts

OUR OPERATIONAL REFERENCES





Water intake installation

In Ras Al Khair, Eastern Saudi Arabia we have installed a 300 m OilFence33 boom fitted on sliders in a V configuration. DESMI got jelly fish nets suspended from the booms.

The booms are anchored every 25m and is doing quite well for the past 6 years. The customer flips the boom in water every 4 months so that the marine growth on the boom skirt dries away. The symmetrical geometry of the boom permits this, unlike other booms.

This “longterm boom solution” is installed inside the intake channel, closer to the pump house and is less exposed to rough open sea conditions.



The DESMI Sea Turtle Sargazo Project

In 2015, DESMI began the DESMI SEA TURTLE – SARGAZO initiative to find an alternative solution to handle the massive algae arrival on the Caribbean beaches and the first sargazo mechanical remover unit was named DESMI SEA TURTLE. It was based on a weir skimmer unit with a special arrangement that allowed the removal of the sargazo algae from the water free of sand.

Special DESMI floating barriers´ were designed to deflect the seaweed. All eco-friendly and able to withstand long-term environmental conditions. The initiative produced a configuration efficiency of up to 80%.

By January 2016, DESMI successfully installed the first complete DESMI SARGAZO BOOM configuration.

The tests have proved to be very positive and highlighted the versatility of the boom for both installation and seaweed removal. Manufactured with environmentally friendly materials and meeting local environmental regulations, the system does not present any risk to the local sea life. Further, the design allows for a very low visual impact, creating a peaceful environment for the locals and tourists alike.

Booms installed have provided +2 years of continuous beach protection to our customers in the Caribbean, including a power plant that had been affected for this algae.



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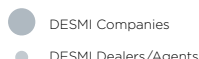
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MARINE & OFFSHORE

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