

## Onboard Oil Cleanup and Recovery System

*A complete system to skim, pump and separate oil from water, continuously discharging the clean water while storing the oil for offloading.*

*Goal: To maximize working time by eliminating the storage and transfer of oily water.*

### The Challenges

1. Being able to process oil and water onboard small craft is critical for clean-up speed and efficiency.
2. Emulsification is the 'make or break' criteria for running gravity separation on small boats. The separation requires much more time and separator volume when oil and water are mixed. The result is equipment too large and heavy for small craft and lower flow rates = less oil cleaned up
3. Creating an effective and complete system that can actually fit on smaller craft and deliver full performance and reliability.



### The Solutions for Skimming, Pumping and Separating

#### Pump technology that reduces separator size and increases capacity

- The Pitbull® pumping action is unique and does not agitate the fluid.
- Separator capacity increases by (3) times or more when fed by the Pitbull® pump. This makes high productivity skimming and separation systems on small craft possible. The separator can be reduced to 1/3 its typical size, or used at a flow rate 3X higher.
- Pitbull® pumps are certified for pumping live fish, shrimp and crabs and are also used to pump fruits and vegetables without damage.



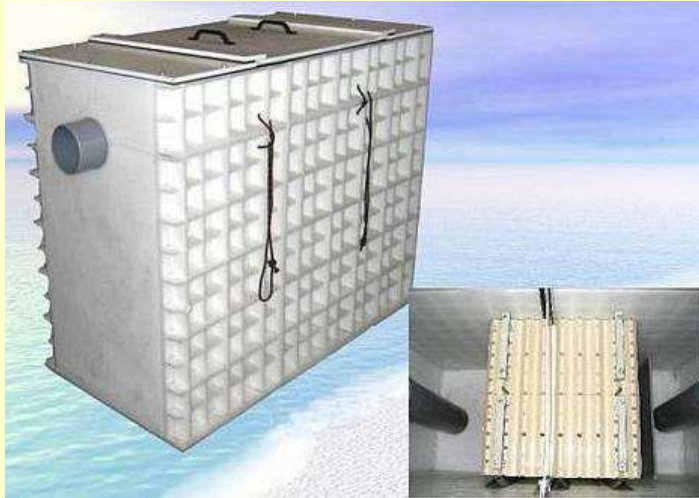
Left: Huge passages through pump eliminates turbulence and mixing.

Right: Air operated Pitbull® pump combined with portable compressor



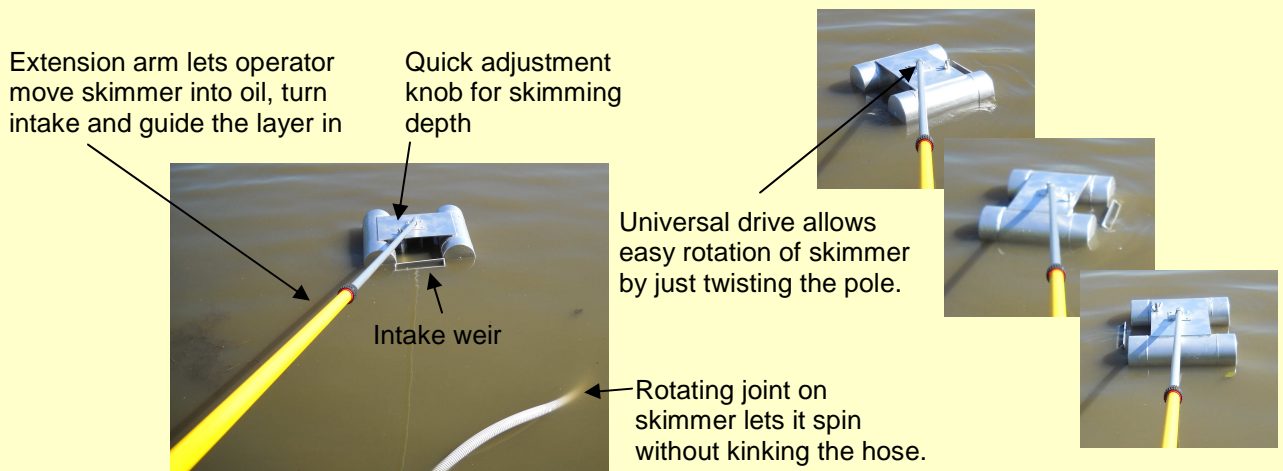
**Innovative Freylit separator discharges clean water below 10 part per million (oil) directly overboard**

- The small, highly efficient separators discharge water at levels below 10 ppm of oil (half the level of a visible sheen).
- With no moving parts, an internal oil storage compartment with drain off valves and inlet debris screens, the separator is designed for crude oil applications.
- Completely scalable and field proven on crude oil applications from 9 gpm to 12,000 gpm.



**CIPC Floating Intake Skimmer**

- This design features an extendable handle and remote 360° rotational control via a specially designed universal joint.
- Because it can be pushed out, pivoted and then pulled back, operators can work the skimmer to continuously positioned and maximize oil pickup.
- The inlet weir has a simple knob for quick height adjustments. The hose connects to a rotating joint to minimize the effect of the hose on the skimmer.
- Additional 'sweeper arms' can be attached to widen the skimming path as the unit is maneuvered through thin oil layers.



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## **Additional Details**

### **Pitbull® Pumps**

These are air operated, positive displacement pumps typically used for very difficult industrial applications because of their simple, rugged design and lack of components to maintain. Constructed of stainless steel with only a pair of check valves as moving parts, the Pitbull® pump is overbuilt for this application and will hold up for years of service with almost no maintenance or repair.

For use on smaller craft and barges a small, portable engine driven compressor or portable generator with an electric compressor is required and added into the package.

The pump is provided with its own control panel, with adjustments for flow rate and output pressure. Lower flow pumps are self-priming and placed on the boat deck.

### **Freylit Separators**

Smaller units are built from lightweight, oil-attracting polypropylene. Larger units can be built locally according to design specification and the internal components supplied separately.

### **Packaged Recovery Systems**

Complete packaged systems starting at 9 gpm (8,640 gallons in a 16 hr day) all the way up to 425 gpm (400k gallons per 16 hr day) are available.

**Note:** The engineering design and feasibility for a skimming system using the Pitbull® pump combined with the Freylit separator has been done up to 12,000 gpm. This is 11.5 million gallons a day (daylight hours) of skimming, separation and oil collection than can go non-stop until the oil storage is full. This can be fitted on barge sized craft (not a super tanker) with additional storage tank(s) in tow. Pumps and separators of this size have long been in operation by both companies, with decades of application experience.