



Sea Sweep, Inc.

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Environmentally Benign Oil Absorbent

DESCRIPTION OF THE TECHNOLOGY

With support from the Environmental Protection Agency's (EPA) Small Business Innovation Research (SBIR) Program, Sea Sweep, Inc., developed and commercialized an innovative absorbent called Sea Sweep® that functions both on land and water to absorb spilled oil and chemicals. The absorbent is made using a patented process that involves heating sawdust to a temperature at which the oil-like pyrolysis products render it very attractive to oil (oleophilic), but so repellent to water (hydrophobic) that it floats for many days. It absorbs the oil or chemicals immediately upon contact, and will float indefinitely in water, preventing environmental damage to marine life and bird species.

Sea Sweep® can absorb up to four times its weight in oils and chemicals immediately on contact, and it will not leach. Typically, 1 lb of Sea Sweep® absorbs 3.5 lbs of oil (the product absorbs oils on both fresh and salt water). Nonsaturated Sea Sweep® is nontoxic, biodegradable, and harmless to microorganisms and wildlife (the product does not adhere to the feathers of birds or to any type of marine life). Sea Sweep® can be applied by using a variety of methods to drop it onto a spill (e.g., using a blower or auger system from a barge or tugboat, or releasing drop bags from a helicopter, crane, or boat boom). It can be recovered in place with a screen scoop or boom system, or it can be pushed

to a designated area for retrieval by mechanical or suction methods.

SIGNIFICANCE OF THE TECHNOLOGY

There are many absorbents on the market that attract oil and chemicals to their surface, but these products release them easily (leach), like a mop. Sea Sweep's absorbent is unique in that oils or chemicals are taken into the interior of the particles (an absorbent), similar to a sponge, where the oil and chemicals are held and do not leach. Sea Sweep® absorbs spilled oils and chemicals, and it is easily retrieved from spill sites, which helps prevent damage to shorelines and beaches. In addition, Sea Sweep® helps bacteria attack the spilled oil or chemical.

SBIR funding enabled Sea Sweep to evaluate the performance of this absorbent using various types of sawdust to determine which is most effective for absorbing oils and chemicals. Sea Sweep found that softwood sawdust is optimal in performance, availability, and cost. The tests also demonstrated that Sea Sweep® absorbs almost all chemicals, including antifreeze and some strong acids. Saturated Sea Sweep® can be burned as fuel for power plants or industrial furnaces.

Oil spills from vessels and facilities (both onshore and offshore) are regulated by the Clean Water Act. Sea Sweep® has been recognized by EPA in the National Contingency

SBIR Impact

- ◆ Sea Sweep, Inc., has developed an innovative absorbent that functions both on land and water to absorb spilled oils and chemicals.
- ◆ Nonsaturated Sea Sweep® is nontoxic, biodegradable, and harmless to microorganisms and wildlife. It is capable of absorbing up to four times its weight of oils and chemicals immediately on contact and it will not leach. Sea Sweep® also floats indefinitely making it easy to collect with screens or skimmers.
- ◆ In 1993, Sea Sweep® was selected by *R&D Magazine* as one of the 100 most technologically significant new products of the year.
- ◆ Sea Sweep® is licensed by the State of California and has been recognized by EPA as an oil spill cleanup agent. It also is a listed product on the U.S. Coast Guard National Strike Force Response Resources Inventory.



Sea Sweep® is used around the world to clean up oil spills of all sizes and can be recycled as a petroleum product. Here, Sea Sweep's President, William Mobek, prepares a demonstration in Indonesia.

Plan for use in recovering oil spills in U.S. navigable waters. Sea Sweep® also is a listed product on the U.S. Coast Guard National Strike Force Response Resources Inventory. In addition, Sea Sweep's absorbent is licensed by the California State Water Control Board as an oil spill cleanup agent for use in California marine waters.

Immediately on contact, Sea Sweep® absorbs crude oils, refined hydrocarbons, and many chemicals on land or sea, even after extensive loss due to volatilization. Crude oils, 17° API and 37° API are absorbed at ratios of 1,000 and 1,500 gallons per ton of Sea Sweep®, respectively. Refined hydrocarbon absorption capacity varies from 720 to 1,960 gallons per ton of Sea Sweep®.

COMMERCIALIZATION SUCCESS

Sea Sweep® is marketed in the United States, Europe, South America, Australia, New Zealand, Japan, Indonesia, and the Persian Gulf. Internationally, Sea Sweep's absorbent has received approval for use by the United Kingdom River Authority, Thames Region; the Greek Ministry of Merchant Navy, Directorate of Marine Environment Protection and Ministry of Industry, Energy, and

Technology; the Chilean Oceanographic Institute and the Chilean Navy; the Ministry of the Environment in Malta; and the Argentinian Coast Guard. Sea Sweep® also has received an LR-type approval from Lloyds Register of Shipping in London; it is the only spill absorbent to hold this distinction. The company's customer list includes oil companies, fire departments, and shipping companies across the United States and internationally.

AWARDS AND COMPANY HISTORY



In 1993, the Sea Sweep product was selected by *R&D Magazine* as one of the 100 most technologically significant new products of the year. At the Clean Seas '93 International Conference, Sea Sweep was the only commercial company to be awarded a gold medal "for its praiseworthy efforts in conjunction with the preservation of a Clean Marine Environment." In 1997, Sea Sweep, Inc., received a Gold Medal from the United States Defense Supply Center, identifying Sea Sweep® as one of the Center's "Best Value" products. Sea Sweep was founded in 1990, in the wake of the Exxon Valdez oil spill on the Alaskan coast in March 1989.

What is the SBIR Program?

EPA's Small Business Innovation Research (SBIR) Program was created to assist small businesses in transforming innovative ideas into commercial products. The SBIR Program has two phases—Phase I is the feasibility study to determine the validity of the proposed concept and Phase II is the development of the technology or product proven feasible in Phase I. EPA also offers Phase II Options to accelerate the commercialization of SBIR technologies and to complete EPA's Environmental Technology Verification (ETV) Program. For more information about EPA's SBIR Program and the National Center for Environmental Research, visit <http://www.epa.gov/ncer/sbir>.