

Smart Sponge® Filtration Media

REDUCTION OF HYDROCARBONS, HEAVY METALS AND BACTERIA

SMART SPONGE TECHNOLOGY IS BASED ON A PROPRIETARY BLEND OF SYNTHETIC POLYMERS AIMED AT THE REMOVAL OF HYDROCARBONS AND OIL DERIVATIVES FROM WATER.



SMART SPONGE®

Is chemically selective to hydrocarbons and capable of removing up to 1.5 times its own weight in hydrocarbon contamination. The Smart Sponge is capable of transforming hydrocarbons into a stable solid per the EPA's Toxicity Characteristic Leaching Procedure (TCLP).

SMART SPONGE® PLUS

Is registered with the EPA (Registration # 86256-1) for the reduction of total coliform bacteria. Smart Sponge Plus features an antimicrobial agent that is chemically and permanently bound to its polymer surface.

SMART SPONGE® HM

Reduces Cadmium, Copper, Chromium, Lead, Zinc, Iron, Arsenic, Selenium and Orthophosphate. Smart Sponge HM also inhibits growth of mildew and mold in a variety of applications.

AbTech Industries' Smart Sponge technology is at the heart of its product innovation. Smart Sponge's unique molecular structure is based on innovative polymer technologies that are chemically selective to hydrocarbons. Certain variations of the media can reduce bacteria levels (Plus) and remove heavy metals (HM). Products incorporating Smart Sponge technology are non-mechanical, do not require structural changes to stormwater systems and are easily installed and maintained.

HYDROCARBON REMOVAL

Smart Sponge fully encapsulates recovered oil, resulting in a substantially more effective response that prevents absorbed oil from leaching. It is also capable of successfully removing sheen. In addition, the Smart Sponge remains buoyant in calm or agitated water, permitting it to remain in place until fully saturated, resulting in no wasted product.

Once oil is absorbed, the Smart Sponge transforms the pollutants into a stable solid for easy recycling, providing a closed-loop solution. Smart Sponge technology is a cost-effective BMP with low installation and maintenance labor costs. In comparison to other products, the Smart Sponge technology allows for less expensive and less problematic handling and disposal of the waste product designed not to deteriorate in water, allowing for a longer product life.

The Smart Sponge technology is deployed in products that offer customized solutions for stormwater pollution prevention, oil spill response, process water filtration and other industrial applications to meet specific environmental needs. AbTech Industries offers an extensive product line that is upgradeable to meet evolving community needs and regulatory requirements.

ANTIMICROBIAL REDUCTION

Smart Sponge Plus features an antimicrobial agent chemically and permanently bound in a proprietary process to the Smart Sponge polymer surface which reduces total bacteria. Due to this permanent bond, the antimicrobial agent is active but does not leach or leak, avoiding any downstream toxicity issues. AbTech's Smart Sponge Plus targets bacteria such as enterococcus, Escherichia coli and fecal coliforms.

The agent used for this innovative technology is an organosilane derivative which is widely used in a variety of fields including medical, consumables, pool equipment, and consumer goods to reduce coliform bacteria. This Smart Sponge Plus mode of action, through its bound agent, is very simple (no chlorine or heavy metals involved) and - in surface bound applications - it neither introduces chemicals into the treated water nor produces toxic metabolites. The antimicrobial mechanism is based on the patented agent's interaction with the microorganism cell membrane, causing microorganism inactivation, but no chemical or physical change in the agent. Antimicrobial activity, therefore, does not reduce the agent's capability or cause its depletion maintaining long-term effectiveness. Additionally, the hydrocarbon absorption capability is not inhibited.

Experts in Water



THE EXPERTISE TO CONSULT BUSINESSES ON COMPREHENSIVE WATER SOLUTIONS

HEAVY METALS REMOVAL

AbTech's Smart Sponge Heavy Metals (HM) media uses renewable resource based metal nanocomposites extruded into a macro-porous sponge. The media is in the form of hematite/magnetite and will bind to phosphorus resulting in removal rates as high as 98%. When applied as tertiary treatment, Smart Sponge HM has been shown to present low capital cost, smaller footprint and significantly lower operating costs than conventional treatment systems.

Phosphorus is one of the major nutrients contributing in the increased eutrophication of lakes and natural waters. Its presence causes many water quality problems including increased purification costs, decreased recreational and conservation value of impoundments, loss of livestock and the possible lethal effect of algal toxins on drinking water.

Smart Sponge Product Line

1. **Ultra-Urban Filter** - an innovative low-cost Best Management Practice (BMP) that helps meet National Pollutant Discharge Elimination System (NPDES) requirements.
2. **Smart Vault** - a comprehensive and cost effective solution for treating stormwater runoff. The vault utilizes the Smart Sponge filtration media in the form of Smart Paks, and can be retrofitted into existing collection systems or included in new construction or redevelopment projects.
3. **Smart Pak** - designed for use in new or existing stormwater vaults that experience hydrocarbon, heavy metal pollution accompanied by sediment, debris, bacteria and heavy metals. Smart Paks help meet and/or exceed stormwater National Pollutant Discharge Elimination System (NPDES) permit requirements with effective filtration, absorption, life expectancy and maintenance costs.
4. **Smart Drum** - developed for hydrocarbon removal applications. The Smart Drum HAC is ideally suited for free phase and mechanically emulsified hydrocarbon removal for industrial wastewater process streams, hazardous waste remediation, produced water and many other hydrocarbon removal applications.
5. **Line Skimmers** - allow water to pass through the product absorbing sheen levels of hydrocarbons in low energy flow environments. Once the hydrocarbon is in contact with the Smart Sponge, it permanently absorbs in the structure of the polymer and can not be released under any amount of pressure.
6. **Passive Skimmers** - are designed to absorb petroleum hydrocarbons by floating directly on the water. Passive Skimmers are packaged in flexible mesh containers and can be easily linked together to form a protective line of defense.
7. **Bilge Skimmer** - an engineered and designed for permanently encapsulating the petroleum hydrocarbons that appear as oily sheen in the engine compartment during normal boat operation. The Bilge Skimmer will absorb the contaminant and allow the boater to discharge clean water from the bilge pump.

ABOUT ABTECH

AbTech offers innovative solutions for Stormwater Management and Industrial Water Treatment. AbTech integrates its own advanced technologies along with third-party technologies and systems to provide customers with effective and economical solutions. AbTech products include advanced filtration media technologies and various water treatment systems.

ABTECH'S PROCESS CREATES A VERY POROUS STRUCTURE WITH HYDROPHOBIC AND OLEOPHILIC CHARACTERISTICS CAPABLE OF SELECTIVELY REMOVING HYDROCARBONS WHILE ALLOWING FOR HIGH FLOW THROUGH RATES.

DISPOSAL

The Smart Sponge samples saturated with hydrocarbons both in the lab and in the field have been tested according to the EPA's Toxicity Characteristic Leaching Procedure ("TCLP"). These tests show that Smart Sponge is a "non-leaching" (i.e., non-detect or "N.D.") product. As a result, Smart Sponge technology can afford many cost effective and environmentally friendly disposal options.

Waste-to-Energy Facilities - A specialized segment of the solid waste industry has used spent Smart Sponge as an alternative fuel in the production of electricity.

Cement Kilns - This industry has used the spent Smart Sponge as an alternative fuel in the production process of Portland Cement. This process is considered a beneficial reuse of waste products. The BTU value of spent Smart Sponge is consistently above the average acceptable levels set for this high temperature.

Landfills - As discussed above, spent Smart Sponge products have been classified as a solid waste and have been accepted at Subtitle D Landfills.

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