

# Smart Sponge® Smart Pak®

## 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.



The Smart Pak is designed for use in new or existing stormwater vaults that experience hydrocarbon, heavy metal pollution accompanied by sediment, debris, or bacteria. Smart Paks help meet or exceed stormwater National Pollutant Discharge Elimination System (NPDES) permit requirements with effective filtration, absorption, life expectancy, and maintenance costs.

### 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 removing low levels of oil from water, thereby successfully removing sheen. In addition, the Smart Sponge remains buoyant in calm or agitated water, permitting it to remain in place until fully saturated and 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 to water pollution. Smart Sponge technology provides a cost-effective BMP with low installation and maintenance labor costs. In comparison to other products, the Smart Sponge technology also allows for less expensive and less problematic handling and disposal of the waste product since its technology transforms liquid oil and other pollutants into a stable solid. The Smart Sponge was designed not to deteriorate in water, allowing for a longer product life.

Smart Pak products are constructed with AbTech's patented Smart Sponge media which is non hazardous and can be specified for a variety of applications. Smart Paks can be scaled to virtually any size vault. 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

AbTech has developed an antimicrobial technology synergistic with the Smart Sponge technology. This effort produced Smart Sponge Plus, which 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 antimicrobial Smart Sponge 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, and maintains long-term effectiveness. Additionally, the hydrocarbon absorption capability is not inhibited. The antimicrobial agent is registered with the EPA (EPA Registration #86256-1) for a variety of applications and has performed well specifically in cases where a reduction in harmful bacterial counts in stormwater runoff is desired.

# 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.

## APPLICATIONS

- Groundwater Remediation
- Mining
- Nuclear Plant Decommissioning
- Parts Machining Operations
- Produced Water Treatment
- Petrochemical and Refineries Aquatic centers
- Food processing and packaging industries
- Public health sites
- Stormwater
- Mining Applications
- Commercial fuel distributor facilities
- Truck Stops
- Beach Communities
- Road and street improvements
- Stormwater pollution plans
- Best Management Practice (BMP)
- New and Existing Vault Infrastructure

## SPECIFICATIONS

Smart Pak Product Code	Description	Dimensions (inch)	Smart Sponge Weight per Unit (lb)
SMPK-1212-2.5-HM	Smart Sponge Filtration Module individually contained in porous fabric	12" x 12" x 2.5"	5.5 lbs
SMPK-1212-3-HM	Smart Sponge Plus Filtration Module individually contained in porous fabric	12" x 12" x 3"	5.5 lbs
SMPK-1515-2.5-HM	Smart Sponge Filtration Module individually contained in porous fabric	15" x 15" x 2.5"	7 lbs
SMPK-1515-3-HM	Smart Sponge Plus Filtration Module individually contained in porous fabric	15" x 15" x 3"	7 lbs

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

## 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.

## 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.

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