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# DEGRADATION OF HYDROCARBON WASTE

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## MATERIAL INFORMATION

Suitability of SpillFix Industrial Organic Absorbent for the absorption and biological degradation of hydrocarbon waste.



GALUKU GROUP LIMITED



AMERICAN GREEN VENTURES

## ABSORPTION AND BIOLOGICAL DEGRADATION OF HYDROCARBON WASTE

### 1: SUITABILITY OF SPILLFIX INDUSTRIAL ORGANIC ABSORBENT FOR THE ABSORPTION AND BIOLOGICAL DEGRADATION OF HYDROCARBON WASTE

#### 1.1 RESEARCH ON SEVERAL PRODUCTS USED FOR ABSORBING HYDROCARBON SPILLS

Research conducted on several products used for absorbing hydrocarbon spills. One derived from cotton waste and contains a biological agent that is claimed to promote a more rapid degradation of hydrocarbons.

SpillFix Industrial Organic Absorbent is based on a finegrade of coir which is produced from coconut husks. Two important properties of this material in this application are its porous structure (each particle is like a small sponge) and its large surface area per unit volume (Estimated as 6000m<sup>2</sup>/L).

Cotton waste and coir readily absorb oil but differ in the way they behave once this has happened. Cotton waste absorbents being dusty tend to lose volume and form a paste. Whereas, coir being more crumb like retains its flowable properties for longer.

I have found no published research on how these two materials influence the biological degradation of absorbed hydrocarbons. However, the physical properties of the SpillFix Industrial Organic Absorbent should provide a more suitable environment for the microbial activity that drives this process. The more open structure of the material means that oxygen can diffuse in and waste gasses can diffuse out more readily. Biological processes are inhibited by lack of oxygen in the case of aerobic organisms and by the build-up of toxic by-products. This open structure means that water can pass through the material more readily supplying the needs of microorganisms and removing water soluble wastes. The large surface area available in the coir provides an ideal environment (biofilm) for micro organisms to live and process the hydrocarbons.

I cannot answer the question of whether there is any significant advantage obtained from inoculating the material with an organism. However, studies overseas where large quantities of oil have been added to native soil indicate that suitable organisms occur naturally in the soil. Finally, the end product of the biodegradation of the SpillFix Industrial Organic Absorbent will be a material with exceptional water holding capacity which will increase the fertility and moisture retaining characteristics of the amended soil.

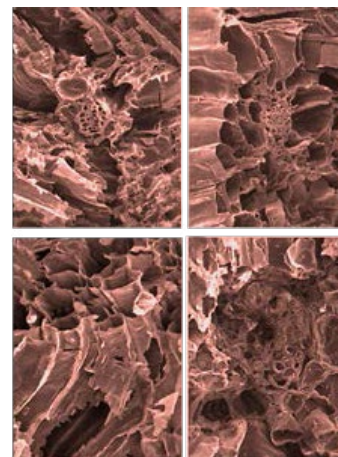
### 2: PRODUCT MATERIAL INFORMATION

SpillFix is formulated from premium coir. Coir, also known as 'coir fiber pith', is a natural and renewable resource that is free of any chemicals and toxins, produced as a by-product when coconut husks are processed for the extraction of the long fibers.

The coir is washed, heat treated, screened and graded to a unique absorbent specification before being packaged. SpillFix Industrial Organic Absorbent is consistent and uniform in texture and is a completely homogeneous material composed of millions of capillary micro-sponges.

## 2: PRODUCT MATERIAL INFORMATION (cont.)

SpillFix material (image magnification X350) It has been estimated that the surface area of SpillFix to be approximately 0.6ha (6000M2) in a single liter of coir. The large surface area is created by the hollow channel structure. It will absorb and retain up to 9 times its own weight in liquids.



<i>Absorbent</i>	<i>Absorbency</i>	
	<i>Mass</i>	<i>Volume</i>
SpillFix (Coir)	295%	67%
Diatomite (Clay)	40%	27%

It demonstrates a preference for hydrocarbons over water and will remove hydrocarbons from an oil/water emulsion making it suitable for emergency road response application.

SpillFix Industrial Organic Absorbent is a highly stable absorbent that is suitable for use in a wide range of hazardous spill applications including acids and caustics. The inert nature of the media does not cause any reaction with unstable liquid chemicals.

SpillFix Industrial Organic Absorbent has been tested to the USEPA Leachate standards for landfill disposal (always confer with local authorities). It is biologically stable and free of harmful micro-organisms. When absorbed media is disposed of it provides a perfect environment for the development of biodegradating organisms that can oxidize contaminated waste.

- *Source:* Study by Geoff Cresswell in September 2010

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HYDROCARBON  
WASTE**

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