



RAMSORB

PREMIUM OIL ABSORBENT

The Industrial Strength Absorbent That Makes Environmental Problems Disappear

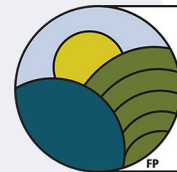
WHY RAMSORB?

- ◇ Light-weight, non-toxic, 100% natural, cellulose, industrial strength absorbent
- ◇ 10 times more absorbent than traditional clay products
- ◇ Absorbs up to 6 times its own weight in oil and leaves a clean surface
- ◇ Contains natural bacteria that degrade petroleum hydrocarbons
- ◇ Completely absorbs and encapsulates hydrocarbons and prevents leaching
- ◇ Cleans contaminated soil by bioremediation by simply raking or tilling the product into the soil
- ◇ Passes leachate test and paint filter test
- ◇ Harmless to plant and animal life
- ◇ No danger of airborne silica
- ◇ Completely biodegradable
- ◇ Non-abrasive and will not harm machinery
- ◇ Reduces or eliminates disposal costs & waste generation
- ◇ Gives you fast, cost-effective cleanup of spills



PERFECT FOR:

- ◇ Fuel
- ◇ Oil
- ◇ Paint
- ◇ Coolant
- ◇ Pipelines
- ◇ Roadways
- ◇ Shop floors
- ◇ Fueling locations
- ◇ Oil production sites
- ◇ Tank storage facilities
- ◇ Anywhere hydrocarbons need to be removed



**USDA
CERTIFIED
BIOBASED
PRODUCT**
PRODUCT 100%

RamSorb can also save on disposal costs. It can be incinerated and will contribute approximately 7,000 BTUs per pound during incineration, with less than 4% ash. It can typically be placed in landfills where no "free liquids" and no strong petroleum odors are allowed.



Call Us Or Visit Our Website

3216 Cahaba Heights Rd. Phone: (205) 969-0708
Birmingham, AL 35243 Fax: (205) 263-1036
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Product	Part Number
RamSorb 5 lb Shaker Bottle	1500-001-SH
RamSorb 30 lb Bag	1500-001-30
RamSorb 5 Gallon Pail	1500-001-5G
RamSorb 55 Gallon Drum	1500-001-140

LIQUIDS THAT CAN BE ABSORBED BY RAMSORB

- ◇ Acetone
- ◇ Acetonitrile
- ◇ Amylacetate
- ◇ Benzene
- ◇ Butanol
- ◇ 2-Butanone
- ◇ Bromodichloromethane
- ◇ Bromoform
- ◇ Bunker C
- ◇ Canola Oil
- ◇ Carbon Disulfide
- ◇ Carbon Tetrachloride
- ◇ Chloroform
- ◇ Chloromethane
- ◇ Chlorobenzene
- ◇ Corn Oil
- ◇ Cutting Oils
- ◇ Cyclohexane
- ◇ Dichloromethane
- ◇ Dichlorobenzene
- ◇ 1,2-Dichloroethane
- ◇ Diesel Fuels
- ◇ Ethanol
- ◇ Ethylbenzene
- ◇ Ethyl Ether
- ◇ Ethylene Glycol
- ◇ Gasoline
- ◇ Heptane
- ◇ Hexane
- ◇ Hexachlorobenzene
- ◇ Hexene
- ◇ Hydraulic Oil
- ◇ Isobutanol
- ◇ Isoprene
- ◇ Jet Fuels
- ◇ Kerosene
- ◇ Methanol
- ◇ Methylene Chloride
- ◇ Methylphenol Ketone
- ◇ Methylphenol
- ◇ Motor Oil
- ◇ Naphthalene
- ◇ 2-Nitroaniline
- ◇ Nitrobenzene
- ◇ Oil Base Paints
- ◇ Oil Base Fluids
- ◇ Oil Base Ink
- ◇ Paraffin Oil
- ◇ Pentane
- ◇ Pentachlorophenol
- ◇ Phenol
- ◇ Propanol
- ◇ Scintillation Liquid
- ◇ Silicon Oils
- ◇ Styrene
- ◇ Tetrachloroethane
- ◇ Tetrachloroethylene
- ◇ Tetrahydrofuran
- ◇ Toluene
- ◇ Trichlorethylene
- ◇ Trichlorophenol
- ◇ Varsol
- ◇ Vinyl Acetate
- ◇ Vinyl Chloride
- ◇ Xylenes

This is a partial list - additional liquids can be verified upon request.



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Oil Spill Clean-Up Products

Absorbency Chart

Product	Size/Weight	Absorption Rate*	Amount of Oil Absorbed
RamSorb	30lb Bag	4 to 6 times	16 to 24 gallons
5 in. Boom	5 in. x 10 ft.	8 to 12 times	5 to 8 gallons
8 in. Boom	8 in. x 10 ft.	8 to 12 times	12 to 20 gallons
Sock	3 in. x 4 ft.	8 to 12 times	1.5 to 2 gallons
Pillow	11 in. x 18 in.	8 to 12 times	1 to 1.3 gallons
Pad	17 in. x 19 in.	15 to 20 times	30 to 40 gal./100 pads

* Based on how many times its own weight each product will pick up hydrocarbon spills

Cost Comparison Chart

Product	Absorption Rate	Absorption Cost per Gallon
RamSorb	4-6 to 1	\$2.45
Kitty Litter	0.4 to 1	\$ 5.00

RamSorb hydrocarbon absorbents are light-weight, non-toxic, 100% cellulose and easy to use. RamSorb is more absorbent, pound for pound, than other absorbent products and is the most economical product you can use.



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RAMSORB

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Product Summary and Application Protocol

The biotechnology that RamSorb embraces is unique in that it processes an agricultural waste stream (a by-product of cotton processing) that carries an indigenous, naturally-occurring bacteria within its cellulose structure. The waste product is processed to render it suitable for packaging as an absorbent to surround and then, in most cases, remediate petroleum hydrocarbon and hazardous waste spills.

The process that has been perfected is that of understanding, providing and controlling an artificial environment in which beneficial bacteria can thrive within the absorbent material. These beneficial bacteria grow natively with and naturally attach to certain cellulose and agricultural waste products, such as cottonseed lint. When the agricultural product is processed, the bacteria remain with the seed or hull of the product. Under special conditions, the bacteria can be nurtured and provided with enhanced growth conditions that not only keep them alive but allow them to propagate. By using a waste agricultural product as the medium to grow the bacteria, RamSorb has incorporated two proven environmental cleanup products (absorbents and bacteria) into one very powerful product line: *biologically active absorbents*.

RAMSORB is therefore a chemically modified cellulosic fiber containing all the necessary ingredients, nitrogen, sulfur, phosphorus, to enhance the native bacteria it contains along with indigenous bacteria in soil for biodegradation of hydrocarbons. When activated by the addition of moisture, these bacteria have an ideal condition within which to reproduce and rapidly accumulate to the available hydrocarbon food source.

The strong wicking action of “RamSorb” acts as a physical emulsifier by actually extracting hydrocarbons from less absorptive material. It encapsulates the fine droplets until the available hydrocarbons are consumed as food for the active bacteria.

Application of “RamSorb” is relatively simple. “RamSorb” is applied by blending the dry absorbent with the contaminated soil as effectively and efficiently as possible. Once the hydrocarbon contacts the “RamSorb,” it is completely encapsulated (up to the saturation level) and cannot be extracted by naturally occurring contact with water. Even when wet, “RamSorb”

will actually give up water to take on hydrocarbons. This extraordinary characteristic separates “RamSorb” from all other absorbents and allows the exceptional bacterial remediation to occur.

When furnished with a proper atmosphere for growth, bacteria will multiply rapidly. Therefore, small quantities of bacteria will perform the task of bioremediation over time if properly fed nutrients, oxygen and moisture. The most challenging job is to properly disperse the bacteria throughout the contaminated soil to achieve a homogeneous mixture. In other bacterial technologies, after the hydrocarbons have been broken down into droplets, containment of the hydrocarbon can pose a significant problem. This problem is overcome with the application of “RamSorb”.

In remediation, no two situations are identical, making it very difficult to formulate recipe-type instructions for all cases; however, a few standardized steps should be taken that will assure better than average success. If this procedure is followed, a minimum degradation of 40% should be achieved every 30 days. In optimal conditions, we have achieved as much as 80% reduction in 30 days.

- 1)** The pH of soil to be remediated should be buffered to a pH level of not less than 6.0 and no higher than 8.5 for optimum bacterial growth.
- 2)** Excessive levels of some heavy metals, chlorinated solvents, fungicides and pesticides will slow bacterial growth
- 3)** For liquid remediation, completely absorb the liquid in “RamSorb” until dry to touch. Add water to completely saturate the bed, even to the point of flooding. Frequent wetting is desirable as long as the bed does not stand flooded for long periods.

Since liquids represent the highest level of hydrocarbons to be remediated, it may be necessary to add additional nutrients (nitrogen and phosphorus) if the rate of degradation levels out. Normally it will be as simple as adding additional “RamSorb,” tilling the soil thoroughly for oxygen replenishment and continuing to keep damp with frequent watering.

- 4)** For low level soil contamination (below 20,000 ppm) we recommend effective tilling with a minimum of one bag of “RamSorb” per cubic yard of soil. You could use lesser amounts for satisfactory results but homogenous blending to assure maximum contact with available bacteria is more easily achieved with adequate material. You may want to dampen the soil during the tilling procedure to reduce dusting and promote migration of hydrocarbon particles into the absorbent.

After tilling is completed, thoroughly wet the area down even to the point of flooding, especially if left uncovered, which is preferred. Be more careful about flooding if area is to be kept covered.

Retain a moisture level no less than 30%. No further aeration should be necessary for at least 60 days and only if degradation stalls.

Temperatures about 120° F for extended periods will slow the degradation process and temperatures below 40° F will slow bacterial growth. However, the absorbent will maintain its encapsulation characteristic preventing hydrocarbon leaching until the bacteria are again active. “RamSorb” will not biodegrade itself before all absorbed hydrocarbons have been degraded, thus eliminating any hydrocarbon leaching.

5) For high levels of soil contamination (up to 450,000 ppm) we would recommend an amount of “RamSorb” absorbent equal to one half the calculated amount of hydrocarbons to be remediated.

For example, an extreme case of 450,000 ppm is approximately 45% hydrocarbon or .45 x 2700 lbs. = 1215 lbs. per cubic yard. 600 pounds of “RamSorb” per cubic yard would provide the encapsulation necessary to contain the contaminant without leaching while providing enough nutrients to achieve maximum degradation with minimum aeration.

At 40,000 ppm the hydrocarbon content would be approximately 108 lbs. per cubic yard and require approximately 50 lbs. of absorbent for optimum performance.

We have found it very difficult in the field to judge the hydrocarbon content without frequent testing and time-consuming procedures. With “RamSorb” this is not necessary as visual observation is adequate to assure proper application. Simply add absorbent to heavily concentrated areas until the soil is dry to touch or takes on the appearance of normal soil in the area. If the soil still appears tacky after homogenous blending, simply add more “RamSorb”.

After tilling is complete, wet down the area completely and maintain at least a 30% moisture level throughout the remediation period. Frequent wetting is desirable as it helps migrate the hydrocarbons from the contaminated soil into the “RamSorb” where it is encapsulated and consequently digested.

If degradation levels off by TPH testing, simply till the soil thoroughly with more “RamSorb” and continue to keep damp with frequent watering.

RamSorb/protocol



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