

HC-2000 Safety Data Sheet

December 31, 2015

Section 1. Identification HC-2000

- Chemical Name & Synonyms: Enzyme Blend Formula: Proprietary Blend
- D.O.T. Proper Shipping Name: Non-Hazardous Liquid, D.O.T. Hazardous Class: Non-Hazardous
- Manufacturer - Remtech Engineers, 200 Cobb Parkway North, Suite 208, Marietta, GA 30062, Phone 770-427-7766, Fax 770-427-7001.
- Use - Biostimulation agent for cleaning and biodegradation of petroleum hydrocarbons and solvents.

Section 2. Hazardous Ingredients None

Section 3. Composition/Information on Ingredients Enzymes, biosurfactants, nutrients

Section 4. First-aid Measures

- Eye Contact: May have slight irritation affect, wash with water
- Skin Contact: None, wash with water
- Inhalation: None
- Ingestion: May cause slight laxative condition
- Non-carcinogenic

Section 5. Fire and Explosion Data Treat same as water

Section 6. Accidental Release Measures

Material is viscus and sticky. Solidify with oil dry or sand. Material may be moped up with water.

Section 7. Precautions for Safe Handling and Storage

No special gloves, ventilation, exhaust, protective clothing, special equipment or respiratory protection required. Store at temperatures less than 120°F. Store with vent cap or loose cap to avoid pressure buildup.

- Incompatibility: None. Product is compatible, will not polymerize nor create hazardous by-products. There are no specific conditions to avoid.
- Hazardous Polymerization: Will not occur.

Section 8. Exposure Controls/Personal Protection

No special gloves, ventilation, exhaust, protective clothing, special equipment or respiratory protection required.

Section 9. Physical/Chemical Properties

- Specific Gravity: (H₂O) 1.17 , Boiling Point: 212°F, Freezing Point: 32°F, Vapor Pressure: N/A, pH: 3.1 to 3.5
- Evaporation Rate: Same as Water
- Solubility in Water: Complete
- Appearance & Odor: Brown Liquid with Slight Sweet Odor
- Bacterial Information: Contains no pathogens, no fecal coliform, and no salmonella
- Environmental Information: Contains no nitrates or sulfites. Potassium, sodium, sulfates, and organic nitrogen - <1% each. Calcium, iron, magnesium, phosphorus - <0.1% each. Water - > 50%. Enzymes, cofactors, biosurfactants – proprietary

Section 10. Stability & Reactivity Data

- Stability: Stable. Avoid high temperatures (>120°F) as this will neutralize the enzymes.
- Avoid low or high pH substances (i.e., acids, caustics).
- Incompatibility: None. Product is compatible, will not polymerize nor create hazardous by-products.
- There are no specific conditions to avoid.
- Hazardous Polymerization: Will not occur.

Section 11. Toxicological Information Material is non-toxic

Section 12. Ecological Information Use or apply according to label instruction should have no adverse environmental impact

Section 13. Disposal Considerations Dispose of according to local, state and federal regulations

Section 14. Transport Information D.O.T. Proper Shipping Name: Non-Hazardous Liquid, D.O.T. Hazardous Class: Non-Hazardous

Section 15. Regulatory Information N/A

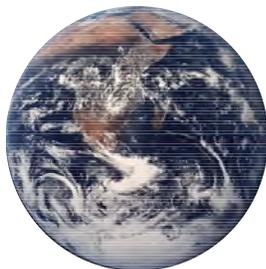
Section 16. Other information SDS prepared 12/2015



200 North Cobb Parkway, Suite 208, Marietta, Georgia 30062
Phone: 770-427-7766 or 800-377-3648, website: www.remtech-eng.com

HC-2000 Product Label

HC-2000 Bioremediation Accelerator & Surface Cleaner A Green Sustainable Technology



*Restoring Our World
for Future Generations*



200 North Cobb Parkway, Suite 208, Marietta, Georgia 30062, Phone: 770-427-7766 or 800-377-3648

for . . .

**Soil, Railroad Ballast, Gravel,
Groundwater, Concrete, and
Asphalt Petroleum Hydrocarbon
& Solvent Cleanups**

- non-hazardous
- hypo-allergenic
- non-abrasive

Mix/ Shake Well Prior to Using

HC-2000 Activation & Stability

HC-2000 (HC2) is activated when mixed with water. It is stable when in its concentrated form and may be stored for years. HC-2000 concentrate is sold with vented caps. It is also preferable to loosen caps and store in areas less than 120°F to avoid pressure buildup. Be sure to use up all diluted mixtures when cut with water. Shelf life of diluted solutions is a couple of weeks.

Soil, Ballast & Gravel Treatment

Each gallon of HC-2000 concentrate will treat between 6 and 10 cubic yards of petroleum hydrocarbon contaminated soil, ballast, or gravel. For example, 100 cubic yards of contaminated soil requires 10 to 16.7 gallons of concentrate. Over a five-week treatment period, apply 1/5th of the total dosage or 2 to 3.34 gallons of concentrate in 16 volumes of water or 32 to 53.4 gallons of mix each week. Note that actual treatment periods may extend to six months or longer depending on type, location, and permeability of soil; type of petroleum hydrocarbon, and cleanup level required.

Each site may require different application rates. Soils less than three feet in depth, may be treated topically and should be tilled prior to the first application and at the treatment mid point. For deeper soils, deep tilling methods may be employed, providing soil stability and geotechnical requirements are not violated.

Note that it is best to remove mobile bulk fuels prior to treating with HC-2000 with leachate collection or drainage trenches. HC-2000 may be used to “wash” bulk fuels out of soil pours or gravel voids to allow collection and removal via pumping.

HC2 applications can be made through injection wells or trenches. Optimal degradation rates generally occur under aerobic conditions at 20% moisture or 80% of the field holding capacity of soil. See Remtech’s Technical Application Package for further instructions.

Groundwater Treatment

Each gallon of HC-2000 concentrate will treat between 6 and 10 cubic yards of petroleum hydrocarbon contaminated groundwater. For example, if you have 100 cubic yards of contaminated groundwater, 10 to 16.7 gallons of concentrate are required. Over a five-week treatment period, apply 1/5th of the total dosage or 2 to 3.34 gallons of concentrate to 30 volumes of water or 60 to 100 gallons each week.

Note that actual treatment periods may extend to six months or longer depending on location, permeability of the saturated zone, type of petroleum hydrocarbon, and cleanup level required. It is best to remove bulk mobile fuels prior to treating with HC-2000. HC-2000 may be used to “wash” or accelerate the removal of bulk fuels. See Remtech’s Technical Application Package for further instructions.

Asphalt, Concrete & Surface Cleaning

Mix one part of concentrate in five to 10 parts of water. Apply cleaning solution to surface and agitate with broom or power broom. Let stand for 20 minutes and rinse surface with water or pressure washer. Collect rinsates for disposal. Repeat if necessary. For pressure washer applications - **DO NOT INJECT THROUGH PUMP - ONLY INJECT PAST PUMP**. Mix one part of concentration with three parts of enzyme concentrate and educt with chemical nozzle. Let enzyme set for 20 minutes then wash off with high pressure. See Remtech’s Technical Application Package for further instructions.

Enzyme Application Systems

HC-2000 may be applied with the following pumps: diaphragm, centrifugal or roller. Use coarse fire nozzles as finer spray systems may be clogged by pulp in concentrate. Do not inject HC2 through pressure washers (post pump injection only). See Remtech’s Technical Application Package for further instructions.



200 North Cobb Parkway, Suite 208, Marietta, Georgia 30062
Phone: 770-427-7766 or 800-377-3648, website: www.remtech-eng.com

Georgia Department of Natural Resources

7 Martin Luther King, Jr., Drive-Room 643, Atlanta, Georgia 30334

Environmental Protection Division

Lonice C. Barrett, Commissioner

Harold F. Reheis, Director

404/656-6905

Mr. Mark D. Ryckman, P.E., D.E.E.
Remtech Engineers
200 North Cobb Parkway
Suite 124
Marietta, GA 30062

May 22, 2002

Dear Mr. Ryckman;

I have reviewed the information you forwarded regarding the use of your proprietary bioremediation product HC-2000. Based on this information, this product may be used for hydrocarbon spill response and remediation in Georgia, with the following restrictions.

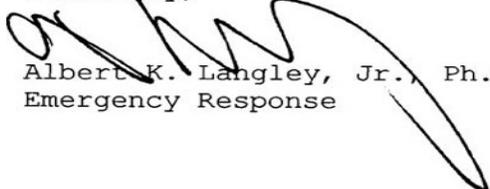
No product may be applied to waters of the state of Georgia for purposes of spill remediation without the case-by-case approval of the Georgia Environmental Protection Division, and the Regional Response Team. Approval can be obtained by calling my office at the above number during working hours or our Emergency Operations Center after hours at (404) 656-4863 or 1-800-241-4113. Approval can usually be granted within an hour.

The use of any spill control or bioremediation product on land-based spills is subject to the same requirements as any other industrial operation. Any material applied must be contained and properly disposed. Likewise, water containing the control agent may not be discharged to state waters or onto the land surface without direct approval by EPD. This material may be discharged into a sanitary sewer system, with the approval of the sewer authority.

We encourage the use of bioremediation in appropriate situations. Your HC-2000 material does not contain any hazardous chemicals and in general should be useful in many remediation applications. However, use of it in remediation of insitu groundwater contamination will require specific case-by-case approval due to Georgia's specific rules for underground injection. Use of the product for land-based remediation however does not require any specific approval.

I hope the above is of use to you. Please feel free to call with any further questions.

Sincerely,



Albert K. Langley, Jr., Ph.D.
Emergency Response



Jeb Bush
Governor

Department of Environmental Protection

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

David B. Struss
Secretary

May 6, 1999

Mr. Mark Ryckman
Remtech Engineers
200 North Cobb Parkway, Suite 208
Marietta, Georgia 30068

Re: HC-2000

Dear Mr. Ryckman:

The Bureau of Petroleum Storage Systems hereby accepts HC-2000 as a product for both in situ and exsitu bioremediation of soil and groundwater at petroleum and other suitable hazardous waste contaminated sites in Florida. As indicated in Remtech's submittal of information, the product is a non-toxic, non-allergenic, biodegradable mixture of proteins, enzymes, micronutrients, and emulsifiers. It does not contain bacteria or other microorganisms but rather stimulates the activity of the indigenous contaminant-degrading microorganisms already present at a remediation site. Enclosure 1 is a proprietary chemical analysis voucher for the product.

For vadose remediation where the underlying groundwater will not be affected by leaching of this product, there are no special concerns beyond those which would normally need to be addressed in preparing a Remedial Action Plan and conducting a cleanup in accordance with the petroleum cleanup requirements of Chapter 62-770, Florida Administrative Code (F.A.C.). For ex situ groundwater treatment, where an aboveground treatment system produces effluent meeting the petroleum cleanup criteria of Chapter 62-770, F.A.C., and the drinking water standards of Chapter 62-550, F.A.C., for disposal via recharge gallery or NPDES permit, there are no special concerns. But for in situ groundwater remediation, via injection of products into an aquifer, there are underground injection control (UIC) regulations that must be observed. Since in situ aquifer remediation via injection is likely to be the most common application of this product, the bulk of the regulatory requirements discussed herein will be directed to that topic.

The bureau recognizes HC-2000 as a viable product for the bioremediation of petroleum contaminated sites in Florida. There are no objections to its use provided: (a) the considerations of this letter are taken into account; (b) a Remedial Action Plan is approved by the Department; and (c) applicable and appropriate underground injection control regulations are observed when the product is used for in situ remediation.

While the Department of Environmental Protection does not provide endorsement of specific or brand name remediation products or processes, it does recognize the need to determine their acceptability from an environmental standpoint with respect to applicable rules and regulations, and the interests of public health, safety, and welfare. Vendor's must then market the products and processes on their own merits regarding performance, cost, and safety in comparison to competing alternatives in the marketplace. For HC-2000, the major environmental and regulatory considerations are set forth in enclosure 2.

Preparers of Remedial Action Plans are advised to include a copy of this letter in the appendix of plans they submit, and call attention to it in the text of their document. In this way, technical reviewers throughout the state will be informed that you have contacted the Department of Environmental Protection in regard to HC-2000. To aid those reviewers, the Bureau of Petroleum Storage Systems provides supplemental information as enclosure 3.

The Department reserves the right to revoke its acceptance of any product or process if the nature or composition of either or any of its principal and proprietary ingredients, or its performance has been falsely represented. Additionally, Department acceptance of any product or process does not imply it has been deemed applicable for all cleanup situations, or that it is preferred over other treatment or cleanup techniques in any particular case. A site specific evaluation of applicability and cost-effectiveness must be considered for any product or process, whether conventional or innovative, and adequate site specific design details must be provided in Remedial Action Plans prescribing the product or process. You may contact me at 850/487-3299 if there are any questions.

Sincerely,

Rick Ruscito, P.E.
Bureau of Petroleum Storage Systems

c: W. Evans - FDEP/Tallahassee
T. Conrardy - FDEP/Tallahassee