

## BIOREMEDIATION FOR OUR INDUSTRY

Bioremediation is a natural process that is your safest and most OSHA compliant cleaning option.

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### **By definition:**

The degradation, (break down), of organic matter using microorganisms.

### **How it works:**

Microorganisms break down petroleum based compounds and convert them to carbon dioxide and water, eliminating the oil and grease in the cleaning solution and eliminating the need to transport hazardous materials.

### **How it works in a parts cleaning system:**

1. The **cleaning agent**, (surfactant/de-greaser) removes the oil and grease from the part.
2. The **primary filter**, (steel fine mesh), removes the largest of the particles.
3. The **secondary filter** and in some cases the microbe host removes the small contaminant, (as small as 50 microns), and as the cleaning agent goes through releases a combination of hydrocarbon degrading microbes and nutrients into the heated bio-reactor holding tank. Now the microbes come to life and eat the oil and greases.
4. The **cleaning agent** is heated in the tank to approximately 105 degrees Fahrenheit and pumped back to the beginning of the process.

Effective bioremediation systems use a combination of aerobic, (atmospheric oxygen) and anaerobic, (support biological activity in which no oxygen is present), microorganism to function. Aeration provided by the flow of fluid through nozzles and spigots or a separate aerator provide adequate additional oxygen to certain strains while others work below the surface in the holding tank.

The most important part of this continuing cycle is to keep the microbes working and the containments at a safe level for safe and legal disposal. This is the correct environment with the solution at the correct temperature and requires replacing and disposing of the filter mat as often as every few weeks based on the level of usage. In the case of multilevel filter mats removal and disposal of the top level may be all that is required. To maintain the microbes the mat should be replaced at least once a month. Microbes can be added separately as a booster.

The fluid cleans the part and the microbes clean the fluid.

### **Key factors to the success of using Bioremediation in your cleaning processes:**

- The correct and healthy microbes with 105-degree solution. Using higher temperatures will kill the microbes.
- Keeping the filter clean, both primary and filter mat
- Specifically blending the fluid and microbes to your specific parts cleaning needs.
- Maintaining maximum efficiency in your biosphere with the proper concentration of microbes. This is easily done with a simple kit

### **More Important Information:**

- Parts do not have to be rinsed with anything after being cleaned
- Using a Bioremediation solution, the microbes cannot survive out of their basic liquid state.
- Data has shown that this process is able to break down petroleum products at a rate of up to 15mg/1/hr, 90% motor oil is degraded in three (3) days.
- A properly maintained BIOREMEDIATING parts washing system has virtually no odor and need never be emptied. Any fluid that is lost through "walk away" or normal evaporation is simply topped off with more fluid.

### **Bioremediation benefits:**

- Nontoxic to the environment
- No down time for maintenance
- Simple to use
- Safe for employees
- Conserve energy and water
- Low operating costs
- Can be used in ultrasonic units under special conditions.

**Caution!**

Mixing the biodegradable solution with other solutions can kill the microbes.

**The following information is required, for each machine, to determine what it takes to convert your existing water or solvent system to a Bioremediating System.**

1. What type of machine are you using?
  - a) Shaker
  - b) Hot Water Washer
  - c) Hot Tank
  - d) Manual Wash Tank
  
2. Operational temperature in degrees of Fahrenheit?
  
3. What solution are you currently using?
  - a) Safety Clean
  - b) Varsol
  - c) Water
  - d) Other, please specify
  
4. What soap are you currently using?
  - a) Manufacturer
  - b) Type
  
5. Volume of solution in current machine in gallons?
  
6. Total LB's processed per day?
  
7. Parts being cleaned?
  - a) Armatures
  - b) Rotors
  - c) Stators
  - d) Field cases
  - e) Solenoids
  - f) Aluminum housings
  - g) Steel housings
  - h) Rectifiers
  - i) Regulators
  - j) Hardware
  - k) Fans
  - l) Pulleys
  - m) Plastic insulators and parts
  - n) Starter drives
  - o) Other, please specify.