



MICRO CLEAN™

Designed to clean, degrease and to remedy the presence of hydrocarbons in any solid surface.

WHAT IS IT?

Micro Clean™ is a biological cleaner and degreaser, it contains terpenine (citrus essential oil) as well as 10 species of hydrocarbon degrading bacteria including Acinobacter, Citobacter, Pseudomonas and Pseudoxanthomonas in an emulsion with water.

Micro Clean™ was designed to clean, degrease and remediate hydrocarbons on any solid surface.

USES AND APPLICATIONS

Because **Micro Clean™** can be used on any solid surface its application for the cleaning of grease, oil, hydraulic fluid, diesel or hydrocarbons in the industry is very wide:



Oil And Gas

Well valves and heads, flow lines, compressor stations, storage tanks, equipment parts and accessories, refinery components, fire wall, ballast and associated floors, fittings and concrete floors.



Automotive

Service floors and ramps, washing stations, waste registers, pumping stations, tools, parts, engines and equipment.



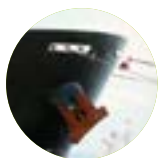
Railway

Engines, track changer, lanes and tracks, ballast, hazardous waste, remnants, parts, concrete and associated floors.



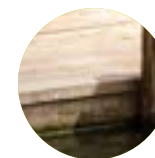
Factories

Equipment and parts, service platforms, washing stations, waste logs, metal chips, concrete floors, absorbent sands.



Naval

Ships, docks and shipyards.



Any surface

Any surface where it is necessary to remove vegetable oils and minerals.

HOW DOES IT WORK?

Micro Clean™ has a double mode of action, on the one hand the dispersant present in essential oil of citrus (**d-limonene**) provides an emulsifier, on the other the microbial fractions remediate mineral or

vegetable oleic compounds, as well as hydrocarbons, improving the quality of the water. See diagram 1.

EMULSIFYING AND DEGRADING EFFECT OF MICROCLEAN



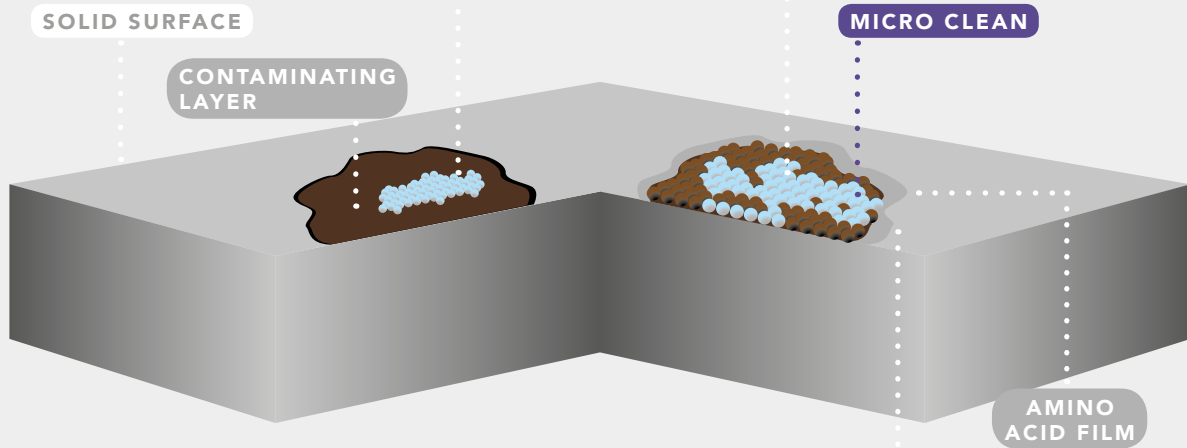
BREAKS THE CONTAMINATING LAYER

The dispersant present in **Micro Clean™** d-limonene is a natural surfactant that comes from an extract of citrus. Its function is to break the contaminating layer in small spheres to facilitate the action of bacteria.



DEGRADES POLLUTANTS

Once bacteria meet pollutants, degradation begins, bacteria break down long chains and break them into increasingly simple compounds.



The end products after remediation are fatty acids, water and CO₂.

WHAT ARE THE BENEFITS?

- Clean and degrease the presence of hydrocarbons on any solid surface.
- Remediate or remove any hydrocarbon residue.
- Eliminates or reduces hazardous waste associated with surface cleaning.
- Encapsulates hydrocarbon vapors, low LEL
- Reduces costs associated with the use and disposal of conventional solvents.
- Minimizes health and safety risks from the use of chemicals.
- Nonflammable, non-toxic and non-corrosive.
- Not pathogenic, it does not harm living beings or the environment.
- Does not require special permits for its use, storage and / or disposal.

HOW TO APPLY:

PREPARATION:

1. Prepare a Micro-Clean - Water solution.

Mix 1 ounce of Micro-Clean concentrate in 20 ounces of water (1:20 dilution).

Shake Micro-Clean concentrate prior to dilution with water, once diluted, the Micro-Clean solution should be used within 7 days.

2. Apply the mixture to the area to be cleaned.

Use a low pressure disperser to completely cover the area to be cleaned with the diluted Micro-Clean solution. Use a brush to cover areas that contain deposits of grease or heavy oil.

To clean heavily soiled areas you may need several applications or to use a higher concentration of Micro-Clean in water. For areas that are easy to clean or frequent cleaning, Micro-Clean can be diluted to 1 part Micro-Clean in 50 parts water (1:50 dilution).

One gallon of Micro-Clean diluted in 20 gallons of water (1:20 dilution) will cover 500ft² (46.45 m²) with an approximate thickness of 1/16 “.

One gallon of Micro-Clean at a dilution ratio of 1:50 will cover 1200 ft². This is the minimum thickness of Micro-Clean™ that can be used and this is the maximum area that can be covered

3. Let the product act.

Allow the product to act for 30 minutes or until the Micro-Clean solution begins to dry.

4. Remove the product.

Rinse with water under pressure, with a disperser or a hose.

Dispose of the used Micro-Clean™ solution (containing the residues removed) in accordance with local regulatory requirements for such waste.

SUCCESS CASES

[1] INDUSTRIAL CLEANING



CLEANING PARTS AND EQUIPMENT IN CLEANING BOOTHS USUALLY USES SOAPS, MINERAL SPIRITS OR SOLVENTS. UNLIKE THESE SUBSTANCES THE USE OF MICROCLEAN HAS SHOWN:

It can operate at high temperatures obtaining the same or better results than conventional solutions.

The washed oil is bio-remediated.

Does not promote corrosion, abrasion, or affect soft metals and metals.

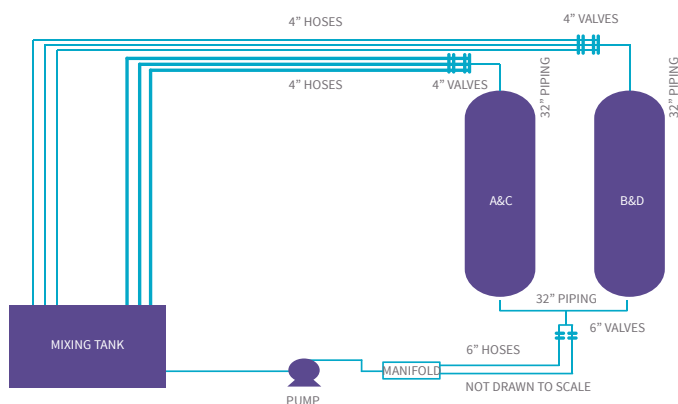
More effective cleaning compared to washing, cleaning and drying times of other solutions.

Removes rust from cabin components and parts entering the unit for cleaning.

Cleans carbon build-up.

No residue on metal parts.

[1] INDUSTRIAL CLEANING



A paraffin sample was obtained from the system and laboratory tests were performed to determine the melting point of the paraffin as well as tests to determine the appropriate dilution of **MicroClean** in water that allowed to dissolve the paraffin deposits efficiently.

Once the required volume of MicroClean was determined, the mixture was run counter flow through the closed synthesis and separation circuit for 48 hours until all the paraffin was completely removed, finally the systems were washed with water.

The presence of copper and zinc was monitored during the cleaning process to be associated with the removal of paraffin content.

As a result of the cleaning process in the two circuits their efficiency increased from 51.8 and 57.7% to 105.6 and 107.5%, respectively



PROBLEM: ACCUMULATION OF PARAFFIN AND CATALYST POWDER IN THE CIRCUIT OF SYNTHESIS AND SEPARATION.

REFERENCES.

[1] Industrial cleaning of equipment.

[2] Methanol Holding's. 2016

Cleaning of synthesis circuit and separation in methanol plants.



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