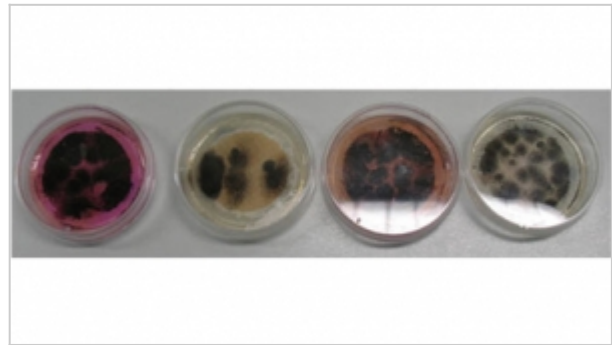


Treatment of diesel storage tanks against biological contamination.

Microorganisms are present everywhere in various forms: molds, yeasts and bacteria. They are very useful in various industries such as food and pharmaceuticals, but because of their uncontrolled multiplication can become a serious problem.



The microbial growth is only possible in the presence of water without which they are not able to survive or they enter into a sleeping phase. In general it is sufficient a quantity of water of 100 ppm (part per million) for the multiplication of microorganisms.

The standard fuels contain up to 0.2 ml of water per litre, one-third of this is dissolved in the fuel while the remainder it is collected on the bottom of the diesel tanks.

Therefore microorganisms can live and multiply in diesel fuels particularly in the condensate that collects on the bottom of the tanks or which is finely distributed in the fuel.

The consequence of microbial growth is the formation of sludge in the contaminated tanks that cause the blockage of filters. In addition, metal tanks are corroded by the acid formed by the metabolism of microbial growth.

Maintenance and use of chemical biocides can solve microbial problems that occur.

WHY THE PROBLEMS OF DIESEL CONTAMINATION ARE INCREASING?

One of the main reason is the use of biodiesel and the reduction of sulphur (natural bacteria killer) into Diesel

The DIRECTIVE 2003/30/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 May 2003 on the promotion of biofuels or other renewable fuels for transport has given a boost to the biodiesel in

the diesel fuel obtained from petroleum. The percentage of biodiesel is therefore to increase every year. If on the one hand the mixing of biodiesel within the conventional diesel obtains the effect of reducing the environmental impact of combustion, on the other end, the presence of water in the fuel itself (the water is present in the biodiesel) leads to possible bacteria contamination.

Analysis of fuels (bacterial contamination)

The bacterial contamination of fuels, is a growing problem.

- Microorganisms may grow in the tanks and tanks of vehicles
- A quantity of water of 100 ppm is sufficient to allow microbial growth
- Bacterial contamination gives rise to the formation of sludge and slime
- Consequences: blockage of nozzles and filters, corrosion

The bacteria produce the sludge (biomass), which are acidic products of microorganisms. They clog filters and pumps, injectors, and also develop a strong corrosive action on all surfaces, metals included.

The only way to see if the fuel is contaminated and to what extent a bacterial analysis is needed.

The diesel engines of the latest generation use the new common rail fuel system. This system needs a fuel absolutely free of impurities, in particular of bacteria and mucilages, otherwise it can cause the block of the system and serious damages.

The analysis of the bacterial diesel allows to detect the presence of microorganisms harmful to pumps, injectors, tanks and filters.

That of 'bacterial contamination of fuels, is a very complex problem and, lately, more and more widespread.

Bacterial contamination gives rise to the formation of sludge (biomass) and corrosion as a result of acidic metabolic products of microorganisms (biocorrosion). The biomass causes the blocking of filters that must be replaced frequently sometimes daily. Both problems, blocking of filters and corrosion, can be attributed to the microorganisms.

The most common types of bacteria that may be present in the fuel are:

Bacteria

Pseudomonas sp.
Flavobacterium sp.
Sarcina sp.
Desulfovibrio sp.
Desulfotomaculum sp.
Hydrogenomonas sp.
Clostridium species

Fungi

Hormoconis resinae
Fusarium sp.
Candida sp.
Aspergillus sp.

Treatment and use of the bacteria killer products

Although the oil company take utmost attention to the treatment of diesel fuel, the diesel may still be contaminated by microorganisms; this mainly happens during the transportations and storing into the intermediate deposits and it is more evident in hot climate.

It is therefore necessary to use special and dedicated bacteria killer tailored to address the specific problem.

Use of the bacteria killer

The bacteria killer (or biocide) can have two functions.

1. as 'killer-dose' treatment, in case of contaminated fuel with the purpose to kill the microbial contaminant within a short period of time. Heavily contaminated fuels require higher doses of biocide superior to the slightly contaminated ones.
2. as 'prevention-dose', to reduce the risk of future contamination.

It is very important that the biocide is not only effective but also it must be compatible with the fuel and all system components.

The biocide should not affect any characteristic of the fuel. Compatibility tests must be performed before any use into the fuel.

Choice of bacteria killer.

The use of a proper bacteria killer is very important to guarantee immediate results. The correct product and dosage should be indicated by experts and normally only after a chemical analysis of the fuel.

The bacteria killer should be approved by engine manufacturers and have all required certifications.

The bacteria killer is a hazardous product and it should be handled with care only from trained people.

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