

TORYON TECHNOLOGIES' MIRAGREEN – THE BENEFITS OF MIRAGREEN AS A CLEANER & ODOR REMOVER VS. OTHER PRODUCTS

There are two fundamental mechanisms of action of MiraGreen: Biological and Chemical, where synergies between the combination of the two effects leads to numerous benefits

I. CHEMICAL EFFECTS

A. Reduces Interfacial Tension

- 1 - Improves ability to lift oils, hydrocarbons, dirt, etc. off surfaces
- 2 - Penetrates into porous surfaces and crevices
- 3 - Improves wetting onto surfaces
- 4 - Uses less surfactants, which improves environmental sustainability

B. Converts oils, diesel and other hydrocarbons into detergent-like compounds, creating an autocatalytic cleaning effect that is different and more effective than saponification, which only takes place at high pH and with vegetable oils.

C. Dual mode cleaning and odor control reduces the amount of chemicals and manual cleaning operations needed.

D. Keeps on working in the drains and sewer lines (see item II. Biological, below), by breaking down organics and hydrocarbons, preventing and removing build-up and ultimately resulting in reduced BOD (Biological Oxygen Demand) of the organics flowing to the wastewater treatment plant (WWTP). This reduces the WWTP energy and sludge removal costs by 30% to over 50% of the treated organic material. The WWTP gets these benefits, in essence, for FREE!!

E. Where steam cleaning is used to remove odors, C.O.D.E.TM cleaners provide large reductions in energy (reducing steam frequency) and manual labor.

II. BIOLOGICAL – uncoupling of microbial metabolism

A. Biofilm control – removal and prevention

1 - Penetrates into porous surfaces like concrete, tile, and grout which are typically fouled and then breaks down biofilms that would otherwise lead to odors and poor cleanliness

2 - Sanitizers typically used for controlling odors do not penetrate or remove biofilms: the amount of chlorine, for example, that would be needed to remove biofilms, would harm the substrate material leading to other cost increases

3 - by removing biofilms in porous surfaces, nutrients for bacteria are removed which helps to maintain a more sanitary environment

B. The autocatalytic effect noted above in I.B. is amplified by natural microorganisms present in the environment.

C. “The wastewater treatment process begins at the point of use,” (see I.D. above) where the C.O.D.E.™ proteins’ effects on natural microbiology amplify the effects on organic materials being digested in the wastewater. The WWTP gets these benefits, in essence, for FREE!!

III. OTHER BENEFITS

- A. Reduces insurance costs due to reduced risk of exposure to chemicals
 - 1 - Near neutral pH, 4.5 neat to 6.0 diluted, about the range of human skin
 - 2 - No solvents – typically have toxicity issues and VOC’s
 - 3 - No harsh builders, such as caustics which can be hazardous to users and substrate materials being cleaned
 - 4 - In cafeterias and kitchens, which are prone to oily floors, slip resistance is improved leading to fewer slips, falls and injuries
- B. No Volatile Organic Compounds (VOC’s) for improved Environmental Sustainability.
- C. No butyl or glycol ethers.
- D. Safe on virtually all surfaces including concrete, tile, plastic, rubber, glass, carpeting, fabrics & upholstery (delicate and water sensitive fabrics, such as silk may not be appropriate).
- E. Rinses off easily.
- F. Can be used with high pressure washers, Zamboni’s, etc.
- G. Does not leave a film or produce shadow effects on cleaned areas, especially on carpets and fabrics, as many other stain removers can.
- H. Removes odors immediately upon application – urine, feces, vomit, seafood, rancid food, garbage areas, bathroom and then “keeps on working” as noted in I.D. and II. above.
- I. Does not contain isolated enzymes, which can be allergenic and require special storage conditions.
- J. Shelf life stable – needs no special handling or storage conditions, but should not be allowed to freeze or separation of constituents may occur.
- K. Stable at high temperatures: compatible with hot water up to boiling.
- L. Protein component meets NSF (National Sanitation Foundation) requirements for potable water.
- M. Approved by Coast Guard for marine use and disposal.
- N. All ingredients meet FDA guidelines for food contact use.