



WHY CHOOSE MIRAGREEN™ OVER OTHER GREEN PRODUCTS AND/OR BACTERIA DIGESTANTS

1 - A key feature to removing greasy substrates and other soils off of a multitude of surfaces is the interfacial tension (IFT) between the cleaner and the effluent being removed (cleaned). MiraGreen™ is composed of proteins and surfactants where the proteins act to lower interfacial tension levels, thus improving the efficiency of lifting oils, greases and dirt, which are then emulsified into the cleaning solution and flushed away. Bacteria based cleaners can be formulated with surfactants, but the cleaning efficiency is limited by the IFT of the surfactants, which are not as low in IFT, and therefore not as effective, as utilized in the protein composition used in MiraGreen™.

2 - When oils are exposed to the protein solution of MiraGreen™, the oils are broken down and converted into surfactant-like compounds, thus amplifying the cleaning effect. Naturally occurring bacteria further amplify the autocatalytic cleaning effect. Bacteria based products have a negligible effect in this regard.

3 - An additional benefit to lowering the IFT is that MiraGreen™ penetrates into tiny pores including concrete, tiles, grout and the like, to remove deposits from porous surfaces. Other cleaners, whether using bacteria or not, have higher IFT levels and are less effective in penetrating these pores. An additional issue is that many persistent odors emanate out of deposits in these types of porous surfaces.

4 - Penetrating deposits in pores is a two-fold process. First, the low IFT of MiraGreen™ penetrates into the pores as noted in item 3 above. Second, many deposits are also composed of biofilms that contain live microorganisms. They are difficult to penetrate with bacteria based cleaners. The protein composition in MiraGreen™ acts upon the microorganisms to break down the biofilms, thus eliminating the source of persistent odors.

5 - One of the key objectives of cleaning is to remove nutrients, including oils and greases that would otherwise feed microorganisms, such as bacteria that might include harmful species. Reducing nutrient levels helps to control the bacteria populations. Further, sanitizers and disinfectants are used to remove bacteria directly. The idea of adding bacteria to an area goes against the most basic purpose of cleaning.

6 - While bacteria based cleaners are labeled as using safe microorganisms, if a person has a cut and is exposed to these cleaners, they run the risk of serious infection. MiraGreen™ is inherently safe and does not pose such a hazard to the user.

7 - Bacteria based cleaners are less stable and may require special handling and storage conditions. They can also be sensitive to hot water. MiraGreen™ has no special handling or storage requirements and is stable and functional both during and after exposure to

water that is above 200 °F, much higher than most cleaning operations.

8 - In addition to removing biofilms that can be a cause of persistent odors, MiraGreen™ is effective at immediately eliminating odors on contact, including urine, vomit, feces, rotting food, rancid oils and seafood in garbage bins, etc. The lower IFT is one of the reasons for the effectiveness. Additionally, the reaction of the proteins with the odor causing molecules is unique and is not seen in other cleaners whether they use bacteria or not. This adds to the uniqueness of MiraGreen™ as a dual purpose cleaner and odor remover.

9 - Downstream benefits of MiraGreen™ are as follows. It is not formulated with any bacteria and its method of action is such that the proteins in its composition stimulate the indigenous bacteria populations to accelerate the biodegradation of organic matter. The wastewater treatment process actually begins at the point of use, and the proteins continue working in the sewer lines so that the amount of organic matter going to the wastewater treatment plant is significantly reduced, thus reducing its energy and operating costs. These benefits at the wastewater treatment plant are essentially free, as the cost of the MiraGreen™ cleaners do not add any costs to the operation.

10 - Bacteria based cleaners merely add bacteria to the environment and do not accelerate the biodegradation of organic matter. The organic loading going to the wastewater treatment is not noticeably reduced when bacteria based cleaners are used.