

# Bio-inoculant Technology for Effluent Treatment Plants

## Environment-friendly and low-cost biotechnologies

Petroleum refining produces a large quantity of wastewater during its operation. As per a conservative estimate, water use of a refinery is around 1-1.3 times of crude oil volume processed. Wastewater produced in petroleum refineries is treated in the ETPs using physio-chemical and biological processes. Physico-chemical methods are energy intensive processes and are unable to recover all oil contaminants economically.

Biological units reduce the oil and grease content by catabolic capacities of microbes. The extent of degradation depends on presence of required catabolic gene pool as well as in their numbers. Effluent treatment plants are usually unable to completely degrade the wastewater being treated in the biological unit due to deficiency of microbes with required metabolic characteristics. By providing the microbes with required catabolic potential in adequate numbers, the overall efficiency of the treatment system can be improved.

IndianOil R&D has developed “Bio-inoculant Technology” which can enhance the degradation efficiency of microbes in the system. This innovative product helps in compliance with MINAS standards without need for any ETP revamp/modification.

### Technology Description

The technology includes a mixture of selected microbes and optimized nutrients. It is dosed in aeration tank/biological section of ETP in the aeration chamber system. The microbes included in the product are highly robust with a strong cell envelope and high tolerance to high levels of hydrocarbons, which allow them to thrive in the variable hydrocarbon contaminated environment, temperature, wide range of pH, osmotic and shock load conditions. This novel bio-inoculant has the ability to degrade oil and grease, phenol, sulphides and bezo (a) pyrene in presence of heavy metals like Cr, V, Ni, Hg and cyanides and reduce them to the extent to meet the MINAS standards.



## Salient Features

- Efficient, cost-effective, simplified, easy-to-adopt solution to enhance ETP efficiency for multiple contaminants
- Effectively removes multiple contaminants
- The product has enviro-tolerant and long lasting characteristics:
- It improves Mixed Liquor Suspended Solids (MLSS).
- Degradation of contaminants in aeration tank at lower stirring - saves energy
- Tolerant to shock loading of contaminants in ETP
- Effective and able to withstand extreme seasonal variations without compromising the performance.
- Totally indigenous and highly cost-effective
- Compatible with microbes in activated sludge

## Commercial Experience

- This bio-inoculant technology has been successfully deployed across IndianOil refineries for the last 10 years to ensure compliance with new MINAS standards without altering the existing refinery ETP configuration.



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