

Pharmaceutical Industry

Savings

- 80% reduction in contaminants, decreasing retention time in biological treatment systems.
- 75% energy savings by lowering contaminant load in the ozone biological process.
- 50% reduction in sludge production.
- Low maintenance costs for major equipment.

Solutions

- Removal of high concentrations of COD, TSS, and nutrients.
- Improves influent quality by reducing toxicity/inhibition levels in biological systems caused by pharmaceutical contaminants.
- Works in combination with advanced oxidation biological systems.
- Ensures compliance with discharge or reuse regulations.

Case Study

Introducción

Influent streams from a pharmaceutical industry facility were treated, including sanitary wastewater and discharges from cosmetic and solid product manufacturing areas. These influents are primarily characterized by high levels of COD, TSS, nutrients, TDS, and acidic pH tendencies. They also exhibit high toxicity or inhibitory effects on biological treatment systems. **(Photo 1)**

Molecular Disruption Technology (TDM) is a unique physicochemical process that uses a chemical blend to create an ionized state in the water to be treated. This facilitates the breakdown of complex organic matter into simpler compounds.

Analysis / Treatment Proposal

The proposed solution involved advanced physicochemical treatment using TDM® technology. This process successfully removed a significant portion of COD, TSS, nitrogen, and adjusted the pH. The resulting effluent was then processed through a biological treatment system to eliminate remaining contaminants, achieving compliance with the official Mexican standard (NOM-001-SEMARNAT-2021).

(Photo 2)

Results:

Parameters	Influent	Effluent TDM	Biological Effluent
pH (unid)	8	8.5	8
Conductivity $\mu\text{S/cm}$	12,800	11,000	11,000
TDS (mg/L)	10,900	10,900	9,500
TSS (mg/L)	180	0	0
Turbidity (NTU)	170	0	0
Color	1,250	18	0
COD (mg/L)	2,500	500	52

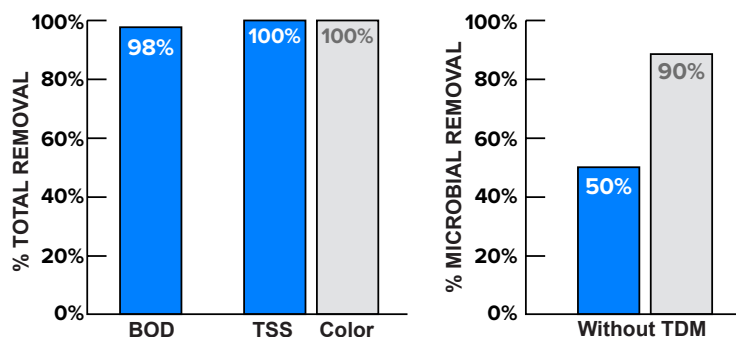


Photo 1

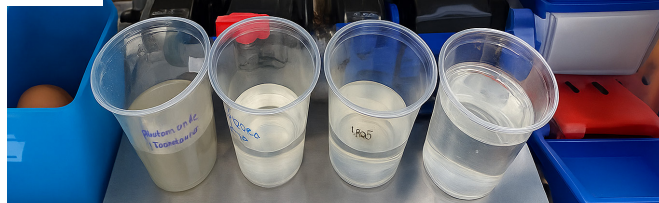


Photo 2



TDM®, in combination with biological processes, enables a comprehensive and integrated treatment solution for high-load wastewater containing elevated concentrations of COD, nitrogen, and TSS, along with high inhibitory potential. It achieves treatment efficiencies above 90%, while maintaining optimal oxygenation costs.

