



**BIO-ORGANIC CATALYST**  
THE POWER IN NATURE®

# PAPER & PULP

Environmental Solutions



## Environmental Solutions

- ✓ Eliminates the formation of biological film.
- ✓ Increases oxygen transfer rates.
- ✓ Reduces manufacturing downtime for cleaning.

Bio-Organic Catalyst has introduced a green, non-toxic, chemistry model that combats slime formation, and its problems in paper processes, replacing the toxic biocides normally used in papermaking process.

Papermaking processes uses a huge amount of water, with most of it recirculating throughout the system. Recirculation increases the content of soluble and insoluble organic waste materials that are found in the raw pulp, including wood fiber fines, starch, organic polymers and others.

Due to this abundance of organic wastes within the paper process water, an excellent microbial broth for the development of a culture of microorganisms, especially slime producing bacteria. This slime can grow abundantly, and sticks all over the wet end section machinery, including: white water pit, head box, pipe slow flow sites like elbows, hanging from low vacuum boxes, every dewatering element (foils boxes) and frame.

Instead of being a bacterial killer, like normal biocides, BOC eliminates the formation of biological film growth by increasing oxygen transfer rates within the process water, and elevating the dissolved oxygen levels in water. The BOC technology deploys very fine micro-bubbles that will attach themselves to the protective microbial structure of biofilms and cause them to dissolve.

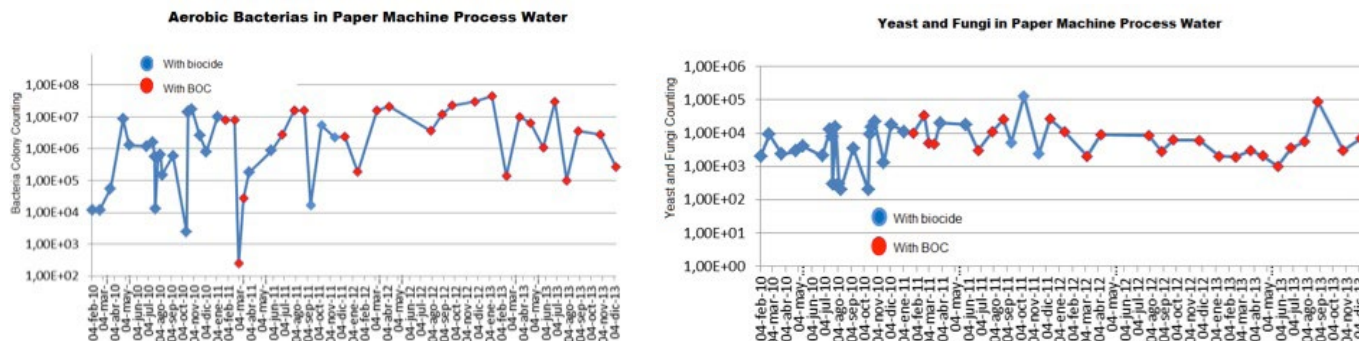
The ability of BOC bio-catalytic formulations to increase oxygen transfer rates has been proven scientifically, and is also a key factor in eliminating odors and enhancing aerobic biological conditions in water bodies, both important factors in paper manufacturing, where smells and lagoon discharge treatment are critical operational issues, especially in those processing recycled fibers.

The bio-catalytic capabilities provide a broad spectrum of chemical bonds cleavage pathways by enzymatic mechanism. Those characteristic could be the reason that permit to keep bacterial counting in the same level than when adding normal biocides as can be seen in Figure 1.

It has been proven that machine producing paper from recycled fibers (test liner, corrugating medium, tissue) can be kept clean and free of slime adding BOC to process water.



Another advantage when BOC is added in papermaking process is that it will benefit the wastewater treatment process by accelerating the oxidation mechanism. It will increase the efficiency of BOD-COD degradation process. In the papermaking process, BOC formulations have shown to substantially reduce the manufacturing downtime required in the cleaning of rollers due to their impact on dissolving the molecular structure of the starch that accumulates on the surfaces of rollers, requiring periodic cleaning with solvents. This economic aspect provides a strong incentive to the environmental aspects of replacing toxic biocides.



**Figure 1-** Aerobic bacteria, yeast and fungi counting in process water from a paper machine producing test liner and corrugating medium (100% recycled fiber material) when normal biocide and BOC was added.

## Cleaning Organic Wastes

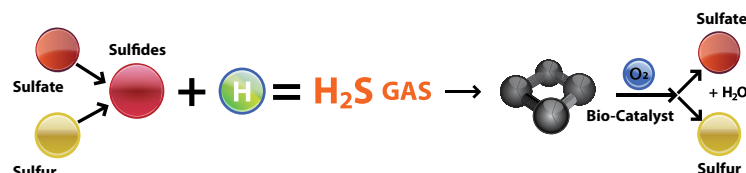
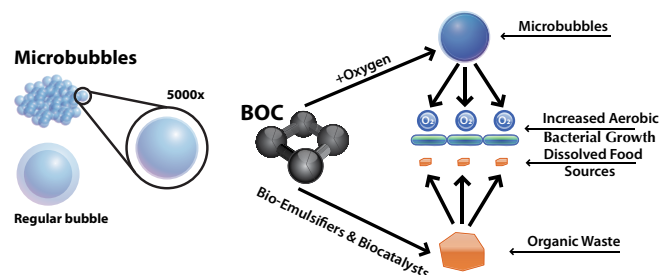
### Bio-Catalytic Factors For Exceptionally Deep Cleaning

- Initiates an immediate catalytic breakdown of wastes,
- Eliminates the accumulation of organic slime growth and microscopic scum,
- Maintains drains and interceptors free flowing with no odors.

## Odor Elimination

### Superior Odor Control

- Oxidizes noxious gases through oxygen transfer,
- Establishes more oxygenated and healthy aerobic biological conditions,
- Instantaneous odor neutralization on contact.



### Seal of Safety™

The Bio-Organic Seal of Safety™ is our trademark declaration of our commitment to offering green biocatalytic solutions that shift the treatment of our water resources to a more sustainable ecological model.