OxiPRO™ Microbial Control Technology

On-site, Real-time Monitoring and Control

OxiPRO Microbial Control Technology is a patented and integrated program that effectively controls microbial growth and deposit-formation in papermaking systems. Uncontrolled microbial growth can negatively impact the profitability of the papermaking operation through:

- Machine deposits
- Sheet spots, holes
- Breaks
- Offensive odor in the process and in the sheet
- Hazardous gas production
- Increased Wash Ups
- Increased boilouts and unscheduled shutdowns
- Increased water and energy usage
- Under deposit and corrosion
- Increased safety risk

OxiPRO Microbial Control Technology incorporates Nalco’s comprehensive mechanical, operational and chemical approach to optimizing the deposit control program, including:

1. System specific chemistries
2. Real time monitoring
3. Application Expertise and documented Best Practices

**System specific chemistries:**

OxiPRO Technology uses the optimum chemistry for the process conditions. Using a foundation of stabilized oxidants, the program can be complemented with additional biocides to deliver broad spectrum efficacy across various grades and furnish types. OxiPRO chemistries have been successful in freesheet, wood containing and recycled pulps.

OxiPRO technology uses a complete range of stabilized oxidants including:

- A cost effective inorganic stabilizer that produces a monochloramine intermediate
- A patented organic stabilizer that can reduce corrosion potential
- A variably stabilized oxidant program where the benefits of full stabilization may not be indicated

By bringing all of the best available technology to the market, OxiPRO technology has the largest number of options to effectively controls microbial growth and deposit-formation in papermaking systems.

The chemical program is delivered by a slug feed strategy or continuous feed through a carefully engineered Nalco designed feed system built to exact standards. The feed system has been designed with intelligent features that safely deliver the right dose, in the right place, at the right time.

Your Nalco sales rep can help determine which combination of chemistries is best for your system through a thorough system assessment.

*Figure 1 – The OxiPRO feeder generates stabilized oxidants on site safely and delivers it to the right place in the process, at the right concentration, and at the right time.*
Real Time Monitoring

OxiPRO technology integrates the paper machine operation with an assessment of the microbial populations in the process. Traditional microbial monitoring testing techniques are labor intensive that limit the frequency of analysis and a significant time lag to give useful operational information in time to make fine adjustments to the program.

The OxiPRO online real time monitor is able to rapidly and continuously evaluate the viability of a microbial population and the efficacy of the biocide program. Increasing the frequency of the analysis and linking the operational data creates a powerful combination that changes the way papermakers look at deposit control programs.

Faster ATP measurement techniques have given better insight into the variable paper process and allowed for more direct matching of the impact of uncontrolled microbial growth. ATP measurements are also used to troubleshoot systems during process upsets.

Instead of reacting to information on systems with a 48 hour lag time, the OxiPRO technology approach detects variations sooner and allows for proactive operational or chemical changes to be made.

The OxiPRO monitor is capable of being connected to the internet securely via a direct mill provided connection or wireless cell technology. This provides:

- Automatic reports to be sent through email that are accessible via computer or smart phone
- Monitor alarms that can be sent via SMS text message indicating of possible upset conditions
- Real time remote access to the process data by the local team and application experts to aid in troubleshooting problems

Application Expertise

Nalco continues to be a market leader in papermaking microbial control including chemistry, technology, and the people who develop and apply the programs. Sales engineers and technical service representatives work to understand our customers’ process, policies, and procedures to design your program to be safe, effective, and sustainable.

The local team is supported by a global network of application experts, researchers, and analytical scientists using the latest knowledge, and technology to deliver successful programs.

Figure 2 – The OxiPRO Monitor incorporates bulk water and surfaces in a measuring device that continuously records microbial activity without the need for reagents.

Figure 3 – Continuous and representative sampling (bulk water and surfaces) vs. traditional batch testing approaches (standard plating and ATP).
Some of the tools used include:

- TrendGen, a Nalco exclusive software program that integrates multiple data sets from a number of sources for fast in depth analysis.

- Well Care Audits are scheduled after the program has been applied for several months. Application experts work with the local teams to confirm that the program is performing as expected, respond to upcoming changes in the process or grade mix, and ensure the local team has best practices in place.

- Connections, a knowledge management system that puts the formalized information in the hands of the local teams. Information posted to this resource is composed, developed and vetted to be accurate and concise and help local teams respond.

OxiPRO Deposit Control Technology contributes both a financial and environmental return on investment (eROI) as reported in documented eROI values for our customers. More than simple microbial control, OxiPRO technology can deliver sustainable value to the papermaking process.

**eROI Value Propositions**

**SAFETY**

- Engineered feed equipment integrated into the mill process control system preventing accidental and unnecessary application reducing potential for worker exposure
- Alarmed monitors to reduce the incidence of over and under feeding
- Online microbial activity measurement insures only the required amount of treatment is applied
- Eliminating hazardous process gas generation through proper water treatment

**ASSETS**

- Increased production through less downtime for breaks, wash-ups, and boil outs
- Increased production through less off specification product
- Reduced corrosion potential through application of less volatile, less aggressive chemistry
- Reduced corrosion by elimination of under deposit microbial induced corrosion (MIC)

**WATER**

- Reduced water usage from less wash-ups and boilouts
- Improved water quality for on machine cleanliness

**EARTH**

- Increased production efficiency reduces primary sludge generation and discharge to landfill
- Reduced use of chlorine compounds

**ENERGY**

- Reduced steam consumption not needed to reheat fresh process water
- Reduced microbial based deposition in press clothing improves dewatering efficiency resulting in less drying steam required
Complimentary Applications

OxiPRO Microbial Control Technology is complimented by other Nalco technologies.

- Boilouts and Cleaning programs are the cornerstone to good microbial control. Starting with clean surfaces and cleaning areas of stagnant stock build-up eliminate areas where microorganisms can flourish and re-seed the system.

- Fabric Care and Cleaning programs remove areas for depositions and contaminants to build allowing microbial populations to become established and further reduce fabric performance and fabric life.

- Retention Drainage and Formation programs retain and distribute small particles in the sheet so they can be sold rather than creating agglomerations, deposits on piping, and seed points for microbial deposits.

- Freshwater clarification and disinfection programs eradicate viable fresh water organisms from entering the process. By reducing turbidity carryover the incoming organic load is reduced decreasing the demands on the microbial control program. Additional benefits of color removal and other detrimental substances reducing bleaching efficiency, scale, and metals deposition can improve operational efficiency and preserve assets.

Ordering Information

Contact the appropriate Paper Services Division Grade Team or the Expertise Center for Deposit Control to determine if OxiPRO Microbial Control Technology is suitable for your application.