At Praxair, we are making our planet more productive. By providing industrial gases that are used in process and wastewater streams in pulp and paper manufacturing, our technologies help facilities to reliably meet their effluent treatment guidelines. Ultimately, Praxair is helping companies improve their productivity.

Pulp and paper manufacturing is water intensive, and as much as 40-60 m³ of water is utilized per air dried metric tonne of finished product. The wastewater from a P&P facility may contain contaminants such as carbohydrates from wood fiber or recycled paper, color compounds, solvents, organic acids, spent alkali, surfactants, reduced sulfur compounds and odorants like mercaptans and hydrogen sulfide.

**Washing Improvement Through Brownstock Acidification**

**Challenge:** The need to maximize the efficiency and minimize the environmental impact of pulp bleaching is an imperative today. High pH (e.g. 9 and above) in brownstock washers can lead to poor drainage, excessive water use and retention of sodium ions and organic materials in the pulp mat that can present a cost and operational burden to both the bleaching plant and downstream effluent treatment units.

**Praxair Approach:** CO₂ acidification of Brownstock washers is a reliable, low-capital solution that can provide multiple performance enhancements including increased throughput, either reduced wash water consumption or improved chemical recovery, and more efficient utilization of ClO₂ in the bleaching process. In actual field trials, Praxair’s technologies for carbon dioxide pH control have been shown to reduce soda losses and carryover of BOD/COD to the bleach plant by as much as 50%, thereby offering pulp mills significant savings and operational benefits.

**pH Reduction with CO₂**

**Challenge:** Process water, wastewater influent and wastewater effluent, often require pH. However, the use of strong acids may pose safety risks. These risks are associated with storage, handling, corrosion and the possibility of overshooting. When a strong acid is added to reduce pH, a slight excess of the acid can make the treated water pH drop far below 7, which will cause hydrogen sulfide and other toxic gases to be released.

**Praxair Approach:** Praxair’s CO₂ application for pH control allows facilities to effectively neutralize alkaline wastewaters. Handling CO₂ is easier and less hazardous than the handling requirements of mineral acids. Carbon dioxide does not require spill protection or corrosion resistant piping, and it also eliminates the possibility of over treating. CO₂-water equilibrium conditions ensure that pH levels do not drop below 6.5.
High Strength Loads

**Challenge:** Chemical oxygen demand in pulp & paper wastewaters can range from about 300-1000 mg/l. The high organic loading of pulp and paper wastewater means that a significant amount of oxygen is required in a small footprint. This leads to a high oxygen uptake rate (OUR) in the selector tank, and sometimes in the main aeration basin as well. At high OUR values, aeration systems can become limited, leading to oxygen deficiencies.

**Praxair Approach:** High purity oxygen and Praxair’s oxygen delivery systems can reliably provide facilities with all of the oxygen needed in the process tanks. The range of oxygenation devices delivers oxygen exactly where and when it is needed. This helps facilities meet their treatment goals and maintain regulatory compliance.

Sludge Bulking

**Challenge:** Sludge bulking is a major issue in most pulp & paper wastewater systems. Bulking can be caused by insufficient dissolved oxygen (DO) in selectors or the main aeration basin. It may also be due to an imbalance in the food to mass ratios between the selector and the main aeration basin.

**Praxair Approach:** Praxair’s high purity oxygen helps to ensure that wastewater treatment systems obtain adequate amounts of needed oxygen, preventing DO deficiencies from occurring. Praxair has also developed a proprietary patent pending approach for operating pulp and paper facilities that helps to optimize organic loading and sludge quantities in the selector and main aeration tanks to mitigate bulking concerns.

Conclusion

- Whether your wastewater treatment system is an extensive aerated lagoon, or a compact wastewater process, our technology offerings can provide you with effective and reliable treatment.
- Praxair’s tested and proven wastewater offerings have been deployed in a variety of food processing wastewater operations
- Call us today to discuss your particular wastewater treatment process needs, and let us help you improve your productivity.