CROISSANCE CORPORATION
Air, Water & Innovation...

# PULP & PAPER BLEACHING WITH OZONE TECHNOLOGY

**Brighter | Cleaner | Eco-FriendlyProduction**

## INTRODUCTION

The pulp and paper industry has long relied on chlorine-based chemicals for bleaching, but this approach raises serious environmental and health concerns. Chlorine bleaching produces harmful by-products such as dioxins and organochlorines, which contaminate water bodies and pose long-term ecological risks.

Ozone ($O_3$), a powerful oxidant, offers a cleaner, safer, and more sustainable alternative. By using ozone in pulp bleaching sequences, mills can achieve high brightness and strength while drastically reducing chemical consumption and toxic effluents

# How It Works?

**01** Ozone Generation

Oxygen is converted into ozone using high-capacity generators

**02** Application in Bleaching

Ozone is introduced into pulp under controlled conditions (medium consistency, 8–12%)

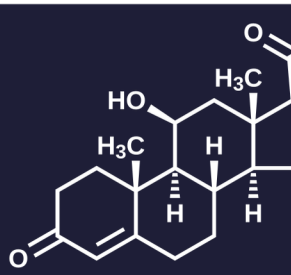
**03** Oxidation Process

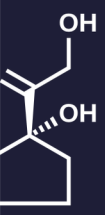
Ozone selectively attacks lignin molecules, breaking them down and improving brightness

**04** Decomposition

Ozone naturally reverts to oxygen, leaving no harmful residues in the pulp or effluent

# Benefits at a Glance




**Eco-Friendly**
Reduces or eliminates chlorine-based bleaching agents

**High Brightness**
Achieves ISO brightness >88 with optimized ozone stages

**Strength Preservation**
Minimal impact on pulp viscosity and fiber strength

**Reduced Effluent Load**
Lower AOX (adsorbable organic halides) discharge

**Cost Savings**
Decreases chemical usage, wastewater treatment, and energy

# Applications in Pulp & Paper

**Bleached Kraft Pulp Mills**
For chemical pulping sequences (EOP, Z/DEop, etc.)

**Mechanical & Recycled Fiber Mills**
Odor control, de-inking, and brightness improvement

**Water Loop Sanitation**
Ozone can also be applied to process water to prevent slime and microbial growth

# Technical Notes

**01** **Pulp Consistency**
Typically applied at medium consistency (8–12%)

**02** **Dosage**
0.2–0.6% ozone on dry pulp

**03** **Brightness Gain**
5–10 ISO points per ozone stage

**04** **Integration**
Used as part of an Elemental Chlorine-Free (ECF) or Totally Chlorine-Free (TCF) bleaching sequence

**05** **Compliance**
Recognized under EU BAT guidelines for Best Available Techniques in pulp bleaching

# Safety First

**01** High-concentration ozone requires sealed application systems with safety interlocks

**02** Proper off-gas destructors must be used to neutralize unused ozone

**03** Ozone monitoring sensors recommended for worker safety

**04** Systems should comply with OSHA ozone exposure limits (0.1 ppm, 8-hr TWA)

# Recommended Products

**(as per requirements we suggest)**

**01** Oxipure CC-Series Ozone Generators (SUEZ)

High-capacity ozone generation for pulp bleaching stages

**02** Oxipure CC Series Ozone Generators

Flexible, modular units for medium-scale applications

**03** Ozone Destructors

To safely neutralize off-gas from bleaching reactors

**04** Ozone Mixing Systems

For efficient ozone-pulp contact at medium consistency

# Conclusion

Ozonebleachingis a proven,sustainable alternative for the pulp and paper industry. It reduces chlorine dependency, lowers effluent toxicity, and enhances product quality—all while meeting modern environmental standards. With Croissance's advanced ozone systems, mills can achieve cleaner operations, brighter pulp, and long-term cost savings

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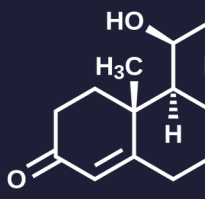
# Your Next Step

Experience the future of safe, sustainable sterilisation.

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