TURBIDITY MONITORING IN PULP & PAPER

DRIVING EFFICIENCY AND QUALITY CONTROL

In the water-intensive world of pulp and paper manufacturing, every process stream — from raw water intake to final effluent — must be closely controlled. Turbidity, the measure of cloudiness or haziness caused by suspended particles (fibers, fillers, fines, and precipitates), is much more than a water quality metric. It's a **real-time indicator of efficiency, product quality, and chemical balance**.

Turbidity is typically measured in Nephelometric Turbidity Units (NTU) using a white light source, or in Formazin Nephelometric Units (FNU) with infrared, depending on the stream's color and particulate load. Instruments that use a ratio measurement principle, such as the Kemtrak TC007 Ratio Turbidity Analyzer, compensate for sample color and optical window fouling, delivering stable and accurate readings across the full range of mill conditions — from clear filtrate to dark pulping liquors.

Manual grab sampling and lab analysis often miss transient events that lead to fiber loss, chemical overuse, or environmental excursions. **Continuous inline turbidity monitoring turns those unknowns into real-time control**, improving process stability and profitability.

KEY PROCESS POINTS WHERE TURBIDITY CONTROL DRIVES RESULTS

1. WHITE WATER TURBIDITY AND FIBER RETENTION CONTROL

The white water drained from the forming section carries valuable fibers and fillers. Turbidity is a direct measure of retention performance.

- **Process Control**
  A sudden turbidity increase in the white water circuit signals fiber or filler loss. Real-time monitoring allows immediate adjustment of retention aid dosage or machine speed, reducing raw material costs.
- **UF Filtration Protection**
  For ultrafiltration or reuse loops, consistently low turbidity is required to protect membranes.
- **Chemical Optimization**
  Turbidity trends guide coagulant and flocculant dosing in DAF or filtration, ensuring efficient solids recovery.

2. GREEN AND WHITE LIQUOR CLARIFICATION MONITORING

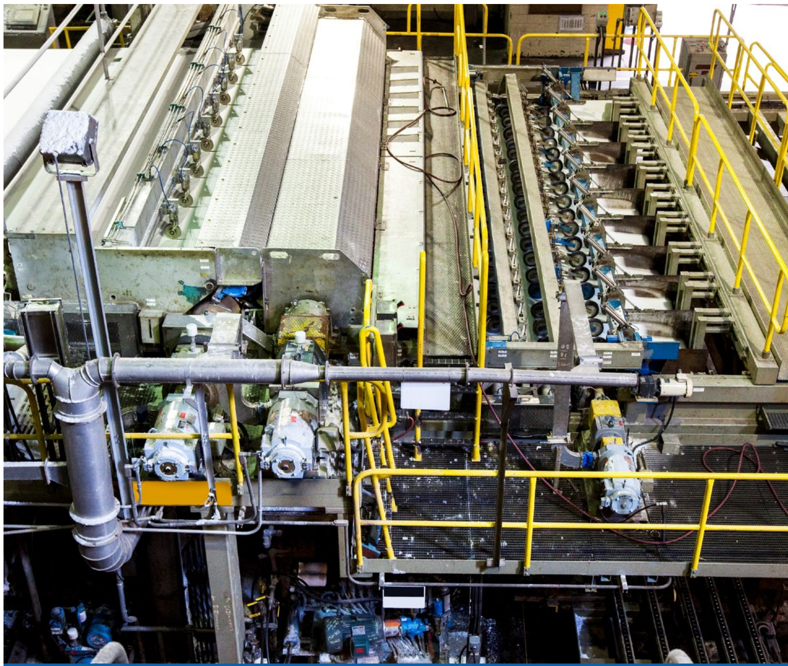
In chemical pulping, liquor clarity protects downstream assets and maintains cooking quality.

- **Green Liquor Clarity**
  Monitoring the clarified green liquor confirms dregs removal. Using infrared FNU measurement compensates for liquor color. Consistently low turbidity minimizes issues in the causticizing loop and keeps TSS equivalent below ~75 ppm.
- **Process Integrity**
  Clear white liquor protects digesters, heat exchangers, and the causticizing plant from fouling and costly downtime.

3. RAW WATER TREATMENT AND PRODUCT QUALITY ASSURANCE

Incoming water quality directly affects product brightness, cleanliness, and equipment uptime.

- **Defect Prevention**
  Low turbidity in treated water avoids specks, off-coloration, and deposit formation in sensitive process areas.
- **System Verification**
  Continuous monitoring confirms pre-treatment system performance, ensuring stable water quality for critical production steps.



4. FINAL EFFLUENT AND ENVIRONMENTAL COMPLIANCE

Meeting discharge limits for Total Suspended Solids (TSS) is a legal and environmental requirement. Turbidity is the most practical real-time surrogate.

- **Regulatory Assurance (Typical target: ≤ 5 NTU, site-specific)**
  Inline monitoring ensures discharge quality stays within permit limits. In stricter jurisdictions, targets may approach < 1 NTU.
- **Treatment Optimization**
  Turbidity feedback stabilizes secondary and tertiary clarification, minimizing chemical use while meeting TSS requirements.

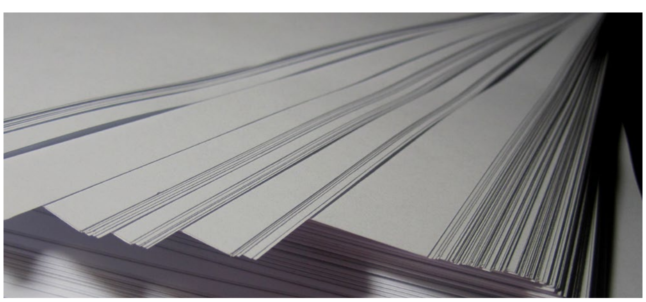
THE VALUE OF CONTINUOUS INLINE MONITORING

Benefit	Impact
Real-Time Insight	Fast response to process upsets
Chemical Cost Control	Optimized dosing of retention aids and coagulants
Material Recovery	Maximizes fiber and filler retention
Equipment Protection	Minimizes scaling and fouling
Quality Assurance	Consistent raw water clarity

PRECISION CONTROL WITH THE KEMTRAK TC007

Deploying a robust, self-cleaning turbidity sensor in these critical streams shifts operations from reactive troubleshooting to proactive control. The Kemtrak TC007 Ratio Turbidity Analyzer is designed to withstand harsh pulp and paper environments while delivering accurate, drift-free measurements across the entire range — from sub-0.1 NTU water to dark liquor FNU measurements.

Its ratio-compensated design eliminates errors from color and window fouling, ensuring dependable results with minimal maintenance.



- **Wide dynamic range** covering sub-0.1 NTU clarity checks to high-solids FNU liquor applications
- **Maximize fiber and filler recovery** by detecting turbidity changes in real time before losses escalate
- **Optimize chemical dosing** (retention aids, coagulants, flocculants) and reduce overuse costs
- **Improve product quality consistency** by maintaining clean water streams and stable process conditions
- **Strengthen environmental compliance** using continuous turbidity as a real-time TSS indicator

GET IN TOUCH

SOUTH FORK INSTRUMENTS
info@southforkinstruments.com

3845 Buffalo Road
Auburn, CA 95602

CALL US AT: (925) 461-5059