Foam Detection and Control in Papermaking

Foam is a common and costly problem in the papermaking process. At the wet end, entrained air and foam can interfere with drainage, sheet formation, and the stability of chemical additives. Left uncontrolled, foam causes production losses, reduces paper quality, and increases chemical consumption.

Traditionally, mills rely on continuous defoamer dosing and operator oversight to manage foam in the head box. With mills under pressure to reduce costs while maintaining consistent sheet quality, a smarter, automated solution is required.

BACKGROUND

Air becomes trapped in pulp stock during pumping, agitation, and mixing. Although much of the dissolved and entrained air is removed by mechanical deaerators, the paper machine headbox remains especially vulnerable to foam generation. Pressure drops and turbulence release dissolved gases into fine bubbles, which then coalesce into larger bubbles and surface foam.

Excess foam at the headbox leads to multiple production issues:

- **Paper defects** such as pinholes, surface marks, and uneven formation.
- **Strength loss** due to poor bonding and inconsistent fiber distribution.
- **Reduced dewatering rates**, increasing machine downtime.
- **Foam overflows**, leading to solids loss and cleanup costs.

In this case, the mill relied on permanent deaeration chemical feed and manual adjustments of defoamer addition. While defoamer dosing reduced foaming, overdosing had a direct negative effect on the efficiency of sizing agents and dry-strength additives—undermining both product quality and overall profitability. Operators faced the continual challenge of striking a moving balance between too much and too little chemical addition.

SOLUTION

To address the problem, the mill installed a **Hycontrol SureSense+ foam detection and control system** directly at the headbox.

The system integrates seamlessly with existing process infrastructure: the SureSense+ controller was connected to the defoamer pump and linked with the spray water system. Its patented sensing technology offered key advantages:

- **True foam detection** – Unlike capacitance or conductivity probes designed for liquid levels, SureSense+ sensors were engineered specifically to measure foam.
- **Resistant to fouling** – Sensors ignore coating build-up, a common cause of probe failure in paper mills.
- **Splash discrimination** – Turbulence and spray do not trigger false dosing signals.
- **Automatic closed-loop control** – Defoamer is only added when foam is detected, eliminating the need for constant operator supervision.

With this setup, the defoamer was delivered precisely when needed, rather than as a continuous, manual, or estimated feed. Operators only had to periodically review system operation, freeing up labor hours for other tasks while ensuring consistent, reliable foam suppression.

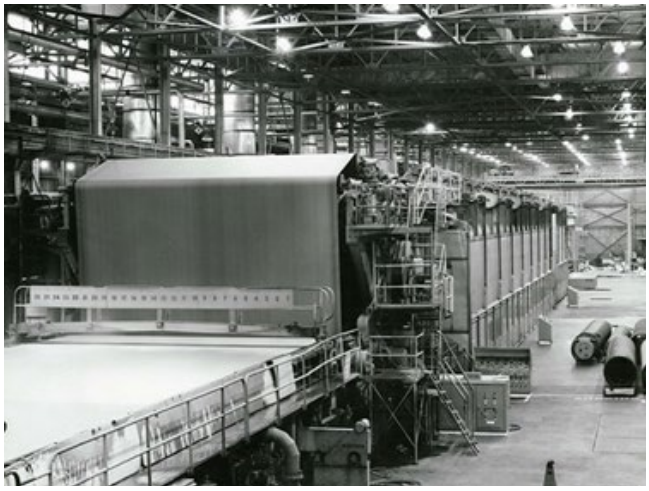
"By using defoaming chemicals only when needed, a 13% saving in the use of defoamer was achieved, resulting in considerable cost savings for the company."

RESULTS

The impact of the SureSense+ installation was immediate and measurable:

- **13% reduction in defoamer usage** – Significant chemical cost savings were achieved by eliminating unnecessary dosing.
- **Improved sheet quality** – Stable foam control reduced surface defects, pinholes, and strength variations in the finished paper.
- **Operational efficiency** – Manual monitoring and adjustment were virtually eliminated, allowing operators to focus on higher-value activities.
- **Better chemical performance** – Avoiding overdosing meant sizing agents and strength additives worked more effectively, improving the overall quality of production.

The mill found that, beyond direct cost savings, the SureSense+ system provided peace of mind: foam was controlled automatically and consistently, regardless of process variations.



CONCLUSION

Foam control is not just about keeping a process clean—it has a direct impact on cost, efficiency, and paper quality. In this application, Hycontrol's SureSense+ system delivered a more intelligent approach: reliable foam detection, automated chemical control, and measurable reductions in defoamer usage.

By moving from manual oversight and continuous dosing to automated, on-demand control, the mill gained:

- Lower chemical bills.
- Higher and more consistent product quality.
- Reduced operator intervention and labor costs.
- A robust, low-maintenance foam control system built for the demands of papermaking.

For paper mills facing similar challenges, SureSense+ offers a proven way to transform foam from a recurring headache into an opportunity for savings and improved performance.

SureSense Foam Detection and Control Systems:

- **Purpose-built foam measurement** – developed specifically to detect foam, not adapted from standard level sensors.
- **Immune to build-up** – sensor performance is not degraded by product deposits or fouling.
- **Automated dosing integration** – directly controls anti-foam dosing systems, reducing chemical usage and waste
- **Improve Paper Quality** – minimize blemishes and sheet inconsistencies caused by foam carryover

GET IN TOUCH

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