NALCO Water
An Ecolab Company

Delivering $2M via Annual Savings Sizing Optimization and Reduced ASA & Fiber Usage at a Specialty Grade Mill

CASE STUDY

BACKGROUND

This specialty grade mill produces multi-ply paper grades used in industrial converting applications, where water resistance (Cobb), dimensional stability (expansion) and consistency are essential to ensure downstream converting performance.

The mill operates in a highly constrained environment where tighter quality requirements directly translate into higher operating costs. Recent changes in testing procedures, including the implementation of a more stringent high-temperature Cobb test, drove a significant increase in sizing demand across all grades. At the same time, more stringent dimensional stability targets were introduced to address downstream converting challenges, particularly impacting one of the mill's largest volume grade families.

To maintain product performance, the mill was forced to increase ASA usage and add basis weight to affected grades.

This combination of higher chemical demand, increased fiber usage and production losses created a significant economic burden. The mill required a solution that could fundamentally improve sizing efficiency rather than relying on incremental inputs.

SOLUTION

Nalco Water implemented a full-scale evaluation of NALSIZE™ 63029, a next-generation ASA emulsifier designed to improve sizing efficiency per pound of applied ASA. The trial was conducted across multiple primary grade families under full production conditions.

The solution focused on optimizing Cobb performance and dimensional stability while maintaining machine stability. Performance was normalized against ASA dosage to validate intrinsic efficiency improvements rather than absolute results alone.

Key elements of the solution included:

- Replacement of incumbent emulsifier with NALSIZE 63029 under standard operating conditions
- Evaluation of sizing efficiency across multiple grades and layers
- Monitoring of machine runnability and wet-end stability
- Analysis of size masking and reversion behavior

RESULTS

The NALSIZE 63029 ASA emulsifier program delivered approximately $2 million in annual Total Value Delivered (TVD) at the specialty grade mill, driven by measurable improvements in sizing efficiency, fiber utilization and production quality across the mill's primary grade families.

Quantified results included:

- $874K/year reduction in ASA spend tied to the new 3-min 120°F Cobb specification
- $1,155K/year in avoided fiber cost from eliminating basis weight add-ons required to meet quality targets

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ANNUAL VALUE

PRODUCTIVITY

300,000 lbs. ASA saved

PRODUCTIVITY

5,700 tons dry fiber saved

TOTAL VALUE DELIVERED

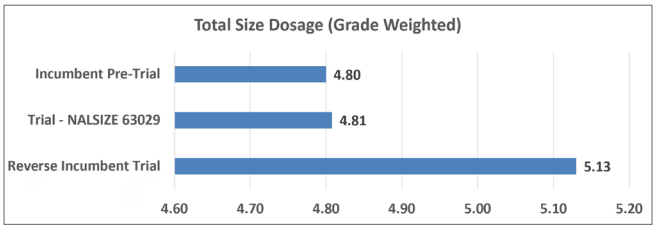
$2 million annually

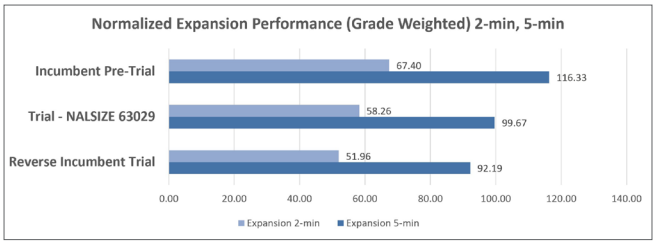
Beyond the quantified financial impact, the mill achieved significant operational and product-quality improvements, including:

- Best normalized sizing response per pound of ASA across all grades and conditions tested
- Filler Cobb masking reduced from 220% (out-of-spec) with the incumbent emulsifier to 65% (in-spec) with NALSIZE 63029, addressing the root cause of downstream converting issues
- Improved uncured Cobb and reduced 2-min and 5-min expansion on affected grades without compromising machine runnability
- Stable wet-end chemistry and zero off-quality production during the trial

The program reduced total ASA chemistry demand and conserved wood fiber through the elimination of basis weight add-ons. This translated to lower embedded energy, water and emissions across the value chain, while more consistent sizing performance helped protect downstream customer supply.

The major return for the customer was the combination of lower ASA dosage and avoided fiber add-ons, along with additional benefits including more consistent downstream converting performance and a clear runway for further optimization across the mill's multi-ply grade portfolio.





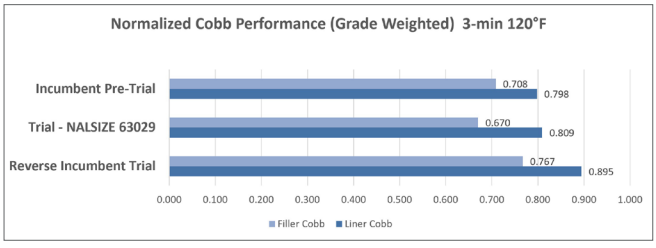
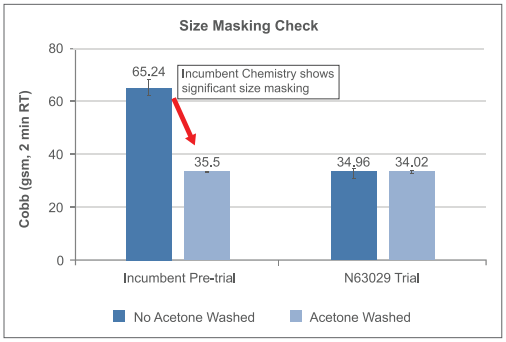


FIGURE 1: Normalized sizing performance: NALSIZE 63029 vs. incumbent ASA emulsifier (grade-weighted total size dosage, Cobb and expansion)



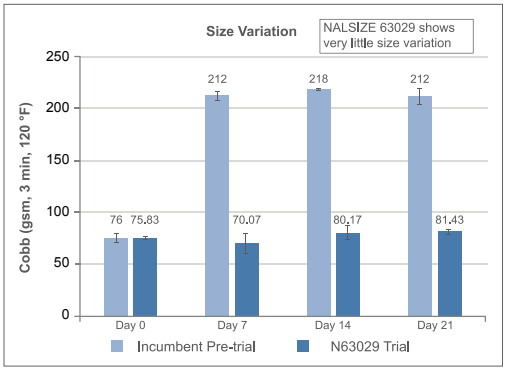


FIGURE 2: NALSIZE 63029 reduced size masking and size variation — acetone-washed Cobb matched untreated Cobb, confirming true sizing performance vs. the incumbent's masking gap

CONCLUSION

The month-long evaluation of NALSIZE 63029 ASA emulsifier at the specialty grade mill successfully addressed the sizing efficiency challenges driven by tighter quality specifications and increased ASA demand. Across multiple primary grade families, NALSIZE 63029 delivered the best normalized sizing response per pound of ASA of any condition tested, achieving comparable Cobb control and improved dimensional stability at a marginally lower total ASA dosage than the incumbent emulsifier. It also proved substantially more resistant to size masking and reversion, with filler Cobb masking dropping from 220% (out-of-spec) to 65% (in-spec) and acetone-washed Cobb values matching untreated results, confirming true sizing performance rather than a masking gap. These gains were achieved while maintaining machine runnability, wet-end stability and emulsion quality, with zero off-quality production during the trial.

By replacing the incumbent ASA emulsifier with NALSIZE 63029, Nalco Water delivered a more efficient program that unlocked approximately $2 million in annual Total Value Delivered. This value was driven by an $874K reduction in ASA spend (roughly 300,000 lbs of ASA saved) and $1,155K in avoided fiber cost (approximately 5,700 tons of dry fiber conserved) through the elimination of basis weight add-ons. The program also improved mill sustainability by reducing total ASA chemistry demand and conserving wood fiber through the elimination of basis weight add-ons, while more consistent sizing performance helped protect downstream customer supply.

The results in this case study are based on data reported in 2026. The results are specific to this individual customer and will vary for other customers based on factors and circumstances in their operations.

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