

# TAD machine sees improved strength capability, optimized wet and dry strength program and improved fiber retention with Metrix™ Titan 63822

## CASE STUDY

### ▶ BACKGROUND

Tissue and towel makers require optimized strength programs across all machine platforms and grade environments. Nalco Water provides a robust portfolio of wet and dry strength products, unrivaled expertise and service and digital technology (Wet End Monitor). Metrix™ Titan Technology for Strength provides towel manufacturers with the ability to increase strength, enhance drainage and balance system chemistry to improve productivity, enhance product quality and optimize fiber use.

To produce a more effective strength program for towel producers, Nalco Water

developed the Metrix Titan Technology (Metrix™ 63822). Metrix 63822 provides an increased strength capability with significantly lower wet strength resin dosages compared to market anionic dry strength products.

A TAD machine producing 250 TPD of towel in North America wanted to replace CMC (carboxymethyl cellulose). Following a market APAM (anionic polyacrylamide) trial, Nalco Water proposed trialing Metrix 63822 dry strength resin as a replacement for CMC.

### ▶ SOLUTION

Nalco Water's Metrix 63822 is a new generation of anionic strength and productivity program developed to support the charge balance needs in towel production due to the high usage of cationic wet strength resins. Metrix 63822 performance should be optimized through an audit of all wet end programs.

Metrix programs in many cases enhance dewatering and drying efficiency resulting in increased machine speed in addition to sheet strength properties. The Metrix program can facilitate the use of weaker fibers and lower basis weights.

Compared to APAM or CMC programs, Nalco Water's Metrix 63822 provides:

- INCREASED dry and wet tensile strength at reduced refining
- REDUCED wet strength resin / anionic dry strength resins like CMC or APAM
- ENABLED fiber savings or substitution
- IMPROVED dewatering, retention, charge balance and energy efficiency
- FLEXIBILITY to improve sheet properties



**ANNUAL SAVINGS**  
While maintaining same grade targets at reduced strength program dosages



#### PRODUCTIVITY

**30% reduction in wet strength**  
**40% reduction in dry strength**  
**50% reduction in defoamer**



#### RAW MATERIAL OPTIMIZATION

**25% decrease in solids to DAF**  
**1.3% substitution in long fiber**



#### QUALITY

**3.8% total tensile increase**  
**3.8% reduction in refining**



#### ENERGY

**4.5% decrease in refining energy**  
**4.5% decrease in natural gas**



#### GREENHOUSE GASES

**2800 tons**



#### TOTAL VALUE DELIVERED

**\$2.1 million**



▶ RESULTS

Nalco Water trialed Metrix 63822 and saw a significant decrease in wet and dry strength dosages while maintaining the same grade targets. At the same time, this decrease in dosage also created value through increased tensile, fiber savings, fiber substitution and energy savings. While grade development was not in scope, the trial showed the ability to improve wet over dry tensile significantly above current grade targets.

**Towel Strength & Quality**

Metrix 63822 increased strength capability:

- 3.8% increase in Total Tensile
  - 4.3% increase in MD Tensile
  - 2.9% increase in CD Tensile
- 2.5% increase in CD Wet Tensile at Baseline Dose
- 3.8% decrease in Refining

This trial succeeded in maintaining strength and softness targets through fiber adjustments.

**Energy**

Metrix 63822 reduced energy equivalent to \$240,000 in savings:

- Refining electricity by 4.5%
- Natural gas by 4.5%

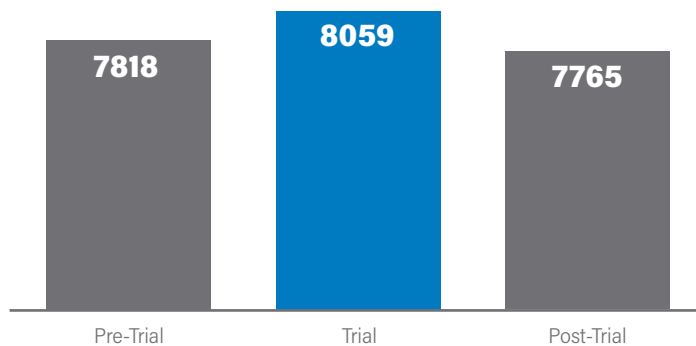


FIGURE 1: Total Tensile Improvement During Metrix™ 63822 Trial (g/3-in)

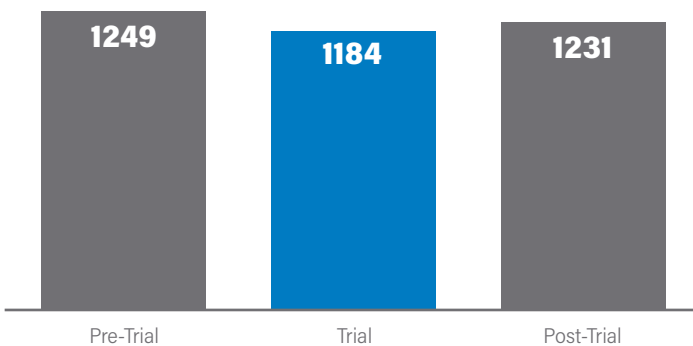


FIGURE 2: Refining Decrease During Metrix™ 63822 Trial (kW)

**Fiber Savings & Substitution**

Metrix 63822 enabled both fiber savings and fiber substitution in this trial. During the trial:

- DAF inlet turbidity decreased by 30%
- Solids to DAF decreased by 25%

The mill estimated this fiber savings equated to 560 tons of fiber saved per year equivalent to \$420,000.

Machine operators also adjusted the fiber ratio to maintain spec given the increase in strength capability from the chemistry program. For this grade, this resulted in 1.3% decrease in long fiber per year equivalent to \$175,000.

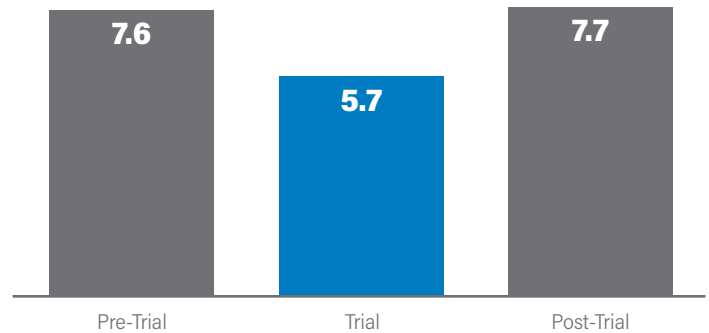


FIGURE 3: Solids to DAF Decrease During Metrix™ 63822 Trial (Tons/Day)



## ▶ RESULTS (continued)

### Strength & Wet End Optimization

Metrix 63822 eliminated CMC usage and reduced both wet and dry strength dosages by 30% and 40%, respectively, resulting in \$1,200,000 chemical savings. In addition, the cleanliness of the wet end improved. Most significantly, defoamer usage was cut by 55% resulting in \$140,000 in chemical savings.

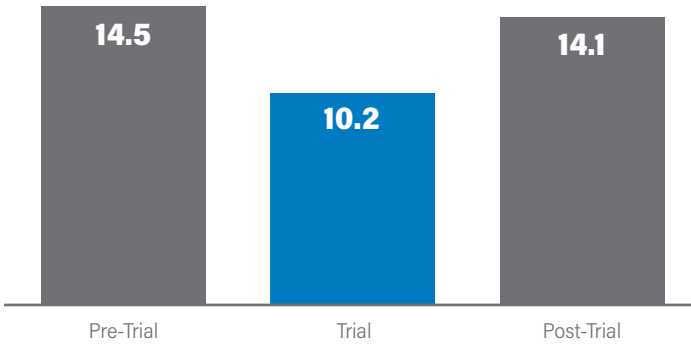


FIGURE 4: Wet Strength Dosage During Metrix™ 63822 Trial (Lbs/Ton)

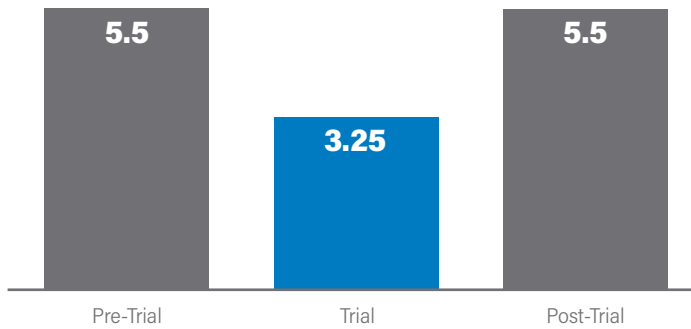


FIGURE 5: Dry Strength Dosage During Metrix™ 63822 Trial (Lbs/Ton)

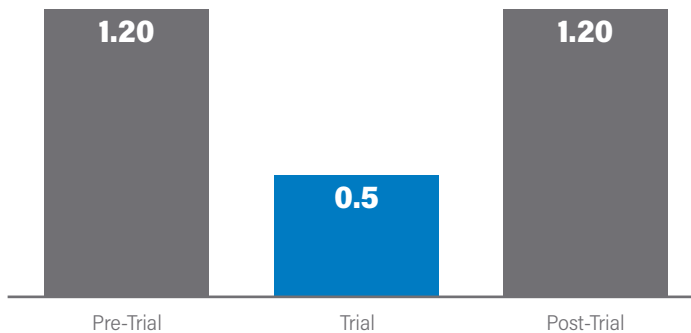


FIGURE 6: Defoamer Dosage During Metrix™ 63822 Trial (Lbs/Ton)

## ▶ CONCLUSION

Metrix 63822 provided significant benefits compared to APAM and CMC programs. Not only was the customer able to realize value while maintaining grade targets, this program offers the flexibility to explore additional development opportunities.