

PenSurf™ Digester Additive Technology

Nalco Water PenSurf Digester Additive technology increases pulp yield and quality. Increasing liquor penetration into the chips, results in a more uniform cooking process, producing fewer knots, reduced white liquor usage, minimized bleaching costs, increasing pulp yield, and improving operational efficiency.

PULP MANUFACTURERS HAVE BEEN USING NALCO WATER'S DIGESTER ADDITIVES OR CHIP PENETRANTS TO ACCOMPLISH THE FOLLOWING BENEFITS:



Increase in
**YIELD AND
PRODUCTION**



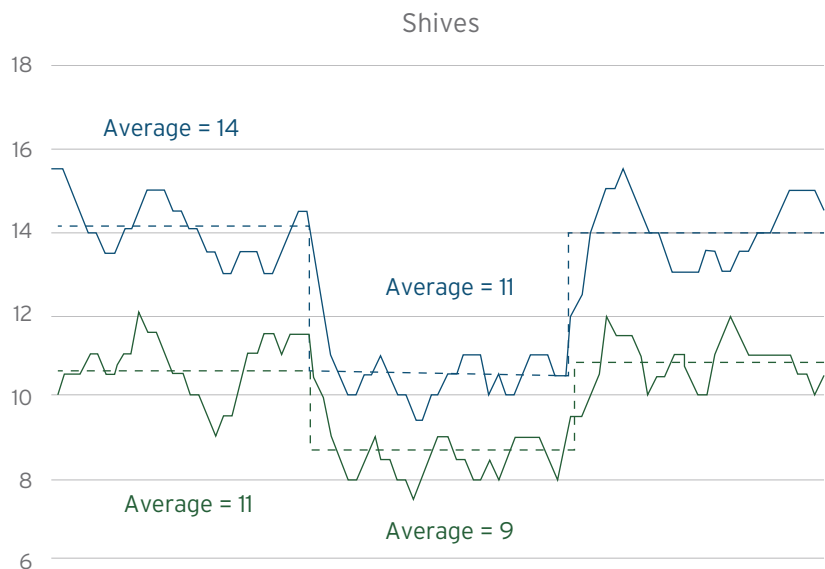
Reduction in
**WHITE LIQUOR
CONSUMPTION**



Reduction in
**EXTRACTIVES
CARRYOVER**

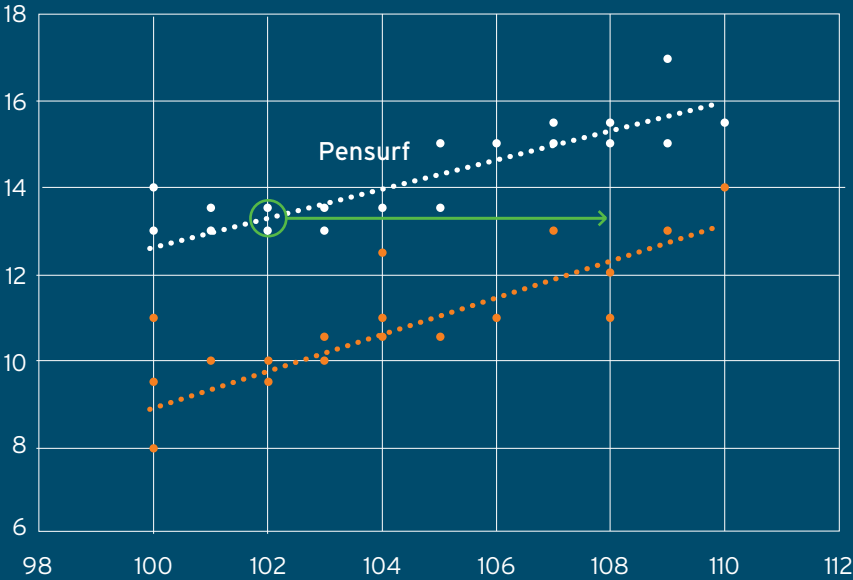
Reducing Shives

PenSurf technology allows manufacturers to significantly improve rejects and **REDUCE SHIVES BY 20%** for a given Kappa target in this example.



Increasing Kappa

When looking at the relationship between pulp quality, shives content in this case, we see that the curve has shifted favorably with the addition of PenSurf. Based on the data, the mill now has the capability to **INCREASE THE KAPPA TARGET BY 6+ POINTS**, translating to a **1 - 1.5% YIELD INCREASE**, translating to a potential payback of **\$1MM PER YEAR RETURN ON INVESTMENT**.











CASE STUDY

PENSURF VALUE DELIVERED

Extractive Control ROI

Case Study 1: 74418 To Digester HWD Mills

 COSTS  50-60% Extractives REDUCTION	 WASTE  ELIMINATION of talc	 COSTS  10-15% Defoamer REDUCTION	 WASTE  0.25-1.0 lbs/ton to chip chute pump
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Case Study 2: PP10-3148 in BSW & Bleach Plant

 COSTS  50-80% REDUCTION in sheet deposits	 WASTE  0.25-0.75 lbs/ton to 2nd stage showers
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