SuperWash™ Program delivers €2.5M/Year in savings to a European Market Pulp producer

NALCO Water
An Ecolab Company

CASE STUDY – PULP & PAPER
CH-2055

BUSINESS SITUATION

A European Bleached Softwood Pulp mill was experiencing high defect levels and quality issues with their finished pulp. This modern fiberline utilized 8 batch digestors, brown stock washing with 3 presses, a double oxygen stage, followed by a 4-stage bleaching process that can produce both ECF (Elemental Chlorine Free) and TCF (Total Chlorine Free) pulp – See Figure 1 for system process flow diagram. Presses are used for washing in the bleach plant, and filtrates are recycled back to the previous stages through a counter current washing strategy. The mill had a low overall water usage at < 20 m^3/ADT on average and cycle up of constituents contributed to deposition.

Pitch, Silicone, and other inorganics, comprise most of the defects observed in the pulp. Excess silicone from the brown stock washing filtrate had accumulated in the process and caused deposition issues with the continuous Tall Oil reactor. The mill also experienced high operating costs in the bleach plant during both their ECF and TCF transitions and extended runs. The Nalco Water local sales team was approached by the customer to help resolve the quality and production challenges facing the mill.

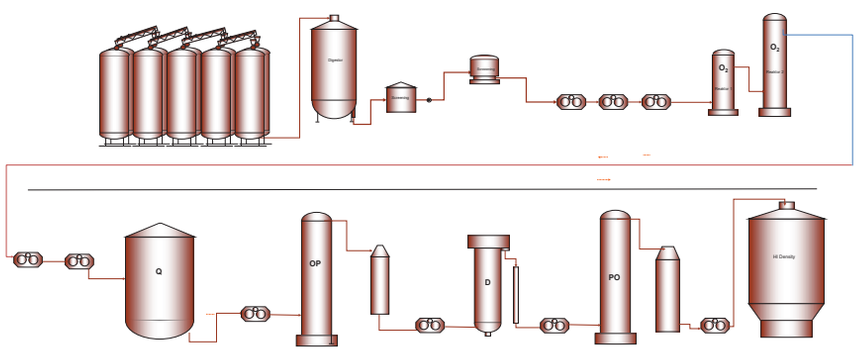

Figure 1. Mill Fiberline

CUSTOMER IMPACT	eROI℠	ECONOMIC RESULTS
Reduced Steam Energy Demand in Evaporators by 20,000 tonnes/yr.	ENERGY	Increased profitability by €0.4M/yr.
Reduced Bleach plant Hydrogen Peroxide by 10%	ASSETS	€0.9M savings/yr.
Reduced Off Quality pulp Production by 12,000 tonnes	ASSETS	€1.2M savings/yr.

eROI is our exponential value: the combined outcomes of improved performance, operational efficiency and sustainable impact delivered through our services and programs.

SOLUTION

Before a chemical solution was proposed to the mill, a detailed site audit was completed at the facility. A comprehensive "Slaker to Pulp Machine" audit was conducted that included pulp, liquor analysis, deposition analysis, review of pulp mill operating principles, process flow and chemical program efficiencies. The focus of the audit was to identify mill challenges, improved application strategies and program solutions to resolve the challenges.

A Mechanical, Operational, and Chemical (MOC) process audit, identified that the fiberline equipment and operational controls were operating well within standard industry norms. The dirt and off quality issues on the pulp machine were not a result of poor operational strategies. Analysis of the deposits and dirt in the pulp, identified they were predominantly silicone with pitch and calcium. The deposits were then traced to improper application of the brown stock wash program and pitch control program. Both programs were feeding too far down the washing process allowing for pitch to agglomerate and form deposits. These deposits would then break off
during process changes or upset conditions creating off quality pulp.

The Nalco Water sales team recommended the SuperWash brown stock washing program and an Organic Wash Aid Program to help improve the pulp quality on the fiberline. The SuperWash program allowed for improved washing and minimized the amount fed into the process. The Organic Wash Aid recommendation focused on its use at the beginning of the fiberline prior to the Oxygen Delignification stages. By maximizing the wash efficiency and removing the organic material at the beginning of the fiberline, the propensity to agglomerate and deposit was reduced.

ENVIRONMENTAL & ECONOMIC RESULTS

Based on our "Slaker to Pulp machine" audit approach and recommendations, the mill allowed Nalco Water to conduct a 30-day evaluation of our SuperWash and Organic Wash Aid programs.

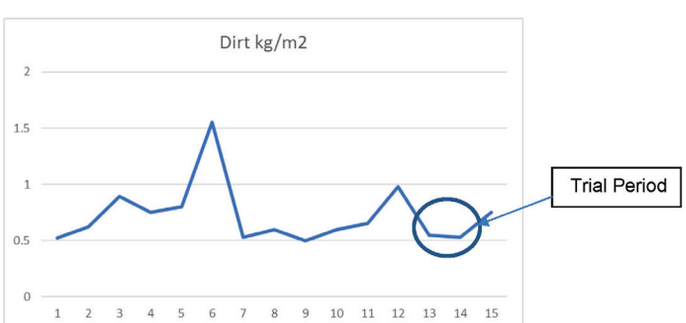

Figure 2. Pulp machine Dirt

Baseline operations with the current treatment programs had high dirt counts, espcially during the ECF and TCF transitions.

During the Nalco Water trial period, the mill experienced a step reduction in overall dirt in the pulp machine. No problematic dirt spikes occured during the ECF and TCF transitions.

The mill historically produced over 1000 Tons per month of off-quality pulp due to these dirt excursions just from the ECF and TCF grade transitions. The pulp was still sellable, but it was discounted over €100/ton.

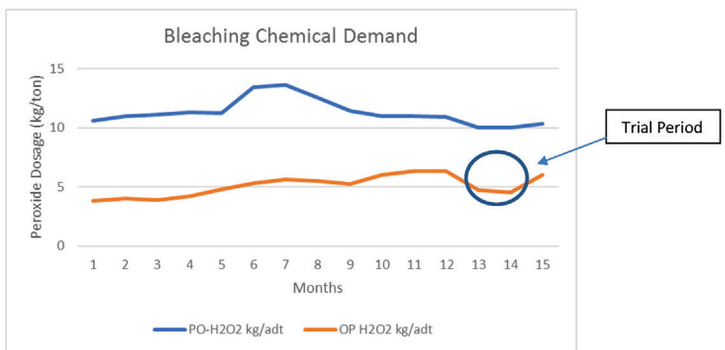

Figure 3 Bleach Chemical Demands

During our trial period, the OP stage required 2-3 kg/ton less peroxide to achieve the same extracted kappa number in the bleach plant. See figure 3. This was a clear indication that the brown stock and post O2 washing had improved during our trial period. The SuperWash program along with the Organic Wash Aid improved the performance of the presses and reduced the organic and inorganic loading into the bleach plant. One key aspect was that the overall kappa was higher during our trial than during normal operation. The mill would have expected an increase in bleaching demand during this period. If the kappa entering the bleach plant had been at specification, the chemical demand would have been lower and our savings would have been much higher.

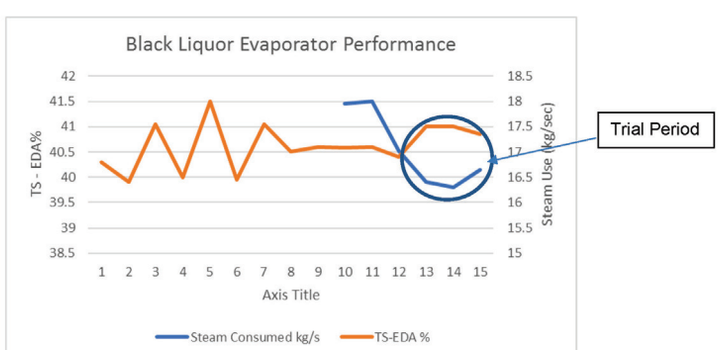

Figure 4. Black Liquor Solids and steam Consumption

The trial program performed so well on the brown stock presses, the pulp mill dilution factor was reduced automatically by the mills DCS control. The reduction of the overall dilution factor increased the black liquor solids feeding to the recovery area. With higher black liquor solids; less steam was required in the evaporators to achieve post evaporator liquor solids targets.

Figure 4 showes the step decrease in overall steam and energy usage of 1.5Kg/s of high pressure steam.

CONCLUSION

Nalco Water SuperWash Defoamer along with our Organic Wash Aid program helped this Market Pulp producer to improve the overall quality and cost of operation. By first using a thorough understanding of the problems affecting the fiberline, The Nalco Water team and customer applied the SuperWash program and Organic Wash Program using an improved strategy that allowed for a reduction in off quality pulp and improved operations. The mill implemented the program full time and resulted in the mill saving € 2.5M/Year.

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