



Corrugator Wastewater Reuse Results Containerboard Packaging

The corrugating facility installed a DMP system to treat the flexo wastewater, starch from operations and rinse water from the ink. The process operated in 5,000-gallon batches. The batch treatment used ferric chloride (coagulant), caustic (sodium hydroxide), and an anionic flocculant (polymer).

The chemicals are added and the flocculated wastewater is allowed to settle and dewatered. The treated water is reused as makeup for the starch. The corrugation operation requires heat to quickly setup the glue. The faster the bond set up, the faster the corrugator's speed.

The reuse of the treated water caused problems in the form of scale buildup on the glue rolls, uneven glue lines, delamination of the corrugated board, and unacceptable finished product. The glue rolls had to be hand cleaned to remove the scale. The scale was sent out for analysis and it was 70.5% calcium carbonate. Calcium carbonate scaling and deposition rates increase as the temperature increases.

The reuse water was inconsistent in pH and clarity. High levels of conductivity, calcium, and total hardness constituted the problem. A trial was started using Floccin-D product at a dosage of 125-lbs/5,000 gallon batch. The conductivity dropped from 8,500 μ ohms to 3,000 μ ohms, a 62.5% decrease in the ions. The gel temperature dropped from 153 degrees F to 145 degrees F within the first week of using the Floccin-D. The viscosity was easier to control and stabilized over several hours requiring less, if any caustic addition in the starch makeup operation. Additionally, conversion from the original chemical system to Floccin-D resulted in a 28.5% reduction in the treatment cost per gallon of water.

They are now able to operate the corrugator at a lower temperature, thereby saving energy costs in the boiler with reduced steam demand. The improved starch quality has decreased the de-lamination problems and has directly increased the monthly output from the operations. The reduced scale on the corrugator glue rolls has improved the production time by minimizing down time to de-scale the rollers or lost board due to poor lamination characteristics. In the recent heat wave, the reduced gel temperatures did not cause any production upsets or finished corrugated board problems and they maintained good quality and strong corrugated board production rates.