

Fouling prevention in Black Liquor Evaporators



Client: Pulp and Board Mill
Location: Finland

ISSUE

The customer has seven tubular evaporators in series that use steam to evaporate water from black liquor to increase dry material content in liquor from 10% to over 50%. As the temperature of the process gets higher, the dry material content and the viscosity of the black liquor increases. Therefore, resulting in calcium-based fouling issues across the production line, especially at the hottest evaporators 1A and 1B, by clogging the tubes inside the evaporators. Fouling decreases the efficiency of the evaporation process and causes process downtime.

SOLUTION

The power ultrasound solution is externally attached to the two hottest evaporators, 1A and 1B. The fouling prevention solution is based on focusing a high-power ultrasonic field to the black liquor flowing in the pipes of the evaporators and affecting the crystal structure of calcium-based fouling to avoid fouling attaching into the tubular structure of evaporators.

RESULTS

Since the permanent installation of the power ultrasound solution, the mill has been able to keep the evaporators clean, and the need for mechanical cleaning has decreased more than 70 % per year. Also, the pumping efficiency is increased by more than 10%, proving that the evaporators are kept clean from fouling.

