

AFT Case Study

FB4

- **Improved OCC quality**
- **Increased Plate Life**

AFT Finebar® refiner plates represent a breakthrough in refiner plate technology. Using a patented technology, this advanced manufacturing process allows the production of plates with very fine bar patterns and high volumetric capacities. Low intensity refining and high material purity create a number of opportunities to improve pulp quality, increase plate life, and improve refining efficiency.

AFT Finebar® refiner plates were supplied to an Eastern U.S. mill to improve plate life and provide low intensity refining of the mill's linerboard sheet made from 100% OCC.



The Background

The subject mill produces 200,000 TPY of linerboard from 100% OCC. The mill has three refiners: Primary, Base Sheet, and Top Sheet. The existing plates operated at approximately 1s/m with a 17-4 pH alloy. Plate life was averaging 8-12 weeks.

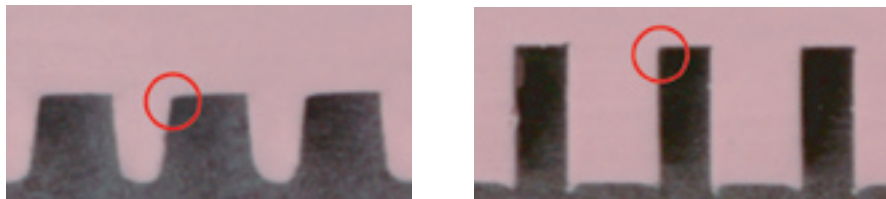
The mill's objectives were to have longer plate life and improved sheet quality (Mullen, STFI) by utilizing lower intensity refining on the recycled fiber.



The Solution

Following an analysis of the refiner system, AFT Finebar® recommended a plate pattern with twice the bar edge length to reduce the refining intensity to slightly below 0.5 Ws/m.

Also, micrographs of the cast plate bars showed severe bar edge rounding taking place. Therefore it was recommended that the bars on the AFT Finebar® plates be coated with Cobalt to reduce edge rounding and maintain longer life. Initial trials in the Top Ply refiner showed that the AFT Finebar® plates maintained a sharper leading edge radius than the cast plate as illustrated below (photos are same scale; area shown in black is bar profile; leading edge is on left).



Also, AFT Finebar® plates have a greater groove volume that maintains its width over the life of the plates, providing more throughput at a given bar height and significantly extending plate life. After 20 weeks of operation, the AFT Finebar® plates still had significant groove volume left.

As a result of the lower intensity and sharp bar edge, handsheet testing indicated gains in Mullen and STFI properties were increased by about 10% compared with cast plates for a given freeness drop (an absolute gain of 2-3%).

Due to the extended length of operation, occasional damage to the bars can occur due to heavy contaminants in the system. AFT Finebar® was able to successfully recondition the plates to operate an additional 20 weeks for minimal cost. This has since become a standard routine for the mill.

The Benefits

After the installation of AFT Finebar® refiner plates, the mill achieved the following process improvements and savings.

- Plate life doubled to an average of 20 plus weeks of life. The plates are then refurbished by grinding and reconditioning the bars. After reconditioning, the plates operate for an additional 20 week time frame.
- Reduced plate costs and man-hour savings due to the longer plate life.
- Incremental increases in burst and stiffness were achieved.
- AFT Finebar® refiner plates now run in all positions (Primary, Top Sheet, Base Sheet) for maximum process and economic benefit

