

First Experience with a new ultrafine Refiner Plate

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The refining of pulp is one of the most important steps in the paper making process. With optimized ultra-low intensity (ULI) refining, high quality products can be produced using less expensive fiber e.g. Eucalyptus pulp or recycled fibers while reducing both chemical and energy usage. Today proper refining is more important than ever due to higher paper machine speed and the force on all paper mills to reduce the manufacturing costs. For short fibered pulps such as hardwood pulp, recycled fibers and mechanical pulp, many studies were conducted over the years that have confirmed the beneficial effects of refining at very low intensity. These benefits include better strength and porosity development, improved refining efficiency and higher shive reduction. Using the experience from the aerospace manufacturing industry, the producers of AFT Finebar® plates have developed and commercialized an innovative technology that allows for significant reductions in refining intensities without compromising operating costs. The plate manufacturing method utilizes laser technology to produce component parts from cold rolled stainless steel plates. The parts are then sandwiched together in a patented diffusion bonding process. Unique plate geometries can be produced that achieve extremely high bar edge lengths, while maintaining or exceeding flow capacity and operating life of conventional refining plates. Results from these ultra-low intensity refining plates have demonstrated significant improvement of strength properties for hardwood and mechanical pulp and simultaneously energy savings.

During the past years the share of eucalyptus fiber in short fiber pulp has been raised significantly at UPM Nordland, therefore birch share was reduced. In order to utilize the advantages of eucalyptus fiber the fiber treatment in refining needed to be adjusted. The first big step was to implement separate refining for eucalyptus pulp. After that the focus was on development of refiner fillings together with our partners. Today's strategy is to utilize as fine fillings as possible in order to achieve a low specific edge load for eucalyptus refining. Thus, we achieve a good operating window regarding paper quality parameters, dewatering in wire- and press section, runtime of the fillings and refining capacity.