SESSION 3A MECHANICAL PULPING

3A1 Effect of Compression of Wood Chips on Cellulose Accessibility
Miguel Villalba, UBC

Wood-chip compression and enzyme impregnation are used as pre-treatment prior to refining to reduce energy consumption and improve pulp quality. This work aims at characterizing the effect different degrees of compression on cellulose accessibility to the enzyme impregnation. This objective was achieved by quantifying the amount of glucose produced by the enzymes after compression of wood-chips with a high-performance liquid chromatograph. A laboratory compressor and a controlled uniaxial load set-up were implemented to test different compression ratios and compression rates. The trial results showed that the cellulose accessibility increased with compression ratio. However, compression rate had no apparent effect on the cellulose accessibility. The improved accessibility is due to changes in wood morphology as well as the removal of extractives. Microscopy imagining showed buckling and fractures of the cell walls. Fractures lead to improved enzyme penetration and the reduction of chips size resulted in higher available surface area.

3A2 Optimising BCTMP at Pan Pac Forest Products
Tika Tedjamukti, Pan Pac Forest Products*; Dan Davies,* Evonik Canada

The Pan Pac Forest Products mill has produced TMP for over 40 years, but only recently started brightening a portion of the pulp. Although BCTMP is a well-known process in other parts of the world, the geographic isolation of this mill and lack of similar mills nearby made optimisation of the BCTMP process more challenging. Pan Pac has developed considerable capability in this new-to-them process. In addition, Evonik provided assistance, by importing expertise developed in other parts of the world, where BCTMP has been in use for a longer time. This paper discusses some of the efforts made to improve the mill's brightening process

3A3 Benefits and Successes of Leveraging a KMAP Tool in our TMP Plant
Dennis Maltais*, Yu Sun,* Catalyst Paper, Crofton*; Norm Wilde – Project Engineer Specialist,* BCH

The upgrade occurred in 2016 of a new Fibre Imaging Module and along with new operating strategies, allowed the mill to achieve 50 – 70 GWh of annualized electrical energy savings.

3A4 Spatial Registration of Bar Force Profiles in Low Consistency Refining
Matthias Aigner*, Peter Wild,* University of Victoria

A high speed quadrature rotary encoder in combination with a piezo electric refiner force sensor is implemented in a laboratory-scale low consistency 16-inch refiner. The sensor measures normal and shear force distributions applied to a bar on the stator plate for each bar passing event. Previous work in this field focuses primarily on analysis of the distribution of peak force corresponding to each bar passing event. In this work, time domain data gathered by the refiner force sensor is analyzed in conjunction with rotary encoder data that locates the rotor bars relative to the stator bar in which the sensor is located. The high resolution data sets gathered show the appearance of the peak of the normal force and the shear force during the bar passing event for different plate gaps and two different pulp furnishes. This detailed insight into the relationship between plate position and force distribution sheds light on the role of edge forces and friction forces during bar passing events and how these metrics are affected by refining conditions such as plate gap and pulp furnish.

3A5 Energy Reduction in High Consistency CD-82 Reject Refiner (Mill Trial)
Vilas Rewatkar, Wood Canada

It is challenging to reduce energy consumption in a high consistency refiner without sacrificing pulp quality. An attempt was made to reduce energy consumption in a high consistency CD-82 reject refiner at a 550 BDt/d TMP plant. Refiner plates were modified and a 55 day trial was completed. Appropriate operational parameters such as plate gaps, dilution water, and blow-line consistency were varied during trial to achieve target pulp freeness. This presentation will discuss various operational challenges and the trial results. Average energy savings of 210 kWh/BDt were achieved for a typical reject

refining rate of 200 BDt/d with the trial plate design. This translated into annual energy savings of $440,000 at an average power price of $30/MWh.