

Disk Refining at Canfor Pulp

Procedure

Samples of pulp are tested at our R&D centre for benchmarking their papermaking characteristics in a 12 inch Sprout Bauer disk refiner. All samples are allowed to equilibrate to stable moisture for a minimum of 24 hours, prior to sampling for moisture content. Once accurate moisture content is determined, the equivalent of 20kg oven dry pulp is diluted with 570 litres of de-ionized water in a repulping tank and is agitated for 10 minutes. De-ionized water is used throughout the entire process to ensure reproducibility between tests as well as to control the effects of ions such as calcium and aluminum on the refining process.

Once the stock is fully repulped it is pumped into the refining system where it circulates through the Sprout Bauer disk refiner. Five samples of pulp are taken at 0, 50, 100, 150, 250 kWhr/te. These five samples are then used to develop the refining response curve for the respective pulp. The samples taken during the refining process are dewatered from 3.5% consistency to approximately 20% consistency. Extra attention is given to this step to ensure that any fines that were generated during refining are collected with the pulp.

Freeness Determination, Handsheet Making and Testing

For each of the 5 sample points the equivalent of 24 grams of oven dry pulp is measured and diluted to a total volume of 2 liters. This slurry is then disintegrated in a British Standard disintegrator at 3000RPM for a total of 15,000 revolutions. The slurry is then diluted to 8litres in total for a final consistency of 0.3%.

Canadian Standard Freeness is measured in accordance with Tappi procedure T227 by sampling 1 liter of pulp slurry and following and introducing it to the CSF tester.

Handsheets for physical testing are made from the same slurry in accordance to Tappi procedure T205. A semi automatic British Standard handsheet maker is used to produce handsheets having an area of 200 cm² and basis weight of 60g/m² (OD)

All physical testing on the handsheets is conducted in a constant temperature and humidity room set at 23^oC and 50% relative humidity. The table below details the standard suite of testing performed on market pulps. Samples of unrefined pulp are also evaluated for fibre length and coarseness using a Kajaani FS200.

Non Destructive Testing	Destructive Testing
Caliper [mm]	Tear Index [mN·m ² /g]
Bulk [cm ³ /g]	Burst Index [kPa·m ² /g]
Density [g/cm ³]	Breaking Length [km]
Air Resistance [Gurley-Sec]	Stretch [%]
Smoothness [SCCM]	Modulus Of Elasticity [mN·m/kg]
Brightness [ISO]	Tensile Energy Absorption [J/kg]
Yellowness [%]	Strength [kNm/kg]
Opacity [%]	Zero-Span Tensile (Wet and Dry) [km]
Scattering Coeff. [kg/m ²]	
Absorptions coefficient [m ² /kg]	