

## **MICROWAVING LOGS FOR ENERGY SAVINGS AND IMPROVED PAPER PROPERTIES FOR MECHANICAL PULPS**

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### **ABSTRACT**

High-power microwave cooking of commercial black spruce pulpwood logs was investigated as a pretreatment for mechanical pulping. Several dozen logs were treated at a variety of power levels (10 to 50 kW) and for various times (1 to 10 min). The mechanical pulping trials resulted in significant energy savings—up to 15% for the highest power level. In addition, there was a corresponding increase in handsheet properties (+35% burst index, +20% tear index, and +13% tensile index) and a modest reduction in brightness (−10%). Handsheets were made to simulate a lightweight coated furnish, and microwave-treated thermomechanical pulp was used to supplement a reduction in the kraft component. Based on handsheet properties, as much as 10% kraft pulp could be substituted with only slight reductions in strength. Annual pulp cost savings were estimated for an 800 ton/day pulp mill based on anticipated kraft substitution levels, refiner energy savings, and microwave pretreatment costs.