Improving Mechanical Pulping

Microwaving Logs Saves Energy and Strengthens Paper

Mechanical pulping accounts for about 25% of wood pulp production in the world today. It produces a higher yield than Kraft pulping and therefore uses less of the forest resource. However, mechanical pulping uses high amounts of electrical energy, and because of low fiber bonding strength, the paper produced is weaker than that produced with Kraft pulping. These two technical barriers must be breached before mechanical pulping can become more widely used.

Researchers at the USDA Forest Service, Forest Products Laboratory, have found a way to reduce the unwanted effects of mechanical pulping. They have found that microwaving logs reduces the total energy required to produce mechanical pulp while increasing fiber bonding strength. The study shows that the total electrical energy required for mechanical pulping can be reduced by 15% if the logs are microwaved first. And the strength properties of the resulting paper can be increased by as much as 18% to 36%.

Microwave equipment is very cost effective, and with the benefits of lower energy use and stronger paper, it may lead the way to widespread use of mechanical pulping.

Figure 1. A frequency generator with an attached waveguide produces microwaves that are channeled to an oven chamber (Fig. 2).

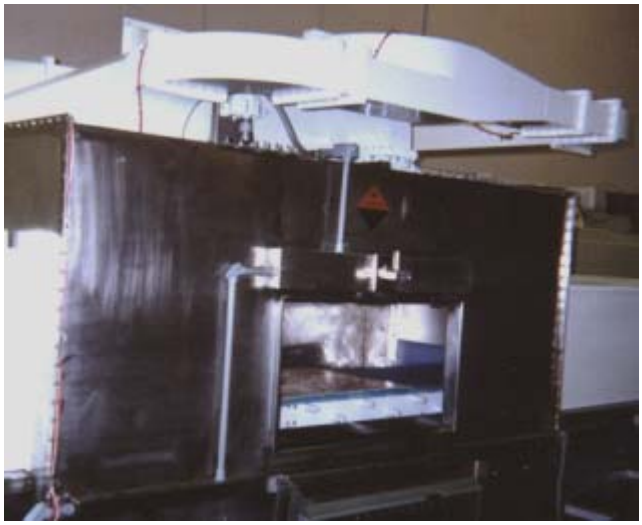

Figure 2. Oven chamber.

Figure 3. Steam escaping from microwaved logs.