

Enzymatic Refining of Chemical Pulp

**Tripathi Sandeep, Sharma Nirmal, Mishra Om P., Bajpai Pratima,
Bajpai Pramod K.**

ABSTRACT

Laboratory scale studies were performed on mill bleached mixed hardwood pulp containing *Acacia* and MTH (mixed tropical hardwood) with different commercial imported and indigenous enzymes. The pulp was treated with enzymes at the same dose level before refining and impact on energy savings and physical strength properties were studied. The energy saving was highest, 30%, in case of Enzyme 5, 14-15% in case of Enzyme 3 and Enzyme 4 and 6-9% in case of Enzyme 1 and Enzyme 2 at 495 ml CSF. However, in case of Enzyme 5, all the strength properties of refined pulps were lower. To avoid the drop in strength properties, study with lower doses (below 175 g/T) of Enzyme 5 was conducted. Even at a lower dose of 75 g/T, the energy saving was significant (16-17% at 433-535 ml CSF). All the strength properties were better than control at 550 and 500 ml CSF. At 500 ml CSF, tensile index, burst index, tear index and double fold improved by 5%, 11.5%, 3.2%, 15.8% respectively. At enzyme dose level of 100 g/T, 125 g/T, 150 g/T, 175 g/T, the energy savings ranged from 19-21%, 22-26%, 24-28% and 31-32% respectively. However, there was drop in strength properties at lower CSF (550 to 425 ml).

Addition of Enzyme 5 to the unrefined and refined stock (prerefining and postrefining treatments) at dose level of 75 g/T and 75 g/T respectively showed 17% reduction in refining energy, 20.0% improvement in drainage and improvement in strength properties (at 500 ml CSF). Reduction in refining energy was 12% and improvement in drainage was 14.5% when Enzyme 5 was added to the unrefined and refined stock at dose level of 50g/T and 50g/T respectively. The strength properties were better in this case also. Two-stage enzyme treatment appears effective in providing energy savings, drainage and strength benefits.