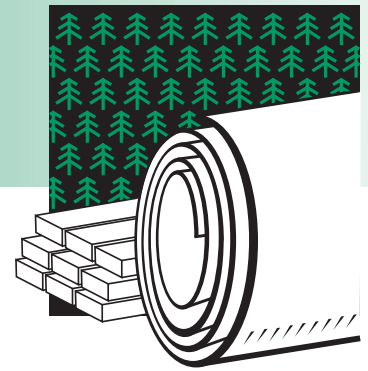


# FOREST PRODUCTS

## Success Story



## MANUFACTURING TISSUE PAPER PRODUCTS USING A HIGH CONTENT OF RECOVERED OFFICE PAPERS

### New Manufacturing Process for Tissue Paper Reduces Energy Use While Increasing Use of Recovered Office Papers

#### Benefits

- ◆ Increased use of recovered office papers from 10.5% to 17% of total feed stock
- ◆ Decreased use of purchased electric power by 5,746,090 kWh/yr
- ◆ Reduced pulping temperatures resulting in fuel savings of 214,500 gallons of #6 fuel oil
- ◆ Lower VOC emissions due to reduced solvent requirements

#### Applications

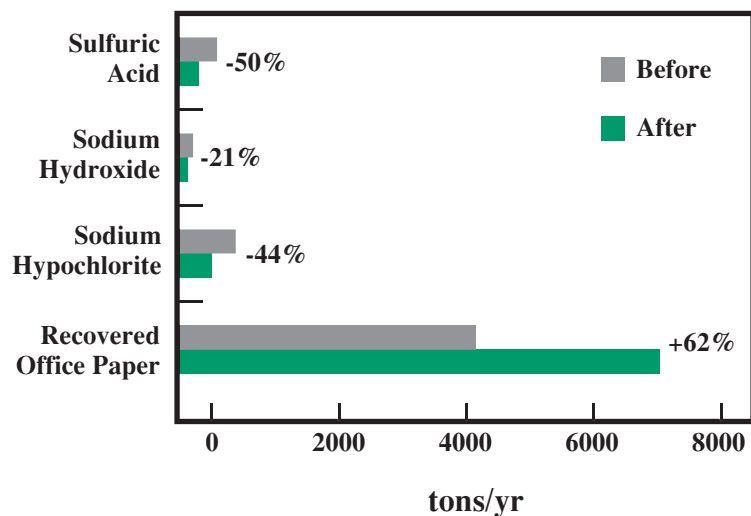
This project specifically addresses the technical challenges facing the forest products industry. These challenges are centered on cost-effectively using recycled materials, meeting environmental regulations, and reducing energy costs. Any pulp manufacturer or paper manufacturer that makes its own pulp can use the improved process developed at Erving to increase the amount of post-consumer waste in its products.

#### Project Partners

- ◆ Erving Paper Mills, Inc.  
Erving, MA
- ◆ Executive Office of Environmental Affairs,  
Office of Technical Assistance  
Boston, MA
- ◆ Massachusetts Department of Energy Resources  
Boston, MA
- ◆ Massachusetts Electric  
Boston, MA
- ◆ University of Massachusetts  
at Amherst  
Amherst, MA

Tissue paper is traditionally made from a mix of industrial waste paper, recovered office paper (postconsumer waste), and preconsumer waste paper (pulp-sub). Industrial and postconsumer waste papers must go through a deinking process before being blended with the pulp-sub. Erving Paper Mills Inc., manufacturers of tissue and napkin products using waste paper as raw material, wanted to find a way to use more recovered office paper to lower costs and increase the amount of recycled paper in their products.

With help from the U.S. Department of Energy's NICE<sup>3</sup> (National Industrial Competitiveness through Energy, Environment, and Economics) Program, Erving has successfully demonstrated an improved paper manufacturing method, primarily in the deinking process, without compromising product value and quality. The improved method has helped Erving increase the amount of recovered office paper used in their finished products, decrease specific volatile organic compound (VOC) emissions, and reduce the amount of bleach used in the process.



*Erving Paper Mills realized environmental and economic benefits due to reductions in several chemicals used in the manufacturing process while increasing the use of recovered office paper.*

#### Process Improvement Results



To increase the use of recovered office paper, Erving installed a dynamic moving belt in the final washing stage of the deinking process, upgraded the centrifugal cleaners, and installed a froth flotation cell. These new technologies increased the amount of recovered office paper used in the mix from 10.5% in 1996 to 17% in 1997 (a 62% increase).

Decreases in pulping temperatures from the improved process also reduced the amount of gummy contaminants prevalent in postconsumer waste paper, reducing the need for solvents and lowering VOC emissions. Decreased pulping temperatures also saved the Erving plant 214,500 gallons of #6 fuel oil annually.

To reduce the use of traditional bleach in the manufacturing process, two chemicals (Enessco-D and FAS) were considered as alternative bleaching agents. FAS was not used due to the difficulties in the material handling of a powder. Enessco-D (a deinking aid) was successfully substituted in the process; however, it currently is not economically feasible and therefore has not been incorporated at the plant. However, the mechanical changes in the deinking process and employee awareness of chemical usage during the Enessco-D trials led to an overall reduction in the amount of bleaches used.

The mechanical modifications to the deinking system, along with several other energy conservation projects undertaken at the plant, contributed to reduced manufacturing costs by decreasing the amount of purchased electrical power by 5,746,090 kWh/yr.

Erving is currently successfully using this improved paper manufacturing method at their Massachusetts plant, resulting in energy savings and reduced costs.



**NICE<sup>3</sup> – National Industrial Competitiveness through Energy, Environment, and Economics:**  
An innovative, cost-sharing program to promote energy efficiency, clean production, and economic competitiveness in industry. This grant program provides funding to state and industry partnerships for projects that demonstrate advances in energy efficiency and clean production technologies. Awardees receive a one-time grant of up to \$525,000. Grants fund up to 50% of total project cost for up to 3 years.

For project information, contact:

**Tom Newton**  
General Manager  
Erving Paper Mills, Inc.  
P.O. Box 38  
Erving, MA 01344-0038  
Phone: (978) 544-2711, ext. 269  
Fax: (978) 544-2102

For more information about the NICE<sup>3</sup> Program, contact:

**Lisa Barnett**  
Program Manager  
NICE<sup>3</sup> Program  
U.S. Department of Energy  
1000 Independence Avenue SW  
Washington, D.C. 20585-0121  
Phone: (202) 586-2212  
Fax: (202) 586-7114  
lisa.barnett@ee.doe.gov

Visit our home page at  
[www.oit.doe.gov](http://www.oit.doe.gov)



Order # NICE<sup>3</sup> FP-3  
January 2002