

NEWS From GEORGIA TECH'S ENGINEERING EXPERIMENT STATION

Atlanta, Georgia 30332

Contact: Mark Hodges/Ray Moore
(404) 894-3444

TECH SHOWS COMMERCIAL VIABILITY
OF MACHNOZZLE AT J.P. STEVENS PLANT

For Immediate Release

April 30, 1982

ATLANTA, GA. -- The Georgia Institute of Technology has demonstrated that the Machnozzle is a commercially viable predrying device for the textile industry.

The tests showed that the Machnozzle saves enough energy to pay for itself in as little as three and a half months. At the same time, the device does not adversely affect product quality of fabrics.

The project was sponsored by the Department of Energy and J.P. Stevens and Co., Inc. Georgia Tech's Engineering Experiment Station and School of Textile Engineering conducted the research.

The Machnozzle is a sonic velocity steam nozzle manufactured by the Brugman Machinefabrik of the Netherlands. When a fabric is passed across the end of the nozzle, a high velocity steam flow blows water out of the yarn. The steam then is directed into a condenser where it is mixed with cold water to yield a hot water source for the plant. In this way, much of the steam's energy is recovered, making the predrying process more energy efficient.

In this demonstration project, a 43.3 inch Machnozzle was installed on a continuous finishing range at the J.P. Stevens and Co., Inc. Delta #1 plant in Clemson, South Carolina. Experimental tests were conducted on five types of 43 inch, sheeting-weight fabrics, with each tested at two to four speeds. Machnozzle steam supply pressures of 20 to 115 psig were investigated and the number of can stacks in use were changed.

(more)

"The results of the in-plant demonstration showed that the Machnozzle can substantially reduce the regain in sheeting-weight fabrics," said Wiley Holcombe of Georgia Tech. "The regain after the squeeze roll and just prior to the use of the Machnozzle generally ranged from 70 to 85 percent. Typically, the Machnozzle reduced the regain of the fabric to approximately 20 to 35 percent at a steam supply pressure of 100 psig."

The reduction in regain obtained with the Machnozzle depended on fabric speed and steam supply pressure. For the range of conditions investigated, the effect of steam supply pressure was greater than that of fabric speed.

The energy requirement of the Machnozzle compared favorably with that needed for steam cans. The typical energy consumption of this device ranged from approximately 0.5 to 1.1 pounds of steam per pound of water removed (lbs/lbw). Steam cans normally require 1.5 to 3.3 lbs.lbw. This data did not take into account the energy recoverable as the steam passes through the fabric.

"Tests indicated that 60 to 70 percent of the thermal energy of the steam entering the Machnozzle can be recovered," said Holcombe. "Assuming a 65 percent recovery, the steam requirements to predry fabrics with the Machnozzle ranged from 0.2 to 0.4 lbs/lbw."

Additional tests made on fabric samples for color, air permeability and pilling showed that the Machnozzle does not harm product quality.

Further information on this program is available from Holcombe at Georgia Tech Engineering Experiment Station, TAL, Atlanta, GA 30332 (404/894-3623) or from Dr. Chuck Carr, School of Textile Engineering, Atlanta, GA 30332 (404/894-2490).

#