

CHARACTERIZATION OF AIR-YARN INTERFACE IN AIR-JET WEAVING

Dr. Sabit Adanur, Professor
Auburn University, Polymer and Fiber Engineering
Ph: 334 844-5497, e-mail: adanusa@auburn.edu

We successfully developed a computerized experimental system to simulate the filling insertion systems of air-jet weaving machines. We can measure the air and yarn velocity distributions along the insertion channel to find the optimum conditions for any yarn in air-jet weaving.

EXPERIMENTAL SYSTEM DEVELOPED

Figure 1 shows the experimental system developed at Auburn University, Department of Textile Engineering. With the data acquisition with computer interface, this system enables us to obtain data for air and yarn velocity distributions along the reed.



Figure 1 Air-jet filling insertion simulator developed at Auburn University

Air Velocity Measurements

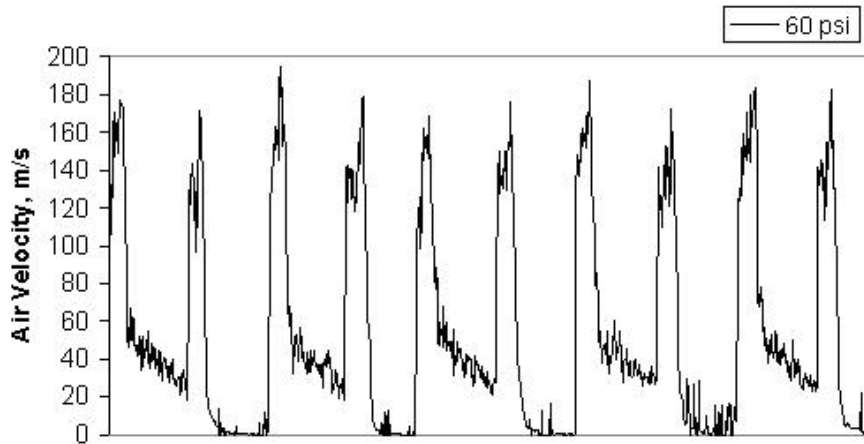


Figure 2 Air velocity versus time at 200 rpm, at 5.5 cm from the start

Yarn Velocity Measurements

The following figures show the examples of yarn velocity measurements to investigate the effect of different yarn types or insertion conditions.

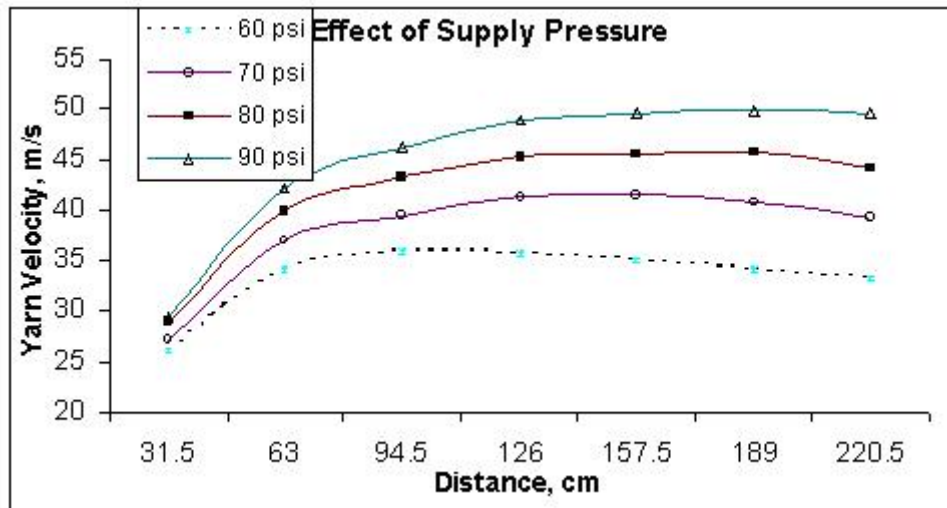


Figure 2. Effect of supply pressure on an OE Ne 10 yarn, at 300 rpm

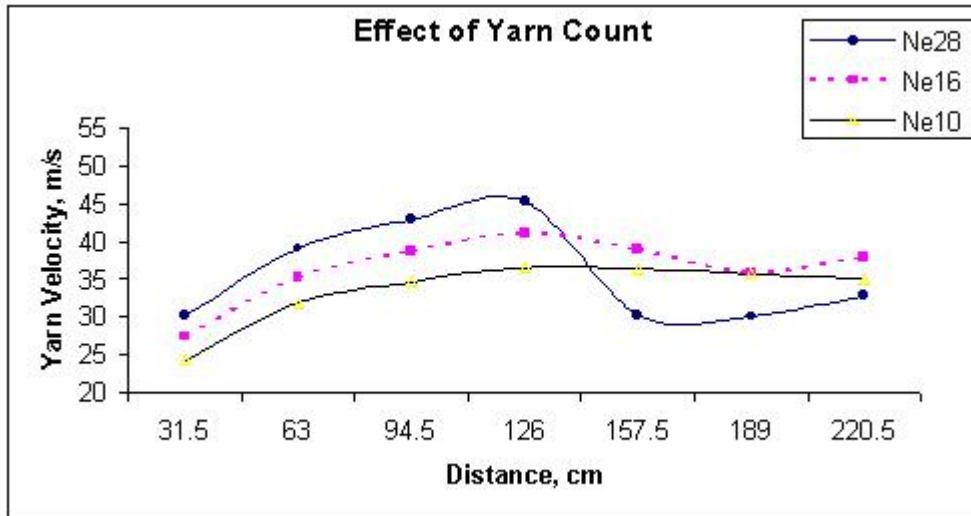


Figure 3. Effect of yarn count at 50 psi, 200 rpm

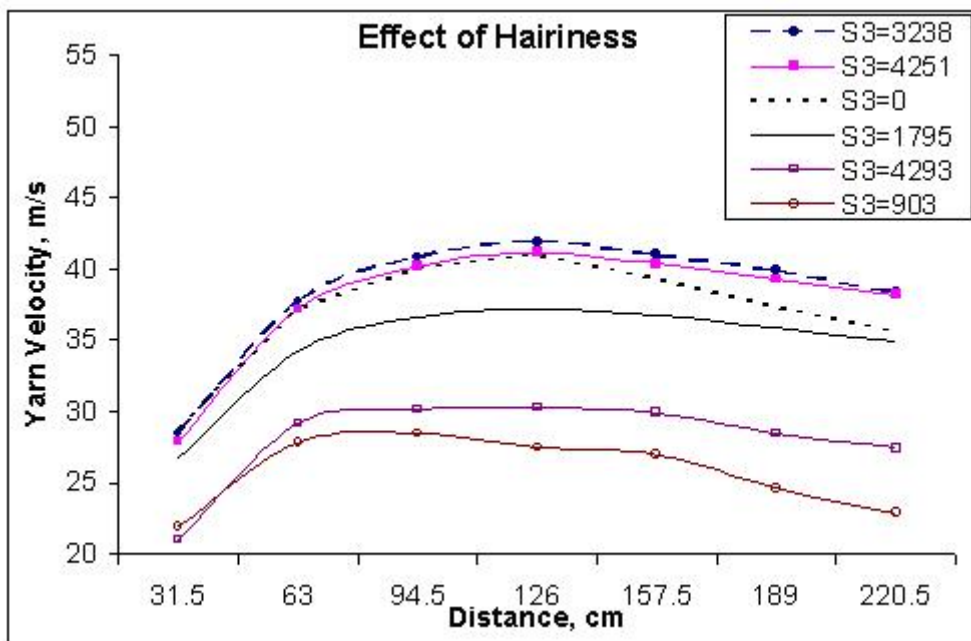


Figure 4. Effect of hairiness at 60 psi, 300 rpm

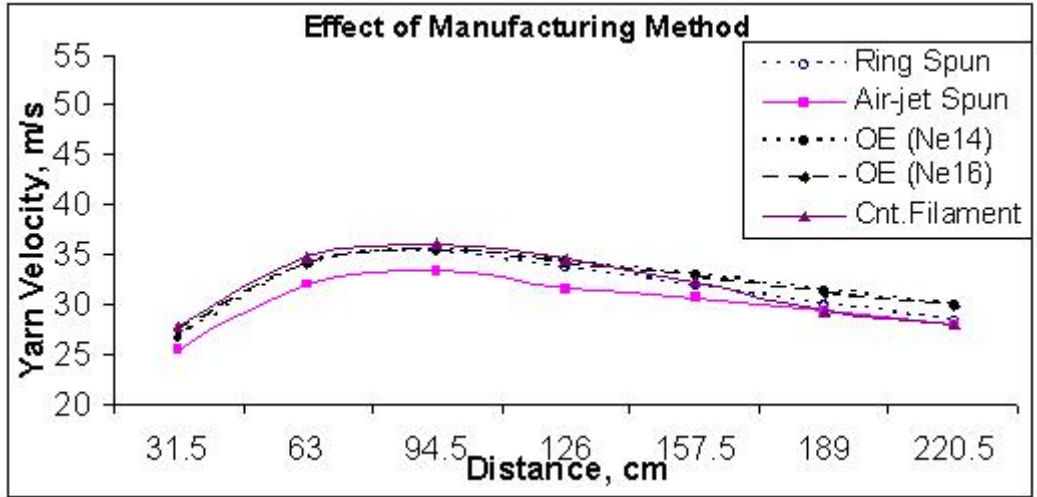


Figure 5. Effect of manufacturing method at 50 psi, 300 rpm

Acknowledgment

This work is supported by the United States Department of Commerce Grant No. 99-27-07400 through the National Textile Center, which is appreciated.