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OPEN-END SPINNING: THE INFLUENCE OF SPINNING CONDITIONS ON ROTOR DUST ACCUMULATION — PART III In the past two issues of *Textile Topics*, we reported on dust deposits in rotors of open-end spinning machines and the equipment and conditions that can influence these deposits. The August 1986 issue described the test that is used at the Textile Research Center for evaluating dust accumulation and presented the influence of certain types of cleaners at the cotton gin and in the early stages of textile processing. The September issue continued the report by covering the influence of carding and drawing machinery. The second part also gave the influence of spinning time on rotor dust deposits along with the influence of yarn number and twist. This third and concluding part of the report presents the influence of rotor profile, navel type, and opening roller speed.

Figure 1 on the next page shows the amount of dust accumulation using various types of rotor profiles on the BD 200M and the Platt T.883 machines. It should be remembered that the BD 200M does not have a dust extraction system, and therefore the deposit was much greater than it might have been on any of the more recently designed machines that have provisions for dust removal. In a separate test and using a different cotton, we found that a measurable amount of dust accumulated in the Platt machine. The rotor with a narrow profile permitted more accumulation, while the wide profile rotor resulted in very little accumulation. Stated another way, the rotor with the least constrictive groove was found to accumulate the least amount of dust.

Figure 2 shows the influence of navel type on dust deposit. It can be seen that navels with a rough surface result in the retention of more dust than those which are smooth. Since grooved navels are used for low twist yarn production, and dust accumulation rates are higher at low twist levels, it is doubly important for knitting yarn spinners to produce clean sliver in order to maintain yarn quality.

Figure 3 presents the influence of opening roller speed. It will be seen that as the speed is increased, dust accumulation decreases. This trend was found in a study performed on a machine equipped with a trash extraction system. It is believed that the reduction in trash content arising from the increased impact forces at higher opening roller speeds more than offset the tendency for dust to be generated as a result of fiber damage. In any event, the higher speeds resulted in less deposit.

This concludes our report on the influence of spinning conditions on rotor dust accumulation. We hope this has been informative and useful to our readers. If anyone missed either Part I or Part II, we will be pleased to send those copies. Write and let us know what information is needed.

As we stated previously, this study has been conducted at TRC by John B. Price, head of our new spinning technologies research. He has been assisted in this by William D. Cole and Albert Esquibel.

FRICTION SPINNING RESEARCH Earlier this year, the Textile Research Center obtained a DREF 3 Friction Spinning machine from the Louis P. Batson Company of Greenville, South Carolina. This is the latest addition to a series of different spinning technologies at TRC. Other systems are cotton-system ring spinning, seven different makes of open-end spinning machines, worsted spinning, wrap spinning, and the Repco twist-untwist system.

We have always put strong emphasis on research to determine the best fiber properties for all spinning systems, and soon after the machine was installed and put in operation, we began a determination of the fiber properties that will give quality yarns. The first blend studied utilized short wool produced in Texas from twice a year shearings. It was quickly realized that the DREF 3 machine is ideal for cotton/wool blends. One of the photographs on page 3 shows slivers of cotton (white) and short length wool

FIGURE 1

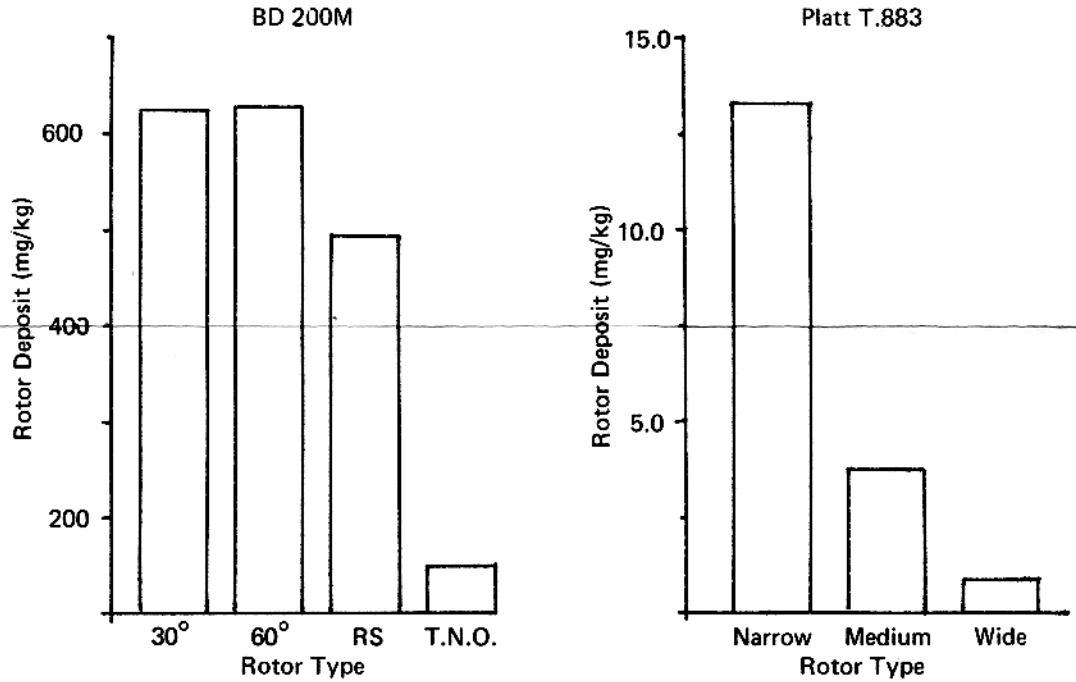


FIGURE 2

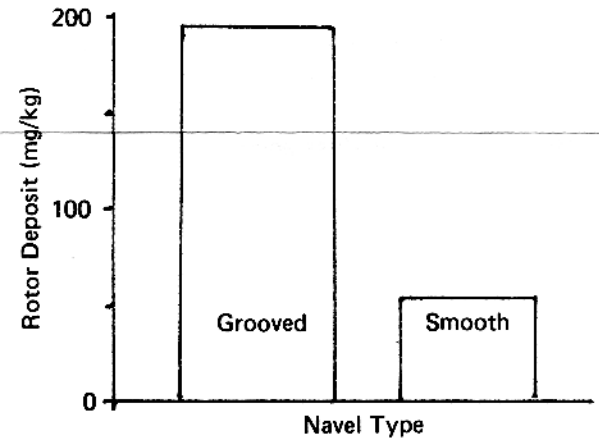
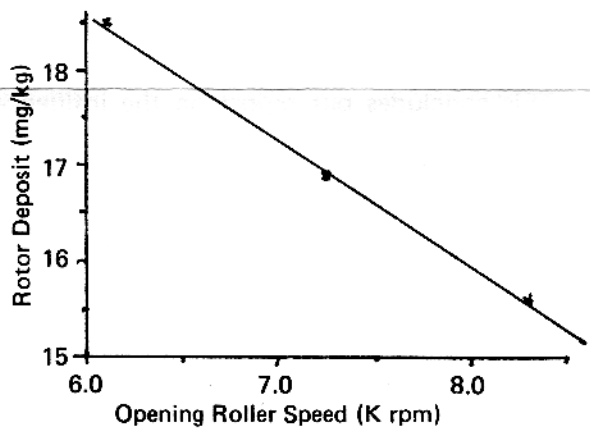


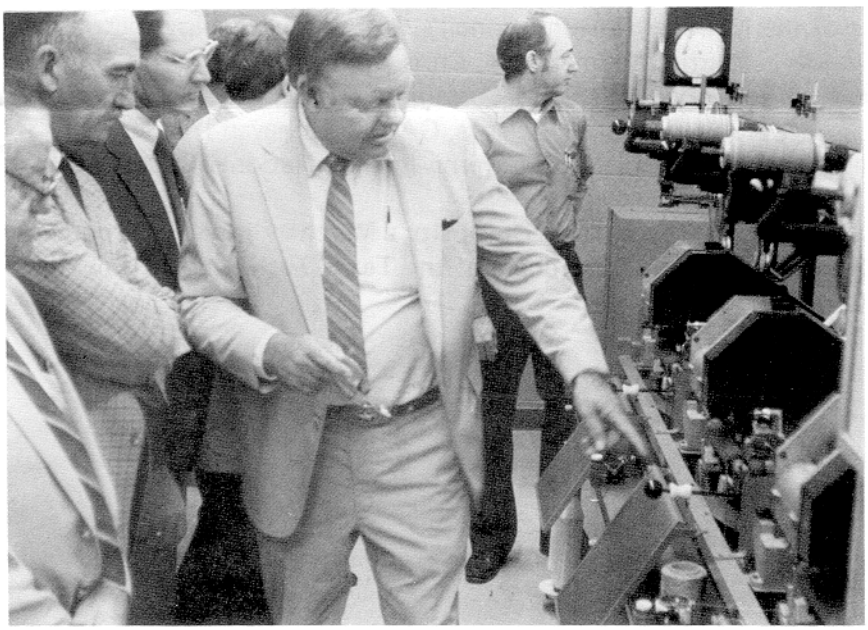
FIGURE 3



entering the machine to be blended at spinning.

A number of textile and fiber producing representatives attended a special ceremony for the inauguration of this new spinning system, and many of those present commented favorably about the yarn appearance, quality, and high production rate. The yarn spun that day subsequently was placed into woven fabrics and samples of these have been sent to interested persons.

We are well pleased with what we have learned so far about the DREF 3 machine. We believe it has considerable potential for certain types of yarn. We are especially pleased that blends of short wool and other fibers can be utilized, for we have encountered difficulties when spinning short wool in blends on some of the other systems. Our studies in this area are supervised by John B. Price, head of our new spinning technologies research. He is assisted by William D. Cole and Albert Esquibel.



A group of those attending the inaugural ceremony study the operation of the DREF 3. At left is Mr. Joe Thompson, President of Southwest Textiles, Abernathy, TX. Others from the left are cotton producers Tommy Fondren, Lorenzo, TX: Don Bell, Wolfforth, TX; and Don Marble, South Plains, TX. In the background is Bill Cole of the TRC staff.

Joe Thompson and Dr. Robert Sweazy, Associate Vice President for Research at Texas Tech University, observe three different fibers being used simultaneously for producing yarn on the DREF 3 machine. In the background are Don Marble, Dr. John Gannaway of the Texas A&M Experiment Station at Lubbock, and Don Anderson, President of the Texas Cotton Marketing Corp., Lubbock.

VISITORS October was rather busy at TRC, with a number of individual visitors and groups. Among those were Roger Bolick and Linley Jones, Allied Plastics & Fibers, Hopewell, VA; Carolyn Snyder, Technicon Instruments Corp., Houston, TX; Carl Cox, Natural Fibers & Food Protein Commission of Texas, Dallas, TX; Tom Vernon, Burckhardt of America, Greenville, SC; A. Fred Copeland, Buffalo Color Corporation, Greenville, SC; Richard H. Pusch and Will Miller, Woven Structures, Compton, CA; Mr. & Mrs. Stephen Felker, Avondale Mills, Sylacauga, AL; Randy Youngblood, Ruse Rouge, Inc., Dallas, TX; Terry L. Tice, Cheerleader Supply Co., Dallas, TX; George M. Holbrook, Peyer Corporation, Spartanburg, SC; Sergej Toedtli, Siegfried Peyer AG, Zurich, Switzerland; and Verena Laanio, Ciba-Geigy Corp., Basel, Switzerland.

A group of cotton industry representatives from Portugal visited TRC on October 14. The group included Fernando Oliviera, Porto; Jose Guimaraes, Bairro; August Ribeiro, Belfama; J. Pereira Fernandes, Pesidem; Joao Ribeiro, Oporto; and Joao Magalhaes, Baiona. They were accompanied by Stephen Bowkett, Amcot, London, England.

On October 27 the 1986-87 class of the National Cotton Council's Cotton Leadership Program came to the Center. This group included Jackie L. Burris, Wellman, TX; Chris Breedlove, Sebastian, TX; Mike Tate, Huntsville, AL; Mike Sturdivant, Greenwood, MS; Steve Sossaman, Higley, AZ; Brad MacNealy, Indianola, MS; Billy Clark, Greenwood, MS; Robert Caldwell, Atlanta, GA; Bill Dunavan III, Memphis, TN; and Andy Warlick, Gastonia, NC. They were accompanied by Laverne Leman, National Cotton Council, Memphis, TN.

In addition to the above, 90 students from Texas Tech University's Merchandising, Environmental Design and Consumer Economics Department, and 17 members of the Texas Tech Student Chapter of the Institute of Industrial Engineers toured the Center.