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ROTOR SPINNING OF WOOL: PART III This month we are continuing our report on the production of yarn from 100% wool at rotor spinning. We began this in the December issue of Textile Topics and continued with Part II last month. We have been pleased with the response to these reports and a little surprised at the inquiries we have received.

In this issue we are presenting the results of spinning the same wool (mixed lot ML previously reported) at different rotor speeds and using two different rotor diameters. The yarn number selected for this was N_e 6, which was spun on 66 mm and 88 mm rotors. Spinning data are given in Tables X through XII. It will be seen that the speed for the 66 mm rotor ranged from 15,000 to 40,000 rpm; when utilizing the 88 mm rotor, speeds were from 15,000 to 30,000 rpm.

Spinning performance with the 88 mm rotor was found quite poor as shown in Table XI. At 15,000 rpm there were a surprising number of breaks. On servicing the spinning unit to investigate the cause of the failures, a noticeable quantity of greasy material was found on the fiber contact surfaces. Spinning was stopped at a maximum rotor speed of 25,000 rpm and the entire spinbox was cleaned. The results of spinning after the grease was removed are shown in Table XII. The yarns produced from the cleaned unit tended to be more regular and could be spun at higher rotor speeds than those produced from the greasy spinbox. The differences in yarn properties between the two degrees of cleanliness within the spinboxes are depicted in Graphs 9 through 12, together with comparable data from the samples produced using the 66 mm rotor.

It should be noted that a lower twist level (3.5 TM) was employed when using the 88 mm rotor in anticipation of more stable spinning with the larger diameter. However, the data presented suggest that satisfactory performances could be expected with either rotor in the speed range of 20,000 to 25,000 rpm for the 66 mm and 15,000 to 20,000 rpm for the 88 mm.

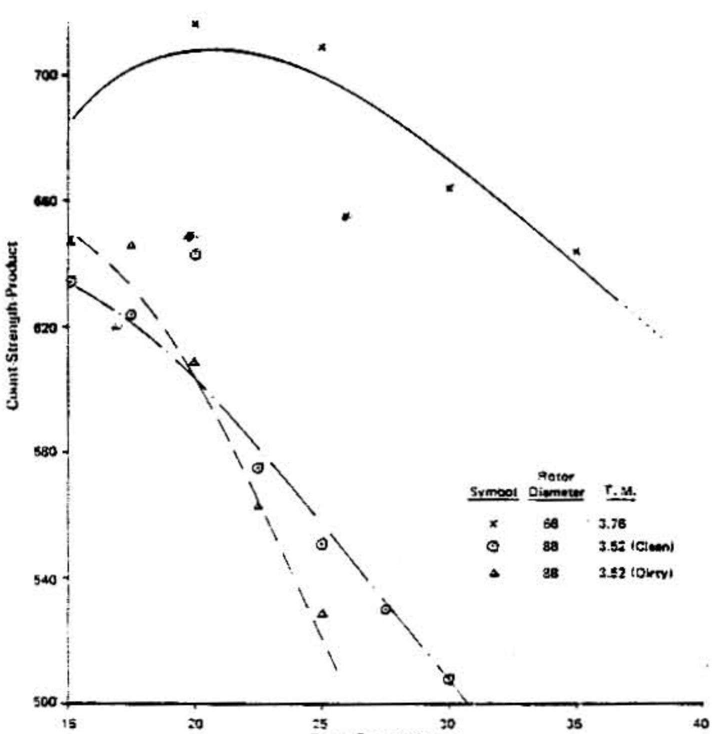
This research was conducted for the Natural Fibers & Food Protein Commission of Texas. We wish to express appreciation to that organization for permitting the publication of these results.

SCHOLARSHIPS AWARDED TEXTILE ENGINEERING STUDENTS The Department of Textile Engineering at Texas Tech University is pleased that several of its students have received scholarships this semester. These were awarded on the basis of a grade point average of 3.0 or higher, and were made available by the Textile Research and Scholarship Foundation, an organization of business leaders in Texas, all of whom have a considerable interest in cotton production and its use by the textile industry.

Scholarship recipients this semester are all residents of Texas. They

TABLE X – Rotor-Spinning Data (66 mm Rotor)

Sliver	70 gr/yd Finisher Drawframe					
Rotor-Spinning Machine	Suessen Spintester, SACM Unit					
Nominal Yarn Number (N_e)	6					
Rotor Type	66 mm					
Rotor Speed (rpm)	15K	20K	25K	30K	35K	40K
Opening Roller Type	Selector –"Vee–Notched"					
Opening Roller Speed (rpm)	5,000					
Draft	49.0					
Twist Multiplier	3.76					
Yarn Speed (yd/min)	46	60	75	91	106	121
Navel	8GS					
Ambient Conditions	70°F/56% RH					
Tension Draft	1.00					
Test Duration (minutes)	37	28	23	19	16	14
Skein Test:						
Actual Yarn Number (N_e)	6.04	5.97	5.95	5.85	5.92	– –
CV of Yarn Number (%)	1.3	1.8	3.1	2.5	1.2	– –
Count-Strength-Product	648	716	709	664	644	– –
CV of CSP (%)	0.6	1.4	1.8	1.7	1.3	– –
Single Yarn Tensile Test:						
Tenacity (g/tex)	4.55	4.89	4.77	4.44	4.32	4.10
Mean Strength (g)	447	486	483	431	423	404
CV of Strength (%)	8.5	7.4	8.1	10.0	9.0	9.8
Elongation (%)	20.0	20.8	19.9	18.2	17.0	14.7
Uster Evenness Test:						
Non-Uniformity (CV%)	15.11	15.49	15.66	15.82	16.39	17.66
Thin Places/1,000 yds	10	22	30	56	56	184
Thick Places/1,000 yds	48	48	34	58	124	198
Neps/1,000 yds	4	2	6	2	8	16
Hairs/100 yds	2570	2097	2108	2240	2187	2277
Performance:						
Number of Breaks	1	0	0	0	1	1

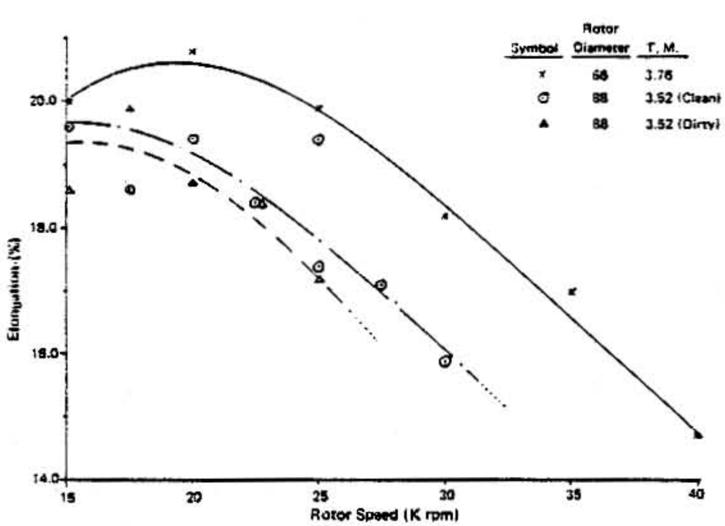


GRAPH 9

Influence of Rotor Speed and Diameter on Yarn Strength

TABLE XI – Rotor-Spinning Data (88 mm Rotor - Greasy Deposit)

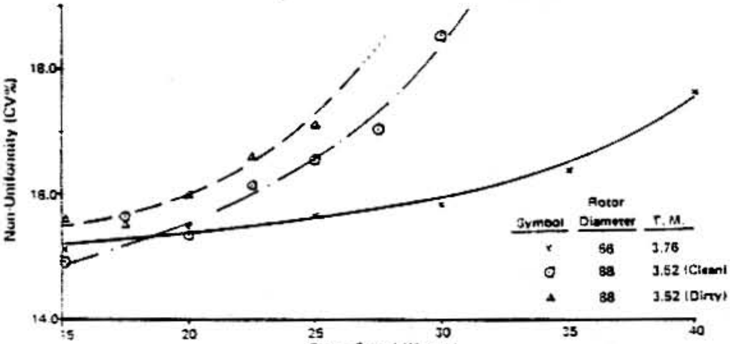
Sliver	70 gr/yd Finisher Drawframe					
Rotor-Spinning Machine	Suessen Spintester, SACM Unit					
Nominal Yarn Number (N_e)	6					
Rotor Type	88 mm					
Rotor Speed (rpm)	15K	17.5K	20K	22.5K	25K	27.5K
Opening Roller Type	Selector Roll – Notched					
Opening Roller Speed (rpm)	5,000					
Draft	49.0					
Twist Multiplier (α_e)	3.52					
Yarn Speed (yd/min)	45	53	60	68	75	83
Navel	8GS					
Tension Draft	1.00					
Test Duration (minutes)	35	31	26	23	21	– –
Skein Test:						
Actual Yarn Number (N_e)	6.02	5.97	5.95	5.91	5.87	
CV of Yarn Number (%)	2.1	1.0	0.4	1.3	1.2	
Count-Strength-Product	647	646	609	563	529	
CV of CSP (%)	1.4	2.0	2.6	2.8	4.5	
Single Yarn Tensile Test:						
Tenacity (g/tex)	4.41	4.47	4.10	4.06	3.74	
Mean Strength (g)	429	470	403	406	368	
CV of Strength (%)	10.1	15.9	11.7	12.3	11.8	
Elongation (%)	18.6	19.9	18.7	18.4	17.2	
Uster Evenness Test:						
Non-Uniformity (CV%)	15.60	15.50	16.00	16.61	17.13	
Thin Places/1,000 yds	32	24	66	54	116	
Thick Places/1,000 yds	54	54	60	68	124	
Neps/1,000 yds	6	8	2	4	18	
Hairs/100 yds	2877	2714	2849	2882	2892	
Performance:						
Number of Breaks	4	3	1	0	2	



GRAPH 10
Influence of Rotor Speed and Diameter on Yarn Elongation

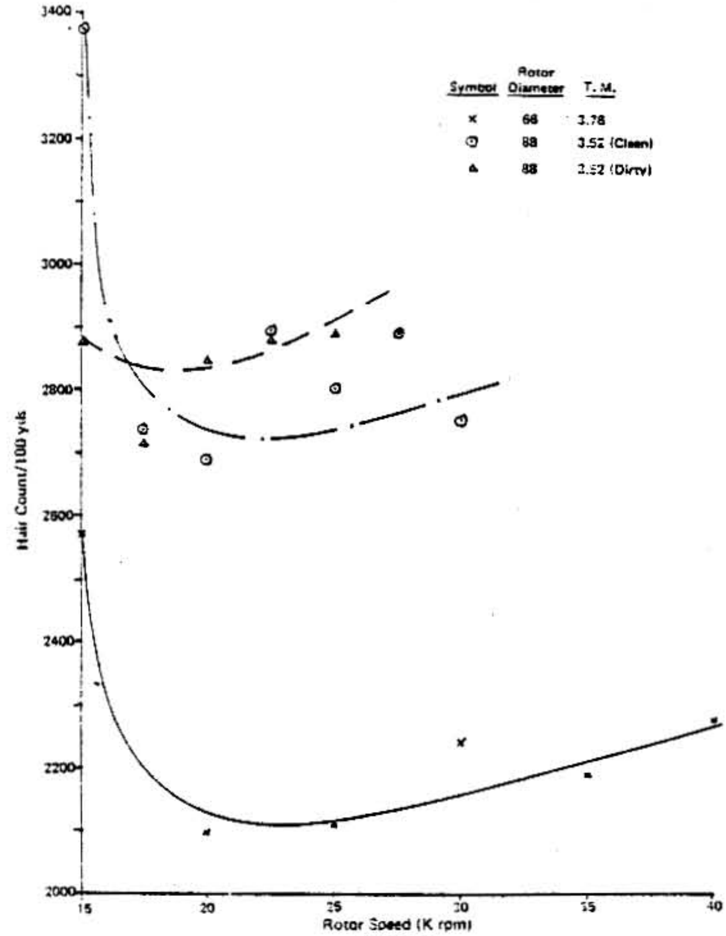
TABLE XII – Rotor-Spinning Data (88 mm Rotor - After Cleaning)

Sliver	70 gr/yd Finisher Drawframe						
Rotor-Spinning Machine	Suessen Spintester, SACM Unit						
Nominal Yarn No. (N_e)	6						
Rotor Type	88 mm						
Rotor Speed (rpm)	15 K	17.5 K	20 K	22.5 K	25 K	27.5 K	30K
Opening Roller Type	Selector Roll – Notched						
Opening Roller Speed (rpm)	5,000						
Draft	49.0						
Twist Multiplier (α_e)	3.52						
Yarn Speed (yd/min)	45	53	60	68	75	83	91
Navel	8GS						
Ambient Conditions	70°F/55% RH						
Tension Draft	1.00						
Test Duration (minutes)	35	29	26	23	21	19	17
Skein Test:							
Actual Yarn Number (N_e)	5.93	5.90	5.96	5.84	5.89	5.84	5.79
CV of Yarn Number (%)	1.2	0.4	0.8	2.0	1.0	0.9	2.1
Count-Strength-Product	634	624	643	575	551	530	508
CV of CSP (%)	1.9	1.9	2.6	2.4	2.1	2.0	3.1
Single Yarn Tensile Test:							
Tenacity (g/tex)	4.46	4.27	4.35	3.93	3.88	3.76	(3.93)
Mean Strength (g)	449	413	426	382	389	375	(382)
CV of Strength (%)	8.2	7.9	6.6	7.7	9.3	7.5	(5.9)
Elongation (%)	19.6	18.6	19.4	18.4	17.4	17.1	(15.9)
Uster Evenness Test:							
Non-Uniformity (CV%)	14.91	15.64	15.35	16.13	16.56	17.03	18.55
Thin Places/1,000 yds	42	38	28	72	64	126	264
Thick Places/1,000 yds	22	58	58	112	112	146	258
Neps/1,000 yds	2	6	4	8	4	6	20
Hairs/100 yds	3374	2738	2690	2897	2802	2893	2753
Performance:							
Number of Breaks	2	1	0	1	0	0	1



GRAPH 11

Influence of Rotor Speed and Diameter on Non-Uniformity (CV%)



GRAPH 12
Influence of Rotor Speed and Diameter on Hair Count

are Lori Rene Alread, Seminole; Joe Don Long, Lubbock; Cecelia Martinez, El Paso; Mary Ann Owen, Tahoka; Keith D. Soechting, New Braunfels; Andrew L. Talbott, Lubbock; and Ann DiLeonardo, San Antonio.

VISITORS Visitors to the Textile Research Center during February included Roger Willis and R.W. Butler, Barber-Colman Company, Gastonia, NC; Ben Childress, Charles Hagood and M. Rudolph Painter, Alice Mfg. Co., Inc., Easley, SC; Robert E. Langilotti and Jim Harris, Hollytex Carpet Mills, Inc., Anadarko, OK; Charles H. Crowder and A. Jack Henderson, WestPoint Pepperell, West Point, GA; and W. A. Edwards, Jr., Avondale Mills, Sylacauga, AL.

Others were Helmut Deussen and Jerry White, American Schlafhorst, Charlotte, NC; Leslie R. Payne and Burke Combs, Dixie Yarns, Inc., Lupton City, TN; Ray W. Griffin, Joe Hickman, James L. Mahaffey and John R. Williams, Dixie Yarns, Inc., Chattanooga, TN; Barbara Shaeffer, Andy Melder and Larry Teague, Motion Control Inc., Dallas, TX; Michael Lewis and David Mauney, Hanes Knitwear, Winston-Salem, NC; Dan J. McCreight, Institute of Textile Technology, Charlottesville, VA; Bardee Underwood, Cotton Incorporated, Dallas, TX; Otto Beck and Wilton E. Carter, Jr., American Truetzschler, Inc., Charlotte, NC; Dan Pustejovsky, G&P Seed Co., Inc., Aquilla,TX; Harvin R. Smith, USDA-AMS, Cotton Div., Washington, DC.; Vinicio Cruz, La Internacional, Quito, Ecuador; and Mike Stevenson, University of New South Wales, Sydney, Australia.