



**TEXAS COTTON QUALITY EVALUATION
Crop of 1993**

**INTERNATIONAL TEXTILE CENTER
TEXAS TECH UNIVERSITY**

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THE TEXAS FOOD AND FIBERS COMMISSION

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Texas Cotton Quality Evaluation – Crop of 1993

ERRATA

When preparing the Texas Cotton Quality Evaluation – Crop of 1993, errors were made in determining the **HVI color grades** for the tables listed below. Please note the following corrections:

Tables 2 - 2a	Pages 10-11	Color Grade	31
Tables 4 - 4a	Pages 14 - 15	Color Grade	51
Tables 7 - 7a	Pages 20 - 21	Color Grade	21
Tables 9 - 9a	Pages 24 - 25	Color Grade	31
Table 12	Page 28	Color Grade	21
Table 15	Page 31	Color Grade	21
Table 16	Page 32	Color Grade	41

We apologize for these errors and for any inconvenience they may have caused.

TEXAS COTTON QUALITY EVALUATION - CROP OF 1993

INTRODUCTION

This is the fourteenth in a series of annual reports to provide interested parties with information regarding the quality of cotton produced in Texas. All testing, processing, and evaluation were done at the International Textile Center.

A sample of sixteen representative cotton bales was obtained in collaboration with key people in the production and marketing sectors within Texas. Also, USDA data on cotton varieties planted were used to ensure that the sample included the dominant Texas varieties. The original intent was to select at least two bales from each of the Texas areas served by eight different USDA Cotton Marketing Service Offices; i.e., Abilene, Altus (OK), Corpus Christi, El Paso, Harlingen, Lamesa, Lubbock, and Waco. Since only one bale of the desired variety could be obtained from the Altus, OK and Waco areas, a third bale was included from both Lubbock and Lamesa, resulting in the 16 bale sample used. All bales are identified by their ginning location as well as by the USDA Marketing Service Area.

Fiber samples from each of the sixteen bales were tested using individual instruments, high-volume instruments (HVIs), the IIC/Shirley FMT II, the Peyer Texlab AL-101, and the Zellweger Uster AFIS. This year, in order to test for stickiness of the cotton, fiber samples were processed through a Hollingsworth card and the degree of sticking on the crushrolls was determined.

The sequence and types of machinery used for processing the fibers into yarns are shown in Figure 1. Changes from previous years include addition of the AMH Blender and use of the Hollingsworth Trashmaster at carding. Also, eight of the longer staple varieties were processed with and without combing, in order to document the impact of combing on yarn quality. These results are contained in Tables 2-9; tables with carded results are numbered 2 through 9, while those with combed results are numbered 2a through 9a.

As before, both rotor and ring spinning were included; spinning specifications are summarized in Table 1. This year the Rieter m1/1 machine was deleted and only the Schlafhorst Autocoro SE-9 was used for rotor spinning tests. This enabled the addition of an Ne 6 yarn size to the rotor spinning tests, which should be of interest to those who manufacture denim and other coarse-count products.

SUMMARY COMMENTS ON COMBING

For evaluating the combed yarns, a size of Ne 30/1 was used. This is approximately the finest yarn count spun commercially on the rotor spinning system, but is also frequently done on the ring spinning system. Therefore, it should provide a good indicator of the improvements that may be obtained by combing.

Major impacts of combing on yarn properties are the following:

- The count-strength product (CSP) by the skein method increased significantly for ring-spun yarns, but only marginally for rotor-spun yarns (Figure 2). The same conclusion applies to single yarn strength as measured by the Uster Tensorapid (Figure 3).
- Elongation showed small improvement for both rotor and ring spinning (Figure 4). For rotor-spun yarns, the improvement was negligible.
- The non-uniformity (CV%) of rotor-spun yarns was unaffected, but it was greatly reduced for the ring-spun yarns (Figure 5). It is noteworthy that combing was needed to make the non-uniformity measurements for ring-spun yarns compare favorably with those for rotor-spun yarns.
- Neps were decreased in number for both types of spinning; the impact was marginal for rotor spinning but was huge for ring spinning (Figure 6).

Taken together, these results indicate that combing may be beneficial to some mills producing ring-spun yarns, but is probably not worthwhile for those using rotor spinning technology.

FIGURE 1: OUTLINE OF MECHANICAL PROCESSES

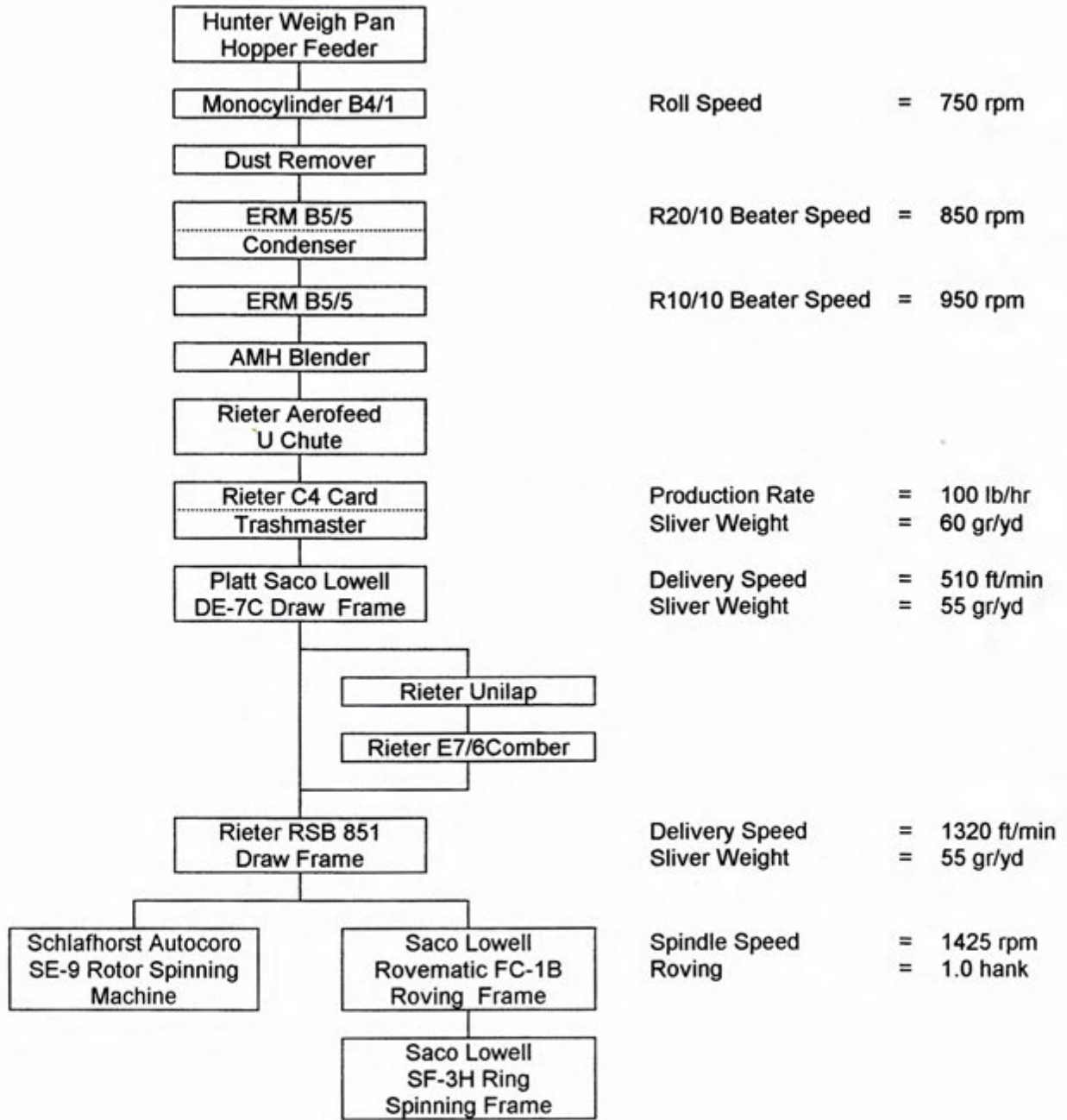


TABLE 1
SPINNING SPECIFICATIONS
(a) ROTOR SPINNING

Sliver		55 gr/yard Finisher Drawframe		
Machine		Schlafhorst Autocoro SE-9		
Nominal Yarn Number (Ne)	6	10	22	30
Rotor Type	U 240 BD	T 231 D		
Rotor Speed (rpm)	70,000	100,000		
Opening Roller Type	B 174 DN	B 174 DN		
Opening Roller Speed (rpm)	8,800	7,500		
Draft	40	66	145	198
Twist Multiplier	4.80	4.80	4.80	4.80
Yarn Speed (m/min)	151	168	113	97
Navel	KN8	KN4 + 1.5		
Torque Stop	None	TS 37		

(b) RING SPINNING

Roving Frame	Saco Lowell
Flyer Speed (rpm)	1425
Roving	1.0 hank
Ring Spinning Frame	Saco Lowell SF-3H
Spindle Speed (rpm)	10,000
Ring Diameter (in)	2
Twist Multiplier	4.00

Figure 2: Count-Strength-Product for Texas Cottons, Carded and Combed
 Yarn Size = $N_c 30/1$

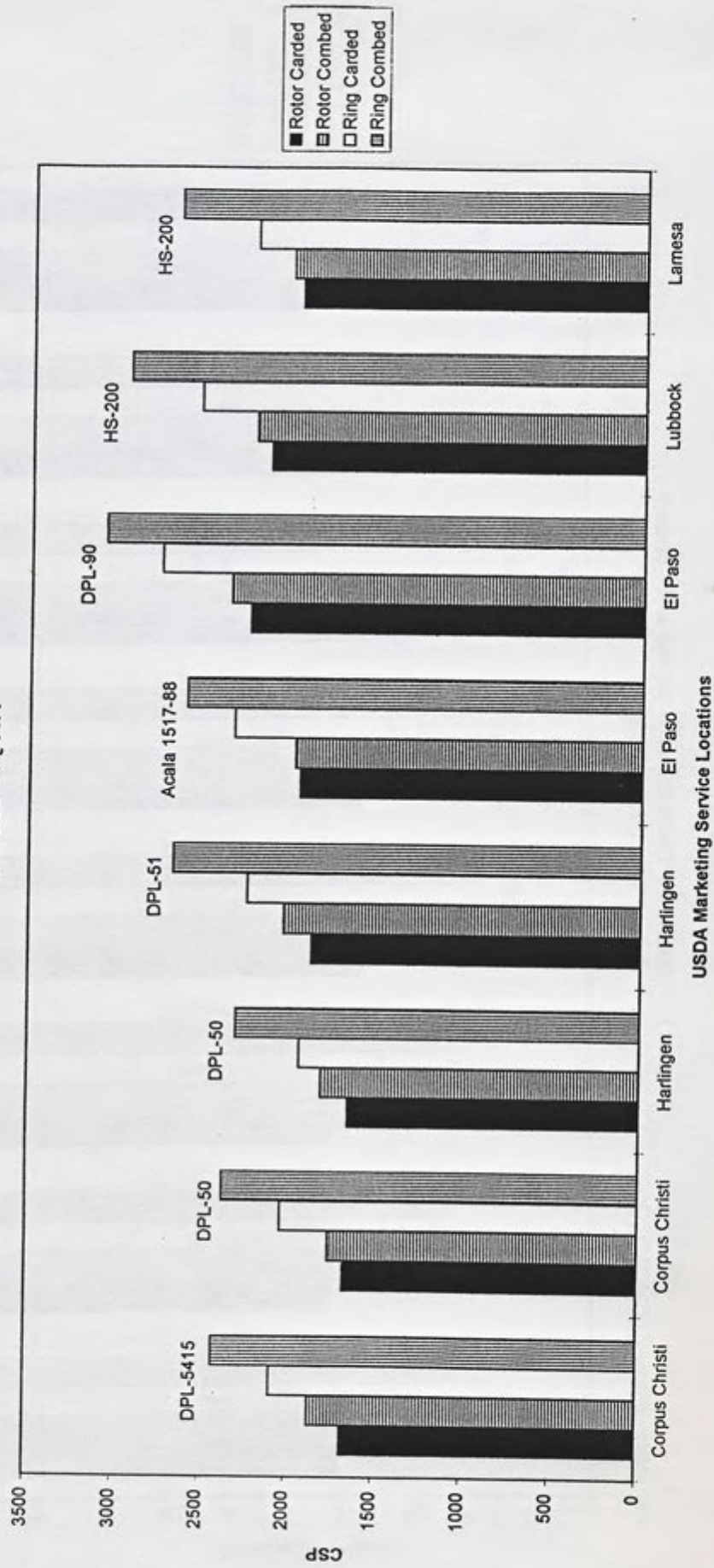


Figure 3: Tenacity for Texas Cottons, Carded and Combed
 Yarn Size = N_6 30/1

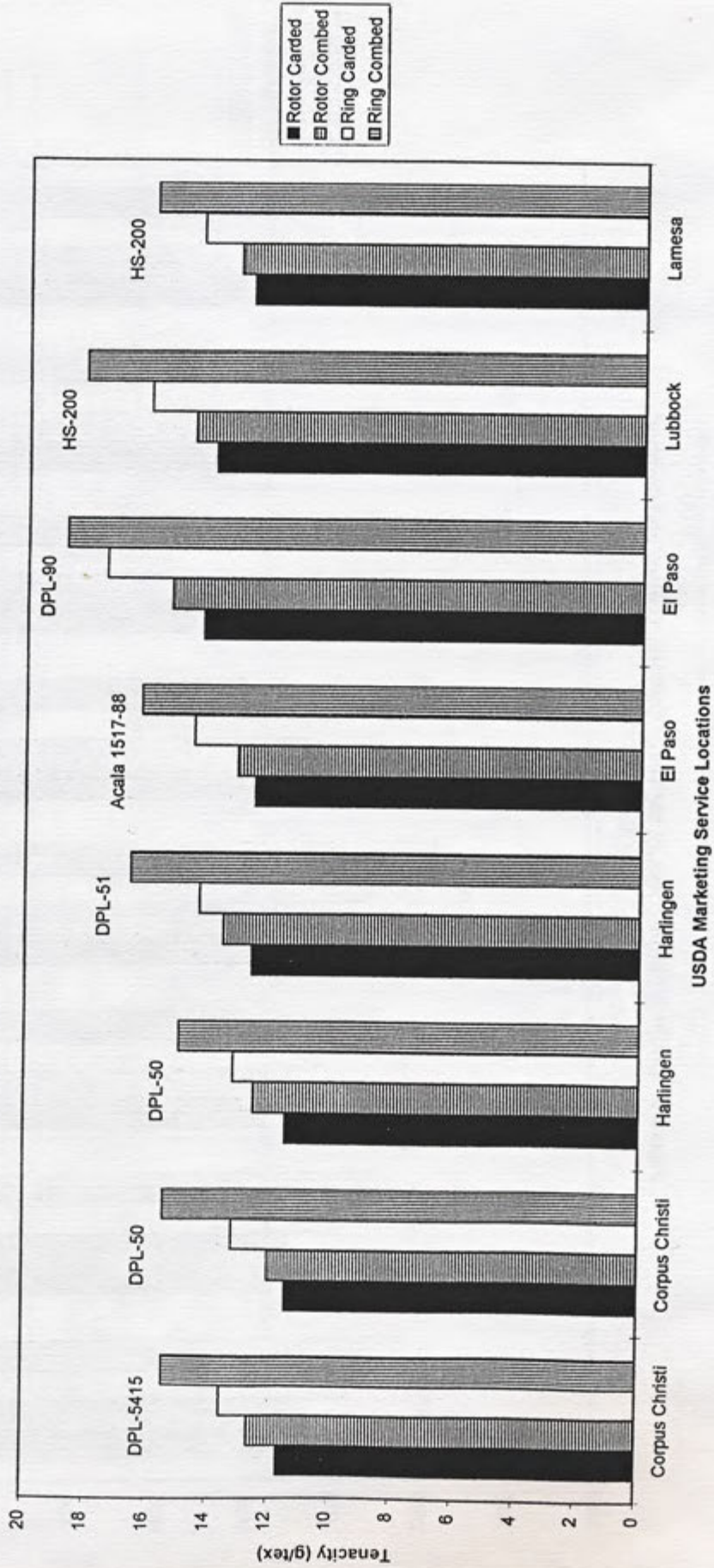


Figure 4: Elongation for Texas Cottons, Carded and Combed
 Yarn Size = N_6 30/1

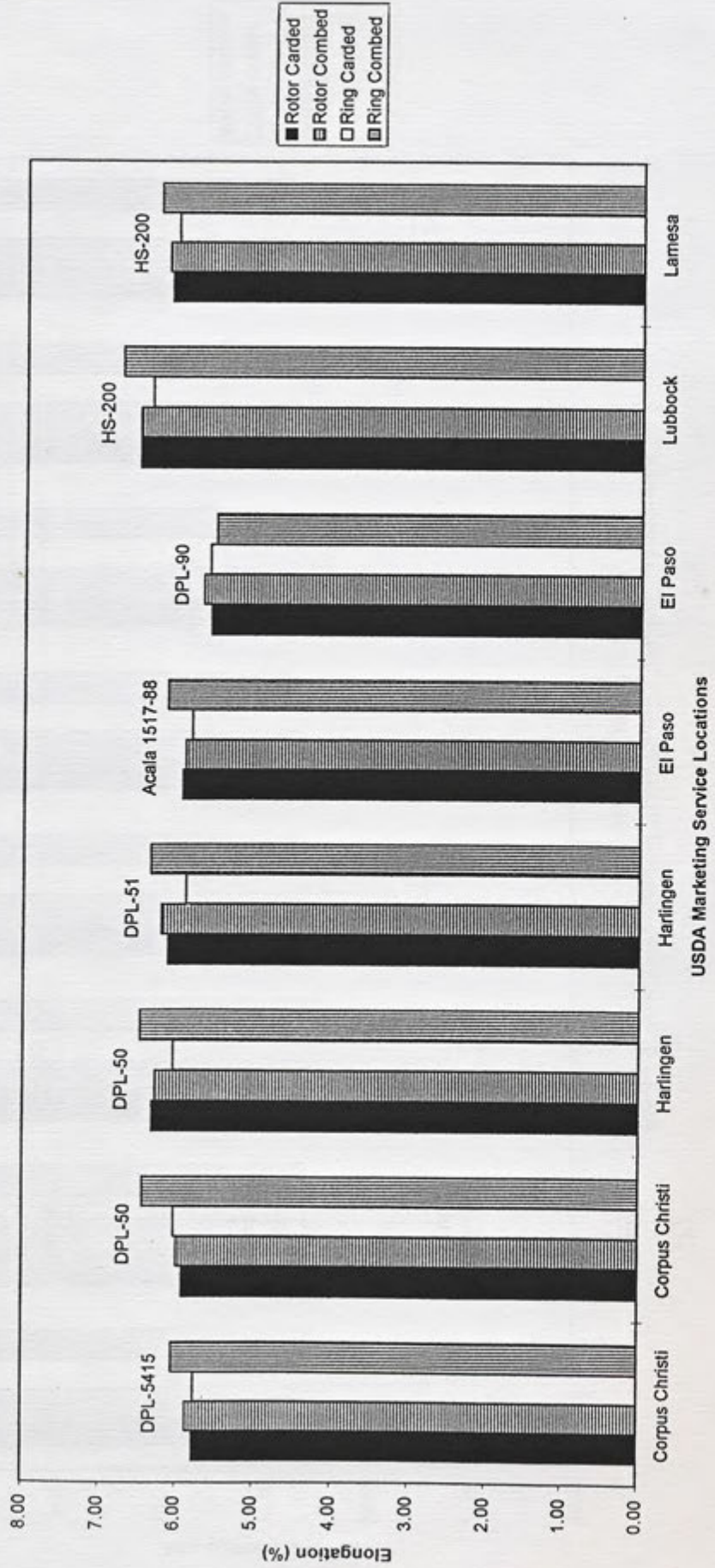


Figure 5: Non-Uniformity for Texas Cottons, Carded and Combed
 Yarn Size = N_c 30/1

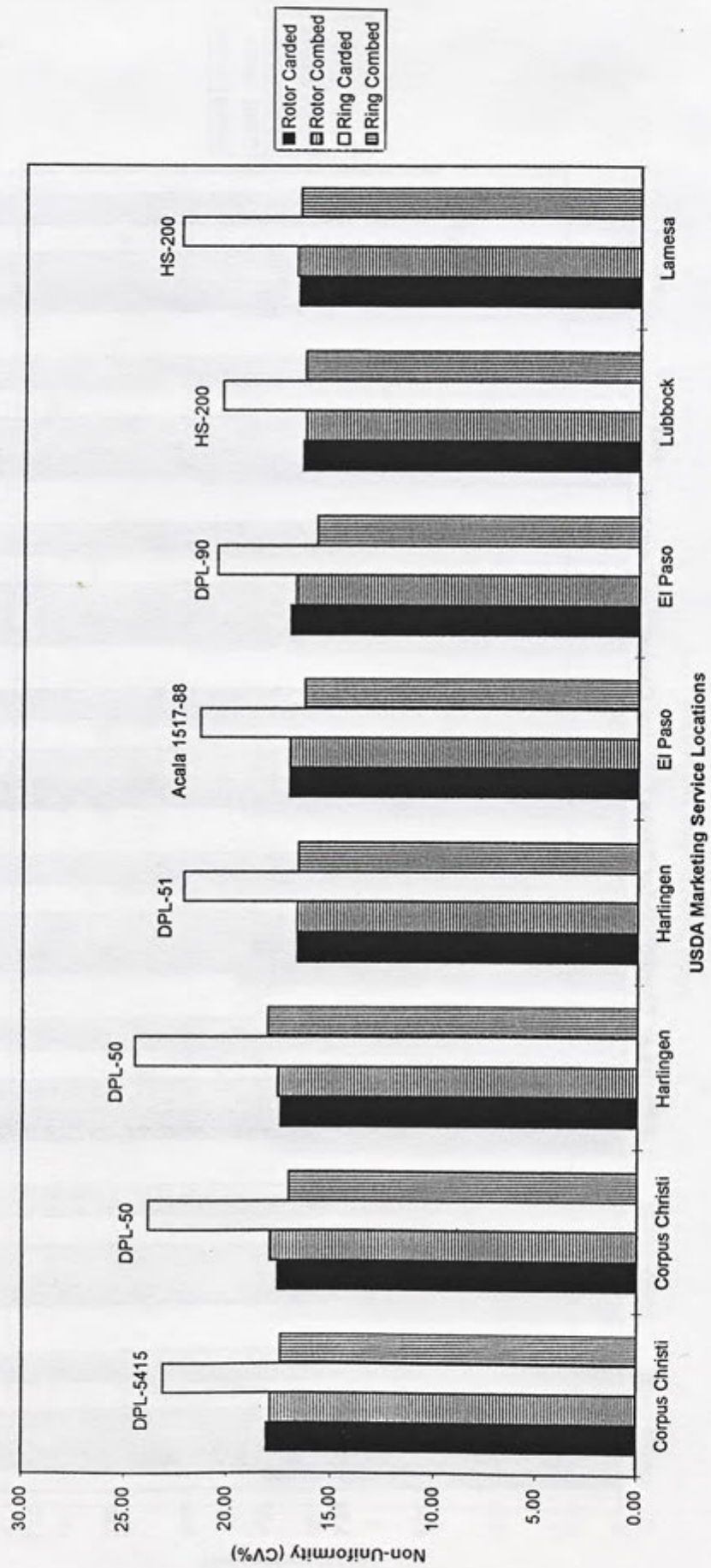
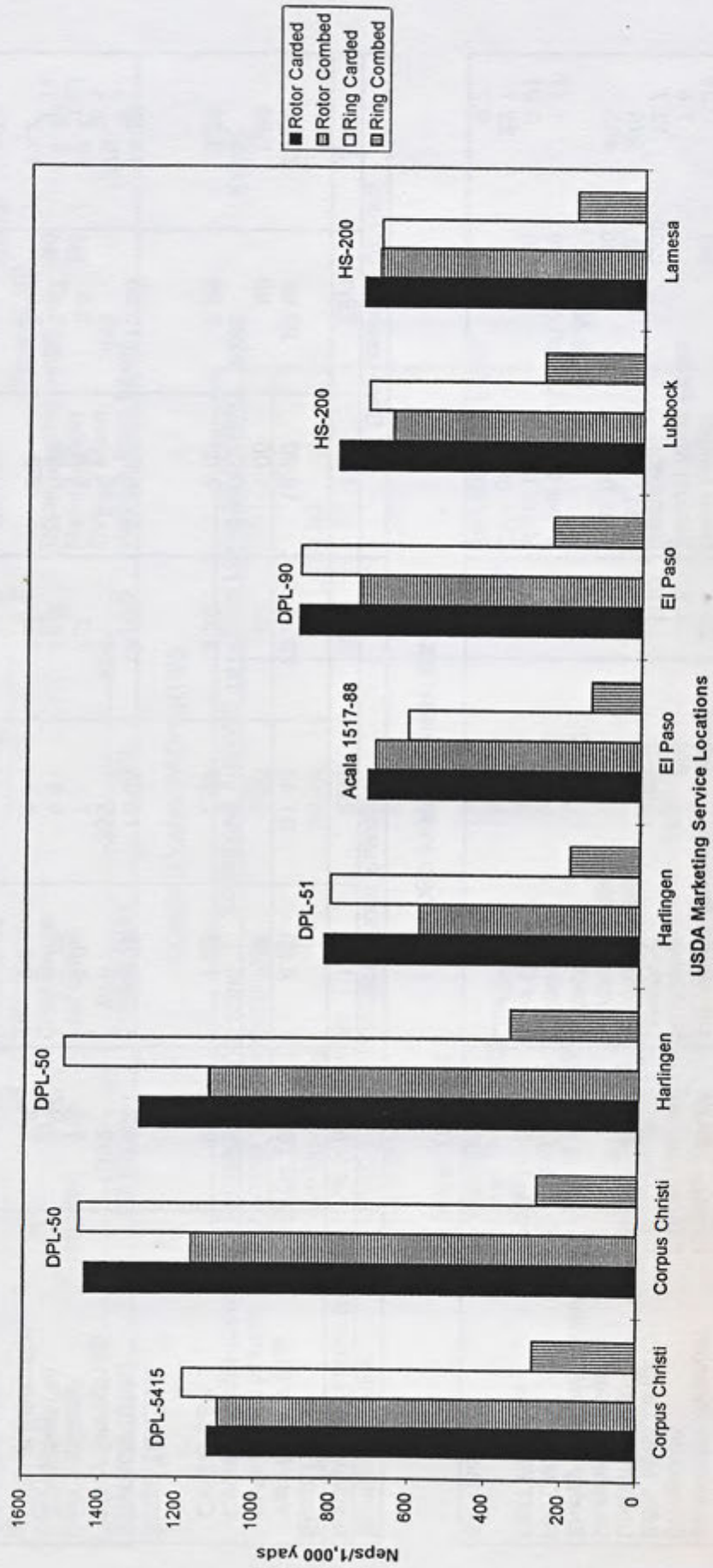


Figure 6: Neps for Texas Cottons, Carded and Combed
Yarn Size = N_e 30/1



FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	24.08	1/8" Gauge Strength (g/tex)	25.4	Upper Quartile Length (w) (in)	1.14
Elongation (%)	7.00	Elongation (%)	5.2	Mean Length (in)	0.94
2.5% Span Length (in)	1.062	Length (in)	1.10	Percent Short Fibers	7.4
Uniformity Ratio (%)	45.5	Uniformity Ratio (%)	82.7	Diameter (µm)	13.7
Micronaire Index	3.90	Micronaire Index (Rd)	4.0	Neps (g)	375
Shirley Non-Lint Content	1.98	Reflectance (+b)	77.3	Total Trash (no./g)	463
F/MT Maturity (%)	73.2	Yellowness	8.7	<u>Peyer AL 101</u>	
F/MT Fineness (mg/tex)	185	Color Grade	28	Upper Quartile Length (w) (in)	1.11
Stickiness	not sticky	Leaf Grade	1	Mean Length (in)	0.91
				CV% of Mean	29.7
				Percent Short Fibers	9.7

CARDED YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro			Saco Lowell SF-3H Ring		
	6/1	10/1	22/1	30/1	16/1	22/1
Nominal Yarn Number (Ne)						
<u>Skein Test:</u>						
Yarn Number (Ne)	6.02	9.83	21.46	29.33	16.20	22.05
CV% of Yarn Number	.33	.38	.70	.82	1.00	.99
Count-Strength-Product	2329	2395	1982	1872	2400	2288
CV% of CSP	2.30	1.89	2.69	3.30	2.03	2.28
<u>Single-Yarn Test:</u>						
Tenacity (g/tex)	14.20	14.58	13.03	12.61	16.04	15.53
Mean Strength (g)	1392	876	359	254	585	416
CV% of Break	4.7	5.8	7.1	7.2	8.8	9.8
Elongation (%)	8.97	7.72	6.61	6.12	6.59	6.47
CV% of Elongation	3.8	5.5	6.1	7.0	8.3	7.6
<u>Uster Evenness Test:</u>						
Non-Uniformity (CV%)	11.46	12.39	14.78	16.68	17.67	19.11
Thin Places/1,000 yds	0	0	17	99	80	130
Thick Places/1,000 yds	3	12	94	217	417	751
Neps/1,000 yds	1	12	156	826	136	251
ASTM Yarn Grade	C	B	B	C+	C	C
						D

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	24.08	1/8" Gauge Strength (g/tex)	25.4	Upper Quartile Length (w) (in)	1.14
Elongation (%)	7.00	Elongation (%)	5.2	Mean Length (in)	0.94
2.5% Span Length (in)	1.062	Uniformity Ratio (%)	1.10	Percent Short Fibers (µm)	7.4
Uniformity Ratio (%)	45.5	Micronaire Index (Rd)	4.0	Diameter (g)	13.7
Micronaire Index	3.90	Reflectance (+b)	77.3	Neps (no./g)	375
Shirley Non-Lint Content (%)	1.98	Yellowness	8.7	Total Trash	463
F/MT Maturity (mg/tex)	73.2	Color Grade	28		
F/MT Fineness	185	Leaf Grade	1		
Stickiness	not sticky	Comber Noils (%)	15.0		
				Upper Quartile Length (w) (in)	1.11
				Mean Length (in)	0.91
				CV% of Mean	29.7
				Percent Short Fibers	9.7

COMBED YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro	Saco Lowell SF-3H Ring
Nominal Yarn Number (Ne)	30/1	30/1
Skein Test:		
Yarn Number (Ne)	29.39	29.59
CV% of Yarn Number	.44	1.12
Count-Strength-Product	2032	2674
CV% of CSP	2.43	2.23
Single-Yarn Test:		
Tenacity (g/tex)	13.54	16.57
Mean Strength (g)	272	331
CV% of Break	8.6	8.8
Elongation (%)	6.21	6.35
CV% of Elongation	7.7	7.5
Uster Evenness Test:		
Non-Uniformity (CV%)	16.68	16.64
Thin Places/1,000 yds	102	54
Thick Places/1,000 yds	230	295
Neps/1,000 yds	578	185
ASTM Yarn Grade	B	C

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	26.89	1/8" Gauge Strength (g/tex)	26.5	Upper Quartile Length (w) (in)	1.14
Elongation (%)	7.08	Elongation (%)	6.1	Mean Length (in)	0.94
2.5% Span Length (in)	1.080	Length (in)	1.12	Percent Short Fibers	9.0
Uniformity Ratio (%)	44.6	Uniformity Ratio (%)	83.3	Diameter (µm)	14.6
Micronaire Index	4.50	Micronaire Index (Rd)	4.5	Neps (g)	334
Shirley Non-Lint Content	3.76	Reflectance (+b)	71.4	Total Trash (no./g)	750
F/MT Maturity (%)	79.0	Yellowness	8.8	Peyer AL 101	
F/MT Fineness (mg/tex)	201	Color Grade	41	Upper Quartile Length (w) (in)	1.08
Stickiness	not sticky	Leaf Grade	2	Mean Length (in)	0.87
				CV% of Mean	31.7
				Percent Short Fibers	12.4

CARDED YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro			Saco Lowell SF-3H Ring			
	6/1	10/1	22/1	30/1	16/1	22/1	30/1
Nominal Yarn Number (Ne)							
Yarn Number (Ne)	5.99	9.89	21.53	29.56	16.08	21.92	30.11
CV% of Yarn Number	.26	.51	.96	.81	.99	.82	1.35
Count-Strength-Product	2229	2279	1798	1677	2310	2162	2090
CV% of CSP	2.57	1.58	1.89	2.70	2.21	2.60	2.34
Single-Yarn Test:							
Tenacity (g/tex)	13.44	13.75	12.12	11.65	15.10	14.29	13.54
Mean Strength (g)	1325	821	333	233	554	385	266
CV% of Break	5.1	6.2	7.4	8.9	8.4	10.8	10.1
Elongation (%)	8.56	7.58	6.37	5.77	6.42	6.37	5.76
CV% of Elongation	9.5	5.6	7.0	9.4	7.4	8.0	8.9
Uster Evenness Test:							
Non-Uniformity (CV%)	12.45	12.92	15.67	18.09	18.72	20.47	23.12
Thin Places/1,000 yds	1	1	40	196	126	241	613
Thick Places/1,000 yds	10	21	145	364	613	1085	1746
Neps/1,000 yds	5	20	286	1118	222	430	1183
ASTM Yarn Grade	C	C+	C+	B	C	D	D

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	26.89	1/8" Gauge Strength (g/tex)	26.5	Upper Quartile Length (w) (in)	1.14
Elongation (%)	7.08	Elongation (in)	6.1	Mean Length (in)	0.94
2.5% Span Length (in)	1.080	Uniformity Ratio (%)	1.12	Percent Short Fibers	9.0
Uniformity Ratio (%)	44.6	Micronaire Index (Rd)	83.3	Diameter (µm)	14.6
Micronaire Index	4.50	Reflectance (+b)	4.5	Neps (g)	334
Shirley Non-Lint Content (%)	3.76	Yellowness	71.4	Total Trash	750
F/MT Maturity (mg/tex)	79.0	Color Grade	8.8		
F/MT Fineness	201	Leaf Grade	41		
Stickiness	not sticky	Comber Noils (%)	2		
			15.7		
				Upper Quartile Length (w) (in)	1.08
				Mean Length (in)	0.87
				CV% of Mean	31.7
				Percent Short Fibers	12.4

COMBED YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro	Saco Lowell SF-3H Ring
Nominal Yarn Number (Ne)	30/1	30/1
Skein Test:		
Yarn Number (Ne)	29.29	29.49
CV% of Yarn Number	.82	1.21
Count-Strength-Product	1866	2425
CV% of CSP	2.04	1.68
Single-Yarn Test:		
Tenacity (g/tex)	12.62	15.43
Mean Strength (g)	254	309
CV% of Break	8.2	9.7
Elongation (%)	5.86	6.05
CV% of Elongation	10.0	8.5
Uster Evenness Test:		
Non-Uniformity (CV%)	17.92	17.43
Thin Places/1,000 yds	198	84
Thick Places/1,000 yds	401	394
Neps/1,000 yds	1093	274
ASTM Yarn Grade	C+	C+

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	24.74	1/8" Gauge Strength (g/tex)	25.0	Upper Quartile Length (w) (in)	1.18
Elongation (%)	7.08	Elongation (%)	5.9	Mean Length (in)	0.97
2.5% Span Length (in)	1.180	Length (in)	1.14	Percent Short Fibers (µm)	8.0
Uniformity Ratio (%)	44.4	Uniformity Ratio (%)	83.7	Diameter (g)	14.1
Micronaire Index	4.10	Micronaire Index (Rd)	4.0	Neps (no./g)	409
Shirley Non-Lint Content	2.84	Reflectance (+b)	68.9	Total Trash	510
FMT Maturity (%)	71.8	Yellowness	8.6	Peyer AL 101	
FMT Fineness (mg/tex)	194	Color Grade	48	Upper Quartile Length (w) (in)	1.16
Stickiness	not sticky	Leaf Grade	3	Mean Length (in)	0.95
				CV% of Mean	30.8
				Percent Short Fibers	9.3

CARDED YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro			Saco Lowell SF-3H Ring		
	6/1	10/1	22/1	16/1	22/1	30/1
Nominal Yarn Number (Ne)						
<u>Skein Test:</u>						
Yarn Number (Ne)	5.98	9.91	21.58	16.06	21.93	30.16
CV% of Yarn Number	.48	.30	.58	.97	.73	1.31
Count-Strength-Product	2167	2182	1759	2218	2062	2036
CV% of CSP	3.74	1.61	1.24	2.00	3.17	3.57
<u>Single-Yarn Test:</u>						
Tenacity (g/tex)	12.87	13.31	11.87	14.54	13.75	13.20
Mean Strength (g)	1271	793	325	534	370	259
CV% of Break	4.8	5.2	7.4	8.9	12.6	9.6
Elongation (%)	8.86	7.82	6.54	6.89	6.43	6.03
CV% of Elongation	5.3	5.4	7.1	8.1	12.5	9.3
<u>Uster Evenness Test:</u>						
Non-Uniformity (CV%)	12.20	13.09	15.22	18.52	20.86	23.83
Thin Places/1,000 yds	0	1	24	100	290	684
Thick Places/1,000 yds	7	27	131	645	1199	1947
Neps/1,000 yds		28	289	280	506	1456
ASTM Yarn Grade	C	C+	C+	C	C	C

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	24.74	1/8" Gauge Strength (g/tex)	25.0	Upper Quartile Length (w) (in)	1.18
Elongation (%)	7.08	Elongation (%)	5.9	Mean Length (in)	0.97
2.5% Span Length (in)	1.108	Uniformity Ratio (%)	1.14	Percent Short Fibers	8.0
Uniformity Ratio (%)	44.4	Micronaire Index (Rd)	83.7	Diameter (µm)	14.1
Micronaire Index	4.10	Reflectance (+b)	4.0	Neps (g)	409
Shirley Non-Lint Content	2.84	Yellowness	68.9	Total Trash	510
F/MT Maturity (%)	71.8	Color Grade	8.6		
F/MT Fineness (mg/tex)	194	Leaf Grade	48		
Stickiness	not sticky	Comber Noils (%)	3		
			15.5		

COMBED YARN PROPERTIES

Spinning Machine:	Schlaifhorst Autocoro	Saco Lowell SF-3H Ring
Nominal Yarn Number (Ne)	30/1	30/1
Skein Test:		
Yarn Number (Ne)	29.37	29.18
CV% of Yarn Number	.74	.80
Count-Strength-Product	1761	2373
CV% of CSP	3.95	3.01
Single-Yarn Test:		
Tenacity (g/tex)	12.01	15.45
Mean Strength (g)	241	313
CV% of Break	9.2	9.1
Elongation (%)	5.99	6.44
CV% of Elongation	10.1	7.6
Uster Evenness Test:		
Non-Uniformity (CV%)	17.95	17.05
Thin Places/1,000 yds	174	60
Thick Places/1,000 yds	412	374
Neps/1,000 yds	1163	268
ASTM Yarn Grade	B	B

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	24.40	1/8" Gauge Strength (g/tex)	25.1	Upper Quartile Length (w) (in)	1.17
Elongation (%)	7.00	Elongation (%)	6.0	Mean Length (in)	0.94
2.5% Span Length (in)	1.072	Length (in)	1.13	Percent Short Fibers	9.7
Uniformity Ratio (%)	42.3	Uniformity Ratio (%)	83.6	Diameter (µm)	14.0
Micronaire Index	3.83	Micronaire Index (Rd)	3.8	Neps (g)	561
Shirley Non-Lint Content (%)	2.16	Reflectance (+b)	74.4	Total Trash (no./g)	357
F/MT Maturity (mg/tex)	67.7	Yellowness	9.1	Peyer AL 101	
F/MT Fineness	186	Color Grade	31	Upper Quartile Length (w) (in)	1.08
Stickiness	not sticky	Leaf Grade	2	Mean Length (in)	0.86
				CV% of Mean	34.0
				Percent Short Fibers	13.4

CARDER YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro			Saco Lowell SF-3H Ring		
	6/1	10/1	22/1	16/1	22/1	30/1
Nominal Yarn Number (Ne)	6/1	10/1	22/1	16/1	22/1	30/1
Skein Test:						
Yarn Number (Ne)	5.94	9.88	21.72	16.44	21.90	30.06
CV% of Yarn Number	.43	.33	.48	1.20	1.31	1.04
Count-Strength-Product	2166	2206	1730	2138	2042	1938
CV% of CSP	3.22	1.54	1.69	1.76	1.97	2.24
Single-Yarn Test:						
Tenacity (g/tex)	12.77	13.35	11.92	13.77	13.74	13.20
Mean Strength (g)	1271	798	324	495	370	259
CV% of Break	4.7	6.2	7.5	9.4	9.6	11.8
Elongation (%)	9.16	8.19	6.94	6.68	6.82	6.05
CV% of Elongation	4.8	5.5	8.5	8.8	7.8	8.8
Uster Evenness Test:						
Non-Uniformity (CV%)	12.50	12.95	15.41	19.38	21.25	24.52
Thin Places/1,000 yds	4	0	26	162	315	850
Thick Places/1,000 yds	12	23	124	754	1265	2114
Neps/1,000 yds	5	24	275	268	503	1498
ASTM Yarn Grade	D	B	C+	D+	D	D

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	24.40	1/8" Gauge Strength (g/tex)	25.1	Upper Quartile Length (w) (in)	1.17
Elongation (%)	7.00	Elongation (in)	6.0	Mean Length (in)	0.94
2.5% Span Length (in)	1.072	Uniformity Ratio (%)	1.13	Percent Short Fibers (µm)	9.7
Uniformity Ratio (%)	42.3	Micronaire Index (Rd)	83.6	Diameter (g)	14.0
Micronaire Index	3.83	Reflectance (+b)	3.8	Neps (no./g)	561
Shirley Non-Lint Content (%)	2.16	Yellowness	74.4	Total Trash	357
F/MT Maturity (mg/tex)	67.7	Color Grade	9.1		
F/MT Fineness	186	Leaf Grade	31		
Stickiness	not sticky	Comber Noils (%)	2		
			17.2		

COMBED YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro	Saco Lowell SF-3H Ring
Nominal Yarn Number (Ne)	30/1	30/1
<u>Skein Test:</u>		
Yarn Number (Ne)	29.44	29.64
CV% of Yarn Number	.31	1.38
Count-Strength-Product	1810	2305
CV% of CSP	2.49	3.73
<u>Single-Yarn Test:</u>		
Tenacity (g/tex)	12.52	14.98
Mean Strength (g)	251	299
CV% of Break	7.5	10.3
Elongation (%)	6.28	6.48
CV% of Elongation	9.0	9.6
<u>Uster Evenness Test:</u>		
Non-Uniformity (CV%)	17.62	18.07
Thin Places/1,000 yds	156	113
Thick Places/1,000 yds	370	540
Neps/1,000 yds	1122	340
ASTM Yarn Grade	C+	C

FIBER PROPERTIES

Individual Instrument Data	HVI Data			Uster AFIS			
	6/1	10/1	22/1	30/1	16/1	22/1	30/1
Stelometer Strength (g/tex)	26.49	18.87	21.52	29.47	16.11	21.83	29.99
Elongation (%)	6.75	.34	.51	.31	.95	.89	1.07
2.5% Span Length (in)	1.132	2407	1938	1946	2484	2368	2326
Uniformity Ratio (%)	45.6	1.09	2.75	4.72	4.06	2.49	2.63
Micronaire Index	4.73	14.62	12.87	12.54	16.18	15.53	14.54
Shirley Non-Lint Content	2.04	875	353	251	593	420	286
F/MT Maturity (%)	84.1	5.6	7.2	9.1	8.2	8.4	10.5
F/MT Fineness (mg/tex)	192	7.66	6.47	5.94	6.34	6.37	5.82
Stickiness	not sticky	4.9	6.0	8.2	8.2	8.0	7.9
		12.54	15.11	17.08	16.90	18.64	21.37
		0	27	136	46	118	343
		7	116	252	320	651	1216
		4	181	716	74	176	612
ASTM Yarn Grade	C	B	B	C+	C+	B	C+

CARDED YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro			Saco Lowell SF-3H Ring			
	6/1	10/1	22/1	30/1	16/1	22/1	30/1
Nominal Yarn Number (Ne)	5.98	9.87	21.52	29.47	16.11	21.83	29.99
Skein Test:							
Yarn Number (Ne)	.40	.34	.51	.31	.95	.89	1.07
CV% of Yarn Number	2364	2407	1938	1946	2484	2368	2326
Count-Strength-Product	2.89	1.09	2.75	4.72	4.06	2.49	2.63
CV% of CSP							
Single-Yarn Test:							
Tenacity (g/tex)	14.04	14.62	12.87	12.54	16.18	15.53	14.54
Mean Strength (g)	1387	875	353	251	593	420	286
CV% of Break	5.0	5.6	7.2	9.1	8.2	8.4	10.5
Elongation (%)	8.71	7.66	6.47	5.94	6.34	6.37	5.82
CV% of Elongation	5.0	4.9	6.0	8.2	8.2	8.0	7.9
Uster Evenness Test:							
Non-Uniformity (CV%)	11.99	12.54	15.11	17.08	16.90	18.64	21.37
Thin Places/1,000 yds	0	0	27	136	46	118	343
Thick Places/1,000 yds	7	14	116	252	320	651	1216
Neps/1,000 yds	4	7	181	716	74	176	612
ASTM Yarn Grade	C	B	B	C+	C+	B	C+

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	26.49	1/8" Gauge Strength (g/tex)	28.4	Upper Quartile Length (w) (in)	1.19
Elongation (%)	6.75	Elongation (in)	6.2	Mean Length (in)	0.95
2.5% Span Length (in)	1.132	Uniformity Ratio (%)	1.17	Percent Short Fibers	10.5
Uniformity Ratio (%)	45.6	Micronaire Index (Rd)	84.2	Diameter (µm)	13.8
Micronaire Index	4.73	Yellowness (+b)	4.7	Neps (g)	302
Shirley Non-Lint Content	2.04	Color Grade	76.7	Total Trash	308
FMT Maturity (%)	84.1	Leaf Grade	8.9		
FMT Fineness (mg/tex)	192		31		
Stickiness	not sticky	Comber Noils (%)	3		
			13.9		

COMBED YARN PROPERTIES

Spinning Machine:	Schlaflhorst Autocoro	Saco Lowell SF-3H Ring
Nominal Yarn Number (Ne)	30/1	30/1
<u>Skein Test:</u>		
Yarn Number (Ne)	29.42	29.50
CV% of Yarn Number	.52	.89
Count-Strength-Product	1974	2601
CV% of CSP	3.36	1.77
<u>Single-Yarn Test:</u>		
Tenacity (g/tex)	13.11	16.26
Mean Strength (g)	263	326
CV% of Break	9.4	9.4
Elongation (%)	5.90	6.14
CV% of Elongation	9.3	7.2
<u>Uster Evenness Test:</u>		
Non-Uniformity (CV%)	17.08	16.37
Thin Places/1,000 yds	142	51
Thick Places/1,000 yds	278	261
Neps/1,000 yds	696	132
ASTM Yarn Grade	B	B

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	29.48	1/8" Gauge Strength (g/tex)	31.2	Upper Quartile Length (w) (in)	1.22
Elongation (%)	5.92	Elongation (%)	5.8	Mean Length (in)	1.00
2.5% Span Length (in)	1.145	Length (in)	1.19	Percent Short Fibers	6.5
Uniformity Ratio (%)	45.9	Uniformity Ratio (%)	84.5	Diameter (µm)	13.1
Micronaire Index	4.50	Micronaire Index	4.5	Neps (g)	306
Shirley Non-Lint Content	2.95	Reflectance (Rd)	75.9	Total Trash	593
F/MT Maturity (%)	80.5	Yellowness (+b)	9.7	Peyer AL 101	
F/MT Fineness (mg/tex)	194	Color Grade	24	Upper Quartile Length (w) (in)	1.20
Stickiness	not sticky	Leaf Grade	1	Mean Length (in)	0.98
				CV% of Mean	30.8
				Percent Short Fibers	7.6

CARDER YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro			Saco Lowell SF-3H Ring			
	6/1	10/1	22/1	30/1	16/1	22/1	30/1
Skein Test:							
Yarn Number (Ne)	5.98	9.89	21.68	29.59	16.38	21.72	29.37
CV% of Yarn Number	.32	.28	.25	.48	1.77	1.71	1.13
Count-Strength-Product	2752	2581	2260	2242	2964	2794	2753
CV% of CSP	2.74	2.27	2.76	1.81	3.58	3.13	2.24
Single-Yarn Test:							
Tenacity (g/tex)	16.07	16.27	14.60	14.26	19.14	17.98	17.43
Mean Strength (g)	1589	971	398	285	690	489	350
CV% of Break	5.2	4.2	6.2	8.5	7.9	9.0	10.7
Elongation (%)	8.12	6.91	6.04	5.58	6.00	5.91	5.60
CV% of Elongation	4.3	6.8	5.4	7.4	6.6	7.2	7.7
Uster Evenness Test:							
Non-Uniformity (CV%)	11.24	12.35	14.95	17.06	16.43	18.08	20.57
Thin Places/1,000 yds	0	0	16	104	22	64	205
Thick Places/1,000 yds	4	14	114	302	323	610	1111
Neps/1,000 yds	3	19	228	898	232	330	896
ASTM Yarn Grade	C+	B	B	B	C+	C	C+

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	29.48	1/8" Gauge Strength (g/tex)	31.2	Upper Quartile Length (w) (in)	1.22
Elongation (%)	5.92	Elongation (in)	5.8	Mean Length (in)	1.00
2.5% Span Length (in)	1.145	Uniformity Ratio (%)	84.5	Percent Short Fibers (µm)	6.5
Uniformity Ratio (%)	45.9	Micronaire Index (Rd)	4.5	Neps (g)	13.1
Micronaire Index	4.50	Reflectance (+b)	75.9	Total Trash	306
Shirley Non-Lint Content (%)	2.95	Yellowness	9.7		593
F/MT Maturity (mg/tex)	80.5	Color Grade	24		
F/MT Fineness	194	Leaf Grade	1		
Stickiness	not sticky	Comber Noils (%)	12.0		

COMBED YARN PROPERTIES

Spinning Machine:	Schlaifhorst Autocoro	Saco Lowell SF-3H Ring
Nominal Yarn Number (Ne)	30/1	30/1
<u>Skein Test:</u>		
Yarn Number (Ne)	29.41	30.02
CV% of Yarn Number	.34	.73
Count-Strength-Product	2351	3075
CV% of CSP	1.65	1.52
<u>Single-Yarn Test:</u>		
Tenacity (g/tex)	15.31	18.74
Mean Strength (g)	307	369
CV% of Break	7.4	7.8
Elongation (%)	5.68	5.52
CV% of Elongation	6.4	6.3
<u>Uster Evenness Test:</u>		
Non-Uniformity (CV%)	16.80	15.79
Thin Places/1,000 yds	180	20
Thick Places/1,000 yds	276	263
Neps/1,000 yds	741	237
ASTM Yarn Grade	B	C+

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	27.45	1/8" Gauge Strength (g/tex)	29.7	Upper Quartile Length (w) (in)	1.17
Elongation (%)	7.17	Elongation (in)	6.2	Mean Length (in)	0.96
2.5% Span Length (in)	1.125	Uniformity Ratio (%)	84.1	Percent Short Fibers (µm)	8.4
Uniformity Ratio (%)	47.4	Micronaire Index	3.4	Diameter (g)	12.8
Micronaire Index	3.43	Reflectance (Rd)	77.0	Neps (no./g)	405
Shirley Non-Lint Content (%)	3.91	Yellowness (+b)	8.6	Total Trash	711
F/MT Maturity (mg/tex)	66.7	Color Grade	31		
F/MT Fineness	172	Leaf Grade	2		
Stickiness	not sticky				

CARDER YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro				Saco Lowell SF-3H Ring		
	6/1	10/1	22/1	30/1	16/1	22/1	30/1
Nominal Yarn Number (Ne)							
Skein Test:							
Yarn Number (Ne)	5.93	9.91	21.57	29.43	16.15	21.74	30.12
CV% of Yarn Number	.43	.33	.40	.37	.73	1.00	.91
Count-Strength-Product	2546	2646	2185	2130	2771	2567	2534
CV% of CSP	2.96	1.77	1.61	2.86	1.88	3.71	2.91
Single-Yarn Test:							
Tenacity (g/tex)	15.38	15.68	14.33	13.90	17.66	16.75	16.03
Mean Strength (g)	1532	935	392	279	646	455	314
CV% of Break	4.1	5.9	7.6	6.9	7.2	8.5	8.8
Elongation (%)	9.52	8.10	7.15	6.52	6.90	6.97	6.36
CV% of Elongation	4.0	5.5	6.1	6.1	7.1	7.5	6.8
Uster Evenness Test:							
Non-Uniformity (CV%)	11.32	12.14	14.48	16.49	16.19	17.85	20.36
Thin Places/1,000 yds	0	1	12	76	24	67	221
Thick Places/1,000 yds	5	9	84	244	241	550	1060
Neps/1,000 yds	2	11	146	798	77	177	720
ASTM Yarn Grade	C+	C+	C+	C+	C	C	C

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	27.45	1/8" Gauge Strength (g/tex)	29.7	Upper Quartile Length (w) (in)	1.17
Elongation (%)	7.17	Elongation (in)	6.2	Mean Length (in)	0.96
2.5% Span Length (in)	1.125	Uniformity Ratio (%)	84.1	Percent Short Fibers (µm)	8.4
Uniformity Ratio (%)	47.4	Micronaire Index (Rd)	3.4	Diameter (g)	12.8
Micronaire Index	3.43	Reflectance (+b)	77.0	Neps (no./g)	405
Shirley Non-Lint Content (%)	3.91	Yellowness	8.6	Total Trash	711
F/MT Maturity (mg/tex)	66.7	Color Grade	31	Peyer AL 101	
F/MT Fineness	172	Leaf Grade	2	Upper Quartile Length (w) (in)	1.19
Stickiness	not sticky	Comber Noils (%)	12.6	Mean Length (in)	0.98
				CV% of Mean	27.0
				Percent Short Fibers	4.6

COMBED YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro	Saco Lowell SF-3H Ring
Nominal Yarn Number (Ne)	30/1	30/1
<u>Skein Test</u>		
Yarn Number (Ne)	29.31	29.36
CV% of Yarn Number	.59	.83
Count-Strength-Product	2214	2943
CV% of CSP	2.36	1.50
<u>Single-Yarn Test:</u>		
Tenacity (g/tex)	14.58	18.15
Mean Strength (g)	294	365
CV% of Break	8.0	7.2
Elongation (%)	6.52	6.75
CV% of Elongation	6.8	6.7
<u>Uster Evenness Test:</u>		
Non-Uniformity (CV%)	16.37	16.39
Thin Places/1,000 yds	77	34
Thick Places/1,000 yds	224	318
Neps/1,000 yds	657	262
ASTM Yarn Grade	C+	C+

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	24.73	1/8" Gauge Strength (g/tex)	28.0	Upper Quartile Length (w) (in)	1.17
Elongation (%)	7.33	Elongation (%)	6.1	Mean Length (in)	0.95
2.5% Span Length (in)	1.103	Length (in)	1.15	Percent Short Fibers	9.4
Uniformity Ratio (%)	47.1	47.1 Uniformity Ratio (%)	84.5	Diameter (µm)	13.1
Micronaire Index	3.73	Micronaire Index	3.7	Neps (g)	420
Shirley Non-Lint Content	2.51	Reflectance (Rd)	78.7	Total Trash (no./g)	322
F/MT Maturity (%)	73.9	Yellowness (+b)	8.2	Peyer AL 101	
F/MT Fineness (mg/tex)	169	Color Grade	28	Upper Quartile Length (w) (in)	1.13
Stickiness	not sticky -slightly sticky	Leaf Grade	1	Mean Length (in)	0.93
				CV% of Mean	30.2
				Percent Short Fibers	8.1

CARDED YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro			Saco Lowell SF-3H Ring			
	6/1	10/1	22/1	30/1	16/1	22/1	30/1
Nominal Yarn Number (Ne)							
<u>Skein Test:</u>							
Yarn Number (Ne)	5.97	9.88	21.67	29.87	16.26	21.57	29.36
CV% of Yarn Number	.41	.50	.25	.74	.84	.73	1.09
Count-Strength-Product	2367	2439	1975	1954	2418	2270	2215
CV% of CSP	2.51	1.56	1.67	2.03	2.66	2.60	3.09
<u>Single-Yarn Test:</u>							
Tenacity (g/tex)	14.32	14.59	12.78	12.71	15.79	15.00	14.37
Mean Strength (g)	1416	872	348	251	574	411	289
CV% of Break	5.1	5.8	6.5	9.3	9.1	11.0	10.6
Elongation (%)	9.12	7.88	6.64	6.11	6.53	6.58	6.03
CV% of Elongation	4.5	5.8	6.7	8.7	8.9	8.8	8.4
<u>Uster Evenness Test:</u>							
Non-Uniformity (CV%)	11.76	12.43	15.08	16.72	17.61	19.72	22.37
Thin Places/1,000 yds	0	0	18	96	81	203	491
Thick Places/1,000 yds	5	12	90	236	391	838	1470
Neps/1,000 yds	2	6	131	734	83	196	690
ASTM Yarn Grade	B	C+	B	B	C	C	C

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	24.73	1/8" Gauge Strength (g/tex)	28.0	Upper Quartile Length (w) (in)	1.17
Elongation (%)	7.33	Elongation (in)	6.1	Mean Length (in)	0.95
2.5% Span Length (in)	1.103	Uniformity Ratio (%)	1.15	Percent Short Fibers (µm)	9.4
Uniformity Ratio (%)	47.1	Micronaire Index (Rd)	84.5	Diameter (g)	13.1
Micronaire Index	3.73	Reflectance (+b)	3.7	Neps (no./g)	420
Shirley Non-Lint Content (%)	2.51	Yellowness	78.7	Total Trash	322
F/MT Maturity (mg/tex)	73.9	Color Grade	8.2		
F/MT Fineness	169	Leaf Grade	28		
Stickiness	not sticky-slightly sticky	Comber Noils (%)	1		
			15.0		
				Upper Quartile Length (w) (in)	1.13
				Mean Length (in)	0.93
				CV% of Mean	30.2
				Percent Short Fibers	8.1

COMBED YARN PROPERTIES

Spinning Machine:	Schlaifhorst Autocoro	Saco Lowell SF-3H Ring
Nominal Yarn Number (Ne)	30/1	30/1
Skein Test:		
Yarn Number (Ne)	29.53	29.79
CV% of Yarn Number	.56	.71
Count-Strength-Product	2008	2656
CV% of CSP	3.01	4.51
Single-Yarn Test:		
Tenacity (g/tex)	13.14	15.91
Mean Strength (g)	263	316
CV% of Break	7.6	9.0
Elongation (%)	6.15	6.26
CV% of Elongation	8.2	7.4
Uster Evenness Test:		
Non-Uniformity (CV%)	16.81	16.65
Thin Places/1,000 yds	106	54
Thick Places/1,000 yds	262	303
Neps/1,000 yds	694	180
ASTM Yarn Grade	C+	C+

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	25.78	1/8" Gauge Strength (g/tex)	24.7	Upper Quartile Length (w) (in)	1.05
Elongation (%)	6.42	Elongation (%)	5.1	Mean Length (in)	0.87
2.5% Span Length (in)	0.995	Length (in)	1.02	Percent Short Fibers (µm)	8.8
Uniformity Ratio (%)	45.7	Uniformity Ratio (%)	81.2	Diameter (g)	14.0
Micronaire Index	3.63	Micronaire Index (Rd)	3.6	Neps (no./g)	421
Shirley Non-Lint Content	3.36	Reflectance (+b)	76.9	Total Trash	877
F/MT Maturity (%)	79.9	Yellowness	8.6	Peyer AL 101	
F/MT Fineness (mg/tex)	193	Color Grade	31	Upper Quartile Length (w) (in)	1.03
Stickiness	not sticky	Leaf Grade	3	Mean Length (in)	0.82
				CV% of Mean	34.2
				Percent Short Fibers	16.6

CARDER YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro			Saco Lowell SF-3H Ring			
	6/1	10/1	22/1	30/1	16/1	22/1	30/1
Nominal Yarn Number (Ne)							
<u>Skein Test:</u>							
Yarn Number (Ne)	6.01	9.89	21.56	29.78	16.26	22.40	30.63
CV% of Yarn Number	1.06	.36	.45	.42	.84	1.06	1.31
Count-Strength-Product	2223	2295	1861	1808	2157	2019	1883
CV% of CSP	4.02	1.80	1.84	1.93	2.88	2.98	3.50
<u>Single-Yarn Test:</u>							
Tenacity (g/tex)	13.33	13.74	12.31	11.82	14.53	13.22	12.71
Mean Strength (g)	1309	820	337	234	528	348	245
CV% of Break	4.8	6.0	7.3	7.9	10.2	12.8	13.1
Elongation (%)	8.36	7.60	6.34	5.68	6.30	5.97	5.42
CV% of Elongation	4.9	5.8	6.9	7.8	8.3	9.3	10.5
<u>Uster Evenness Test:</u>							
Non-Uniformity (CV%)	12.37	12.84	15.30	17.39	19.60	21.66	24.64
Thin Places/1,000 yds	0	1	22	121	238	500	1098
Thick Places/1,000 yds	10	15	105	274	671	1164	1923
Neps/1,000 yds	2	6	187	962	100	246	822
ASTM Yarn Grade	C	B	B	C+	C	D+	D+

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	26.88	1/8" Gauge Strength (g/tex)	27.5	Upper Quartile Length (w) (in)	1.09
Elongation (%)	9.25	Elongation (%)	6.4	Mean Length (in)	0.92
2.5% Span Length (in)	1.045	Length (in)	1.07	Percent Short Fibers (µm)	6.6
Uniformity Ratio (%)	48.5	Uniformity Ratio (%)	81.9	Diameter (g)	14.4
Micronaire Index	4.57	Micronaire Index (Rd)	4.5	Neps (no./g)	292
Shirley Non-Lint Content	2.06	Reflectance (+b)	78.9	Total Trash	332
F/MT Maturity (%)	75.3	Yellowness	8.9	Peyer AL101	
F/MT Fineness (mg/tex)	210	Color Grade	21	Upper Quartile Length (w) (in)	1.08
Stickiness	not sticky	Leaf Grade	2	Mean Length (in)	0.92
				CV% of Mean	25.4
				Percent Short Fibers	4.6

CARDED YARN PROPERTIES

Spinning Machine:	Schlaifhorst Autocoro			Saco Lowell SF-3H Ring			
	6/1	10/1	22/1	30/1	16/1	22/1	30/1
Nominal Yarn Number (Ne)							
<u>Skein Test:</u>							
Yarn Number (Ne)	5.99	9.89	21.76	29.19	15.98	21.81	29.77
CV% of Yarn Number	.23	.35	.35	.46	1.14	.66	.70
Count-Strength-Product	2513	2531	1995	1861	2596	2326	2357
CV% of CSP	2.26	2.43	2.33	1.86	2.88	3.54	2.94
<u>Single-Yarn Test:</u>							
Tenacity (g/tex)	14.93	14.93	13.29	12.72	16.34	15.43	14.39
Mean Strength (g)	1472	891	361	257	604	418	285
CV% of Break	4.4	4.9	9.0	8.2	8.8	8.8	9.4
Elongation (%)	9.52	8.40	7.13	6.61	7.01	7.02	6.46
CV% of Elongation	4.0	4.2	8.0	9.9	7.7	7.1	7.3
<u>Uster Evenness Test:</u>							
Non-Uniformity (CV%)	11.18	12.44	15.28	17.33	16.15	18.02	20.88
Thin Places/1,000 yds	0	0	32	149	28	98	319
Thick Places/1,000 yds	2	10	116	298	224	493	1064
Neps/1,000 yds	0	6	167	711	62	127	471
ASTM Yarn Grade	C+	B	C+	B	C+	C+	C

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength	(g/tex)	1/8" Gauge Strength	(g/tex)	Upper Quartile Length (w)	(in)
Elongation	(%)	Elongation	(%)	Mean Length	(in)
2.5% Span Length	(in)	Length	(in)	Percent Short Fibers	(µm)
Uniformity Ratio	(%)	Uniformity Ratio	(%)	Diameter	(g)
Micronaire Index		Micronaire Index		Neps	(no./g)
Shirley Non-Lint Content		Reflectance	(Rd)	Total Trash	Peyer AL 101
F/MT Maturity	(%)	Yellowness	(+b)	Upper Quartile Length (w)	(in)
F/MT Fineness	(mg/tex)	Color Grade		Mean Length	(in)
Stickiness	not sticky	Leaf Grade		CV% of Mean	
				Percent Short Fibers	

CARDED YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro			Saco Lowell SF-3H Ring			
	6/1	10/1	22/1	30/1	16/1	22/1	30/1
Nominal Yarn Number (Ne)							
<u>Skein Test:</u>							
Yarn Number (Ne)	5.98	9.94	21.57	29.50	16.16	22.30	30.64
CV% of Yarn Number	.40	.27	.54	.65	.62	.50	1.19
Count-Strength-Product	2562	2765	2035	2023	2494	2320	2249
CV% of CSP	3.44	.58	2.16	2.63	3.45	2.16	3.90
<u>Single-Yarn Test:</u>							
Tenacity (g/tex)	15.15	15.52	13.91	13.33	16.10	15.37	14.82
Mean Strength (g)	1496	922	381	267	588	407	286
CV% of Break	5.3	5.8	7.9	8.4	9.4	11.6	12.0
Elongation (%)	8.80	7.76	6.68	5.88	6.40	6.13	5.71
CV% of Elongation	4.4	5.2	6.9	7.8	8.5	7.5	9.5
<u>Uster Evenness Test:</u>							
Non-Uniformity (CV%)	12.04	12.67	15.14	17.33	17.16	19.48	21.80
Thin Places/1,000 yds	0	2	26	134	63	214	477
Thick Places/1,000 yds	4	14	102	265	285	728	1211
Neps/1,000 yds	2	10	142	688	66	154	487
ASTM Yarn Grade	C	B	B	B	C+	C+	C

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	27.13	1/8" Gauge Strength (g/tex)	27.1	Upper Quartile Length (w) (in)	1.06
Elongation (%)	6.25	Elongation (%)	5.1	Mean Length (in)	0.87
2.5% Span Length (in)	1.027	Length (in)	1.06	Percent Short Fibers	9.5
Uniformity Ratio (%)	45.1	Uniformity Ratio (%)	82.3	Diameter (µm)	13.8
Micronaire Index	4.40	Micronaire Index	4.4	Neps (g)	425
Shirley Non-Lint Content	2.16	Reflectance (Rd)	76.1	Total Trash (no./g)	380
FMT Maturity (%)	79.2	Yellowness (+b)	9.2	Peyer AL 101	
FMT Fineness (mg/tex)	195	Color Grade	31	Upper Quartile Length (w) (in)	1.04
Stickiness	not sticky	Leaf Grade	1	Mean Length (in)	0.81
				CV% of Mean	36.5
				Percent Short Fibers	19.1

CARDED YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro			Saco Lowell SF-3H Ring			
	6/1	10/1	22/1	30/1	16/1	22/1	30/1
Nominal Yarn Number (Ne)	6.03	9.93	21.63	29.61	15.95	21.96	29.92
Skein Test:							
Yarn Number (Ne)	.28	.51	.52	.59	.65	1.20	.60
CV% of Yarn Number	2351	2432	1944	1815	2294	2198	2092
Count-Strength-Product	1.57	1.85	1.34	2.13	3.09	3.78	3.45
CV% of CSP							
Single-Yarn Test:							
Tenacity (g/tex)	14.35	14.53	12.80	12.48	15.51	14.52	13.54
Mean Strength (g)	1406	865	350	249	574	390	267
CV% of Break	5.9	5.9	7.0	8.5	9.5	10.5	10.4
Elongation (%)	7.96	6.97	5.92	5.50	5.68	5.72	5.09
CV% of Elongation	4.8	5.3	8.7	8.2	9.1	8.6	8.9
Uster Evenness Test:							
Non-Uniformity (CV%)	11.85	12.79	15.06	17.14	19.21	21.53	24.62
Thin Places/1,000 yds	0	1	16	94	166	379	977
Thick Places/1,000 yds	6	13	94	228	644	1238	2033
Neps/1,000 yds	1	7	150	768	135	344	1046
ASTM Yarn Grade	C	B	C+	B	D+	C	C

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	24.95	1/8" Gauge Strength (g/tex)	25.3	Upper Quartile Length (w) (in)	1.04
Elongation (%)	5.17	Elongation (in)	4.8	Mean Length (in)	0.86
2.5% Span Length (in)	1.035	Uniformity Ratio (%)	81.9	Percent Short Fibers (µm)	10.2
Uniformity Ratio (%)	46.7	Micronaire Index (Rd)	4.2	Diameter (g)	13.8
Micronaire Index	4.10	Reflectance (+b)	72.1	Neps (no./g)	458
Shirley Non-Lint Content (%)	2.63	Yellowness Color Grade	10.1	Total Trash	307
FMT Maturity (mg/tex)	88.6	Leaf Grade	2		
FMT Fineness	161				
Stickiness	not sticky				

CARDED YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro			Saco Lowell SF-3H Ring			
	6/1	10/1	22/1	30/1	16/1	22/1	30/1
Nominal Yarn Number (Ne)							
<u>Skein Test:</u>							
Yarn Number (Ne)	5.97	9.90	21.57	29.71	16.37	21.76	29.65
CV% of Yarn Number	.34	.38	.40	.69	.93	1.10	.98
Count-Strength-Product	2262	2346	1899	1881	2252	2098	1998
CV% of CSP	2.47	1.85	2.40	.356	3.11	4.04	3.39
<u>Single-Yarn Test:</u>							
Tenacity (g/tex)	13.92	14.40	12.98	12.25	14.81	13.95	13.61
Mean Strength (g)	1377	859	355	244	534	379	271
CV% of Break	4.4	5.3	7.2	9.0	10.4	10.8	11.6
Elongation (%)	8.31	7.11	6.05	5.35	5.66	5.55	5.25
CV% of Elongation	4.1	4.7	6.3	8.3	8.8	8.5	9.8
<u>Uster Evenness Test:</u>							
Non-Uniformity (CV%)	12.52	12.96	15.13	17.21	20.80	23.32	26.24
Thin Places/1,000 yds	0	1	11	86	302	668	1355
Thick Places/1,000 yds	10	22	111	315	995	1720	2558
Neps/1,000 yds	6	26	295	1378	320	664	1926
ASTM Yarn Grade	C+	B	C+	C+	D	C	D

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength	(g/tex) 25.30	1/8" Gauge Strength	(g/tex) 27.8	Upper Quartile Length (w)	(in) 1.11
Elongation	(%) 6.58	Elongation	(%) 6.1	Mean Length	(in) 0.89
2.5% Span Length	(in) 1.080	Length	(in) 1.12	Percent Short Fibers	12.7
Uniformity Ratio	(%) 47.1	Uniformity Ratio	(%) 83.6	Diameter	(µm) 13.6
Micronaire Index	4.10	Micronaire Index	4.2	Neps	(g) 395
Shirley Non-Lint Content	2.62	Reflectance	(Rd) 76.3	Total Trash	(no./g) 374
F/MT Maturity	(%) 77.1	Yellowness	(+b) 9.5	Peyer AL 101	
F/MT Fineness	(mg/tex) 187	Color Grade	24	Upper Quartile Length (w)	(in) 1.08
Stickiness	not sticky	Leaf Grade	1	Mean Length	(in) 0.86
				CV% of Mean	34.2
				Percent Short Fibers	14.9

CARDED YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro			Saco Lowell SF-3H Ring			
	6/1	10/1	22/1	30/1	16/1	22/1	30/1
Nominal Yarn Number (Ne)	6/1						
<u>Skein Test:</u>							
Yarn Number (Ne)	5.96	9.89	21.56	29.91	16.43	21.75	29.92
CV% of Yarn Number	.39	.47	.48	.53	1.45	1.72	1.92
Count-Strength-Product	2337	2376	1898	1868	2320	2195	2144
CV% of CSP	2.85	1.69	3.07	3.07	2.04	1.76	3.31
<u>Single-Yarn Test:</u>							
Tenacity (g/tex)	13.81	14.17	12.74	12.36	15.33	14.40	13.97
Mean Strength (g)	1369	846	349	244	551	391	276
CV% of Break	5.4	5.6	7.5	7.9	9.1	9.5	11.3
Elongation (%)	8.98	7.81	6.90	6.15	6.41	6.57	5.87
CV% of Elongation	4.7	5.2	7.1	8.8	10.9	7.4	8.1
<u>Uster Evenness Test:</u>							
Non-Uniformity (CV%)	11.92	12.41	14.79	16.91	18.47	20.58	23.49
Thin Places/1,000 yds	0	0	16	101	116	260	667
Thick Places/1,000 yds	6	8	80	249	556	1063	1796
Neps/1,000 yds	2	6	166	837	132	319	917
ASTM Yarn Grade	C+	C+	B	C+	C	D+	D

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	25.13	1/8" Gauge Strength (g/tex)	25.9	Upper Quartile Length (w) (in)	0.94
Elongation (%)	7.42	Elongation (%)	5.2	Mean Length (in)	0.80
2.5% Span Length (in)	0.932	Length (in)	0.95	Percent Short Fibers (µm)	11.0
Uniformity Ratio (%)	47.4	Uniformity Ratio (%)	78.8	Diameter (g)	14.7
Micronaire Index	4.63	Micronaire Index (Rd)	4.7	Neps (no./g)	275
Shirley Non-Lint Content	3.00	Reflectance (+b)	73.9	Total Trash	763
F/M T Maturity (%)	78.7	Yellowness	8.54	Peyer AL101	
F/M T Fineness (mg/tex)	210	Color Grade	38	Upper Quartile Length (w) (in)	0.95
Stickiness	not sticky	Leaf Grade	2	Mean Length (in)	0.78
				CV% of Mean	29.5
				Percent Short Fibers	14.7

CARDED YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro			Saco Lowell SF-3H Ring			
	6/1	10/1	22/1	30/1	16/1	22/1	30/1
Nominal Yarn Number (Ne)							
<u>Skein Test:</u>							
Yarn Number (Ne)	5.95	9.90	21.58	29.35	15.87	21.63	30.06
CV% of Yarn Number	.31	.36	.52	.38	1.04	1.49	1.63
Count-Strength-Product	2284	2316	1857	1778	2201	1983	1913
CV% of CSP	2.04	1.85	2.73	2.44	3.42	2.67	5.13
<u>Single-Yarn Test:</u>							
Tenacity (g/tex)	14.00	14.24	12.71	12.16	14.21	13.33	12.34
Mean Strength (g)	1389	849	348	245	529	364	243
CV% of Break	5.3	58	8.2	10.7	12.7	13.1	14.7
Elongation (%)	8.56	7.48	6.27	5.72	5.97	5.83	5.10
CV% of Elongation	4.4	4.8	6.8	10.9	9.7	8.4	12.7
<u>Uster Evenness Test:</u>							
Non-Uniformity (CV%)	12.64	13.56	15.69	17.34	20.72	23.08	26.30
Thin Places/1,000 yds	1	4	40	139	363	746	1589
Thick Places/1,000 yds	10	27	115	212	696	1289	2143
Neps/1,000 yds	1	14	165	566	82	215	707
ASTM Yarn Grade	B	C+	B	B	C	C	C+

FIBER PROPERTIES

Individual Instrument Data		HVI Data		Uster AFIS	
Stelometer Strength (g/tex)	26.26	1/8" Gauge Strength (g/tex)	26.4	Upper Quartile Length (w) (in)	1.08
Elongation (%)	6.17	Elongation (in)	5.1	Mean Length (in)	0.88
2.5% Span Length (in)	1.052	Uniformity Ratio (%)	82.2	Percent Short Fibers (µm)	11.8
Uniformity Ratio (%)	45.8	Micronaire Index (Rd)	4.3	Diameter (g)	354
Micronaire Index	4.33	Reflectance (+b)	77.4	Neps (no./g)	345
Shirley Non-Lint Content (%)	1.99	Yellowness	8.6	Total Trash	Peyer AL 101
F/MT Maturity (mg/tex)	79.5	Color Grade	31	Upper Quartile Length (w) (in)	1.08
F/MT Fineness	187	Leaf Grade	2	Mean Length (in)	0.87
Stickiness	not sticky			CV% of Mean	32.3
				Percent Short Fibers	13.1

CARDED YARN PROPERTIES

Spinning Machine:	Schlafhorst Autocoro			Saco Lowell SF-3H Ring			
	6/1	10/1	22/1	30/1	16/1	22/1	30/1
Nominal Yarn Number (Ne)	6/1	10/1	22/1	30/1	16/1	22/1	30/1
Skein Test:							
Yarn Number (Ne)	5.94	9.87	21.73	29.14	16.56	22.06	30.06
CV% of Yarn Number	.21	.36	.43	.55	1.13	1.07	.97
Count-Strength-Product	2378	2467	1974	1854	2290	2216	2120
CV% of CSP	1.60	1.16	2.19	1.74	2.02	3.38	1.69
Single-Yarn Test:							
Tenacity (g/tex)	14.45	14.74	13.08	12.69	15.21	14.37	14.00
Mean Strength (g)	1437	883	356	257	542	385	275
CV% of Break	4.9	6.2	7.1	7.9	8.4	11.2	11.7
Elongation (%)	8.73	7.47	6.20	5.67	5.93	5.75	5.41
CV% of Elongation	4.8	5.4	6.4	7.7	8.1	9.1	8.3
Uster Evenness Test:							
Non-Uniformity (CV%)	12.15	12.47	14.77	16.87	18.96	20.58	23.36
Thin Places/1,000 yds	0	0	18	85	165	278	699
Thick Places/1,000 yds	3	9	81	242	602	989	1683
Neps/1,000 yds	6	124	737	114	218	846	
ASTM Yarn Grade	B	B	B	B	C	C+	C+