



**International Cotton Advisory Committee**



# CSITC Global - Round Trial 2018 - 4 General Evaluation

**Section One: Result Distribution**  
Section Two: Instrument Evaluation  
Section Three: Within Limits Evaluation

## Section One: Result Distribution

Content:

Mandatory Parameters  
-Summary Table  
-Distribution Graphs

Optional Parameters  
-Summary Table  
-Distribution Graphs

Executed By:  
Faserinstitut Bremen e.V., Bremen, Germany\*  
USDA-AMS, Memphis, TN, USA

System Provided by:  
Generation 10 Limited



This report is an outcome of the Project CFC/ICAC/33 – CSITC, which benefitted from support from the Common Fund for Commodities and the European Union, partners in Commodity Development.



\* Faserinstitut Bremen are a Cooperation Partner with ICA Bremen

Global - Round Trial 2018 - 4

Inter-Instrument Averages, Inter-Instrument Variations, Typical within-instrument Variations

Micronaire							
			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
<b>Average of Instruments (Grubbs)</b>			4.848	4.026	4.205	3.334	
<b>Reference Values for Evaluation</b>			4.848	4.026	4.205	3.334	
<b>Number Of Instruments</b>			131	131	131	131	<b>131</b>
<b>Inter-Instrument Variation</b>	based on 30 tests	SD	0.057	0.078	0.081	0.064	<b>0.070</b>
		CV %	1.2	1.9	1.9	1.9	<b>1.7</b>
	based on 6 tests	SD	0.062	0.077	0.083	0.069	<b>0.073</b>
		CV %	1.3	1.9	2.0	2.1	<b>1.8</b>
	based on single tests	SD	0.076	0.086	0.090	0.078	<b>0.082</b>
		CV %	1.6	2.1	2.1	2.3	<b>2.0</b>
<b>Typical within-instrument Variation (Median)</b>	between different days with each 6 tests	SD	0.026	0.026	0.028	0.024	<b>0.026</b>
		CV %	0.5	0.6	0.7	0.7	<b>0.6</b>
	between single tests on one day	SD	0.035	0.034	0.037	0.030	<b>0.034</b>
		CV %	0.7	0.8	0.9	0.9	<b>0.8</b>
	between all tests on different days	SD	0.044	0.042	0.047	0.040	<b>0.043</b>
		CV %	0.9	1.1	1.1	1.2	<b>1.1</b>

Strength							
			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
<b>Average of Instruments (Grubbs)</b>			29.295	33.999	28.364	29.540	
<b>Reference Values for Evaluation</b>			29.295	33.999	28.364	29.540	
<b>Number Of Instruments</b>			130	130	130	130	<b>130</b>
<b>Inter-Instrument Variation</b>	based on 30 tests	SD	0.690	0.840	0.744	0.812	<b>0.772</b>
		CV %	2.4	2.5	2.6	2.7	<b>2.5</b>
	based on 6 tests	SD	0.780	0.897	0.832	0.978	<b>0.871</b>
		CV %	2.7	2.6	2.9	3.3	<b>2.9</b>
	based on single tests	SD	0.931	1.073	1.006	1.138	<b>1.037</b>
		CV %	3.2	3.2	3.5	3.9	<b>3.4</b>
<b>Typical within-instrument Variation (Median)</b>	between different days with each 6 tests	SD	0.349	0.392	0.423	0.405	<b>0.392</b>
		CV %	1.2	1.2	1.5	1.4	<b>1.3</b>
	between single tests on one day	SD	0.501	0.561	0.561	0.591	<b>0.554</b>
		CV %	1.7	1.7	2.0	2.0	<b>1.8</b>
	between all tests on different days	SD	0.610	0.663	0.647	0.721	<b>0.660</b>
		CV %	2.1	2.0	2.3	2.4	<b>2.2</b>

Length							
			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
<b>Average of Instruments (Grubbs)</b>			1.1428	1.1868	1.0232	1.1104	
<b>Reference Values for Evaluation</b>			1.1428	1.1868	1.0232	1.1104	
<b>Number Of Instruments</b>			131	131	131	131	<b>131</b>
<b>Inter-Instrument Variation</b>	based on 30 tests	SD	0.0093	0.0089	0.0099	0.0100	<b>0.0095</b>
		CV %	0.8	0.7	1.0	0.9	<b>0.9</b>
	based on 6 tests	SD	0.0106	0.0110	0.0118	0.0112	<b>0.0112</b>
		CV %	0.9	0.9	1.1	1.0	<b>1.0</b>
	based on single tests	SD	0.0144	0.0142	0.0160	0.0152	<b>0.0149</b>
		CV %	1.3	1.2	1.6	1.4	<b>1.3</b>
<b>Typical within-instrument Variation (Median)</b>	between different days with each 6 tests	SD	0.0057	0.0057	0.0059	0.0057	<b>0.0057</b>
		CV %	0.5	0.5	0.6	0.5	<b>0.5</b>
	between single tests on one day	SD	0.0099	0.0092	0.0099	0.0100	<b>0.0097</b>
		CV %	0.9	0.8	1.0	0.9	<b>0.9</b>
	between all tests on different days	SD	0.0107	0.0106	0.0111	0.0110	<b>0.0109</b>
		CV %	0.9	0.9	1.1	1.0	<b>1.0</b>

Uniformity							
			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			82.585	83.959	79.537	81.091	
Reference Values for Evaluation			82.585	83.959	79.537	81.091	
Number Of Instruments			130	130	130	130	<b>130</b>
Inter-Instrument Variation	based on 30 tests	SD	0.394	0.377	0.450	0.476	<b>0.424</b>
		CV %	0.5	0.4	0.6	0.6	<b>0.5</b>
	based on 6 tests	SD	0.496	0.479	0.542	0.533	<b>0.512</b>
		CV %	0.6	0.6	0.7	0.7	<b>0.6</b>
Typical within-instrument Variation (Median)	based on single tests	SD	0.700	0.642	0.727	0.748	<b>0.704</b>
		CV %	0.8	0.8	0.9	0.9	<b>0.9</b>
	between different days with each 6 tests	SD	0.288	0.250	0.295	0.283	<b>0.279</b>
		CV %	0.3	0.3	0.4	0.3	<b>0.3</b>
Typical within-instrument Variation (Median)	between single tests on one day	SD	0.502	0.429	0.485	0.498	<b>0.479</b>
		CV %	0.6	0.5	0.6	0.6	<b>0.6</b>
	between all tests on different days	SD	0.571	0.507	0.551	0.576	<b>0.551</b>
		CV %	0.7	0.6	0.7	0.7	<b>0.7</b>

Color Rd							
			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			76.217	74.566	76.519	69.736	
Reference Values for Evaluation			76.217	74.566	76.519	69.736	
Number Of Instruments			129	129	129	129	<b>129</b>
Inter-Instrument Variation	based on 30 tests	SD	0.490	0.466	0.538	0.654	<b>0.537</b>
		CV %	0.6	0.6	0.7	0.9	<b>0.7</b>
	based on 6 tests	SD	0.519	0.484	0.567	0.662	<b>0.558</b>
		CV %	0.7	0.6	0.7	0.9	<b>0.8</b>
Typical within-instrument Variation (Median)	based on single tests	SD	0.562	0.549	0.595	0.677	<b>0.596</b>
		CV %	0.7	0.7	0.8	1.0	<b>0.8</b>
	between different days with each 6 tests	SD	0.150	0.160	0.166	0.179	<b>0.163</b>
		CV %	0.2	0.2	0.2	0.3	<b>0.2</b>
Typical within-instrument Variation (Median)	between single tests on one day	SD	0.161	0.164	0.148	0.174	<b>0.162</b>
		CV %	0.2	0.2	0.2	0.2	<b>0.2</b>
	between all tests on different days	SD	0.240	0.255	0.233	0.275	<b>0.251</b>
		CV %	0.3	0.3	0.3	0.4	<b>0.3</b>

Color +b							
			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			9.468	13.877	12.209	14.891	
Reference Values for Evaluation			9.468	13.877	12.209	14.891	
Number Of Instruments			129	129	129	129	<b>129</b>
Inter-Instrument Variation	based on 30 tests	SD	0.210	0.397	0.263	0.357	<b>0.307</b>
		CV %	2.2	2.9	2.2	2.4	<b>2.4</b>
	based on 6 tests	SD	0.237	0.340	0.292	0.362	<b>0.308</b>
		CV %	2.5	2.4	2.4	2.4	<b>2.4</b>
Typical within-instrument Variation (Median)	based on single tests	SD	0.274	0.403	0.312	0.389	<b>0.345</b>
		CV %	2.9	2.9	2.6	2.6	<b>2.7</b>
	between different days with each 6 tests	SD	0.088	0.112	0.093	0.114	<b>0.102</b>
		CV %	0.9	0.8	0.8	0.8	<b>0.8</b>
Typical within-instrument Variation (Median)	between single tests on one day	SD	0.090	0.098	0.080	0.092	<b>0.090</b>
		CV %	1.0	0.7	0.7	0.6	<b>0.7</b>
	between all tests on different days	SD	0.128	0.155	0.140	0.155	<b>0.145</b>
		CV %	1.4	1.1	1.1	1.0	<b>1.2</b>

Optional Parameters

Inter-Instrument Averages, Inter-Instrument Variations, Typical within-instrument Variations

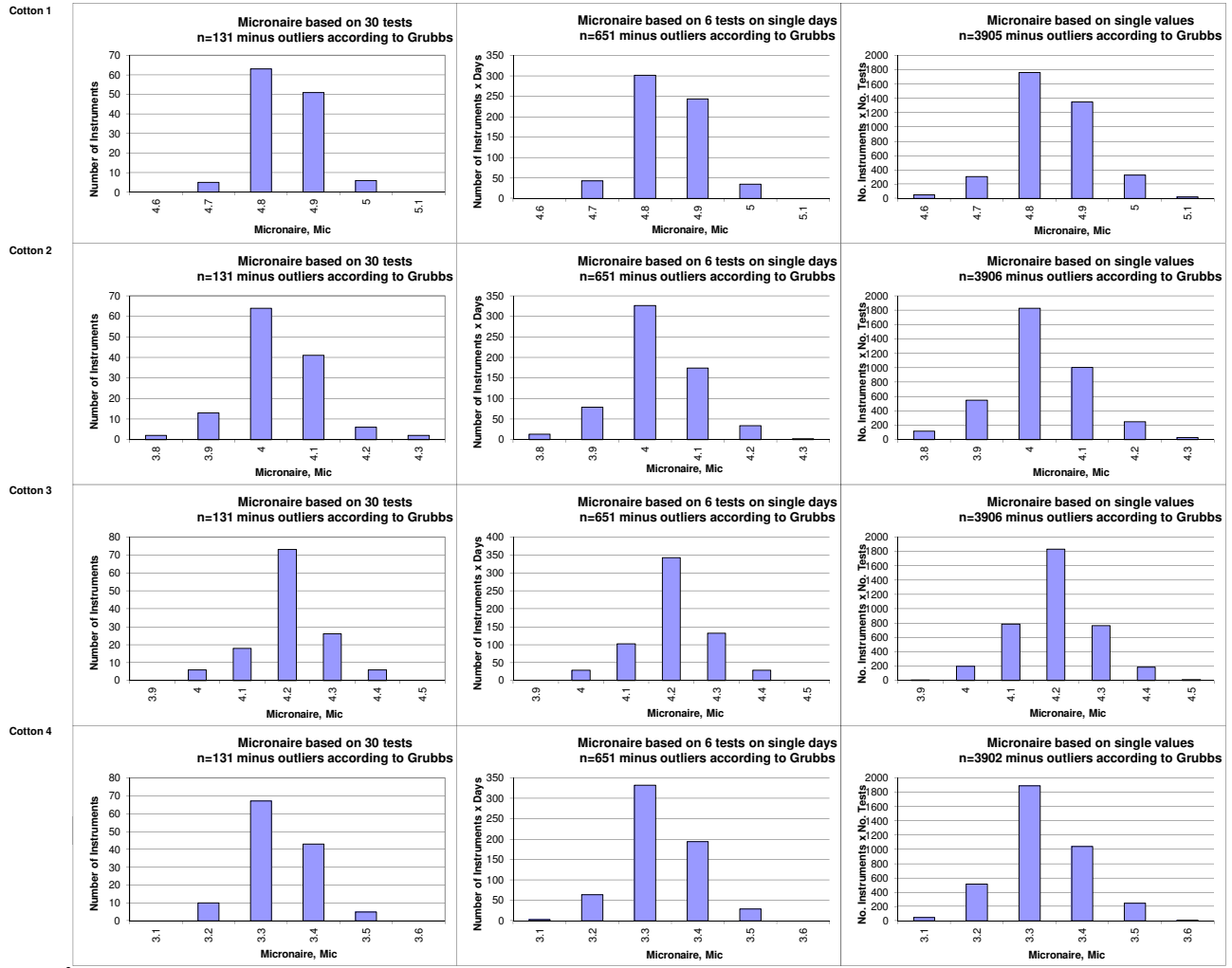
Trash Count							
			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			12.08	25.17	14.86	20.95	
Reference Values for Evaluation			12.08	25.17	14.86	20.95	
Number Of Instruments			81	81	81	81	<b>81</b>
Inter-Instrument Variation	based on 30 tests	SD	4.23	9.48	4.18	6.22	<b>6.03</b>
		CV %	35.0	37.7	28.1	29.7	<b>32.6</b>
	based on 6 tests	SD	4.44	9.57	4.46	6.92	<b>6.35</b>
		CV %	36.8	38.0	30.0	33.0	<b>34.5</b>
	based on single tests	SD	5.02	10.11	5.45	7.34	<b>6.98</b>
		CV %	41.5	40.2	36.7	35.0	<b>38.4</b>
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	1.33	2.08	1.70	1.60	<b>1.68</b>
		CV %	11.0	8.3	11.4	7.7	<b>9.6</b>
	between single tests on one day	SD	2.14	3.06	2.43	2.84	<b>2.62</b>
		CV %	17.7	12.2	16.3	13.6	<b>14.9</b>
	between all tests on different days	SD	2.60	3.78	3.16	3.29	<b>3.21</b>
		CV %	21.5	15.0	21.3	15.7	<b>18.4</b>

Trash Area							
			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			0.125	0.186	0.142	0.179	
Reference Values for Evaluation			0.125	0.186	0.142	0.179	
Number Of Instruments			81	81	81	81	<b>81</b>
Inter-Instrument Variation	based on 30 tests	SD	0.030	0.052	0.033	0.048	<b>0.041</b>
		CV %	24.2	27.8	23.0	26.8	<b>25.5</b>
	based on 6 tests	SD	0.036	0.055	0.037	0.051	<b>0.045</b>
		CV %	28.6	29.5	26.4	28.2	<b>28.2</b>
	based on single tests	SD	0.046	0.064	0.050	0.060	<b>0.055</b>
		CV %	37.1	34.3	35.3	33.7	<b>35.1</b>
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.018	0.018	0.023	0.018	<b>0.019</b>
		CV %	14.0	9.8	15.9	9.8	<b>12.4</b>
	between single tests on one day	SD	0.026	0.027	0.028	0.027	<b>0.027</b>
		CV %	20.4	14.2	19.7	15.2	<b>17.4</b>
	between all tests on different days	SD	0.035	0.033	0.037	0.035	<b>0.035</b>
		CV %	27.7	17.6	26.0	19.8	<b>22.8</b>

Maturity							
			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
Average of Instruments (Grubbs)			86.94	85.63	85.73	84.03	
Reference Values for Evaluation			86.94	85.63	85.73	84.03	
Number Of Instruments			72	72	72	72	<b>72</b>
Inter-Instrument Variation	based on 30 tests	SD	1.20	1.20	0.81	0.92	<b>1.03</b>
		CV %	1.4	1.4	0.9	1.1	<b>1.2</b>
	based on 6 tests	SD	1.14	1.16	0.81	0.97	<b>1.02</b>
		CV %	1.3	1.4	0.9	1.1	<b>1.2</b>
	based on single tests	SD	1.17	1.11	0.83	1.05	<b>1.04</b>
		CV %	1.3	1.3	1.0	1.3	<b>1.2</b>
Typical within-instrument Variation (Median)	between different days with each 6 tests	SD	0.15	0.14	0.15	0.15	<b>0.15</b>
		CV %	0.2	0.2	0.2	0.2	<b>0.2</b>
	between single tests on one day	SD	0.22	0.16	0.19	0.23	<b>0.20</b>
		CV %	0.2	0.2	0.2	0.3	<b>0.2</b>
	between all tests on different days	SD	0.37	0.28	0.35	0.36	<b>0.34</b>
		CV %	0.4	0.3	0.4	0.4	<b>0.4</b>

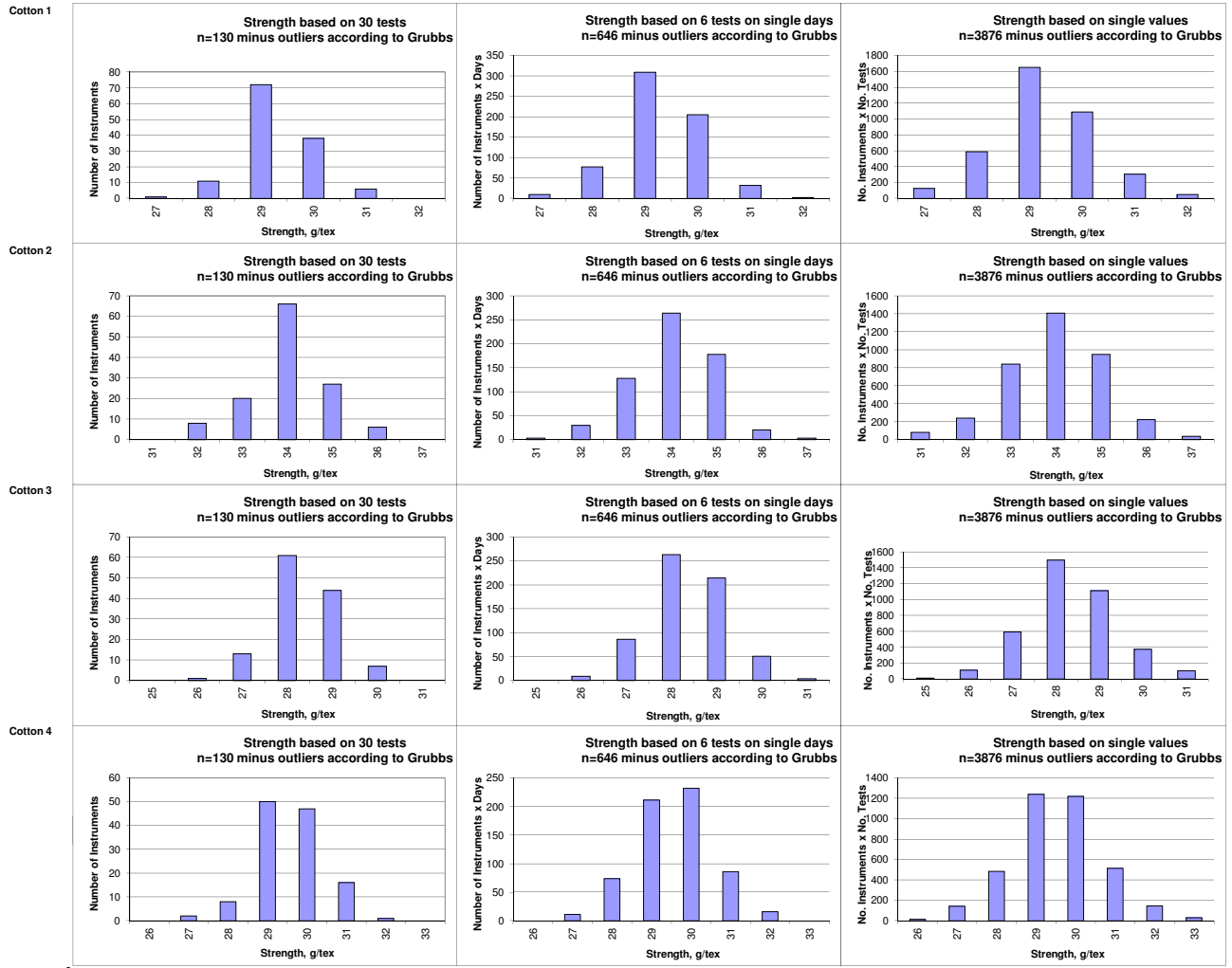
SFI							
			Cotton 1	Cotton 2	Cotton 3	Cotton 4	Average
<b>Average of Instruments (Grubbs)</b>			8.90	7.31	12.51	10.30	
<b>Reference Values for Evaluation</b>			8.90	7.31	12.51	10.30	
<b>Number Of Instruments</b>			84	83	84	84	<b>84</b>
<b>Inter-Instrument Variation</b>	based on 30 tests	SD	0.73	0.61	1.39	1.00	<b>0.94</b>
		CV %	8.2	8.4	11.1	9.7	<b>9.4</b>
	based on 6 tests	SD	0.76	0.67	1.40	1.05	<b>0.97</b>
		CV %	8.5	9.2	11.2	10.2	<b>9.8</b>
	based on single tests	SD	0.88	0.71	1.56	1.21	<b>1.09</b>
		CV %	9.9	9.7	12.5	11.7	<b>10.9</b>
<b>Typical within-instrument Variation (Median)</b>	between different days with each 6 tests	SD	0.26	0.16	0.39	0.27	<b>0.27</b>
		CV %	2.9	2.2	3.2	2.6	<b>2.7</b>
	between single tests on one day	SD	0.41	0.30	0.60	0.48	<b>0.45</b>
		CV %	4.6	4.1	4.8	4.7	<b>4.6</b>
	between all tests on different days	SD	0.50	0.32	0.73	0.56	<b>0.53</b>
		CV %	5.6	4.4	5.8	5.4	<b>5.3</b>

Test Result Distributions  
Micronaire



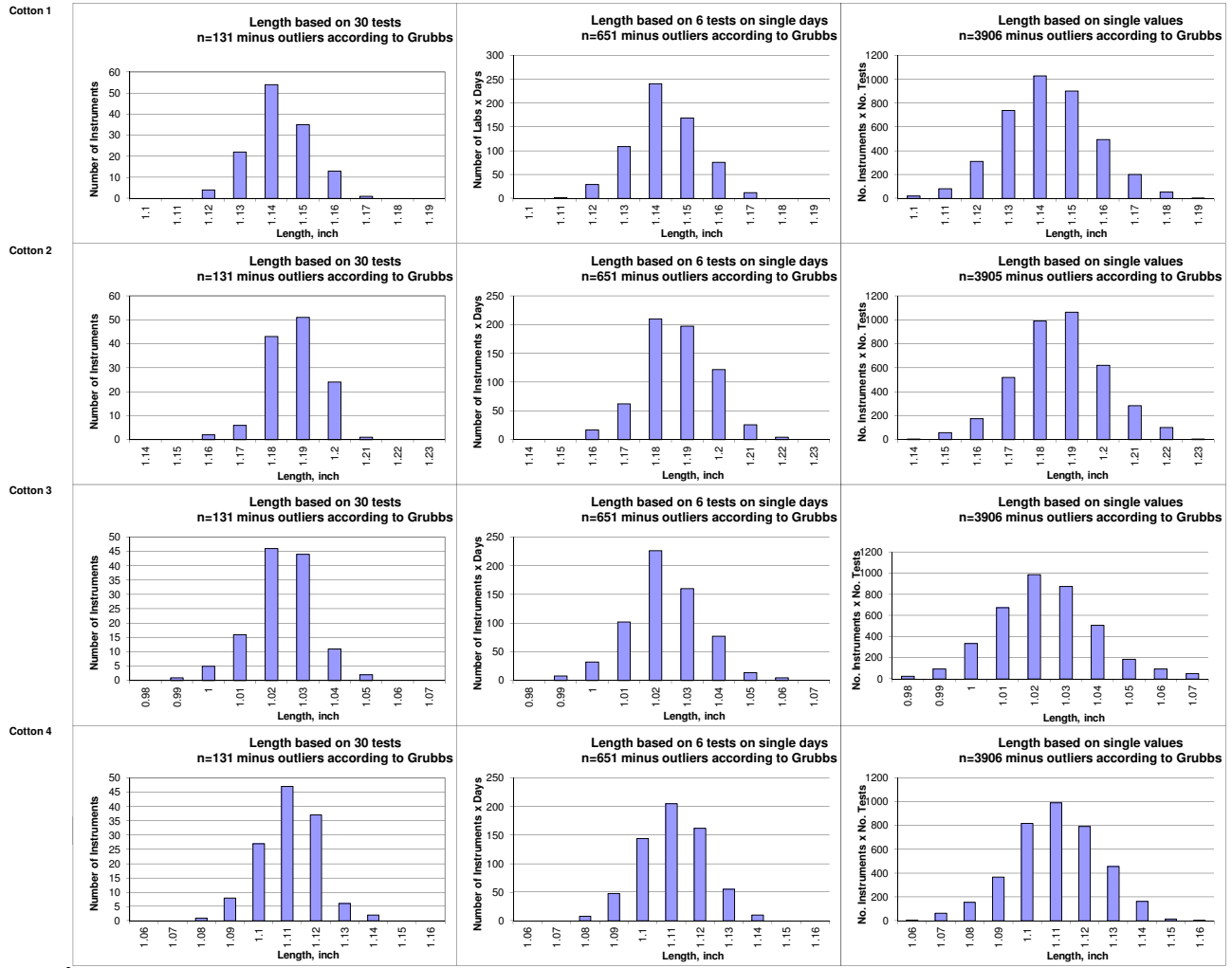
(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method.)  
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions  
Strength



(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)  
(classes are defined as > lower limit and <= upper limit)

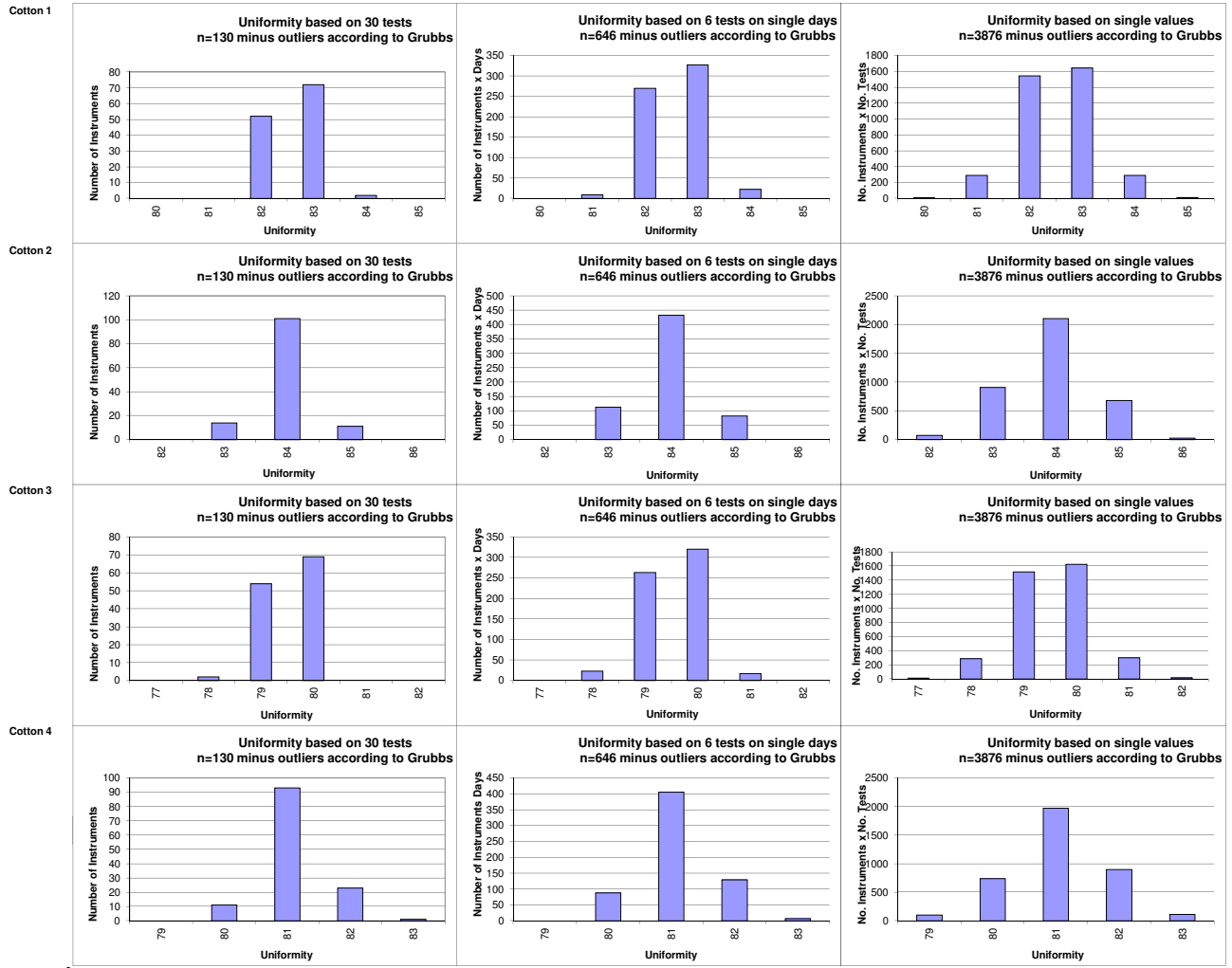
Test Result Distributions  
Length



(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)  
(classes are defined as > lower limit and <= upper limit)

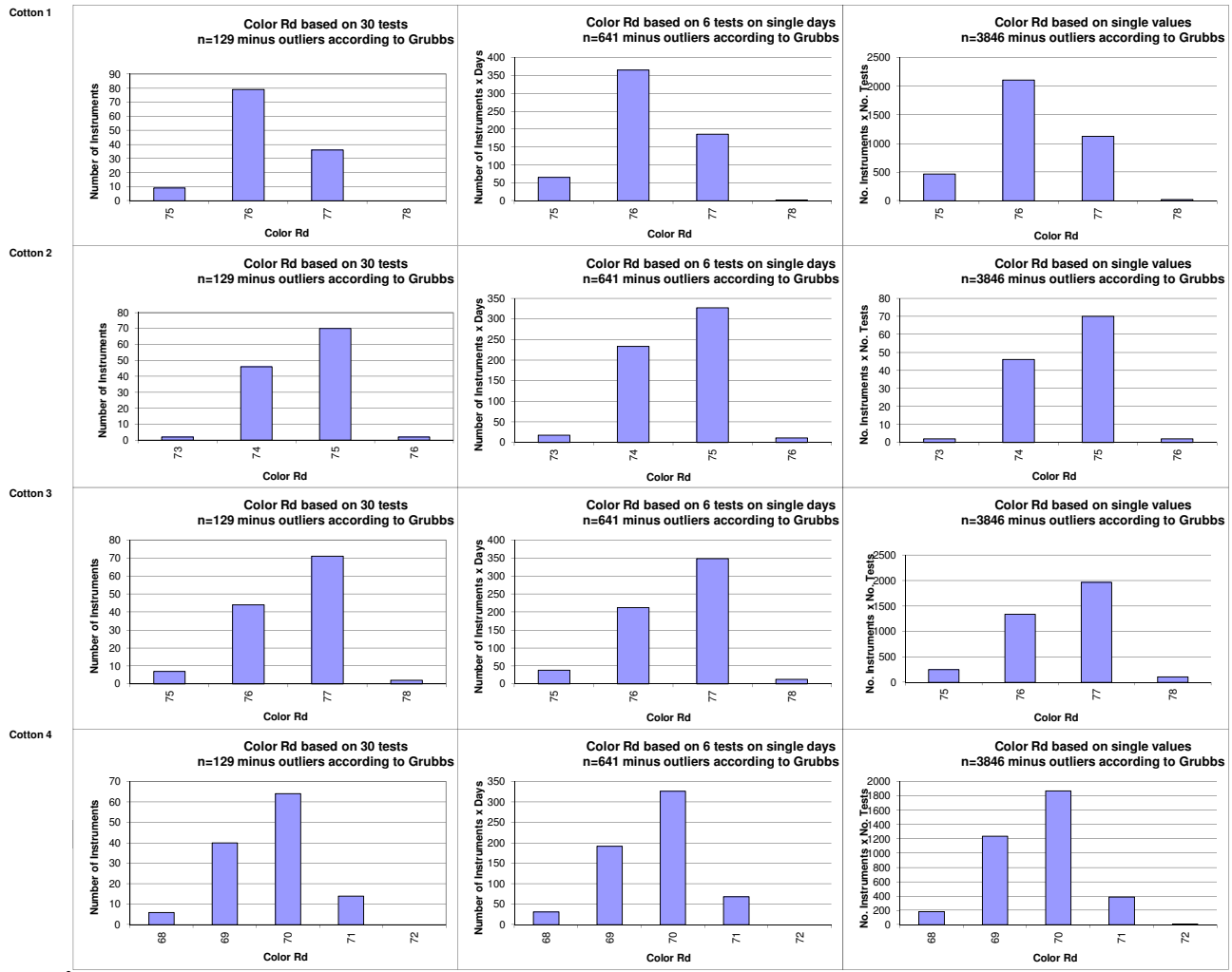


Test Result Distributions  
Uniformity



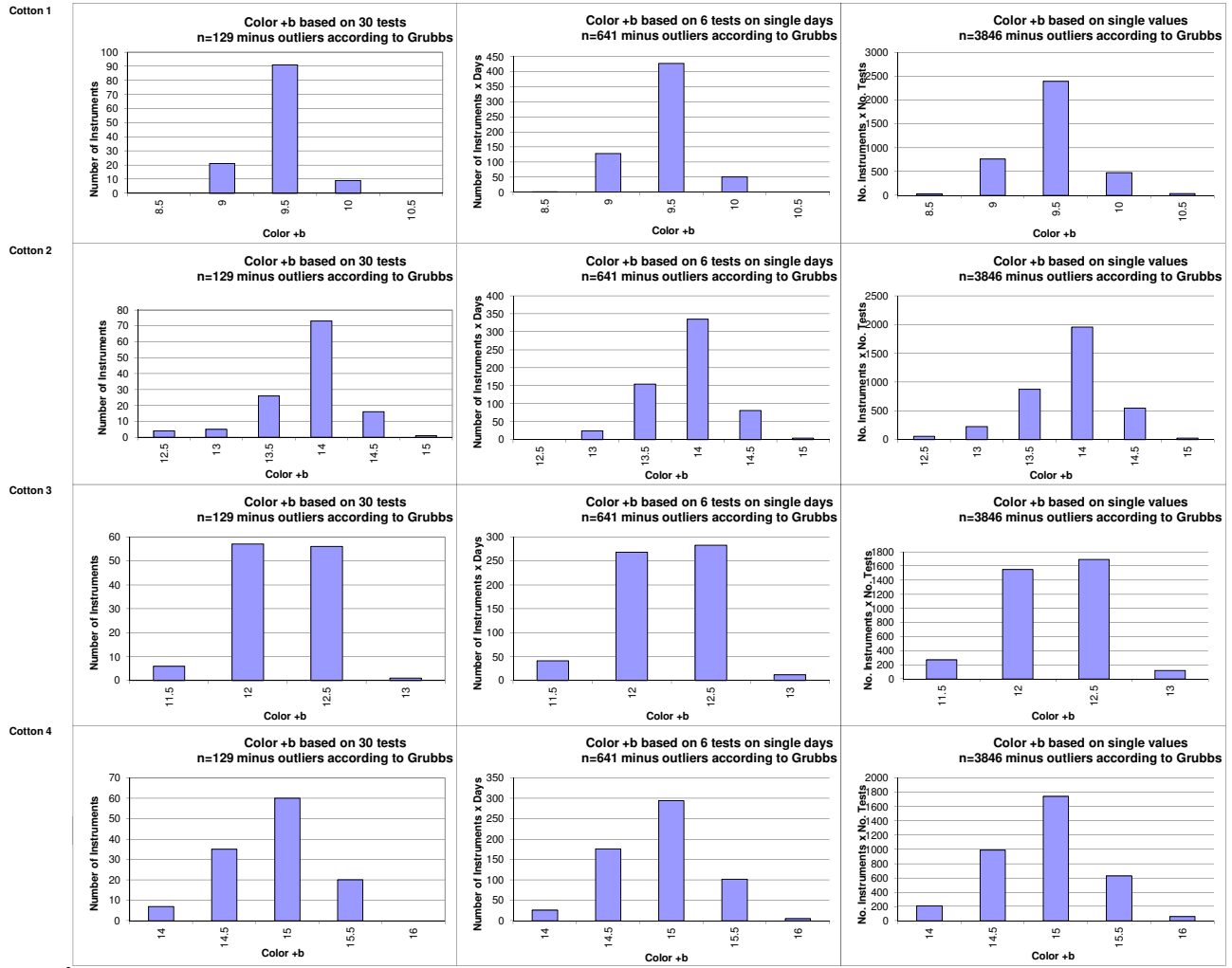
(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)  
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions  
Color Rd



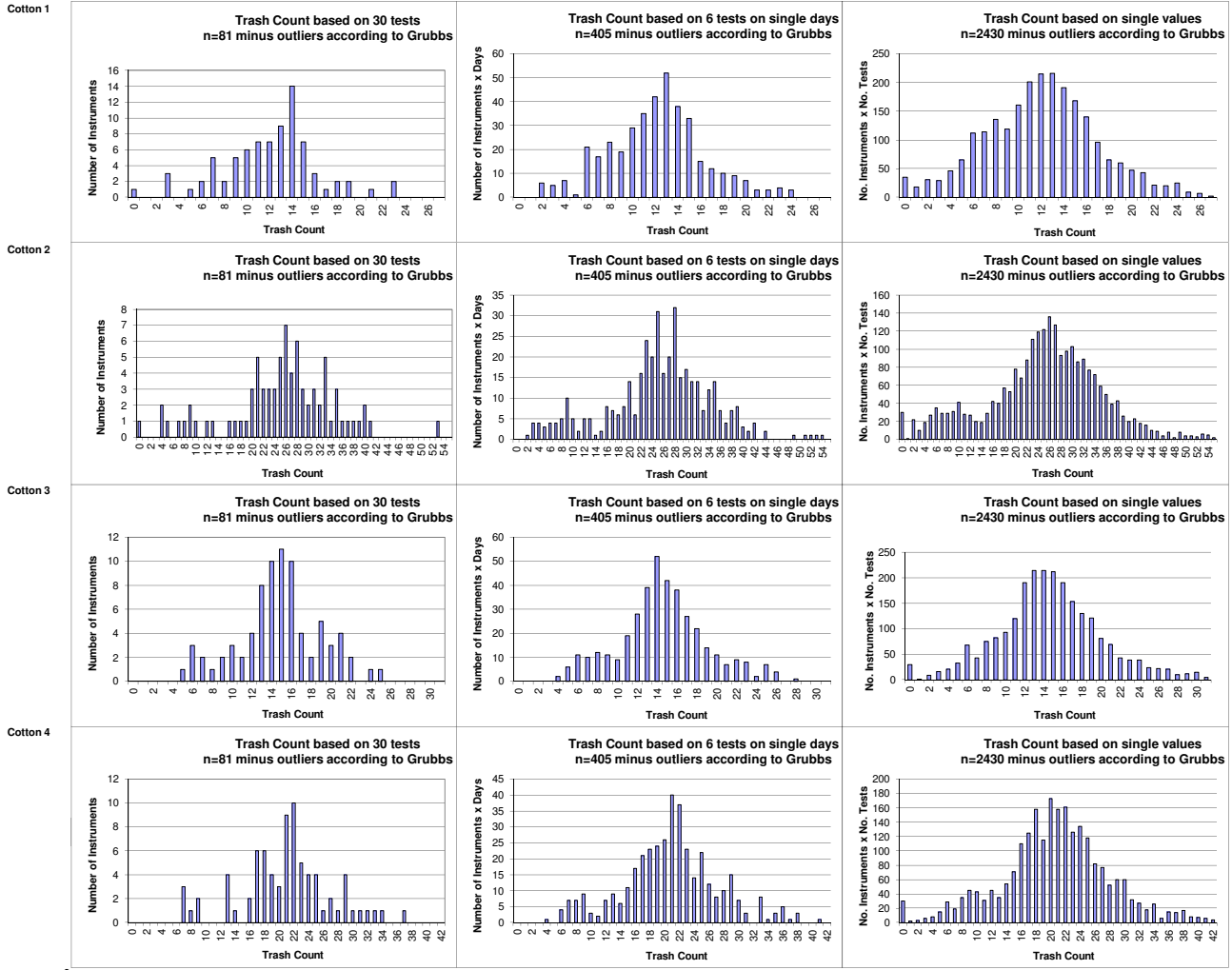
(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)  
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions  
Color +b



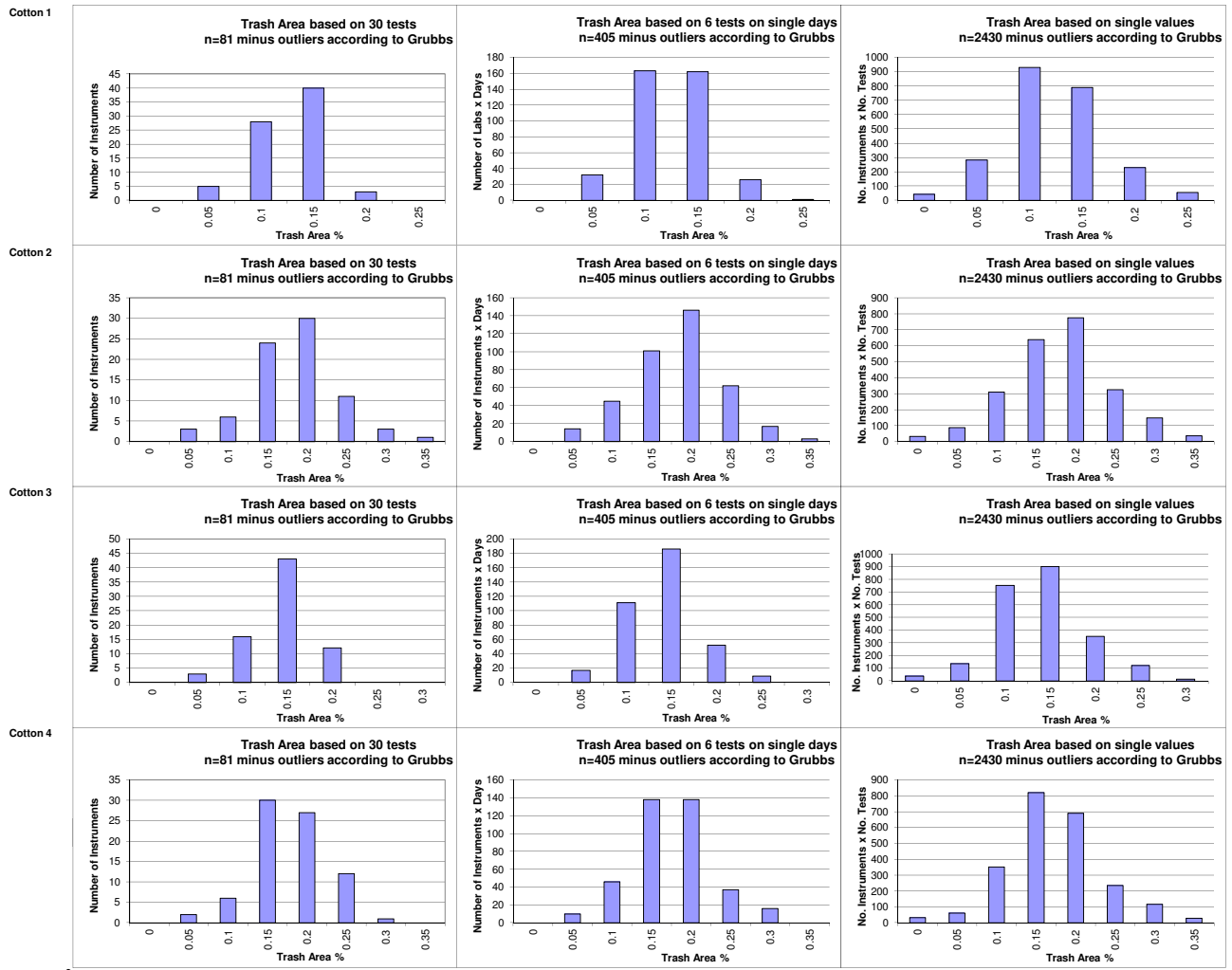
(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)  
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions  
Trash Count



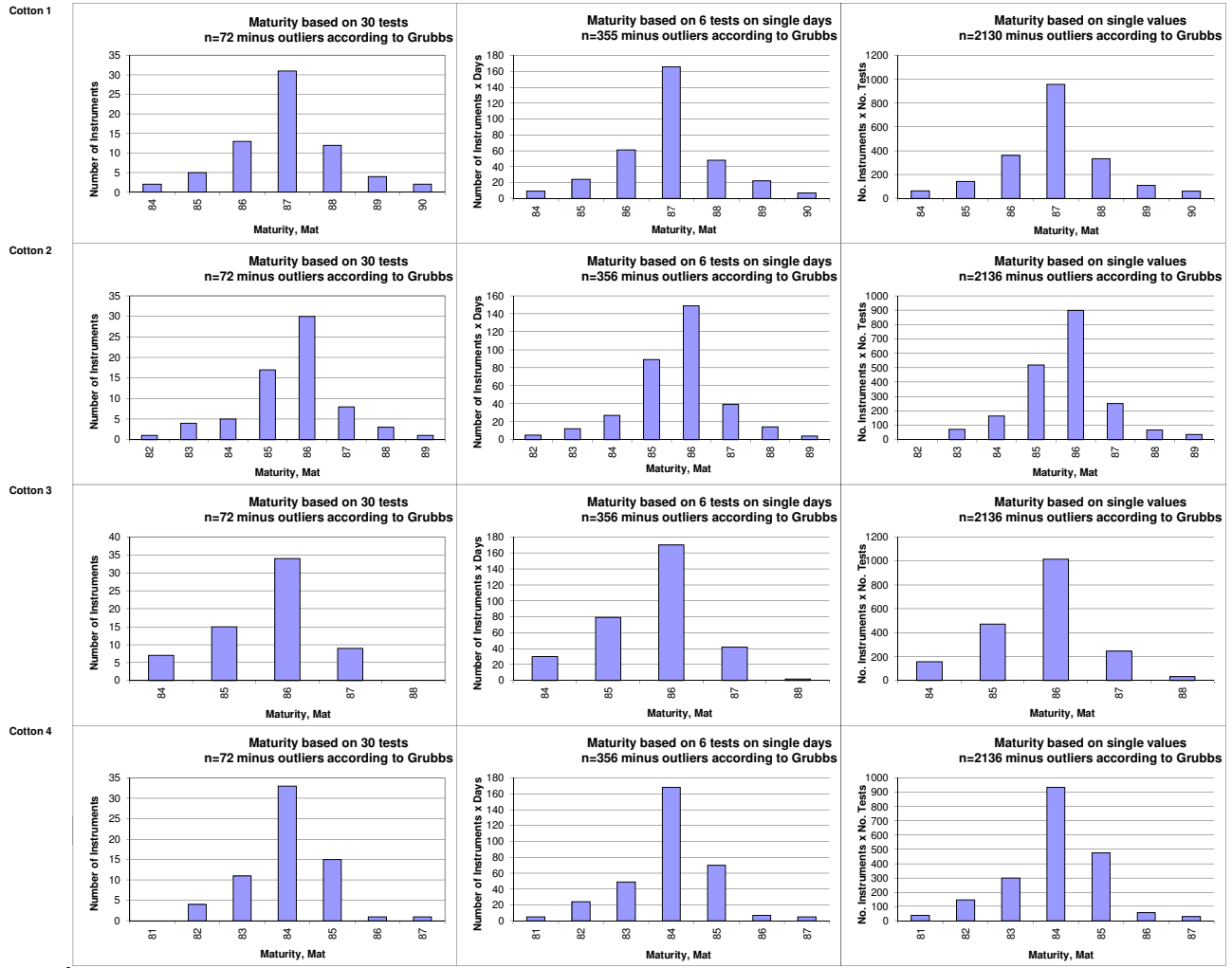
(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)  
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions  
Trash Area



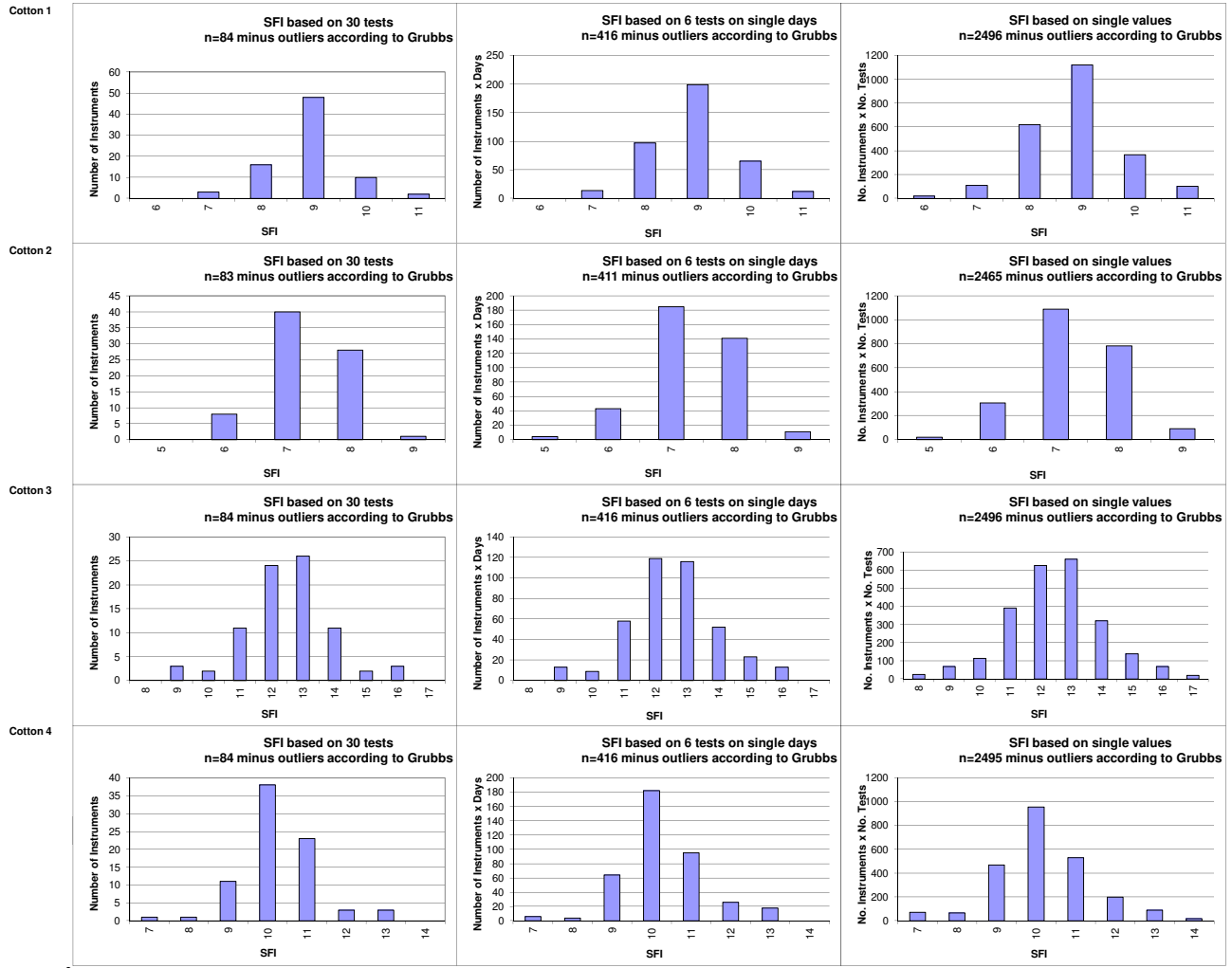
(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)  
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions  
Maturity



(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method.)  
(classes are defined as > lower limit and <= upper limit)

Test Result Distributions  
SFI



(Only results from instruments/days/single tests that are not regarded as outliers according to Grubbs' method)  
(classes are defined as > lower limit and <= upper limit)



International Cotton Advisory Committee



## CSITC Global - Round Trial 2018 - 4 General Evaluation

Section One: Result Distribution  
**Section Two: Instrument Evaluation**  
Section Three: Within Limits Evaluation

### Section Two: Instrument Evaluation

Content:

- Evaluation of Combined Parameters
- Evaluation of Single Parameters

Executed By:  
Faserinstitut Bremen e.V., Bremen, Germany\*  
USDA-AMS, Memphis, TN, USA

System Provided by:  
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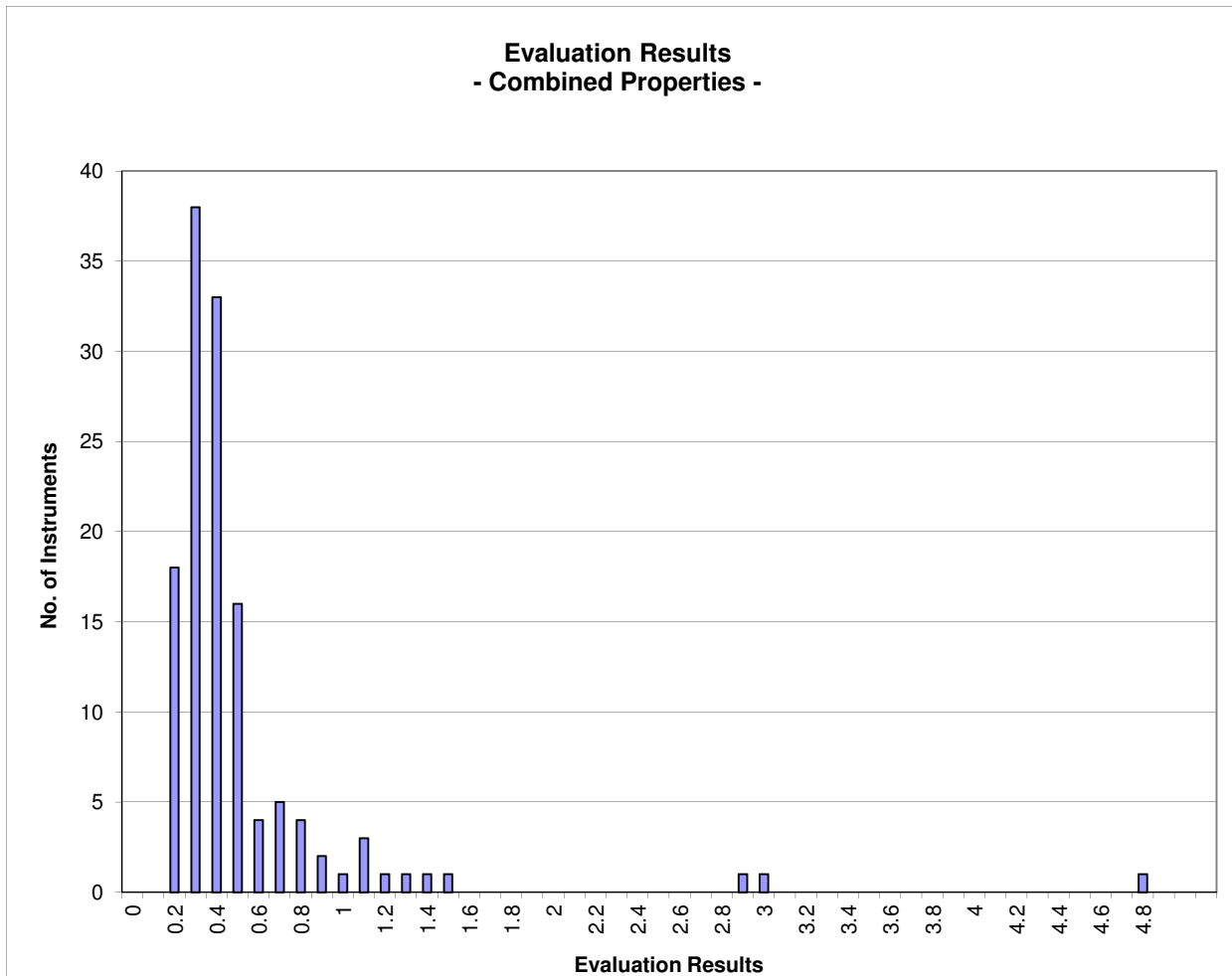
Instrument Evaluation

- Graph of Combined Properties -

According to ICAC CSITC Task Force Recommendations

Global - Round Trial 2018 - 4

		<b>Evaluation Combined Prop.</b>
<b>Statistics</b>	Average	0.52
	Median	0.39
	Best Instrument	0.18
	Worst Instrument	4.85



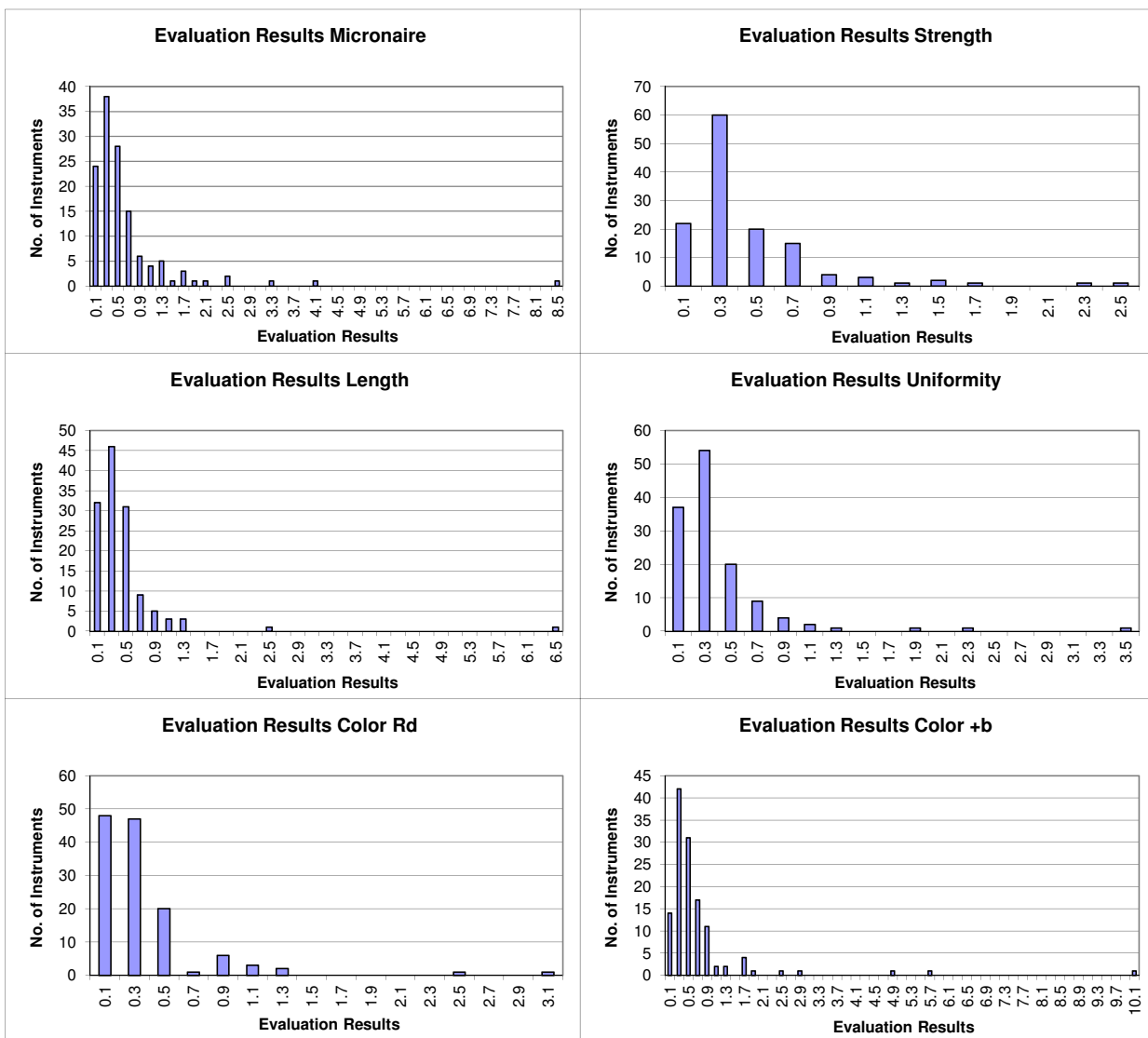
x-Axis shows midpoints of classes

The evaluation results are entered based on the unrounded values

(classes are defined as > lower limit and <= upper limit)

Instrument Evaluation  
 - Graph of Single Properties -  
 According to ICAC CSITC Task Force Recommendations  
 Global - Round Trial 2018 - 4

		Evaluation Micronaire	Evaluation Strength	Evaluation Length	Evaluation Uniformity	Evaluation Color Rd	Evaluation Color +b
Statistics	Average	0.67	0.45	0.46	0.40	0.36	0.71
	Median	0.41	0.34	0.33	0.29	0.26	0.43
	Best Instr.	0.07	0.03	0.06	0.07	0.05	0.06
	Worst Instr.	8.59	2.43	6.57	3.57	3.01	10.06



x-Axis shows midpoints of classes  
 The evaluation results are entered based on the unrounded values



International Cotton Advisory Committee



## CSITC Global - Round Trial 2018 - 4 General Evaluation

Section One: Result Distribution  
Section Two: Instrument Evaluation  
**Section Three: Within Limits Evaluation**

### Section Three: Within Limits Evaluation

Content:

- Based on Average of 30 Test Results
- Based on Single Test Results

Executed By:  
Faserinstitut Bremen e.V., Bremen, Germany\*  
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## Within Limits Evaluation

Based on average of 30 test results for each sample

	<b>Micronaire</b>	<b>Strength</b>	<b>Length</b>	<b>Uniformity</b>	<b>Color Rd</b>	<b>Color +b</b>
Limits	0.20	2.0	0.030	2.0	1.5	0.5
	units	g/tex	inch	%	units	units
Average % Results within Limits	95.0	95.4	97.3	98.3	94.8	86.6
Completely within limits	90.1	90.0	93.9	96.9	89.9	73.6
% of Instruments $\geq 75\%$ within limits	95.4	96.2	97.7	97.7	92.2	86.0
% of Instruments $\geq 50\%$ within limits	96.2	96.9	98.5	98.5	97.7	91.5

## Within Limits Evaluation

Based on Single Test Results

	<b>Micronaire</b>	<b>Strength</b>	<b>Length</b>	<b>Uniformity</b>	<b>Color Rd</b>	<b>Color +b</b>
Limits	0.20	2.0	0.030	2.0	1.5	0.5
	units	g/tex	inch	%	units	units
Average % Results within Limits	93.9	91.6	95.3	96.9	93.5	81.6
% of Instruments 100% within limits	60.3	24.6	34.4	56.9	63.6	20.9
% of Instruments $\geq 95\%$ within limits	83.2	64.6	78.6	90.0	82.9	49.6
% of Instruments $\geq 75\%$ within limits	92.4	92.3	96.9	96.9	89.9	72.1
% of Instruments $\geq 65\%$ within limits	93.9	92.3	98.5	97.7	93.0	79.1
% of Instruments $\geq 50\%$ within limits	96.2	96.2	98.5	97.7	96.1	90.7