

LAWSON-HEMPHILL BROKEN FILAMENT and EVENNESS TEST RESULTS

for GLASSFIBER
with CTT machine





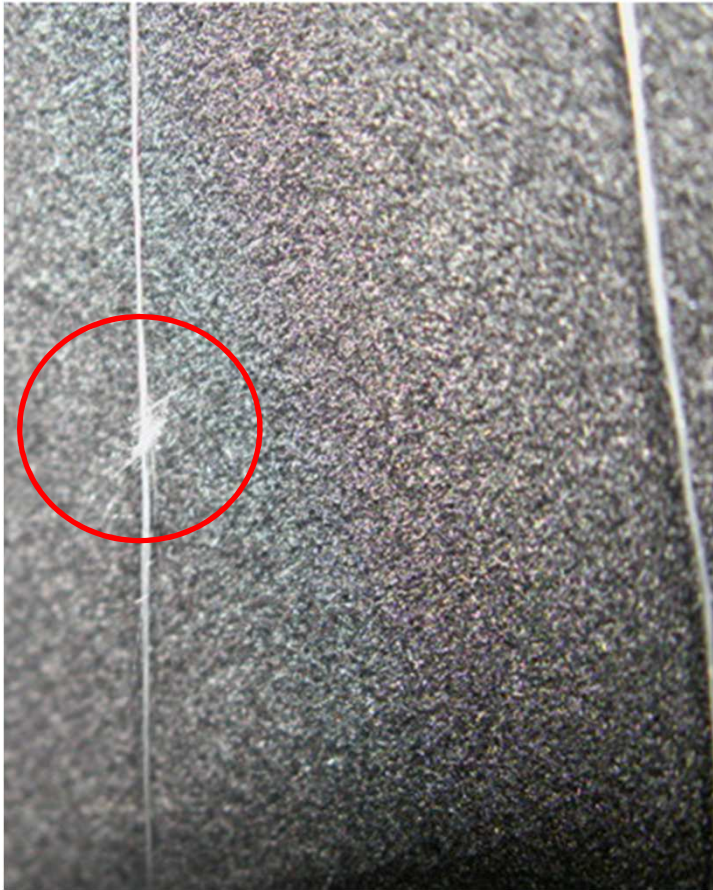
LAWSON-HEMPHILL CTT INSTRUMENT

CTT machine (Constant Tension Transport for Dynamic Yarn Testing)



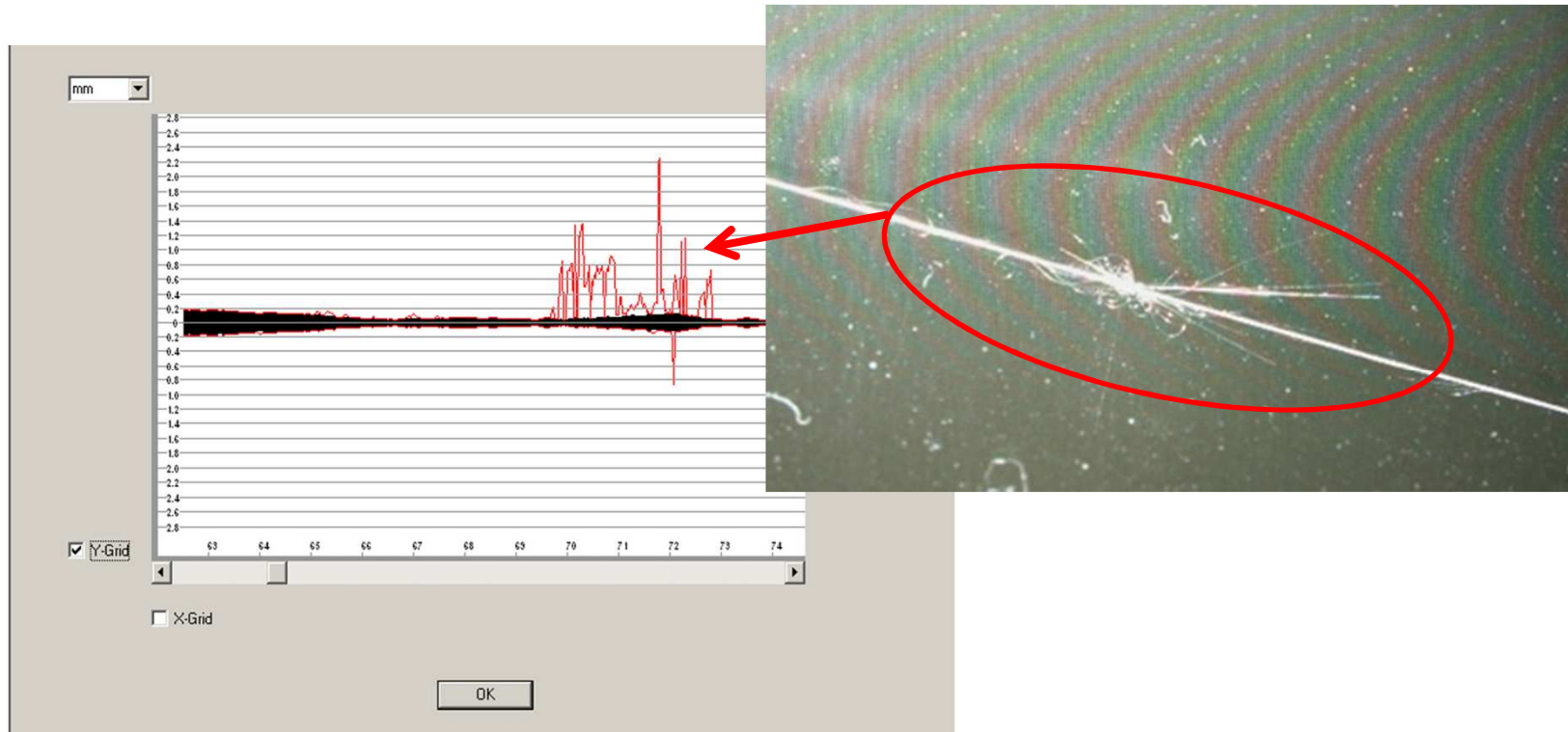


Common Glassfiber Yarn Defects





Glassfiber Yarn Defects as seen by Lawson-Hemphill YAS software





YAS Broken Filament Test Results

This sample has 36 hairs that are 0.5mm long.

Setup:	Reference Diameter: 0.100	Test Length: 100	Test Speed: 50	Light Level: 175														
Results:																		
Threshold	Hairs / Test	Hairs / Meter																
3.00 mm	0	0.00																
2.50 mm	3	0.03																
2.00 mm	5	0.05																
1.50 mm	7	0.07																
1.00 mm	12	0.12																
0.50 mm	36	0.36																
			<table border="1"><thead><tr><th>Threshold</th><th>Percent Contribution</th></tr></thead><tbody><tr><td>3.00 mm</td><td>0.0%</td></tr><tr><td>2.50 mm</td><td>4.8%</td></tr><tr><td>2.00 mm</td><td>7.9%</td></tr><tr><td>1.50 mm</td><td>11.1%</td></tr><tr><td>1.00 mm</td><td>19.0%</td></tr><tr><td>0.50 mm</td><td>57.1%</td></tr></tbody></table>		Threshold	Percent Contribution	3.00 mm	0.0%	2.50 mm	4.8%	2.00 mm	7.9%	1.50 mm	11.1%	1.00 mm	19.0%	0.50 mm	57.1%
Threshold	Percent Contribution																	
3.00 mm	0.0%																	
2.50 mm	4.8%																	
2.00 mm	7.9%																	
1.50 mm	11.1%																	
1.00 mm	19.0%																	
0.50 mm	57.1%																	
Average Diameter: 0.132 Standard Deviation: 0.047 CV%: 35.62																		



YAS Broken Filament Test Results

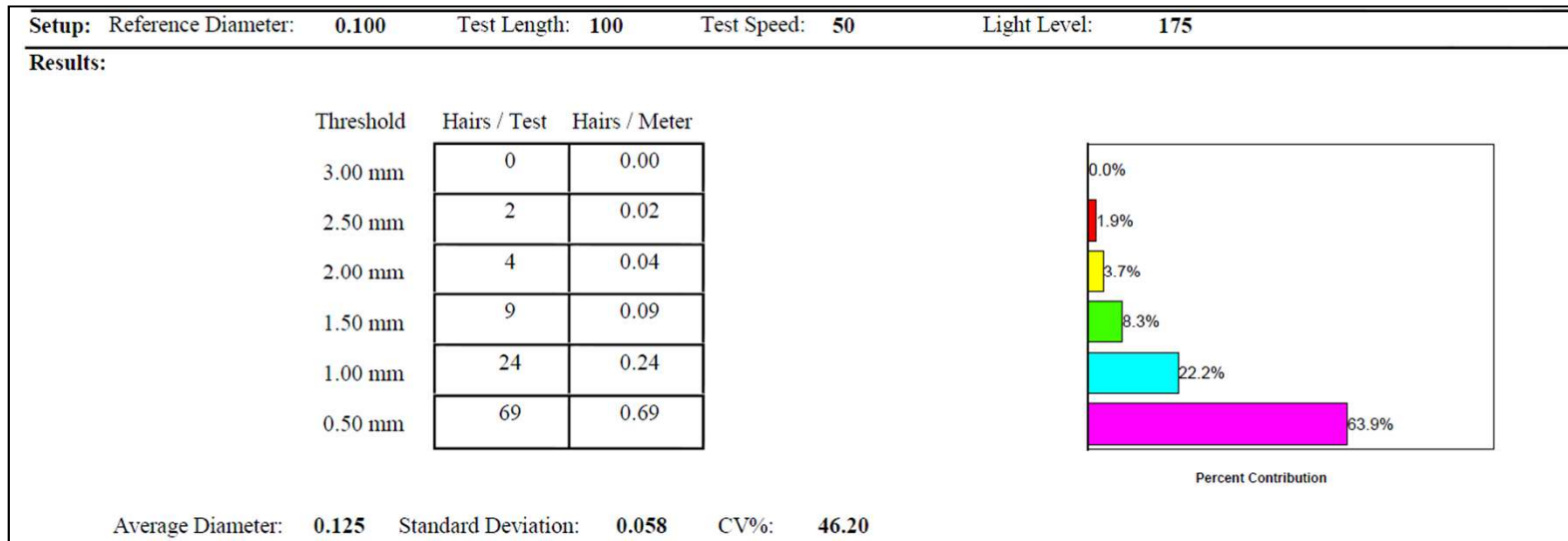
This sample has 1 hair that is 0.5mm long.

Setup: Reference Diameter:	0.100	Test Length:	100	Test Speed:	50	Light Level:	175
Results:							
	Threshold	Hairs / Test	Hairs / Meter				
	3.00 mm	0	0.00			0.0%	
	2.50 mm	0	0.00			0.0%	
	2.00 mm	0	0.00			0.0%	
	1.50 mm	0	0.00			0.0%	
	1.00 mm	1	0.01			50.0%	
	0.50 mm	1	0.01			50.0%	
							Percent Contribution
Average Diameter:	0.134	Standard Deviation:	0.078	CV%:	57.83		



YAS Broken Filament Test Results

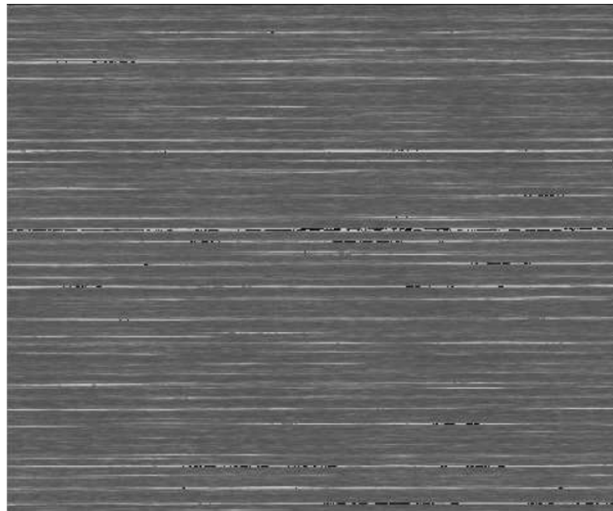
This sample has 69 hairs that are 0.5mm long.



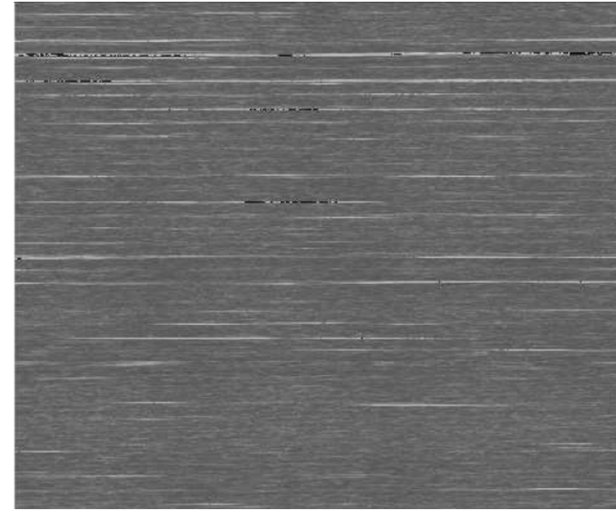


YAS Evenness Test for Glassfiber Yarns

Evenness Comparison of Glassfiber Yarn Sample A and B



Sample A
Total Events = 276



Sample B
Total Events = 170



YAS Evenness Test for Glassfiber Yarns

Evenness Comparison of Glassfiber Sample A >> Total Event = 276

Setup: Reference Diameter: 0.100 Test Length: 100 Test Speed: 100 Light Level: 96																																
Results:																																
Mm. Event Length (mm)	Diameter Difference	Event Length (cm)								Total																						
		0.10 - 0.15	0.15 - 0.20	0.20 - 0.25	0.25 - 0.30	0.30 - 0.35	0.35 - 0.40	0.40 - 0.45	0.45 +																							
10.00	+200 %	4	3	2	1	3	1	0	7	21	<table border="1"> <caption>Percent Contribution</caption> <thead> <tr> <th>Diameter Difference</th> <th>Count</th> <th>Percent Contribution</th> </tr> </thead> <tbody> <tr> <td>+200 %</td> <td>21</td> <td>7.6%</td> </tr> <tr> <td>+100 %</td> <td>80</td> <td>29.0%</td> </tr> <tr> <td>+50 %</td> <td>130</td> <td>47.1%</td> </tr> <tr> <td>-25 %</td> <td>45</td> <td>16.3%</td> </tr> <tr> <td>-50 %</td> <td>0</td> <td>0.0%</td> </tr> <tr> <td>-100 %</td> <td>0</td> <td>0.0%</td> </tr> </tbody> </table>	Diameter Difference	Count	Percent Contribution	+200 %	21	7.6%	+100 %	80	29.0%	+50 %	130	47.1%	-25 %	45	16.3%	-50 %	0	0.0%	-100 %	0	0.0%
Diameter Difference	Count	Percent Contribution																														
+200 %	21	7.6%																														
+100 %	80	29.0%																														
+50 %	130	47.1%																														
-25 %	45	16.3%																														
-50 %	0	0.0%																														
-100 %	0	0.0%																														
10.00	+100 %	24	19	8	8	3	3	1	14	80																						
10.00	+50 %	32	17	16	17	9	9	6	24	130																						
10.00	-25 %	37	6	1	1	0	0	0	0	45																						
10.00	-50 %	0	0	0	0	0	0	0	0	0																						
10.00	-100 %	0	0	0	0	0	0	0	0	0																						
										276																						

Average Diameter: 0.098 Standard Deviation: 0.042 CV%: 42.47





YAS Evenness Test for Glassfiber Yarns

Evenness Comparison of Glassfiber Sample B >> Total Events =170

Setup: Reference Diameter: 0.100 Test Length: 100 Test Speed: 100 Light Level: 96										
Results:										
Min. Event Length (mm)	Diameter Difference	Event Length: (cm)								Total
		0.10 - 0.15	0.15 - 0.20	0.20 - 0.25	0.25 - 0.30	0.30 - 0.35	0.35 - 0.40	0.40 - 0.45	0.45 +	
10.00	+200 %	4	1	2	1	1	1	4	4	18
10.00	+100 %	11	5	12	4	5	3	2	14	56
10.00	+50 %	22	15	14	10	4	8	2	21	96
10.00	-25 %	0	0	0	0	0	0	0	0	0
10.00	-50 %	0	0	0	0	0	0	0	0	0
10.00	-100 %	0	0	0	0	0	0	0	0	0
										170

Average Diameter: 0.105	Standard Deviation: 0.036	CV%: 34.45
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Event Length (cm)	Count	Percent Contribution
0.10 - 0.15	18	10.6%
0.15 - 0.20	56	32.9%
0.20 - 0.25	96	56.5%





CTT APPLICATIONS LIST

- **ELONGATION TEST:** Elongation % is measured under dynamic conditions.
- **FRICTION TESTS:** Yarn to Pin Friction Test (ceramic or metal pin), ASTM D3108
Yarn to Yarn Friction, ASTM standard D3412
- **LINT GENERATION** higher levels of lint indicates higher fiber loss (mg/1000m)
reduced yarn strength and possible slubs on the fabric
also used to test coating loss for glassfibers
- **DIAMETER TEST:** CCD camera measures every 0.50mm of the yarn diameter with
precision of 0.0035mm at 100m/min.

The diameter data is used to count the entanglements in synthetic
yarns and defects such as thick places, thin places and neps in all
other yarns.

measure broken filaments and hairiness

show the yarn profile and appearance on blackboard



CTT APPLICATIONS LIST

- **ABRASION TEST:** To measure the abrasiveness or cutting power of yarn, which affect the wear of the machine components such as needles on knitting & sewing machines, thread guides, healds on the looms.
- **WEAK SPOT TEST:** To find the weak spots in the yarn and its Dynamic Breaking Strength of the yarn. We test the yarn under tension up to 700g when it is running at test speeds up to 360m/min. Every section of the yarn goes under this tension.

Yarn Behavior changes at high test speeds. CTT provides better prediction of the yarn performance when it is formed into fabric.
- **Draw Ratio Test:** We offer this test for the elastomeric yarns with our CTT-E unit.