

**TABLE 1**  
**Board Handsheet Testing Results**

Trial		A	A	B	B	B (REPEAT)	B (REPEAT)	C
Furnish		Control	20%	Control	20%	Control	20%	Control
Replacement For		Curtain	Curtain	Cascade	Cascade	Cascade	Cascade	Curtain
Basis Weight	g/m2	156	155	160	153	148	158	153
Caliper (3 Sheets)	uM	824	840	1049	930	916	909	896
	Std dev	7.83	16.63	13.36	18.25	33.8	14.7	15.17
Slide Angle (1)	Degrees	37.6	37.0	33.5	34.5	35.5	36.2	36.4
	Std dev	2.73	0.94	4.69	2.83	2.55	1.79	3.03
	95 CL Hi	41.0	38.2	39.3	38.0	38.7	38.4	40.2
	95 CL Lo	34.2	35.8	27.7	31.0	32.3	34.0	32.6
Burst Index	kPa*m2/g	2.79	2.93	2.41	2.64	2.54	2.90	2.62
	Std dev	0.173	0.258	0.195	0.137	0.138	0.141	0.101
	95 CL Hi	2.91	3.11	2.55	2.74	2.64	3.00	2.69
	95 CL Lo	2.67	2.75	2.27	2.54	2.44	2.80	2.55
STFI edge compression	klbf-ft/lb	7.20	7.33	4.53	7.14	6.71	6.73	7.71
	Std dev	0.717	0.301	0.629	0.352	0.557	0.277	0.325
	95 CL Hi	7.71	7.55	4.98	7.39	7.11	6.93	7.94
	95 CL Lo	6.69	7.11	4.08	6.89	6.31	6.53	7.48
Water Drop	seconds	>300	<1	1.50	<1	<1	<1	<1
Spots > 0.4 mm		0.00	0.00	0.00	0.00	0	0	0.00
Difference, %		1.88	2.31	2.82	1.99	3.9	4.68	1.890

**NOTES:**

**H 20 %** Large unpulped flakes made pumping difficult. Had trouble running through coarse screen.  
Large flakes plugged pump and screen. Ran smooth through fine screens and cleaners.

**D 20 %** Film on treated material got caught up in pumps and plugged them.  
Some film ragged out on hydropulper thermocouple.  
Stock went through both screens and cleaners smoothly.



<b>C</b>	<b>D</b>	<b>D</b>	<b>E</b>	<b>E</b>	<b>F</b>	<b>F</b>	<b>G</b>	<b>G</b>
<b>20%</b>	<b>Control</b>	<b>20%</b>	<b>Control</b>	<b>20%</b>	<b>Control</b>	<b>20%</b>	<b>Control</b>	<b>20%</b>
<b>Curtain</b>	<b>Cascade</b>	<b>Cascade</b>	<b>Cascade</b>	<b>Cascade</b>	<b>WIM</b>	<b>WIM</b>	<b>Impreg.</b>	<b>Impreg.</b>
155	158	160	152	172	164	163	153	153
909	969	968	872	1005	1052	1074	889	913
3.09	20.0	10.7	16.2	13.9	24.1	17.1	14.3	3.09
36.2	36.3	37.1	38.0	38.3	38.2	33.4	39.1	32.4
2.71	3.23	4.20	2.18	4.27	2.36	2.68	3.47	3.29
39.6	40.3	42.3	40.7	43.6	41.1	36.7	43.4	36.5
32.8	32.3	31.9	35.3	33.0	35.3	30.1	34.8	28.3
2.52	2.70	2.53	2.72	3.34	2.60	2.95	2.69	2.420
0.145	0.044	0.314	0.207	0.201	0.126	0.201	0.231	0.263
2.62	2.73	2.75	2.87	3.48	2.69	3.09	2.86	2.61
2.42	2.67	2.31	2.57	3.20	2.51	2.81	2.52	2.23
7.13	7.42	7.91	7.7	7.52	6.15	5.81	8.00	8.08
0.530	0.355	0.470	0.875	0.829	0.598	0.480	0.49	0.40
7.51	7.67	8.25	8.33	8.11	6.58	6.15	8.35	8.37
6.75	7.17	7.57	7.07	6.93	5.72	5.47	7.65	7.79
<1	<1	<1	<1	<1	5.52	<1	<1	>300
0.33	0	0	0.00	0.00	0	0	0.33	0.00
2.450	4.45	4.17	0.948	0.893	2.07	1.8	0	0.962



<b>G (REPEAT)</b>	<b>G</b>	<b>H</b>	<b>H</b>	<b>I</b>	<b>I</b>	<b>J</b>	<b>J</b>	<b>J (REPEAT)</b>
<b>Control</b>	<b>10%</b>	<b>Control</b>	<b>20%</b>	<b>Control</b>	<b>20%</b>	<b>Control</b>	<b>10%</b>	<b>10%</b>
<b>Impreg.</b>	<b>Impreg.</b>	<b>Impreg/Curt</b>	<b>Impreg/Curt</b>	<b>Curtain</b>	<b>Curtain</b>	<b>WIM</b>	<b>WIM</b>	<b>WIM</b>
157	150	143	150	157	156	150	167	162
912	899	823	866	898	929	854	927	894
19.1	28.0	6.90	6.98	13	26.2	15.3	11.0	13.4
38.5	31.8	33.1	33.3	36.2	36.2	37.0	32.5	34
3.26	1.15	3.86	3.68	9.01	2.51	2.55	2.92	3.3
42.6	33.2	37.9	37.9	47.4	39.3	40.2	36.1	38.1
34.5	30.4	28.3	28.7	25.0	33.1	33.8	28.9	29.9
2.49	2.51	2.59	3.15	3.10	3.05	2.77	3.27	3.11
0.118	0.135	0.128	0.126	0.167	0.198	0.241	0.208	0.19
2.57	2.61	2.68	3.24	3.22	3.19	2.94	3.42	3.25
2.41	2.41	2.50	3.06	2.98	2.91	2.60	3.12	2.97
7.15	6.13	7.43	8.12	8.14	7.95	7.75	7.51	8.09
0.393	0.377	0.637	0.404	0.463	0.576	0.355	0.744	0.7
7.43	6.40	7.89	8.41	8.47	8.36	8.00	8.04	8.59
6.87	5.86	6.97	7.83	7.81	7.54	7.50	6.98	7.59
<1	10.59	<1	3.42	<1	<1	<1	>300	>300
0.333	0	0	0	0	0	0	0	
5.57	4.84	5.22	5.18	1.73	1.77	0.219	0.301	



**TABLE 2**  
**Handsheet Optical Results**

<b>Trial</b>	<b>A</b>	<b>A</b>	<b>B</b>	<b>B</b>	<b>B (REPEAT)</b>	<b>B (REPEAT)</b>
<b>Furnish</b>	<b>Control</b>	<b>20%</b>	<b>Control</b>	<b>20%</b>	<b>Control</b>	<b>20%</b>
<b>Wax Type</b>	<b>Curtain</b>	<b>Curtain</b>	<b>Cascade</b>	<b>Cascade</b>	<b>Cascade</b>	<b>Cascade</b>
<b>Total Number of Spots .4mm or larger</b>	0	0	0	0	0	0
<b>Average/Handsheet</b>	0.00	0.00	0.00	0.00	0	0
<b>Dirt Count / 1 Sq. Meter</b>	629	1020	6030	4090	6077	4237
<b>PPM / 1 Sq. Meter</b>	42.8	81.9	446	302	436	280
<b>Weight Before Carver Press</b>	2.13	2.16	2.13	2.01	2.00	2.05
<b>Weight After Carver Press</b>	2.09	2.11	2.07	1.97	1.92	1.96
<b>Difference, %</b>	-1.88	-2.31	-2.82	-1.99	-3.90	-4.68

**Parameters**

Data is an average of three 6" handsheets and scaled up to 1 square meter

Resolution: 600 dots/inch

Threshold: 35 GSV

256-shade Grayscale Mode

Dirt Spot Size .04 mm up to .25mm

<b>C</b>	<b>C</b>	<b>D</b>	<b>D</b>	<b>E</b>	<b>E</b>	<b>F</b>	<b>F</b>	<b>G</b>
<b>Control</b>	<b>20%</b>	<b>Control</b>	<b>20%</b>	<b>Control</b>	<b>20%</b>	<b>Control</b>	<b>20%</b>	<b>Control</b>
<b>Curtain</b>	<b>Curtain</b>	<b>Cascade</b>	<b>Cascade</b>	<b>Cascade</b>	<b>Cascade</b>	<b>WIM</b>	<b>WIM</b>	<b>Impreg.</b>
0	1	0	0	0	0	0	0	1
0.00	0.33	0	0	0.00	0.00	0	0	0.33
7191	6710	5930	7380	4890	6540	6053	5786	3870
521	457	458	523	358	522	424	406	316
2.12	2.040	2.18	2.23	2.11	2.24	2.09	2.06	2.12
2.08	1.990	2.08	2.14	2.09	2.22	2.05	2.02	2.12
-1.89	-2.45	-4.45	-4.17	-0.948	-0.893	-2.07	-1.80	0.00

<b>G</b>	<b>G (REPEAT)</b>	<b>G</b>	<b>H</b>	<b>H</b>	<b>I</b>	<b>I</b>	<b>J</b>	<b>J</b>
<b>20%</b>	<b>Control</b>	<b>10%</b>	<b>Control</b>	<b>20%</b>	<b>Control</b>	<b>20%</b>	<b>Control</b>	<b>10%</b>
<b>Impreg.</b>	<b>Impreg.</b>	<b>Impreg.</b>	<b>Impreg/Curt</b>	<b>Impreg/Curt</b>	<b>Curtain</b>	<b>Curtain</b>	<b>WIM</b>	<b>WIM</b>
0	1	0	0	0	0	0	0	0
0.00	0.333	0	0	0	0	0	0	0
2639	2615	1259	1190	799	3341	3753	968	1138
189	231	100	79	66.3	251	258	62.3	82.5
2.08	2.14	2.07	2.03	2.05	2.14	2.13	2.13	2.19
2.1	2.02	1.97	1.93	1.94	2.10	2.09	2.14	2.20
0.962	-5.57	-4.84	-5.22	-5.18	-1.73	-1.77	0.22	0.30