



Institute of Paper Science and Technology

PERMANENCE OF PAPER FOR
PRINTED LIBRARY MATERIALS

Project 3655

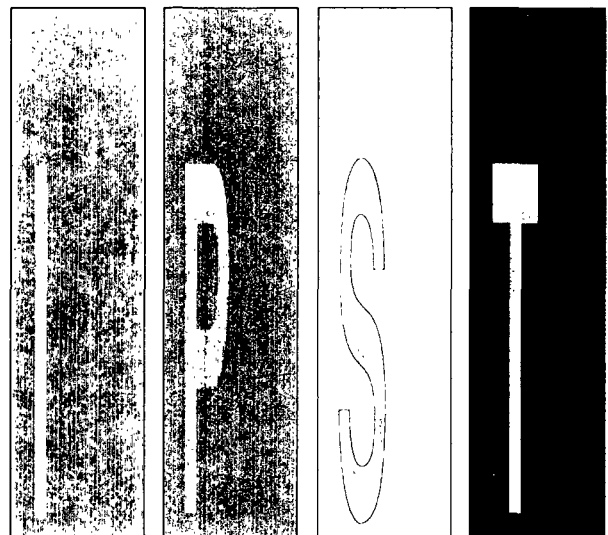
Report Four

A Progress Report

to

NATIONAL INFORMATION STANDARDS ORGANIZATION

September 30, 1991



Atlanta, Georgia

THE INSTITUTE OF PAPER SCIENCE AND TECHNOLOGY

Atlanta, Georgia

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PRINTED LIBRARY MATERIALS

Project 3655

by

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THE INSTITUTE OF PAPER SCIENCE AND TECHNOLOGY

Atlanta, Georgia

PERMANENCE OF PAPER FOR
PRINTED LIBRARY MATERIALS

SUMMARY

Papers intended for printed library materials were subjected to accelerated aging at 90°C and 50% RH. The papers were then tested for tensile strength, folding endurance, and tearing resistance.

Progress Report One, Two and Three presented the results of accelerated aging tests for 17 coated and uncoated papers, most of which contained a high level of alkaline reserve. This report presents data for 4 additional papers which had been alkaline sized.

INTRODUCTION

Papers intended for the library market are expected to have sufficient longevity so as to last several hundred years under normal conditions of library circulation and storage without significant deterioration. The NISO-developed American National Standard for Permanence of Paper for Printed Library Materials (Z39.48) was published in 1984. The standard sets the criteria for permanence of uncoated papers. The standard is being revised to encompass coated papers.

Progress Reports One, January 5, 1989, and Two, June 30, 1989, presented the results of a defined set of tests on 11 coated and 2 uncoated paper samples. The tests were made for unaged paper, and for paper which had been subjected to accelerated aging at 90°C, 50% RH, for intervals of up to 576 hours. All but one of the coated papers had a high pH achieved by the addition of calcium carbonate during the manufacturing process. Progress Report Three, September 21, 1990, presented similar results for 4 additional samples which also had a high level of calcium carbonate.

The present study was undertaken to determine the effect of accelerated aging on papers having a high pH achieved by alkaline sizing. Four paper samples, identified as P-1, P-2, P-3, and P-4 were submitted for the study.

PROCEDURES

The test procedures used for the first part of the study are given in Report One, and are repeated below for completeness of this report.

The paper provided for each of the 4 alkaline sized samples was randomly divided into 6 groups of 46 sheets each. One group was selected as the control, or unaged, sample. The remaining 5 groups were exposed to accelerated aging in a circulating oven controlled at 90°C and 50% RH. The groups were removed from the oven after aging periods of 17, 120, 168, 288, and 576 hours, respectively. All 6 groups were then preconditioned at 15% RH, 23°C, and then conditioned at 50% RH, 23°C, before testing. The testing for each of the 4 samples was completed within two weeks after aging.

It is known that volatiles given off by one sample can sometimes affect the aging rate of other samples. Hence, each of the 4 samples was exposed in the aging chamber independently.

Following aging, 14 sheets were selected from each group for fold and tensile testing. The sheets were cut so that 1 MD tensile, 1 CD tensile, 6 MD fold, and 6 CD fold tests could be made on each sheet. The tensile strength tests were made in accordance with TAPPI method T 494 om-81. The folding endurance tests were made with the MIT tester in accordance with TAPPI method T 511 om-83.

The remaining 32 sheets of each group were used for tear testing. The sheets were cut so that 10 MD and 10 CD tests could be made. The tests were made in accordance with TAPPI method T 414 om-82, using a 1600 g pendulum.

TEST RESULTS

The test results are given in Tables I through IV and in the appendix. Table I is a summary table of all test data showing average results only. The averages and standard deviations for each type of test are summarized in Tables II through IV, respectively. Standard deviations were calculated from:

$$s = [(N \Sigma(x)^2 - (\Sigma x)^2)/(N(N-1))]^{1/2}$$

The individual test results for all test types are given in the appendix. The tensile test results include stretch, tensile energy absorption, and tensile stiffness, in addition to tensile strength. These properties were not requested but are automatically reported by our data acquisition system.

TABLE 1
DATA SUMMARY

SAMPLE CODE	AGING TIME, HOURS	LOG FOLD		TEAR, mN		TENSILE, kN/m	
		MD	CD	MD	CD	MD	CD
P-1	0	2.43	1.52	463	596	6.09	2.20
	17	2.33	1.61	451	595	6.28	2.27
	120	2.33	1.55	440	582	6.26	2.31
	168	2.30	1.54	437	588	6.27	2.26
	288	2.26	1.54	462	609	6.19	2.26
	576	2.27	1.54	460	592	6.28	2.27
P-2	0	2.65	1.91	531	684	7.32	8.72
	17	2.59	1.92	516	652	7.47	2.71
	120	2.60	1.93	502	658	7.48	2.71
	168	2.60	1.91	489	669	7.47	2.73
	288	2.57	1.85	500	649	7.40	2.70
	576	2.54	1.75	557	656	7.44	2.67
P-3	0	2.89	2.19	522	677	8.54	3.38
	17	2.83	2.25	520	675	8.46	3.38
	120	2.84	2.21	500	657	8.95	3.49
	168	2.84	2.20	495	666	8.66	3.45
	288	2.82	2.18	500	640	8.55	3.44
	576	2.81	2.16	482	621	8.58	3.42
P-4	0	3.09	2.53	563	741	8.15	3.73
	17	3.10	2.55	561	741	8.55	3.84
	120	3.06	2.51	532	704	8.83	3.84
	168	3.05	2.50	554	726	8.48	3.85
	288	3.06	2.50	533	732	9.17	3.75
	576	3.03	2.47	557	709	8.57	3.76

TABLE 2

SUMMARY OF TENSILE DATA

TENSILE STRENGTH, kN/m
MACHINE DIRECTION

SAMPLE CODE		UNAGED	AGED 17 HRS	AGED 120 HRS	AGED 168 HRS	AGED 288 HRS	AGED 576 HRS
P-1	AVG	6.09	6.28	6.26	6.27	6.19	6.28
	STD	0.228	0.205	0.225	0.313	0.238	0.238
P-2	AVG	7.32	7.47	7.48	7.47	7.40	7.44
	STD	0.248	0.230	0.200	0.268	0.285	0.359
P-3	AVG	8.54	8.46	8.95	8.66	8.55	8.58
	STD	0.394	0.680	0.306	0.530	0.327	0.376
P-4	AVG	8.15	8.55	8.83	8.48	9.17	8.57
	STD	0.673	0.691	0.718	0.555	0.481	0.626

CROSS DIRECTION

SAMPLE CODE		UNAGED	AGED 17 HRS	AGED 120 HRS	AGED 168 HRS	AGED 288 HRS	AGED 576 HRS
P-1	AVG	2.20	2.27	2.31	2.26	2.26	2.27
	STD	0.058	0.052	0.081	0.055	0.070	0.060
P-2	AVG	2.72	2.71	2.71	2.73	2.70	2.67
	STD	0.090	0.071	0.108	0.086	0.137	0.066
P-3	AVG	3.38	3.38	3.49	3.45	3.44	3.42
	STD	0.101	0.091	0.070	0.012	0.085	0.124
P-4	AVG	3.73	3.84	3.84	3.85	3.75	3.76
	STD	0.141	0.106	0.131	0.113	0.178	0.115

TABLE 3
SUMMARY OF TEAR DATA

TEAR RESISTANCE, mN
MACHINE DIRECTION

SAMPLE CODE		UNAGED	AGED 17 HRS	AGED 120 HRS	AGED 168 HRS	AGED 288 HRS	AGED 576 HRS
P-1	AVG	463	451	440	437	462	460
	STD	8.6	10.2	15.4	14.3	17.5	11.1
P-2	AVG	531	516	502	489	500	557
	STD	14.7	15.1	14.4	18.9	23.9	16.3
P-3	AVG	522	520	500	495	500	482
	STD	13.7	20.0	17.5	20.7	23.9	14.1
P-4	AVG	563	561	532	554	533	557
	STD	11.7	16.8	13.8	15.1	12.4	16.3

CROSS DIRECTION

SAMPLE CODE		UNAGED	AGED 17 HRS	AGED 120 HRS	AGED 168 HRS	AGED 288 HRS	AGED 576 HRS
P-1	AVG	596	595	582	588	609	592
	STD	8.0	11.9	9.7	14.5	17.9	20.5
P-2	AVG	684	652	658	669	649	656
	STD	12.0	12.7	10.2	19.5	17.7	15.8
P-3	AVG	677	675	657	666	640	621
	STD	28.1	6.9	10.8	16.0	17.8	16.3
P-4	AVG	741	741	704	726	732	709
	STD	15.2	16.7	13.1	14.1	18.9	12.8

TABLE 4
SUMMARY OF MIT FOLD DATA

LOG FOLDING ENDURANCE
MACHINE DIRECTION

SAMPLE CODE		UNAGED	AGED 17 HRS	AGED 120 HRS	AGED 168 HRS	AGED 288 HRS	AGED 576 HRS
P-1	AVG	2.43	2.33	2.33	2.30	2.26	2.27
	STD	0.04	0.04	0.04	0.06	0.06	0.08
P-2	AVG	2.65	2.59	2.60	2.60	2.57	2.54
	STD	0.03	0.03	0.03	0.03	0.02	0.03
P-3	AVG	2.89	2.83	2.84	2.84	2.82	2.81
	STD	0.03	0.14	0.02	0.03	0.02	0.05
P-4	AVG	3.09	3.10	3.06	3.05	3.06	3.03
	STD	0.02	0.02	0.03	0.02	0.03	0.03

CROSS DIRECTION

SAMPLE CODE		UNAGED	AGED 17 HRS	AGED 120 HRS	AGED 168 HRS	AGED 288 HRS	AGED 576 HRS
P-1	AVG	1.52	1.61	1.55	1.54	1.54	1.54
	STD	0.11	0.11	0.11	0.13	0.09	0.12
P-2	AVG	1.91	1.92	1.93	1.91	1.85	1.75
	STD	0.11	0.14	0.12	0.13	0.11	0.12
P-3	AVG	2.19	2.25	2.21	2.20	2.18	2.16
	STD	0.09	0.12	0.05	0.05	0.06	0.08
P-4	AVG	2.53	2.55	2.51	2.50	2.50	2.47
	STD	0.07	0.05	0.06	0.06	0.07	0.07

THE INSTITUTE OF PAPER SCIENCE AND TECHNOLOGY



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P1

MD TENSILE, UNAGED

P2

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	5.888	1.565	58.69	663.5	1	7.052	1.557	69.98	809.6
2	6.334	1.666	68.32	694.9	2	7.375	1.774	84.19	787.8
3	5.669	1.398	50.29	684.8	3	7.078	1.585	71.87	802.8
4	6.089	1.628	63.90	677.2	4	7.008	1.749	79.49	757.7
5	6.080	1.635	64.17	675.8	5	7.297	1.762	83.40	779.6
6	6.273	1.702	69.33	688.1	6	7.419	1.920	92.71	752.3
7	5.783	1.316	47.51	712.1	7	7.148	1.708	78.51	771.4
8	6.212	1.698	67.90	681.3	8	7.576	1.930	95.57	767.8
9	6.159	1.494	58.87	712.1	9	7.314	1.758	83.30	783.7
10	6.474	1.661	69.40	711.3	10	7.673	1.971	98.72	761.4
11	5.932	1.582	60.12	664.9	11	7.830	1.982	101.50	778.2
12	5.914	1.484	56.06	686.7	12	7.410	1.736	82.71	783.7
13	6.255	1.699	68.41	681.3	13	7.148	1.561	71.71	811.5
14	6.238	1.660	66.59	679.9	14	7.113	1.695	77.59	760.5
Mean:	6.093	1.585	62.11	686.7	Mean:	7.317	1.763	83.66	779.1
Standard Deviation:	.228	.120	7.13	15.9	Standard Deviation:	.248	.143	10.08	19.0

P3

P4

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	8.793	2.096	120.60	848.3	1	8.084	1.575	83.19	947.5
2	8.705	1.873	106.20	901.1	2	9.501	2.009	124.20	929.8
3	8.915	1.994	115.60	870.2	3	8.801	1.743	98.91	925.7
4	8.609	1.866	103.40	845.1	4	8.591	1.737	96.09	892.9
5	8.679	2.110	118.80	793.2	5	7.270	1.215	55.26	964.4
6	8.460	1.903	104.20	853.8	6	7.130	1.185	52.12	884.7
7	8.504	1.914	105.80	856.1	7	7.883	1.386	68.93	948.1
8	8.250	1.723	92.23	898.4	8	8.058	1.493	76.63	928.4
9	8.180	1.784	93.84	843.8	9	8.635	1.720	97.19	927.0
10	7.437	1.442	67.95	853.3	10	7.883	1.334	66.99	969.9
11	8.836	2.042	117.00	833.7	11	7.498	1.248	59.49	978.6
12	9.011	2.013	118.50	886.5	12	8.968	1.814	106.50	943.4
13	8.644	1.909	107.30	866.5	13	7.848	1.347	67.45	988.5
14	8.600	1.806	100.20	887.4	14	7.926	1.426	72.62	964.4
Mean:	8.544	1.891	105.10	859.8	Mean:	8.148	1.517	80.40	942.4
Standard Deviation:	.394	.173	14.05	28.6	Standard Deviation:	.673	.254	21.30	30.2

P1					CD TENSILE, UNAGED					P2				
Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	2.275	2.940	48.23	213.4	1	2.651	2.991	58.61	257.1	1	2.651	2.991	58.61	257.1
2	2.231	3.089	49.71	203.4	2	2.668	2.986	57.75	255.3	2	2.668	2.986	57.75	255.3
3	2.135	2.467	38.05	214.4	3	2.590	2.803	52.99	252.1	3	2.590	2.803	52.99	252.1
4	2.178	2.684	41.55	212.8	4	2.782	3.363	69.01	248.5	4	2.782	3.363	69.01	248.5
5	2.108	2.599	39.60	214.4	5	2.738	3.303	65.72	242.7	5	2.738	3.303	65.72	242.7
6	2.196	2.733	43.86	213.9	6	2.703	3.147	61.69	256.2	6	2.703	3.147	61.69	256.2
7	2.117	2.438	37.32	215.7	7	2.572	2.643	50.22	257.6	7	2.572	2.643	50.22	257.6
8	2.205	2.842	45.42	213.4	8	2.765	3.336	67.03	252.1	8	2.765	3.336	67.03	252.1
9	2.292	3.173	53.47	223.0	9	2.756	3.134	63.82	251.7	9	2.756	3.134	63.82	251.7
10	2.161	2.856	44.60	204.8	10	2.616	2.751	51.62	263.5	10	2.616	2.751	51.62	263.5
11	2.240	2.865	47.49	239.8	11	2.800	3.101	63.90	262.1	11	2.800	3.101	63.90	262.1
12	2.187	2.766	43.52	220.7	12	2.878	3.089	63.98	270.3	12	2.878	3.089	63.98	270.3
13	2.240	3.114	50.86	219.4	13	2.808	3.086	63.38	265.3	13	2.808	3.086	63.38	265.3
14	2.257	2.858	45.89	222.1	14	2.686	2.839	55.15	264.9	14	2.686	2.839	55.15	264.9
Mean:	2.202	2.816	44.97	216.5	Mean:	2.715	3.041	60.35	257.1	Mean:	2.715	3.041	60.35	257.1
Standard Deviation:	.058	.224	4.79	8.8	Standard Deviation:	.090	.221	6.00	7.5	Standard Deviation:	.090	.221	6.00	7.5
P3					P4					P4				
Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	3.281	3.051	72.77	321.3	1	3.648	2.734	73.22	350.0	1	3.648	2.734	73.22	350.0
2	3.482	3.745	95.52	305.8	2	3.849	3.150	86.59	346.8	2	3.849	3.150	86.59	346.8
3	3.403	3.349	83.37	319.9	3	3.710	2.923	77.53	349.5	3	3.710	2.923	77.53	349.5
4	3.430	3.421	85.27	308.6	4	3.998	3.624	106.70	342.8	4	3.998	3.624	106.70	342.8
5	3.325	3.025	72.84	318.1	5	3.849	3.251	91.38	348.6	5	3.849	3.251	91.38	348.6
6	3.430	3.090	77.05	324.9	6	3.640	3.129	82.23	338.6	6	3.640	3.129	82.23	338.6
7	3.307	3.166	76.42	311.3	7	3.823	3.529	97.26	335.4	7	3.823	3.529	97.26	335.4
8	3.211	2.635	60.70	329.0	8	3.640	3.062	80.30	337.7	8	3.640	3.062	80.30	337.7
9	3.412	3.201	80.60	318.6	9	3.718	3.259	87.23	337.2	9	3.718	3.259	87.23	337.2
10	3.316	2.872	68.20	320.4	10	3.447	2.493	60.60	345.4	10	3.447	2.493	60.60	345.4
11	3.368	3.211	78.08	314.9	11	3.745	3.116	83.08	344.1	11	3.745	3.116	83.08	344.1
12	3.386	3.264	80.12	318.6	12	3.561	2.583	64.21	346.3	12	3.561	2.583	64.21	346.3
13	3.412	3.171	78.46	316.3	13	3.780	2.962	79.81	353.2	13	3.780	2.962	79.81	353.2
14	3.631	3.676	96.74	318.6	14	3.849	3.341	93.90	340.2	14	3.849	3.341	93.90	340.2
Mean:	3.385	3.206	79.01	317.6	Mean:	3.733	3.083	83.14	344.0	Mean:	3.733	3.083	83.14	344.0
Standard Deviation:	.101	.290	9.57	6.1	Standard Deviation:	.141	.326	12.35	5.5	Standard Deviation:	.141	.326	12.35	5.5

P1

MD TENSILE, AGED 17 HOURS

P2

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	5.905	1.472	55.31	671.7	1	7.664	1.789	88.26	787.8
2	6.422	1.718	70.80	675.8	2	7.192	1.629	75.28	779.6
3	5.914	1.432	53.75	688.1	3	7.550	1.744	85.16	796.0
4	6.308	1.585	63.91	688.1	4	7.585	1.700	82.16	802.8
5	6.492	1.729	71.82	673.1	5	7.716	1.782	87.79	787.3
6	6.457	1.682	70.13	694.9	6	7.288	1.667	77.64	779.6
7	6.264	1.531	61.05	699.0	7	7.786	1.789	89.34	802.8
8	6.413	1.591	65.65	707.2	8	7.200	1.621	75.02	787.8
9	6.457	1.694	70.57	686.7	9	7.725	1.814	90.99	796.0
10	6.037	1.399	53.17	712.1	10	7.576	1.664	80.28	809.6
11	6.325	1.602	64.36	688.1	11	7.568	1.757	85.24	787.8
12	6.509	1.646	68.92	700.4	12	7.122	1.568	71.24	786.4
13	6.273	1.652	66.70	671.7	13	7.437	1.618	76.64	815.1
14	6.177	1.514	59.62	702.3	14	7.192	1.609	73.43	779.6
Mean:	6.282	1.589	63.98	690.0	Mean:	7.472	1.697	81.32	792.7
Standard Deviation:	.205	.106	6.49	13.4	Standard Deviation:	.230	.082	6.54	11.3

P3

P4

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	7.988	1.529	77.97	898.4	1	8.110	1.334	67.84	997.2
2	8.285	1.738	92.14	867.0	2	8.705	1.590	89.51	968.0
3	8.635	1.831	102.30	879.3	3	7.708	1.249	60.35	985.2
4	6.404	1.551	63.19	696.3	4	7.428	1.187	55.09	970.8
5	8.451	1.760	96.08	886.1	5	9.379	1.798	108.90	962.5
6	8.574	1.723	95.08	909.3	6	8.906	1.715	98.19	940.7
7	9.081	1.906	112.00	890.6	7	8.145	1.372	70.65	975.4
8	8.145	1.568	81.67	898.4	8	9.755	1.929	122.10	965.7
9	8.556	1.767	97.82	892.9	9	8.898	1.589	90.14	968.0
10	9.046	1.947	113.80	879.3	10	8.950	1.616	92.44	977.6
11	8.696	1.854	103.10	858.8	11	7.769	1.320	64.88	955.7
12	8.635	1.771	98.02	873.8	12	8.259	1.370	71.38	993.9
13	9.143	1.946	114.10	873.8	13	8.346	1.529	81.51	947.5
14	8.784	1.859	105.10	864.7	14	9.309	1.974	119.40	902.0
Mean:	8.459	1.768	96.60	869.2	Mean:	8.548	1.541	85.17	965.0
Standard Deviation:	.680	.139	14.41	51.8	Standard Deviation:	.691	.249	21.50	24.1

P1					CD TENSILE, AGED 17 HOURS					P2				
Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	2.257	2.695	43.87	224.8	1	2.677	2.956	58.51	267.6	1	2.677	2.956	58.51	267.6
2	2.231	2.328	36.89	244.4	2	2.782	3.011	60.89	270.8	2	2.782	3.011	60.89	270.8
3	2.292	2.548	41.98	232.6	3	2.730	2.747	54.64	279.9	3	2.730	2.747	54.64	279.9
4	2.283	2.709	45.44	226.2	4	2.668	2.509	48.95	286.7	4	2.668	2.509	48.95	286.7
5	2.152	2.241	34.17	228.0	5	2.625	2.552	48.58	279.9	5	2.625	2.552	48.58	279.9
6	2.266	2.441	39.92	236.2	6	2.730	3.043	62.32	263.0	6	2.730	3.043	62.32	263.0
7	2.266	2.866	49.09	229.4	7	2.738	2.777	55.13	274.4	7	2.738	2.777	55.13	274.4
8	2.257	2.494	41.12	236.2	8	2.791	2.880	58.88	272.2	8	2.791	2.880	58.88	272.2
9	2.231	2.713	43.63	223.9	9	2.677	2.618	50.12	267.6	9	2.677	2.618	50.12	267.6
10	2.266	2.796	46.45	229.4	10	2.677	2.497	47.75	278.5	10	2.677	2.497	47.75	278.5
11	2.318	2.924	49.88	229.4	11	2.870	3.083	64.67	272.1	11	2.870	3.083	64.67	272.1
12	2.327	2.983	51.61	225.7	12	2.677	2.545	50.08	275.8	12	2.677	2.545	50.08	275.8
13	2.380	2.956	50.91	232.6	13	2.730	2.716	53.17	272.6	13	2.730	2.716	53.17	272.6
14	2.266	2.829	48.23	223.5	14	2.598	2.245	40.90	278.5	14	2.598	2.245	40.90	278.5
Mean:	2.271	2.680	44.51	230.1	Mean:	2.712	2.727	53.90	274.3	Mean:	2.712	2.727	53.90	274.3
Standard Deviation:	.052	.236	5.30	5.8	Standard Deviation:	.071	.247	6.64	6.2	Standard Deviation:	.071	.247	6.64	6.2

P3					P4				
Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	3.281	2.6000	61.480	333.1	1	3.771	2.833	76.68	361.8
2	3.438	3.3200	83.560	321.3	2	3.989	3.314	97.80	348.5
3	3.412	2.8670	71.970	328.6	3	3.701	2.754	73.46	356.3
4	3.255	2.7820	65.540	312.7	4	3.919	2.981	84.72	361.3
Excluded	1.514	.9742	9.480	240.5	5	3.972	3.194	91.55	363.2
6	3.298	2.6100	61.140	328.1	6	3.876	3.033	83.86	356.8
7	3.386	2.7920	68.430	332.2	7	3.657	2.598	67.40	360.0
8	3.473	3.0680	78.910	321.3	8	3.814	2.738	74.43	360.0
9	3.456	2.8720	72.160	338.6	9	3.876	2.897	79.63	363.2
10	3.342	2.8530	69.980	324.9	10	3.771	2.937	79.67	349.5
11	3.246	2.4520	56.550	331.8	11	3.762	2.921	81.65	349.5
12	3.316	2.6100	61.740	327.2	12	3.954	3.013	85.32	360.0
13	3.395	2.8660	70.110	323.1	13	3.771	2.699	72.52	360.0
14	3.517	3.0080	77.070	328.6	14	3.937	3.210	92.70	349.5
15	3.500	3.0310	76.540	330.9					
Mean:	3.380	2.8380	69.660	327.3	Mean:	3.841	2.937	81.53	357.1
Standard Deviation:	.091	.2269	7.774	6.4	Standard Deviation:	.106	.207	8.54	5.5

P1

MD TENSILE, AGED 120 HOURS

P2

Specimen Number	Tensile Strength	% Stretch	Tensile Energy Absorption	Et	Specimen Number	Tensile Strength	% Stretch	Tensile Energy Absorption	Et
	(kN/m)	(%)	J/m ²	(kN/m)		(kN/m)	(%)	J/m ²	(kN/m)
1	6.543	1.518	63.26	728.2	1	7.651	1.781	87.68	781.2
2	6.447	1.672	69.38	688.5	2	7.564	1.714	82.95	779.9
3	6.221	1.412	55.55	713.2	3	7.381	1.737	82.68	762.2
4	6.474	1.547	63.96	713.2	4	7.634	1.786	87.98	773.1
5	6.133	1.515	59.10	683.2	5	7.520	1.771	85.95	770.4
6	6.160	1.509	59.31	696.9	6	6.979	1.515	66.51	773.1
7	6.264	1.585	63.57	688.5	7	7.503	1.599	76.54	800.3
8	6.334	1.430	57.43	732.2	8	7.555	1.734	83.87	771.3
9	5.636	1.193	41.47	715.4	9	7.485	1.740	83.59	769.0
10	6.264	1.449	56.93	713.2	10	7.337	1.661	78.33	781.2
11	6.325	1.507	60.52	715.9	11	7.860	1.848	93.98	784.0
12	6.055	1.535	59.55	675.1	12	7.337	1.623	76.16	781.2
13	6.290	1.492	59.32	705.0	13	7.494	1.659	79.20	784.0
14	6.421	1.636	66.65	679.2	14	7.407	1.690	79.53	769.0
Mean:	6.255	1.500	59.71	702.3	Mean:	7.479	1.704	81.78	777.1
Standard Deviation:	.225	.114	6.51	19.4	Standard Deviation:	.200	.087	6.59	9.4

P3

P4

Specimen Number	Tensile Strength	% Stretch	Tensile Energy Absorption	Et	Specimen Number	Tensile Strength	% Stretch	Tensile Energy Absorption	Et
	(kN/m)	(%)	J/m ²	(kN/m)		(kN/m)	(%)	J/m ²	(kN/m)
1	9.020	1.788	104.10	925.5	1	7.634	1.146	54.29	1005.0
2	8.942	1.911	110.50	878.8	2	9.116	1.609	94.06	985.4
3	9.038	1.853	108.20	899.2	3	9.151	1.628	95.50	997.6
4	8.139	1.589	83.20	891.5	4	8.357	1.442	75.96	966.3
5	8.619	1.678	92.80	916.0	5	9.029	1.632	94.34	974.5
6	9.125	1.883	111.30	902.4	6	8.410	1.308	69.16	1020.0
7	9.203	1.905	113.40	897.4	7	8.139	1.245	63.41	1015.0
8	9.073	1.920	112.20	883.3	8	8.253	1.338	70.20	997.4
9	8.959	1.863	107.00	879.7	9	9.012	1.455	83.14	1017.0
10	8.994	1.784	103.60	916.0	10	7.939	1.185	58.55	1015.0
11	9.395	1.900	115.10	904.6	11	9.814	1.922	122.40	959.5
12	8.663	1.729	96.33	890.3	12	9.186	1.534	89.28	1014.0
13	9.020	1.808	105.20	914.6	13	9.762	1.805	113.40	975.4
14	9.142	1.838	108.10	909.2	14	9.849	1.745	109.60	997.6
Mean:	8.952	1.818	105.10	901.2	Mean:	8.832	1.500	85.24	995.7
Standard Deviation:	.306	.097	8.87	14.4	Standard Deviation:	.718	.238	21.07	20.3

P1

CD TENSILE, AGED 120 HOURS

P2

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	2.305	2.582	43.02	233.6	1	2.619	2.450	46.52	274.9
2	2.322	2.800	49.78	228.7	2	2.610	2.379	45.16	273.6
3	2.348	2.557	43.46	247.7	3	2.715	2.594	50.41	279.0
4	2.348	2.801	49.10	235.5	4	2.549	2.491	46.01	270.8
5	2.122	1.988	29.50	235.5	5	2.592	2.535	47.30	270.8
6	2.409	2.731	47.80	244.1	6	2.758	2.676	54.69	275.8
7	2.357	3.043	53.55	227.3	7	2.610	2.699	52.80	266.8
8	2.418	2.838	50.47	240.9	8	2.758	3.078	64.99	266.8
9	2.322	2.322	38.10	246.3	9	2.811	3.096	63.94	266.8
10	2.279	2.666	43.81	232.7	10	2.828	2.729	55.96	276.7
11	2.252	2.302	37.71	240.9	11	2.671	2.642	50.91	269.0
12	2.348	2.815	49.30	225.5	12	2.941	3.292	72.09	272.2
13	2.348	2.753	48.28	234.1	13	2.715	2.476	48.45	277.7
14	2.183	2.326	36.65	236.8	14	2.706	2.874	57.97	263.6
Mean:	2.311	2.615	44.32	236.4	Mean:	2.706	2.715	54.09	271.8
Standard Deviation:	.081	.288	6.75	6.9	Standard Deviation:	.108	.274	8.15	4.7

P3

P4

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	3.360	2.391	57.46	355.2	1	3.927	3.155	89.66	358.9
2	3.456	2.882	72.99	343.0	2	3.927	3.138	89.79	365.2
3	3.386	2.615	63.44	343.0	3	3.805	2.672	72.63	372.5
4	3.473	3.049	77.32	337.5	4	3.752	2.642	70.27	368.8
5	3.447	2.831	71.36	337.5	5	3.863	2.749	76.59	372.5
6	3.552	2.963	77.78	340.7	6	3.988	3.018	86.69	372.0
7	3.526	2.884	74.07	345.7	7	3.709	2.457	64.13	371.1
8	3.569	3.111	83.11	343.0	8	4.058	3.125	91.48	374.3
9	3.561	3.062	79.70	343.0	9	3.752	2.644	70.68	365.7
10	3.526	2.877	73.79	348.4	10	3.543	2.252	55.67	368.8
11	3.569	3.139	82.78	337.5	11	3.822	2.535	68.19	370.2
12	3.517	2.783	71.44	351.1	12	3.840	2.719	74.07	362.0
13	3.421	2.423	59.01	358.0	13	3.866	2.553	69.76	375.7
14	3.543	2.955	76.36	343.0	14	3.962	2.971	84.58	365.2
Mean:	3.493	2.854	72.90	344.8	Mean:	3.845	2.759	76.01	368.8
Standard Deviation:	.070	.235	8.00	6.4	Standard Deviation:	.131	.281	10.87	4.8

P1

MD TENSILE, AGED 168 HOURS

P2

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	6.447	1.608	65.98	696.9	1	7.154	1.480	66.78	809.8
2	6.360	1.599	65.08	680.5	2	7.738	1.718	85.65	807.1
3	5.523	1.383	44.77	648.9	3	7.442	1.731	82.28	770.4
4	6.133	1.485	57.32	691.4	4	7.485	1.677	79.74	785.3
5	6.744	1.674	72.28	714.5	5	7.695	1.720	85.22	800.3
6	6.221	1.440	56.59	708.8	6	6.814	1.416	60.81	781.2
7	6.578	1.685	71.38	690.1	7	7.468	1.695	81.16	789.4
8	6.282	1.617	64.28	666.9	8	7.494	1.712	82.58	781.2
9	6.491	1.658	69.11	686.0	9	7.250	1.573	72.94	796.2
10	6.308	1.517	60.73	698.2	10	7.485	1.769	85.04	777.2
11	6.020	1.486	56.52	666.9	11	7.468	1.546	73.08	812.5
12	5.968	1.370	51.45	696.9	12	7.590	1.697	82.97	796.2
13	6.107	1.554	60.25	669.6	13	7.660	1.606	78.71	823.4
14	6.587	1.720	72.53	675.1	14	7.895	1.793	91.16	801.7
Mean:	6.269	1.551	62.02	685.1	Mean:	7.474	1.652	79.15	795.1
Standard Deviation:	.313	.124	8.23	18.1	Standard Deviation:	.268	.111	8.15	15.1

P3

P4

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	8.741	1.742	98.24	916.0	1	8.785	1.523	85.80	990.8
2	7.529	1.277	59.82	938.6	2	8.933	1.530	89.45	1004.0
3	8.881	1.856	106.60	895.6	3	8.480	1.457	79.95	984.3
4	8.811	1.621	91.55	958.2	4	7.660	1.135	53.87	1015.0
5	9.203	1.837	109.30	929.6	5	8.453	1.441	77.71	984.3
6	9.230	1.857	110.10	918.3	6	7.538	1.125	54.75	991.9
7	8.846	1.831	104.90	898.3	7	9.317	1.781	107.40	952.7
8	8.933	1.834	106.90	921.4	8	8.776	1.569	88.19	958.2
9	7.660	1.275	61.45	962.5	9	8.558	1.469	79.88	969.1
10	8.767	1.723	97.26	922.8	10	8.000	1.250	62.50	1005.0
11	8.235	1.473	77.27	942.9	11	8.480	1.375	73.58	1012.0
12	8.924	1.801	103.20	907.8	12	7.773	1.177	56.47	999.6
13	8.340	1.483	78.30	941.8	13	8.715	1.441	79.76	1001.0
14	9.108	1.879	111.40	904.6	14	9.230	1.657	98.59	978.6
Mean:	8.658	1.678	94.02	925.6	Mean:	8.478	1.423	77.71	989.0
Standard Deviation:	.530	.216	17.79	21.0	Standard Deviation:	.555	.195	16.27	19.1

P1

CD TENSILE, AGED 168 HOURS

P2

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	2.200	2.176	34.49	242.3	1	2.828	3.074	63.73	273.6
2	2.209	2.282	37.42	240.9	2	2.723	2.777	55.03	273.6
3	2.270	2.620	44.09	228.7	3	2.654	2.345	44.34	281.7
4	2.191	2.323	36.94	232.7	4	2.784	2.803	57.88	279.0
5	2.322	2.713	47.14	235.5	5	2.732	2.737	54.60	273.6
6	2.305	2.533	42.54	235.5	6	2.671	2.489	48.21	277.7
7	2.313	2.458	40.54	240.9	7	2.784	2.803	58.01	279.0
8	2.287	2.670	44.04	228.7	8	2.601	2.017	36.69	285.8
9	2.226	2.371	39.50	236.8	9	2.819	2.790	56.95	275.4
10	2.165	2.097	32.83	236.8	10	2.566	2.099	38.16	281.7
11	2.331	2.671	45.15	240.9	11	2.654	2.468	47.41	273.6
12	2.252	2.385	39.38	240.9	12	2.811	2.731	56.58	276.7
13	2.226	2.263	36.37	240.9	13	2.776	2.763	55.59	279.0
14	2.305	2.598	43.39	230.0	14	2.802	2.950	61.84	272.2
Mean:	2.257	2.440	40.27	236.5	Mean:	2.729	2.632	52.50	277.3
Standard Deviation:	.055	.198	4.29	4.9	Standard Deviation:	.086	.308	8.30	4.0

P3

P4

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	3.578	3.071	79.87	340.7	1	3.840	2.811	77.26	365.7
2	3.404	2.685	66.97	345.7	2	3.927	3.103	88.98	362.0
3	3.412	2.708	66.73	343.0	3	4.049	3.114	90.94	372.5
4	3.543	2.822	72.40	355.2	4	3.691	2.407	63.42	374.3
5	3.543	2.897	74.17	347.5	5	3.875	2.809	78.56	369.8
6	3.282	2.297	53.05	349.8	6	3.796	2.522	67.40	368.4
7	3.595	2.884	76.23	352.5	7	3.595	2.451	62.21	362.0
8	3.526	2.837	73.01	343.0	8	3.814	2.645	71.34	365.7
9	3.482	2.812	70.59	348.4	9	3.831	2.762	76.15	365.7
10	3.473	2.851	73.24	347.1	10	3.988	2.928	85.59	372.5
11	3.430	2.597	64.46	349.8	11	3.796	2.461	65.42	372.5
12	3.438	2.490	60.78	349.8	12	3.883	2.730	75.58	371.1
13	3.151	2.018	45.23	344.3	13	3.892	2.594	71.86	378.8
14	3.500	2.704	68.44	348.0	14	3.866	2.839	79.53	368.8
Mean:	3.454	2.691	67.51	347.5	Mean:	3.846	2.727	75.31	369.3
Standard Deviation:	.120	.272	9.33	3.9	Standard Deviation:	.113	.228	9.07	4.8

P1

MD TENSILE, AGED 288 HOURS

P2

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	6.203	1.632	65.17	671.0	1	7.843	1.679	84.26	822.1
2	6.238	1.526	60.60	686.0	2	7.799	1.726	86.20	808.5
3	5.985	1.501	57.14	665.6	3	7.730	1.708	84.73	804.4
4	6.107	1.513	58.51	673.7	4	7.668	1.818	89.84	762.2
5	5.924	1.358	58.54	691.4	5	7.424	1.673	79.54	774.4
6	6.055	1.514	58.16	669.6	6	7.293	1.643	76.33	769.0
7	6.543	1.793	75.98	671.0	7	7.215	1.586	72.67	777.2
8	5.889	1.434	53.19	682.7	8	7.198	1.706	78.11	739.1
9	6.308	1.635	65.59	673.7	9	7.224	1.609	74.26	777.2
10	6.456	1.635	67.94	692.8	10	7.119	1.471	66.27	793.5
11	5.776	1.318	47.06	686.0	11	7.616	1.752	85.09	773.1
12	6.404	1.639	67.16	676.4	12	7.171	1.523	68.79	793.5
13	6.360	1.540	62.24	688.7	13	7.442	1.673	79.52	781.2
14	6.413	1.596	65.71	692.8	14	6.927	1.448	62.89	774.4
Mean:	6.190	1.545	61.07	680.1	Mean:	7.405	1.644	77.75	782.1
Standard Deviation:	.238	.124	7.68	9.5	Standard Deviation:	.285	.106	8.05	21.0

P3

P4

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	8.547	1.592	86.97	933.7	1	8.835	1.478	82.40	990.8
2	8.198	1.518	79.84	929.6	2	9.585	1.927	118.60	901.0
3	8.704	1.818	101.80	882.0	3	9.995	1.985	128.00	937.8
4	8.870	1.638	93.09	941.8	4	9.637	1.834	112.80	938.7
5	8.905	1.733	99.49	929.6	5	9.262	1.668	99.15	955.5
6	8.661	1.645	91.83	937.8	6	8.390	1.341	70.78	1005.0
7	8.076	1.436	73.28	934.2	7	9.541	1.864	113.80	914.6
8	8.600	1.615	88.27	916.0	8	9.132	1.656	97.29	960.9
9	8.626	1.622	89.42	911.9	9	8.791	1.510	86.40	974.5
10	8.347	1.693	91.03	871.1	10	8.983	1.693	97.65	933.7
11	8.425	1.641	88.16	910.5	11	9.132	1.613	94.15	978.6
12	8.765	1.667	93.27	914.6	12	9.559	1.764	107.70	967.7
13	9.079	1.910	112.20	899.2	13	8.312	1.338	70.10	999.6
14	7.928	1.454	73.00	911.4	14	9.254	1.767	105.30	944.1
Mean:	8.552	1.641	90.12	916.0	Mean:	9.172	1.675	98.86	957.3
Standard Deviation:	.327	.127	10.51	20.9	Standard Deviation:	.481	.202	17.19	31.0

P1

CD TENSILE, AGED 288 HOURS

P2

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	2.270	2.481	40.54	243.6	1	2.549	2.081	37.70	281.7
2	2.244	2.469	40.13	235.5	2	2.662	2.450	47.80	272.2
3	2.261	2.506	41.87	235.5	3	2.776	2.650	53.98	279.0
4	2.392	2.732	47.81	246.4	4	2.837	2.851	59.28	276.7
5	2.261	2.513	41.60	232.3	5	2.340	1.564	25.75	286.4
6	2.252	2.560	41.51	225.5	6	2.749	2.835	57.79	266.8
7	2.374	2.679	47.76	240.9	7	2.863	2.840	60.47	279.0
8	2.385	2.684	45.59	231.4	8	2.767	2.761	55.73	274.0
9	2.174	2.209	35.01	235.5	9	2.627	2.279	42.60	279.0
10	2.287	2.564	43.26	235.5	10	2.619	2.270	42.34	279.0
11	2.113	2.050	30.20	236.8	11	2.741	2.483	49.78	281.7
12	2.296	2.583	43.11	235.5	12	2.697	2.482	49.06	273.6
13	2.235	2.417	38.41	232.3	13	2.837	2.794	59.67	279.0
14	2.252	2.424	39.10	240.9	14	2.706	2.443	46.96	277.2
Mean:	2.265	2.491	41.14	236.2	Mean:	2.698	2.484	49.21	277.5
Standard Deviation:	.070	.183	4.70	5.4	Standard Deviation:	.137	.360	9.84	4.8

P3

P4

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	3.569	3.057	79.31	340.7	1	4.038	3.131	92.14	366.6
2	3.456	2.648	66.89	343.0	2	3.750	2.458	64.35	372.5
3	3.465	2.768	69.23	345.3	3	3.576	2.403	60.37	355.7
4	3.386	2.799	68.86	338.9	4	3.646	2.422	62.42	362.0
5	3.456	2.707	67.19	341.6	5	3.724	2.444	64.58	372.9
6	3.325	2.397	59.51	351.1	6	3.768	2.483	65.87	375.2
7	3.508	2.889	74.10	343.0	7	3.663	2.523	65.38	358.4
8	3.377	2.574	62.52	345.7	8	4.038	3.085	89.94	362.0
9	3.430	2.615	64.65	346.2	9	3.846	2.668	72.88	365.7
10	3.360	2.390	57.75	353.9	10	3.811	2.638	71.84	358.9
11	3.299	2.500	59.75	334.8	11	3.689	2.543	67.42	358.9
12	3.377	2.733	66.66	337.1	12	3.715	2.447	64.65	371.1
13	3.561	2.873	74.21	345.3	13	3.907	2.621	72.08	372.5
14	3.526	2.953	75.74	344.3	14	3.358	1.805	41.10	368.8
Mean:	3.435	2.707	67.60	343.6	Mean:	3.752	2.548	68.21	365.8
Standard Deviation:	.085	.201	6.53	5.1	Standard Deviation:	.178	.314	12.34	6.5

P1

MD TENSILE, AGED 576 HOURS

P3

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	6.149	1.564	61.43	679.2	1	7.649	1.814	89.58	782.6
2	6.628	1.674	71.45	700.9	2	6.733	1.325	55.77	814.5
3	6.192	1.482	58.23	690.1	3	7.614	1.755	85.82	782.1
4	5.966	1.377	51.66	700.1	4	7.736	1.701	84.47	807.1
5	5.730	1.276	45.53	709.9	5	7.588	1.656	80.38	800.3
6	6.428	1.604	65.68	679.2	6	7.527	1.678	80.40	789.4
7	6.219	1.489	58.64	698.2	7	7.998	1.900	99.00	790.3
8	6.471	1.590	65.37	696.9	8	7.248	1.597	73.41	781.2
9	6.314	1.523	61.38	700.9	9	7.396	1.584	74.01	797.6
10	6.367	1.642	67.33	687.3	10	7.335	1.681	78.35	763.5
11	6.410	1.655	68.39	686.0	11	7.535	1.755	85.27	781.2
12	6.175	1.422	55.60	709.1	12	6.707	1.476	62.41	749.9
13	6.576	1.620	68.09	709.1	13	7.710	1.796	89.29	786.7
14	6.349	1.566	63.70	696.9	14	7.405	1.725	82.30	770.4
Mean:	6.284	1.535	61.61	696.0	Mean:	7.441	1.675	80.03	785.5
Standard Deviation:	.238	.115	7.16	10.3	Standard Deviation:	.359	.146	11.11	17.0

P3

P4

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	9.018	1.742	101.40	932.3	1	8.033	1.337	68.45	982.2
2	8.521	1.606	87.51	928.3	2	8.434	1.462	78.72	976.7
3	8.574	1.678	91.82	895.6	3	7.483	1.164	53.74	971.3
4	8.731	1.630	91.38	943.2	4	8.661	1.451	79.15	956.8
5	7.632	1.330	63.93	914.6	5	9.742	1.874	118.10	936.0
6	8.382	1.512	81.41	952.0	6	8.286	1.322	69.45	990.9
7	8.713	1.843	103.60	862.9	7	8.129	1.207	60.31	1029.0
8	8.600	1.683	92.71	891.5	8	9.202	1.716	101.00	948.7
9	8.338	1.507	79.28	922.8	9	9.010	1.601	91.68	967.7
10	8.347	1.528	81.22	925.5	10	8.600	1.422	76.88	971.8
11	8.408	1.676	90.52	891.5	11	8.513	1.599	86.68	918.7
12	8.992	1.789	103.70	910.6	12	9.088	1.633	94.77	960.9
13	9.140	1.840	108.00	909.2	13	7.701	1.178	56.40	990.9
14	8.774	1.646	91.80	933.7	14	9.140	1.687	101.10	975.9
Mean:	8.584	1.644	90.59	915.3	Mean:	8.573	1.475	81.23	969.8
Standard Deviation:	.376	.142	11.73	24.0	Standard Deviation:	.626	.218	18.90	26.4

P1

CD TENSILE, AGED 576 HOURS

P2

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	2.311	2.673	44.95	235.5	1	2.704	2.376	46.57	285.8
2	2.320	2.913	51.16	232.7	2	2.782	2.800	57.20	279.0
3	2.320	2.617	43.94	243.6	3	2.669	2.340	45.12	285.8
4	2.268	2.665	44.12	232.7	4	2.739	2.415	48.01	289.9
5	2.163	2.112	32.32	239.5	5	2.625	2.675	51.67	269.5
6	2.259	2.589	42.76	239.5	6	2.695	2.785	55.74	274.9
7	2.207	2.357	37.31	235.5	7	2.651	3.027	59.29	261.3
8	2.241	2.451	39.74	239.5	8	2.651	2.320	44.58	281.7
9	2.372	2.701	47.72	240.9	9	2.625	2.264	41.85	279.0
10	2.303	2.596	44.53	239.5	10	2.616	2.803	53.43	262.7
11	2.276	2.542	41.68	240.0	11	2.730	2.565	51.62	284.5
12	2.198	2.449	39.28	235.5	12	2.660	2.559	49.80	279.0
13	2.311	2.686	45.75	240.9	13	2.521	2.011	36.74	279.0
14	2.198	2.230	35.42	239.5	14	2.739	2.578	51.09	281.7
Mean:	2.268	2.542	42.19	238.2	Mean:	2.672	2.537	49.48	278.1
Standard Deviation:	.060	.207	5.01	3.3	Standard Deviation:	.066	.269	6.18	8.5

P3

P4

Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)	Specimen Number	Tensile Strength (kN/m)	% Stretch (%)	Tensile Energy Absorption J/m ²	Et (kN/m)
1	3.105	2.061	44.81	343.0	1	3.768	2.638	70.55	360.2
2	3.314	2.516	59.80	334.4	2	3.750	2.629	69.55	360.2
3	3.367	2.826	69.52	327.1	3	3.742	2.469	66.19	368.9
4	3.489	2.871	72.97	336.2	4	3.785	2.508	67.48	377.0
5	3.480	2.692	68.13	343.0	5	3.585	2.439	62.26	348.4
6	3.550	2.903	76.89	343.0	6	3.881	2.729	75.80	371.1
7	3.620	2.946	78.81	347.5	7	3.750	2.711	72.73	356.6
8	3.340	2.467	59.16	338.0	8	3.506	2.100	51.21	370.2
9	3.375	2.612	63.28	338.5	9	3.925	2.933	82.48	358.4
10	3.471	2.972	76.40	337.1	10	3.654	2.332	59.81	367.5
11	3.454	3.014	76.76	334.4	11	3.872	2.951	81.75	349.8
12	3.393	2.770	68.86	345.7	12	3.829	2.492	66.86	365.7
13	3.489	2.800	71.92	343.4	13	3.829	2.713	74.37	358.4
14	3.410	2.802	69.40	336.2	14	3.733	2.577	67.74	349.8
Mean:	3.419	2.732	68.34	339.1	Mean:	3.758	2.587	69.20	361.6
Standard Deviation:	.124	.253	9.16	5.5	Standard Deviation:	.115	.226	8.31	8.8

ELMENDORF TEAR DATA

Elmendorf Tear, mN
Sample P1 Machine Direction

Test Number	Unaged	Aged 17 Hrs.	Aged 120 Hrs.	Aged 168 Hrs.	Aged 288 Hrs.	Aged 576 Hrs.
1	464.2	457.7	438.0	431.5	470.7	444.6
2	470.7	444.6	470.7	438.0	483.8	470.7
3	464.2	464.2	425.0	444.6	464.2	470.7
4	477.3	464.2	444.6	405.4	431.5	451.1
5	457.7	444.6	431.5	438.0	444.6	470.7
6	457.7	438.0	444.6	451.1	451.1	444.6
7	451.1	444.6	431.5	431.5	451.1	470.7
8	451.1	457.7	418.4	444.6	483.8	464.2
9	470.7	438.0	438.0	457.7	477.3	451.1
10	464.2	457.7	457.7	431.5	457.7	457.7
Ave	462.9	451.1	440.0	437.4	461.6	459.6
Std	8.6	10.2	15.4	14.3	17.5	11.1

Cross Direction

Test Number	Unaged	Aged 17 Hrs.	Aged 120 Hrs.	Aged 168 Hrs.	Aged 288 Hrs.	Aged 576 Hrs.
1	595.0	581.9	575.3	595.0	601.5	614.6
2	601.5	601.5	588.4	588.4	634.2	562.3
3	601.5	595.0	581.9	581.9	588.4	568.8
4	588.4	595.0	575.3	575.3	601.5	588.4
5	601.5	595.0	588.4	608.0	640.7	601.5
6	601.5	581.9	595.0	601.5	601.5	588.4
7	581.9	608.0	562.3	575.3	601.5	614.6
8	608.0	608.0	575.3	601.5	621.1	621.1
9	595.0	608.0	588.4	562.3	614.6	581.9
10	588.4	575.3	588.4	595.0	588.4	575.3
Ave	596.3	595.0	581.9	588.4	609.3	591.7
Std	8.0	11.9	9.7	14.5	17.9	20.5

ELMENDORF TEAR DATA

Elmendorf Tear, mN
Sample P2 Machine Direction

Test Number	Unaged	Aged 17 Hrs.	Aged 120 Hrs.	Aged 168 Hrs.	Aged 288 Hrs.	Aged 576 Hrs.
1	516.5	516.5	496.9	470.7	542.7	562.3
2	516.5	483.8	510.0	470.7	496.9	568.8
3	529.6	516.5	503.4	496.9	529.6	536.1
4	549.2	523.0	496.9	510.0	483.8	575.3
5	549.2	510.0	496.9	470.7	510.0	536.1
6	536.1	536.1	483.8	503.4	483.8	562.3
7	529.6	523.0	536.1	464.2	470.7	575.3
8	523.0	536.1	496.9	483.8	510.0	549.2
9	549.2	510.0	510.0	510.0	470.7	536.1
10	510.0	510.0	490.4	510.0	503.4	568.8
Ave	530.9	516.5	502.1	489.0	500.2	557.0
Std	14.7	15.1	14.4	18.9	23.9	16.3

Cross Direction

Test Number	Unaged	Aged 17 Hrs.	Aged 120 Hrs.	Aged 168 Hrs.	Aged 288 Hrs.	Aged 576 Hrs.
1	666.9	647.3	653.8	686.5	634.2	680.0
2	706.1	653.8	680.0	680.0	653.8	653.8
3	686.5	647.3	666.9	627.6	640.7	640.7
4	673.4	653.8	653.8	666.9	660.3	647.3
5	680.0	653.8	666.9	666.9	660.3	647.3
6	680.0	673.4	647.3	680.0	680.0	627.6
7	680.0	627.6	660.3	680.0	627.6	666.9
8	693.0	653.8	647.3	653.8	640.7	666.9
9	699.6	666.9	653.8	693.0	627.6	666.9
10	680.0	640.7	653.8	653.8	666.9	666.9
Ave	684.5	651.8	658.4	668.8	649.2	656.4
Std	12.0	12.7	10.2	19.5	17.7	15.8

ELMENDORF TEAR DATA

Elmendorf Tear, mN
Sample P3 Machine Direction

Test Number	Unaged	Aged 17 Hrs.	Aged 120 Hrs.	Aged 168 Hrs.	Aged 288 Hrs.	Aged 576 Hrs.
1	529.6	523.0	510.0	529.6	542.7	490.4
2	542.7	496.9	470.7	496.9	496.9	477.3
3	523.0	555.7	496.9	496.9	529.6	483.8
4	503.4	510.0	483.8	477.3	483.8	477.3
5	536.1	510.0	483.8	490.4	510.0	477.3
6	510.0	496.9	510.0	483.8	483.8	464.2
7	510.0	523.0	490.4	470.7	470.7	457.7
8	536.1	542.7	510.0	523.0	510.0	503.4
9	510.0	503.4	510.0	510.0	470.7	490.4
10	516.5	536.1	529.6	470.7	503.4	496.9
Ave	521.7	519.8	499.5	494.9	500.2	481.9
Std	13.7	20.0	17.5	20.7	23.9	14.1

Cross Direction

Test Number	Unaged	Aged 17 Hrs.	Aged 120 Hrs.	Aged 168 Hrs.	Aged 288 Hrs.	Aged 576 Hrs.
1	666.9	673.4	653.8	666.9	627.6	621.1
2	666.9	666.9	660.3	666.9	640.7	601.5
3	673.4	680.0	653.8	653.8	660.3	614.6
4	680.0	680.0	666.9	673.4	640.7	601.5
5	680.0	673.4	640.7	666.9	640.7	601.5
6	751.9	666.9	660.3	666.9	680.0	647.3
7	666.9	680.0	640.7	686.5	627.6	627.6
8	660.3	686.5	673.4	666.9	627.6	627.6
9	647.3	680.0	666.9	627.6	634.2	640.7
10	680.0	666.9	653.8	680.0	621.1	627.6
Ave	677.3	675.4	657.1	665.6	640.1	621.1
Std	28.1	6.9	10.8	16.0	17.8	16.3

ELMENDORF TEAR DATA

Elmendorf Tear, mN
Sample P4 Machine Direction

Test Number	Unaged	Aged 17 Hrs.	Aged 120 Hrs.	Aged 168 Hrs.	Aged 288 Hrs.	Aged 576 Hrs.
1	562.3	575.3	529.6	523.0	523.0	562.3
2	549.2	588.4	562.3	542.7	529.6	568.8
3	562.3	562.3	516.5	549.2	536.1	536.1
4	588.4	562.3	516.5	568.8	549.2	575.3
5	555.7	536.1	536.1	568.8	510.0	536.1
6	562.3	536.1	536.1	555.7	523.0	562.3
7	575.3	562.3	529.6	555.7	549.2	575.3
8	562.3	549.2	516.5	549.2	542.7	549.2
9	549.2	562.3	536.1	549.2	529.6	536.1
10	562.3	575.3	536.1	575.3	536.1	568.8
Ave	562.9	561.0	531.5	553.8	532.8	557.0
Std	11.7	16.8	13.8	15.1	12.4	16.3

Cross Direction

Test Number	Unaged	Aged 17 Hrs.	Aged 120 Hrs.	Aged 168 Hrs.	Aged 288 Hrs.	Aged 576 Hrs.
1	751.9	732.3	706.1	732.3	732.3	719.2
2	745.3	745.3	680.0	725.7	693.0	693.0
3	738.8	732.3	712.6	725.7	725.7	693.0
4	745.3	732.3	706.1	719.2	745.3	725.7
5	732.3	732.3	699.6	706.1	719.2	719.2
6	738.8	712.6	699.6	751.9	751.9	693.0
7	764.9	745.3	719.2	732.3	719.2	719.2
8	719.2	771.5	725.7	738.8	758.4	706.1
9	719.2	758.4	699.6	719.2	738.8	719.2
10	758.4	751.9	693.0	706.1	732.3	706.1
Ave	741.4	741.4	704.1	725.7	731.6	709.4
Std	15.2	16.7	13.1	14.1	18.9	12.8

MIT FOLD DATA
MIT Fold, log (10)N
Sample P2 Machine Direction - Unaged

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.64	2.60	2.64	2.72	2.59	2.67	2.64
2	2.57	2.67	2.61	2.57	2.61	2.66	2.62
3	2.65	2.80	2.62	2.53	2.77	2.63	2.67
4	2.72	2.66	2.65	2.72	2.62	2.59	2.66
5	2.55	2.71	2.69	2.61	2.72	2.63	2.65
6	2.61	2.69	2.58	2.65	2.69	2.73	2.66
7	2.61	2.52	2.64	2.65	2.67	2.64	2.62
8	2.77	2.72	2.76	2.60	2.65	2.76	2.71
9	2.65	2.52	2.64	2.56	2.69	2.63	2.62
10	2.70	2.71	2.65	2.43	2.70	2.62	2.64
11	2.54	2.65	2.64	2.60	2.58	2.61	2.60
12	2.62	2.73	2.70	2.63	2.59	2.82	2.68
13	2.55	2.68	2.59	2.66	2.56	2.70	2.62
14	2.70	2.71	2.52	2.64	2.73	2.61	2.65
Average							2.65
Std. Dev.							0.03

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	1.57	1.65	1.53	2.11	1.97	1.91	1.79
2	1.94	1.83	1.77	1.74	1.87	1.91	1.84
3	2.03	2.29	1.70	1.86	1.59	1.81	1.88
4	1.88	2.09	2.06	1.93	1.68	1.95	1.93
5	1.78	1.81	1.92	2.08	1.97	2.10	1.94
6	1.97	1.51	1.78	1.77	1.83	1.70	1.76
7	2.03	2.06	1.76	1.81	1.58	1.66	1.82
8	1.86	2.21	2.40	2.22	2.14	2.42	2.21
9	2.01	1.83	2.03	2.10	1.79	1.92	1.95
10	1.88	1.86	1.93	1.93	1.98	1.93	1.92
11	1.80	1.72	1.82	1.78	1.72	2.11	1.83
12	2.14	2.05	2.04	1.78	2.12	1.74	1.98
13	2.18	1.99	1.93	1.77	2.03	2.24	2.02
14	1.91	1.94	1.71	1.59	2.01	2.23	1.90
Average							1.91
Std. Dev.							0.11

MIT FOLD DATA
MIT Fold, log (10)N
Sample P2 Machine Direction - Aged 17 Hrs.

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.58	2.67	2.71	2.59	2.65	2.64	2.64
2	2.62	2.56	2.40	2.55	2.59	2.68	2.57
3	2.60	2.63	2.44	2.66	2.67	2.62	2.60
4	2.59	2.55	2.71	2.58	2.57	2.60	2.60
5	2.60	2.63	2.51	2.58	2.47	2.56	2.56
6	2.48	2.59	2.62	2.60	2.57	2.67	2.59
7	2.50	2.61	2.61	2.73	2.58	2.62	2.61
8	2.56	2.71	2.67	2.54	2.68	2.53	2.61
9	2.63	2.71	2.56	2.61	2.57	2.56	2.61
10	2.47	2.36	2.60	2.41	2.54	2.75	2.52
11	2.57	2.62	2.49	2.65	2.56	2.50	2.56
12	2.65	2.59	2.57	2.61	2.63	2.63	2.61
13	2.70	2.52	2.66	2.76	2.59	2.57	2.63
14	2.63	2.55	2.65	2.54	2.58	2.55	2.59
Average							2.59
Std. Dev.							0.03

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	1.72	1.95	1.72	1.76	1.56	2.27	1.83
2	1.98	2.00	1.71	2.02	2.20	2.29	2.03
3	2.23	1.49	2.00	2.01	1.79	2.09	1.94
4	2.05	2.14	1.86	1.74	2.01	1.70	1.92
5	2.07	1.81	2.01	1.73	2.29	2.31	2.03
6	2.13	2.06	2.16	1.79	1.91	2.00	2.01
7	1.80	1.88	1.61	1.43	1.67	1.58	1.66
8	1.99	1.85	1.76	1.88	1.70	1.82	1.83
9	1.83	1.88	1.94	2.10	2.01	2.03	1.96
10	1.87	2.31	1.73	2.16	1.97	1.97	2.00
11	1.72	1.65	1.65	1.59	1.67	1.72	1.67
12	1.85	1.86	1.99	1.61	1.85	1.86	1.84
13	1.83	2.13	2.12	2.00	2.12	1.72	1.99
14	1.96	2.04	2.16	2.29	2.10	2.13	2.11
Average							1.92
Std. Dev.							0.14

MIT FOLD DATA
MIT Fold, log (10)N
Sample P2 Machine Direction - Aged 120 Hrs.

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.62	2.45	2.65	2.70	2.62	2.57	2.60
2	2.61	2.68	2.67	2.58	2.58	2.72	2.64
3	2.55	2.55	2.51	2.45	2.54	2.71	2.55
4	2.76	2.66	2.61	2.53	2.50	2.66	2.62
5	2.52	2.66	2.40	2.55	2.68	2.65	2.58
6	2.61	2.65	2.66	2.61	2.74	2.50	2.63
7	2.58	2.70	2.49	2.58	2.58	2.76	2.62
8	2.64	2.56	2.68	2.69	2.62	2.54	2.62
9	2.58	2.53	2.56	2.64	2.58	2.57	2.57
10	2.56	2.62	2.58	2.62	2.64	2.56	2.60
11	2.53	2.72	2.64	2.62	2.66	2.59	2.62
12	2.51	2.47	2.61	2.63	2.68	2.52	2.57
13	2.50	2.58	2.62	2.50	2.61	2.67	2.58
14	2.61	2.51	2.64	2.58	2.58	2.64	2.59
Average							2.60
Std. Dev.							0.03

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.00	1.83	2.05	1.82	2.42	2.30	2.07
2	1.49	1.90	1.95	2.16	1.76	1.84	1.85
3	1.77	1.73	2.11	1.79	2.13	1.76	1.88
4	1.72	2.00	2.23	2.11	1.74	1.89	1.95
5	1.64	1.83	1.57	1.48	1.57	1.99	1.68
6	2.05	1.56	2.04	2.00	2.25	2.07	1.99
7	1.96	1.98	1.64	1.94	1.85	1.96	1.89
8	2.16	2.32	2.22	2.07	1.93	2.14	2.14
9	2.00	1.80	1.98	1.94	1.57	2.10	1.90
10	2.18	2.01	2.15	1.83	2.01	2.07	2.04
11	2.00	1.98	1.81	2.24	2.09	2.03	2.02
12	1.92	1.89	1.89	1.85	1.74	1.72	1.84
13	1.66	1.71	2.05	1.95	1.88	1.86	1.85
14	1.99	1.88	1.72	1.93	2.03	1.51	1.84
Average							1.93
Std. Dev.							0.12

MIT FOLD DATA
MIT Fold, log (10)N
Sample P2 Machine Direction - Aged 168 Hrs.

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.61	2.64	2.57	2.68	2.60	2.62	2.62
2	2.67	2.64	2.65	2.53	2.65	2.49	2.61
3	2.46	2.63	2.63	2.78	2.63	2.49	2.60
4	2.52	2.63	2.58	2.59	2.58	2.59	2.58
5	2.43	2.63	2.65	2.60	2.56	2.57	2.57
6	2.60	2.70	2.53	2.45	2.48	2.51	2.54
7	2.58	2.56	2.69	2.67	2.66	2.56	2.62
8	2.69	2.63	2.67	2.66	2.58	2.60	2.64
9	2.53	2.64	2.58	2.60	2.52	2.68	2.59
10	2.71	2.53	2.56	2.67	2.53	2.69	2.62
11	2.54	2.61	2.63	2.61	2.48	2.66	2.59
12	2.68	2.66	2.68	2.54	2.58	2.62	2.63
13	2.51	2.55	2.55	2.56	2.67	2.61	2.57
14	2.64	2.58	2.59	2.59	2.51	2.55	2.57
Average							2.60
Std. Dev.							0.03

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.24	1.66	1.85	1.62	1.51	1.71	1.76
2	1.61	1.82	1.49	1.79	1.76	2.01	1.75
3	1.73	1.60	1.54	1.84	1.81	2.15	1.78
4	1.74	1.79	1.66	1.87	1.97	1.85	1.81
5	2.18	2.24	1.89	1.85	1.91	1.90	1.99
6	1.92	2.18	1.80	2.01	2.03	1.98	1.99
7	2.04	2.03	1.98	1.91	1.81	1.71	1.91
8	2.26	2.03	2.29	2.08	2.16	1.81	2.11
9	1.99	2.16	2.00	2.24	2.17	2.50	2.18
10	2.02	1.89	2.22	1.96	1.92	1.75	1.96
11	1.97	1.72	2.08	1.91	2.12	1.82	1.94
12	1.79	1.73	1.85	1.72	1.65	1.82	1.76
13	1.84	1.78	1.83	1.62	1.77	2.09	1.82
14	1.98	2.00	2.18	1.75	1.92	1.83	1.94
Average							1.91
Std. Dev.							0.13

MIT FOLD DATA
MIT Fold, log (10)N
Sample P2 Machine Direction - Aged 288 Hrs.

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.63	2.65	2.53	2.55	2.63	2.56	2.59
2	2.51	2.55	2.56	2.59	2.58	2.56	2.56
3	2.55	2.68	2.50	2.61	2.55	2.47	2.56
4	2.56	2.59	2.52	2.58	2.59	2.48	2.56
5	2.66	2.56	2.57	2.66	2.42	2.59	2.58
6	2.56	2.65	2.62	2.51	2.69	2.58	2.60
7	2.56	2.65	2.45	2.58	2.56	2.66	2.58
8	2.53	2.62	2.62	2.56	2.53	2.43	2.55
9	2.53	2.60	2.57	2.41	2.56	2.69	2.56
10	2.45	2.53	2.63	2.47	2.65	2.70	2.57
11	2.60	2.60	2.47	2.55	2.60	2.55	2.56
12	2.56	2.61	2.54	2.67	2.57	2.49	2.57
13	2.57	2.55	2.66	2.57	2.43	2.52	2.55
14	2.55	2.40	2.60	2.59	2.72	2.49	2.56
Average							2.57
Std. Dev.							0.02

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	1.80	1.49	1.61	1.15	1.65	1.69	1.57
2	2.18	1.60	1.67	1.65	1.82	2.05	1.83
3	1.74	1.48	1.65	1.96	1.54	2.04	1.74
4	1.79	1.86	1.76	2.12	1.77	2.22	1.92
5	1.80	1.58	2.14	1.80	1.81	2.42	1.92
6	1.99	2.13	1.74	1.99	1.88	1.89	1.94
7	1.96	1.85	1.89	2.06	1.66	1.92	1.89
8	2.08	2.07	2.00	2.19	1.59	1.65	1.93
9	1.54	2.05	1.96	1.93	1.84	1.72	1.84
10	2.24	1.81	2.01	1.78	2.16	1.67	1.94
11	1.68	2.00	2.02	1.49	2.00	1.66	1.81
12	1.91	1.66	1.95	1.64	1.78	1.48	1.74
13	1.95	1.79	1.86	1.56	1.99	1.71	1.81
14	1.75	2.06	1.80	2.09	1.96	2.10	1.96
Average							1.85
Std. Dev.							0.11

MIT FOLD DATA
MIT Fold, log (10)N
Sample P2 Machine Direction - Aged 576 Hrs.

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.50	2.59	2.54	2.51	2.49	2.57	2.53
2	2.58	2.50	2.64	2.55	2.53	2.59	2.57
3	2.57	2.53	2.58	2.52	2.55	2.69	2.57
4	2.42	2.54	2.56	2.49	2.33	2.52	2.48
5	2.63	2.49	2.59	2.49	2.61	2.65	2.58
6	2.55	2.52	2.68	2.57	2.57	2.56	2.58
7	2.51	2.43	2.44	2.64	2.54	2.57	2.52
8	2.51	2.39	2.57	2.50	2.53	2.54	2.51
9	2.48	2.58	2.62	2.48	2.60	2.43	2.53
10	2.46	2.73	2.56	2.42	2.41	2.59	2.53
11	2.49	2.54	2.56	2.72	2.42	2.54	2.54
12	2.52	2.47	2.50	2.52	2.58	2.49	2.51
13	2.56	2.62	2.38	2.67	2.55	2.58	2.56
14	2.53	2.40	2.49	2.53	2.56	2.50	2.50
Average							2.54
Std. Dev.							0.03

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	1.67	1.43	1.51	1.67	2.00	1.56	1.64
2	1.58	1.67	1.72	1.30	1.45	1.90	1.60
3	1.89	1.90	2.03	1.87	1.88	1.48	1.84
4	1.54	1.54	1.81	1.65	1.72	2.12	1.73
5	1.53	1.91	2.03	1.94	1.86	1.83	1.85
6	1.49	1.78	1.77	1.89	2.08	1.81	1.80
7	1.57	1.54	1.59	1.60	1.58	1.56	1.57
8	1.89	1.99	1.88	1.77	2.27	2.01	1.97
9	1.91	1.70	1.67	1.91	1.93	1.36	1.75
10	1.87	1.62	1.36	1.92	1.64	1.75	1.69
11	1.63	1.36	2.29	1.86	1.80	1.61	1.76
12	2.02	1.79	2.16	2.11	1.76	2.00	1.97
13	1.63	1.60	1.73	1.36	1.72	1.76	1.63
14	2.05	1.41	1.78	1.81	1.59	1.78	1.74
Average							1.75
Std. Dev.							0.12

MIT FOLD DATA
MIT Fold, log (10)N
Sample P3 Machine Direction - Unaged

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.89	2.93	2.95	2.95	2.85	2.87	2.91
2	2.76	2.93	2.90	2.93	2.87	2.88	2.88
3	2.82	2.81	2.87	2.92	2.84	2.98	2.87
4	2.87	2.91	2.83	2.94	2.71	2.79	2.84
5	2.89	2.90	2.94	2.97	2.84	2.85	2.90
6	2.96	2.92	2.89	2.94	3.00	2.91	2.94
7	2.83	2.83	2.86	2.97	2.92	2.89	2.88
8	2.86	2.86	2.87	2.83	2.81	2.85	2.85
9	2.86	2.81	2.92	2.89	2.83	2.91	2.87
10	2.96	2.91	2.85	2.99	2.81	2.91	2.90
11	2.92	2.86	2.88	2.90	2.84	2.90	2.88
12	2.83	2.82	2.90	2.83	2.80	2.87	2.84
13	2.96	2.91	2.91	2.93	2.91	2.99	2.94
14	2.83	2.94	2.88	2.86	2.86	2.96	2.89
Average							2.89
Std. Dev.							0.03

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.00	1.88	2.10	2.09	2.15	1.99	2.03
2	2.12	2.23	2.24	2.33	2.28	2.25	2.24
3	2.30	2.26	2.08	2.20	2.32	2.20	2.23
4	2.08	2.20	2.15	2.24	1.98	1.92	2.10
5	2.27	2.44	2.08	2.10	2.43	2.23	2.26
6	2.13	1.99	1.98	2.17	2.10	2.01	2.06
7	2.14	2.18	2.26	2.04	2.16	2.16	2.16
8	2.12	2.10	2.00	2.20	2.12	2.31	2.14
9	2.24	2.39	2.20	2.29	2.09	2.29	2.25
10	2.32	2.38	2.26	2.14	2.38	2.00	2.25
11	2.30	2.30	2.26	2.12	2.30	2.28	2.26
12	2.04	2.25	2.35	2.55	2.13	2.22	2.26
13	1.96	1.89	2.16	2.06	2.15	2.14	2.06
14	2.39	2.26	2.15	2.54	2.06	2.57	2.33
Average							2.19
Std. Dev.							0.09

MIT FOLD DATA
MIT Fold, log (10)N
Sample P3 Machine Direction - Aged 17 Hrs.

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.85	2.86	2.84	2.89	2.88	2.86	2.86
2	2.88	2.95	2.90	2.94	2.93	2.90	2.92
3	2.88	2.92	2.95	2.89	2.93	2.91	2.91
4	2.81	2.79	2.78	2.82	2.76	2.95	2.82
5	2.93	2.90	2.88	2.89	2.98	2.89	2.91
6	2.82	2.83	2.90	2.88	2.77	2.92	2.85
7	2.82	2.83	2.86	2.80	2.76	2.92	2.83
8	2.78	2.84	2.85	2.90	2.88	2.95	2.87
9	2.86	2.91	2.84	2.80	2.82	2.84	2.85
10	2.82	2.86	2.81	2.91	2.94	2.82	2.86
11	2.84	2.93	2.87	2.83	2.80	2.86	2.86
12	2.90	2.90	2.88	2.93	2.90	2.89	2.90
13	2.41	2.31	2.20	2.40	2.32	2.46	2.35
14	2.89	2.83	2.80	2.82	2.87	2.91	2.85
Average							2.83
Std. Dev.							0.14

Cross Direction							
Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.40	2.17	2.10	2.46	2.21	2.43	2.29
2	2.41	2.16	2.24	2.17	2.06	2.28	2.22
3	2.40	2.35	2.08	2.25	2.20	2.18	2.24
4	2.22	2.30	2.26	2.45	2.31	2.36	2.32
5	2.26	2.08	2.27	2.30	2.37	2.27	2.26
6	2.30	2.36	2.17	2.31	2.38	2.25	2.29
7	2.36	2.33	2.30	2.39	2.21	2.35	2.33
8	2.14	2.05	2.27	2.24	2.06	2.07	2.14
9	2.21	2.28	2.21	2.32	2.30	2.37	2.28
10	2.36	2.21	2.44	2.10	2.39	2.16	2.28
11	2.23	2.09	2.56	2.23	2.55	2.14	2.30
12	2.28	2.02	2.66	2.27	2.16	2.39	2.30
13	1.89	1.78	1.72	1.71	2.07	2.15	1.89
14	2.25	2.32	2.46	2.46	2.42	2.34	2.38
Average							2.25
Std. Dev.							0.12

MIT FOLD DATA
MIT Fold, log (10)N
Sample P3 Machine Direction - Aged 120 Hrs.

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.73	2.83	2.83	2.75	2.82	2.93	2.82
2	2.83	2.85	2.87	2.84	2.80	2.88	2.85
3	2.87	2.81	2.75	2.92	2.85	2.82	2.84
4	2.88	2.94	2.86	2.79	2.94	2.84	2.87
5	2.85	2.85	2.73	2.78	2.89	2.79	2.81
6	2.78	2.82	2.81	2.88	2.87	2.88	2.84
7	2.82	2.82	2.80	2.90	2.83	2.88	2.84
8	2.68	2.91	2.88	2.76	2.92	2.88	2.84
9	2.76	2.81	2.85	2.79	2.85	2.95	2.84
10	2.86	2.84	2.83	2.88	2.87	2.73	2.84
11	2.90	2.69	2.86	2.89	2.86	2.90	2.85
12	2.73	2.94	2.79	2.78	2.79	2.94	2.83
13	2.83	2.81	2.88	2.89	2.79	2.94	2.86
14	2.81	2.87	2.92	2.84	2.82	2.91	2.86
Average							2.84
Std. Dev.							0.02

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.10	1.91	2.26	2.15	2.17	2.33	2.15
2	2.11	2.31	2.05	2.17	2.03	2.03	2.12
3	2.20	2.24	2.17	2.18	2.30	2.14	2.21
4	2.10	2.36	2.10	2.11	2.22	2.17	2.18
5	2.13	2.20	2.51	2.10	2.18	2.37	2.25
6	2.01	2.22	2.40	2.36	2.27	2.19	2.24
7	2.26	1.96	2.23	2.03	2.14	2.22	2.14
8	2.49	2.37	2.40	2.19	2.24	2.12	2.30
9	2.14	2.42	2.11	2.02	2.37	2.23	2.21
10	2.22	2.24	2.36	2.20	2.14	2.22	2.23
11	2.26	2.37	2.13	2.26	2.41	2.26	2.28
12	2.23	2.23	2.16	2.28	2.00	2.36	2.21
13	2.22	2.37	2.34	2.09	2.06	2.24	2.22
14	2.08	2.14	2.25	2.40	2.12	2.40	2.23
Average							2.21
Std. Dev.							0.05

MIT FOLD DATA
MIT Fold, log (10)N
Sample P3 Machine Direction - Aged 168 Hrs.

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.86	2.80	2.81	2.86	2.92	2.89	2.86
2	2.89	2.91	2.95	2.85	2.83	2.90	2.89
3	2.84	2.90	2.88	2.87	2.79	2.89	2.86
4	2.76	2.87	2.91	2.77	2.88	2.85	2.84
5	2.88	2.83	2.90	2.85	2.88	2.85	2.87
6	2.86	2.78	2.86	2.82	2.83	2.82	2.83
7	2.87	2.93	3.05	2.72	2.81	2.97	2.89
8	2.80	2.75	2.76	2.84	2.88	2.77	2.80
9	2.90	2.65	2.94	2.67	2.78	2.85	2.80
10	2.90	2.86	2.72	2.76	2.88	2.79	2.82
11	2.85	2.79	2.74	2.75	2.90	2.85	2.81
12	2.80	2.81	2.82	2.79	2.89	2.96	2.84
13	2.79	2.80	2.88	2.93	2.78	2.81	2.83
14	2.85	2.81	2.93	2.82	2.75	2.93	2.85
Average							2.84
Std. Dev.							0.03

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.23	2.15	2.18	1.95	2.32	2.23	2.18
2	2.14	2.13	2.22	2.17	2.31	2.28	2.21
3	2.26	2.27	2.08	2.30	2.29	2.30	2.25
4	2.12	1.96	2.38	2.24	2.03	2.07	2.13
5	2.31	2.36	2.31	2.31	2.27	2.40	2.33
6	2.12	2.46	2.40	2.43	2.32	2.37	2.35
7	2.26	2.13	2.19	2.27	2.18	2.17	2.20
8	2.09	2.13	2.15	2.16	2.25	2.19	2.16
9	2.14	2.06	1.99	2.09	1.95	2.29	2.09
10	2.14	2.16	2.11	2.29	2.35	2.35	2.23
11	2.02	2.14	2.28	2.16	2.19	2.14	2.15
12	2.10	2.10	2.21	2.24	2.27	2.28	2.20
13	2.17	2.28	2.23	2.33	2.13	2.39	2.25
14	1.99	2.01	2.07	2.08	2.15	2.28	2.10
Average							2.20
Std. Dev.							0.05

MIT FOLD DATA
MIT Fold, log (10)N
Sample P3 Machine Direction - Aged 288 Hrs.

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.76	2.77	2.88	2.75	2.77	2.90	2.80
2	2.81	2.78	2.80	2.67	2.90	2.82	2.80
3	2.76	2.90	2.71	2.84	2.92	2.79	2.82
4	2.81	2.72	2.74	2.75	2.86	2.78	2.78
5	2.81	2.85	2.75	2.87	2.83	2.81	2.82
6	2.84	2.82	2.84	2.84	2.85	2.81	2.83
7	2.88	2.79	2.94	2.74	2.78	2.85	2.83
8	2.75	2.81	2.81	2.84	2.85	2.76	2.80
9	2.75	2.81	2.77	2.80	2.81	2.90	2.81
10	2.77	2.75	2.88	2.93	2.87	2.81	2.83
11	2.87	2.77	2.78	2.88	2.79	2.79	2.82
12	2.79	2.88	2.79	2.82	2.98	2.88	2.86
13	2.78	2.88	2.87	2.90	2.72	2.94	2.85
14	2.78	2.64	2.90	2.82	2.84	2.87	2.81
Average							2.82
Std. Dev.							0.02

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.19	1.93	2.24	2.19	2.19	2.16	2.15
2	2.26	2.26	2.16	2.20	2.29	2.34	2.25
3	2.40	2.21	1.86	2.06	2.26	2.38	2.19
4	2.24	2.12	2.22	2.24	2.22	2.26	2.22
5	2.05	2.13	1.91	2.03	2.03	1.98	2.02
6	2.05	2.36	2.23	2.36	2.22	2.36	2.26
7	1.92	2.23	2.23	2.23	2.36	2.18	2.19
8	2.10	2.11	2.10	2.08	2.20	2.10	2.11
9	2.07	2.29	2.16	2.45	2.16	2.13	2.21
10	2.05	2.28	2.08	2.28	2.29	2.30	2.21
11	2.29	2.28	2.25	2.05	2.06	2.39	2.22
12	2.25	1.96	2.19	2.09	2.15	2.20	2.14
13	2.12	2.04	2.28	2.23	2.14	2.31	2.18
14	1.99	2.07	2.21	2.33	2.27	2.08	2.16
Average							2.18
Std. Dev.							0.06

MIT FOLD DATA
MIT Fold, log (10)N
Sample P3 Machine Direction - Aged 576 Hrs.

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.79	2.69	2.78	2.80	2.75	2.69	2.75
2	2.72	2.76	2.79	2.88	2.83	2.81	2.80
3	2.82	2.77	2.82	2.81	2.81	2.79	2.80
4	2.74	2.75	2.75	2.72	2.80	2.70	2.74
5	2.73	2.83	2.83	2.72	2.74	2.81	2.78
6	2.86	2.82	2.80	2.89	2.79	2.75	2.82
7	2.87	2.78	2.83	2.84	2.81	2.80	2.82
8	2.78	2.85	2.85	2.87	2.74	2.76	2.81
9	2.84	2.78	2.69	2.68	2.76	2.86	2.77
10	2.98	3.04	2.99	2.93	3.09	2.76	2.96
11	2.78	2.88	2.83	2.80	2.83	2.76	2.81
12	2.80	2.97	2.76	2.81	2.79	2.90	2.84
13	2.70	2.73	2.69	2.94	2.81	2.78	2.78
14	2.83	2.79	2.85	2.83	2.83	2.86	2.83
Average							2.81
Std. Dev.							0.05

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.06	2.11	2.15	2.31	2.05	2.24	2.15
2	2.28	2.31	2.25	2.23	2.03	2.05	2.19
3	2.08	2.05	2.34	2.25	2.35	2.41	2.24
4	2.09	2.01	2.40	2.14	1.97	2.11	2.12
5	2.33	1.99	2.29	2.25	2.26	2.44	2.26
6	2.00	1.86	1.99	2.19	1.98	2.11	2.02
7	2.15	2.17	2.02	2.16	2.12	2.00	2.10
8	2.28	2.22	2.18	2.10	2.11	2.04	2.15
9	2.36	2.10	2.00	2.16	2.01	2.18	2.14
10	2.21	2.24	2.28	2.26	2.41	2.27	2.28
11	2.22	2.13	2.49	2.00	2.16	2.32	2.22
12	2.12	2.07	2.19	2.13	2.02	2.23	2.13
13	2.13	2.12	2.19	1.54	2.08	2.18	2.04
14	2.01	2.15	2.02	2.20	2.16	2.36	2.15
Average							2.16
Std. Dev.							0.08

MIT FOLD DATA
MIT Fold, log (10)N
Sample P4 Machine Direction - Unaged

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	3.13	3.08	3.06	3.09	3.05	3.13	3.09
2	3.09	3.13	3.23	3.06	3.11	3.09	3.12
3	3.06	3.05	3.11	3.04	3.03	3.10	3.07
4	3.03	3.09	2.96	3.04	3.12	3.17	3.07
5	3.09	3.19	3.08	3.11	3.03	3.08	3.10
6	3.11	3.18	3.14	3.10	3.06	3.04	3.10
7	3.11	3.09	3.14	3.10	3.10	3.12	3.11
8	3.03	3.03	3.20	3.08	3.09	3.14	3.09
9	3.16	3.11	3.14	3.06	3.03	3.12	3.10
10	3.01	3.10	3.13	3.06	3.07	2.96	3.06
11	2.94	3.03	3.11	3.04	3.21	3.05	3.06
12	2.97	3.10	3.10	3.11	3.08	3.20	3.10
13	3.06	3.11	3.12	3.07	3.06	3.15	3.09
14	3.07	3.12	3.08	3.03	3.10	3.20	3.10
Average							3.09
Std. Dev.							0.02

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.59	2.50	2.65	2.50	2.49	2.69	2.57
2	2.45	2.52	2.49	2.59	2.48	2.47	2.50
3	2.62	2.53	2.56	2.45	2.37	2.64	2.53
4	2.59	2.76	2.47	2.44	2.64	2.38	2.55
5	2.69	2.66	2.68	2.64	2.63	2.73	2.67
6	2.23	2.31	2.64	2.48	2.44	2.49	2.43
7	2.81	2.60	2.58	2.55	2.63	2.52	2.62
8	2.68	2.43	2.45	2.44	2.53	2.43	2.49
9	2.48	2.39	2.53	2.50	2.47	2.45	2.47
10	2.40	2.32	2.31	2.46	2.51	2.47	2.41
11	2.70	2.49	2.78	2.57	2.46	2.61	2.60
12	2.57	2.57	2.49	2.65	2.53	2.57	2.56
13	2.56	2.49	2.63	2.64	2.59	2.53	2.57
14	2.43	2.51	2.52	2.55	2.40	2.51	2.49
Average							2.53
Std. Dev.							0.07

MIT FOLD DATA
 MIT Fold, $\log_{10} N$
 Sample P4 Machine Direction - Aged 17 Hrs.

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	3.09	3.17	3.16	3.05	3.04	3.22	3.12
2	3.11	3.12	3.06	2.98	3.10	3.10	3.08
3	3.05	3.07	3.12	3.05	3.11	3.06	3.08
4	3.11	2.99	3.16	3.07	3.14	3.10	3.10
5	3.11	3.11	3.19	2.98	3.17	3.15	3.12
6	3.17	3.09	3.16	3.11	3.10	3.16	3.13
7	3.08	3.13	3.11	3.07	3.07	3.18	3.11
8	3.05	3.08	3.17	3.03	3.07	3.17	3.10
9	3.11	3.22	3.04	3.13	3.16	3.12	3.13
10	3.02	3.14	3.14	3.05	3.00	3.26	3.10
11	3.02	3.14	3.13	3.03	3.10	3.10	3.09
12	3.05	3.17	3.13	2.97	3.10	3.02	3.07
13	2.98	3.11	3.11	3.06	3.05	3.21	3.09
14	2.98	3.08	3.07	3.14	2.98	3.07	3.05
Average							3.10
Std. Dev.							0.02

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.50	2.68	2.54	2.66	2.42	2.63	2.57
2	2.56	2.56	2.56	2.58	2.54	2.72	2.59
3	2.54	2.52	2.52	2.60	2.61	2.45	2.54
4	2.40	2.31	2.31	2.49	2.57	2.70	2.46
5	2.58	2.69	2.69	2.65	2.53	2.71	2.64
6	2.47	2.61	2.61	2.62	2.64	2.80	2.62
7	2.63	2.45	2.45	2.53	2.59	2.62	2.54
8	2.31	2.54	2.54	2.53	2.56	2.58	2.51
9	2.63	2.67	2.67	2.64	2.50	2.43	2.59
10	2.45	2.57	2.57	2.39	2.46	2.45	2.48
11	2.60	2.53	2.53	2.49	2.56	2.42	2.52
12	2.58	2.49	2.49	2.53	2.56	2.64	2.55
13	2.57	2.45	2.45	2.59	2.51	2.70	2.55
14	2.38	2.49	2.49	2.54	2.62	2.45	2.49
Average							2.55
Std. Dev.							0.05

MIT FOLD DATA
MIT Fold, log (10)N
Sample P4 Machine Direction - Aged 120 Hrs.

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	3.04	3.05	3.18	3.00	3.07	3.19	3.09
2	2.99	3.10	2.95	3.02	3.18	3.08	3.05
3	3.09	3.02	3.06	3.12	3.02	3.13	3.07
4	3.09	3.09	3.03	3.22	3.09	3.06	3.10
5	3.10	3.07	3.05	3.04	3.01	2.96	3.04
6	3.04	3.04	3.12	2.94	2.92	3.01	3.01
7	3.06	3.11	3.05	3.02	3.04	3.18	3.08
8	3.01	3.10	3.10	3.01	3.00	3.06	3.05
9	3.03	3.08	3.08	2.99	3.03	3.04	3.04
10	2.98	3.01	3.10	3.00	2.96	3.12	3.03
11	3.10	3.04	2.96	3.10	3.07	3.16	3.07
12	2.99	2.99	3.01	3.08	2.99	3.05	3.02
13	3.09	3.07	3.11	3.05	3.09	3.07	3.08
14	2.97	3.07	3.03	3.07	3.05	3.13	3.05
Average							3.06
Std. Dev.							0.03

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.49	2.45	2.53	2.67	2.60	2.73	2.58
2	2.47	2.58	2.65	2.39	2.56	2.59	2.54
3	2.40	2.49	2.61	2.43	2.55	2.41	2.48
4	2.37	2.47	2.53	2.40	2.45	2.66	2.48
5	2.52	2.46	2.43	2.61	2.60	2.57	2.53
6	2.62	2.53	2.55	2.41	2.47	2.48	2.51
7	2.44	2.38	2.60	2.44	2.35	2.30	2.42
8	2.61	2.47	2.48	2.37	2.63	2.34	2.49
9	2.39	2.48	2.38	2.27	2.49	2.45	2.41
10	2.32	2.56	2.28	2.57	2.62	2.50	2.47
11	2.35	2.60	2.57	2.43	2.52	2.51	2.50
12	2.63	2.66	2.57	2.66	2.62	2.70	2.64
13	2.40	2.56	2.45	2.50	2.57	2.46	2.49
14	2.49	2.47	2.53	2.46	2.57	2.73	2.54
Average							2.51
Std. Dev.							0.06

MIT FOLD DATA
MIT Fold, log (10)N
Sample P4 Machine Direction - Aged 168 Hrs.

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	3.06	3.00	3.13	3.00	3.08	3.15	3.07
2	2.99	3.11	3.12	3.03	3.00	3.03	3.05
3	2.96	2.98	3.07	3.05	3.07	2.96	3.01
4	3.03	3.12	3.02	3.01	2.98	3.03	3.03
5	3.09	3.04	3.00	2.95	3.07	3.04	3.03
6	3.06	3.02	3.12	3.04	3.10	3.14	3.08
7	3.04	3.11	3.13	3.10	3.06	3.12	3.09
8	3.07	3.07	3.08	3.12	3.09	2.96	3.07
9	3.06	3.04	3.13	2.95	3.08	3.01	3.04
10	3.04	3.04	3.08	3.05	2.99	3.04	3.04
11	3.08	3.00	3.00	3.04	3.08	3.07	3.04
12	3.07	3.18	2.98	3.10	3.10	3.06	3.08
13	3.06	3.02	3.03	3.07	2.90	3.05	3.02
14	3.09	3.06	3.02	3.10	3.01	3.03	3.05
Average							3.05
Std. Dev.							0.02

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.74	2.64	2.41	2.40	2.36	2.59	2.52
2	2.46	2.22	2.59	2.60	2.46	2.67	2.50
3	2.58	2.53	2.52	2.57	2.56	2.73	2.58
4	2.52	2.53	2.59	2.52	2.35	2.51	2.50
5	2.48	2.37	2.50	2.47	2.30	2.54	2.44
6	2.41	2.28	2.52	2.54	2.34	2.45	2.42
7	2.55	2.52	2.55	2.31	2.52	2.40	2.48
8	2.50	2.66	2.63	2.40	2.60	2.63	2.57
9	2.34	2.42	2.57	2.57	2.44	2.54	2.48
10	2.39	2.79	2.58	2.52	2.48	2.59	2.56
11	2.63	2.57	2.63	2.45	2.70	2.66	2.61
12	2.55	2.45	2.44	2.34	2.68	2.45	2.49
13	2.39	2.49	2.22	2.22	2.61	2.49	2.40
14	2.52	2.60	2.39	2.51	2.34	2.59	2.49
Average							2.50
Std. Dev.							0.06

MIT FOLD DATA
MIT Fold, log (10)N
Sample P4 Machine Direction - Aged 288 Hrs.

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	3.01	3.03	3.04	3.08	3.03	3.13	3.05
2	3.08	3.09	3.26	2.96	3.05	3.13	3.09
3	3.06	3.03	3.07	3.15	3.15	3.09	3.09
4	3.10	3.04	3.15	3.12	3.21	3.07	3.12
5	3.10	3.13	3.03	3.09	3.07	3.10	3.09
6	3.03	3.01	3.10	3.07	3.02	3.07	3.05
7	3.10	3.05	3.09	2.99	3.04	3.07	3.06
8	2.96	3.11	3.08	3.04	3.11	3.13	3.07
9	2.97	3.06	3.11	3.13	3.05	3.08	3.07
10	3.05	3.08	3.04	3.16	3.04	3.08	3.07
11	3.04	3.18	3.05	2.96	3.06	3.09	3.06
12	3.07	3.07	3.07	2.81	2.96	3.01	3.00
13	2.98	3.03	2.95	3.10	3.00	3.02	3.01
14	3.09	3.08	3.04	3.04	2.93	2.96	3.03
Average							3.06
Std. Dev.							0.03

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.52	2.68	2.56	2.34	2.53	2.73	2.56
2	2.52	2.47	2.54	2.48	2.67	2.55	2.54
3	2.44	2.42	2.49	2.55	2.57	2.42	2.48
4	2.50	2.39	2.32	2.62	2.25	2.41	2.42
5	2.52	2.53	2.47	2.63	2.29	2.44	2.48
6	2.36	2.36	2.41	2.42	2.41	2.37	2.39
7	2.67	2.45	2.62	2.71	2.71	2.67	2.64
8	2.59	2.48	2.45	2.53	2.66	2.63	2.56
9	2.60	2.39	2.44	2.60	2.61	2.58	2.54
10	2.58	2.51	2.62	2.54	2.42	2.35	2.50
11	2.46	2.47	2.49	2.33	2.53	2.47	2.46
12	2.41	2.40	2.46	2.43	2.50	2.46	2.44
13	2.56	2.57	2.47	2.56	2.54	2.55	2.54
14	2.31	2.52	2.39	2.73	2.37	2.48	2.47
Average							2.50
Std. Dev.							0.07

MIT FOLD DATA
MIT Fold, log (10)N
Sample P4 Machine Direction - Aged 576 Hrs.

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	3.01	3.13	2.98	3.05	3.08	3.11	3.06
2	3.07	3.05	3.09	3.07	3.11	3.11	3.08
3	2.99	3.02	3.09	2.94	3.10	3.01	3.02
4	2.98	3.08	2.98	2.96	2.97	3.04	3.00
5	3.03	3.06	3.08	3.05	3.03	3.10	3.06
6	3.03	3.09	3.07	3.03	3.05	3.10	3.06
7	3.05	3.12	3.08	2.97	3.06	3.13	3.07
8	3.03	2.99	3.04	3.08	3.09	2.98	3.03
9	2.99	3.04	2.90	2.94	3.03	3.05	2.99
10	2.93	3.02	3.10	2.92	3.04	2.99	3.00
11	2.98	3.01	3.03	3.06	3.15	3.00	3.04
12	2.96	3.07	2.98	3.02	3.01	3.00	3.01
13	3.01	3.08	3.01	3.00	3.11	3.00	3.04
14	2.97	3.00	3.02	2.98	2.97	2.89	2.97
Average							3.03
Std. Dev.							0.03

Cross Direction

Sheet Number	Test 1	Test 2	Test 3	Test 4	Test 5	Test 6	Average
1	2.46	2.37	2.43	2.61	2.38	2.48	2.46
2	2.22	2.39	2.30	2.15	2.55	2.34	2.33
3	2.39	2.38	2.28	2.31	2.56	2.58	2.42
4	2.17	2.53	2.56	2.33	2.61	2.54	2.46
5	2.43	2.53	2.36	2.77	2.40	2.60	2.52
6	2.44	2.39	2.41	2.37	2.36	2.51	2.41
7	2.42	2.57	2.71	2.70	2.71	2.58	2.62
8	2.49	2.39	2.70	2.49	2.51	2.61	2.53
9	2.53	2.44	2.50	2.36	2.49	2.43	2.46
10	2.45	2.44	2.51	2.43	2.53	2.37	2.45
11	2.62	2.33	2.53	2.49	2.47	2.41	2.48
12	2.45	2.73	2.66	2.47	2.45	2.38	2.52
13	2.45	2.33	2.55	2.47	2.63	2.41	2.47
14	2.31	2.56	2.46	2.58	2.08	2.44	2.41
Average							2.47
Std. Dev.							0.07

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