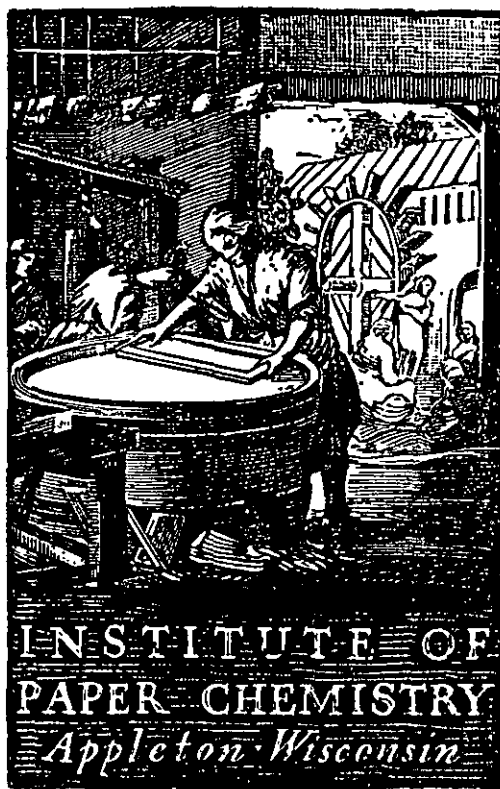


Institute of Paper Science and Technology
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CONTINUOUS BASELINE STUDY

Project 1108-13

Progress Report 161

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

September 1, 1960

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS BASELINE STUDY

Project 1108-13

Progress Report 161

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

September 1, 1960

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THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

SUMMARY

The objective of the continuous baseline study on linerboard is twofold. The first objective is to provide an indication of the quality of the 42-lb. fourdrinier kraft linerboard being produced by each of the participating mills and by the industry as a whole. The second objective is to provide a procedure whereby the mills have the opportunity to compare their test results with those obtained at the Institute on similar materials, thus providing a convenient system of instrument verification. The first objective is implemented by the weekly sampling of the product of each machine manufacturing 42-lb. kraft linerboard and submitting these weekly samples to The Institute of Paper Chemistry where they are evaluated for basis weight, caliper, bursting strength, and Elmendorf tearing strength. The second objective of the continuous baseline study--namely, to provide a convenient system of instrument verification--is achieved by the testing of analogous samples by the mill and the Institute. The mill data are sent to the Institute, and a comparison of Institute and mill test results is included in the monthly reports. In addition to fulfilling the two prime objectives described above, the baseline study is accumulating an invaluable ever-growing reserve of background information essential for the intelligent evaluation of specifications of any kind.

During the month of August, eighty-nine sample lots of 42-lb. fourdrinier kraft linerboard representing the production of sixteen mills were evaluated at The Institute of Paper Chemistry. Shown below are the maximum and minimum current mill averages for each test (the current mill average is the average of the results obtained on all sample

lots of linerboard submitted from a given mill during the current period); also shown for each test is the current F.K.I. average which is determined by averaging the current mill averages and is indicative of the test level being maintained by the industry as a whole to the degree that the industry is represented by the participating mills:

	Maximum Current Mill Av.	Minimum Current Mill Av.	Current F.K.I. Av.
Basis weight, lb.	44.0	42.7	43.5
Caliper, pt.	13.9	11.8	12.6
Bursting strength, p.s.i. gage	122	104	113
Machine direction, Elmendorf tear, g./sheet	374	277	338
Cross-machine direction, Elmendorf tear, g./sheet	423	343	379

As mentioned previously, the study provides a procedure whereby the mills have the opportunity to compare their test results with those obtained on corresponding sample lots of linerboard at the Institute so that a convenient system of instrument verification is readily available to all participants. A summary of the agreement obtained in the comparisons of Institute and mill test results for the current period is shown below. The tabulated data show the number of mills (and the percentage of all mills which this number represents) whose average test results for the month of August fall within the designated percentages from the average test results obtained at the Institute on corresponding materials.

		Average Percentage Difference Between Institute and Mill Test Results										
		+0.5	+1	+2	+3	+4	+5	+7.5	+10	+13		
Basis weight												
Number of mills		3	11	16								
Percentage of all mills		18.8	68.8	100.0								
Caliper												
Number of mills		0	3	12	14	15	16					
Percentage of all mills		0.0	18.8	75.0	87.5	93.8	100.0					
Bursting strength												
Number of mills		4	5	7	9	13	14	16				
Percentage of all mills		25.0	31.2	43.8	56.2	81.2	87.5	100.0				
Tearing strength, in												
Number of mills		0	2	4	6	7	8	10	12	15		
Percentage of all mills		0.0	13.3	26.7	40.0	46.7	53.3	66.7	80.0	100.0		
Tearing strength, across												
Number of mills		1	2	4	4	6	8	12	14	15		
Percentage of all mills		6.7	13.3	26.7	26.7	40.0	53.3	80.0	93.3	100.0		

INTRODUCTION

The objective of the continuous baseline study on linerboard is twofold. One objective is to provide an indication of the quality of the 42-lb. fourdrinier kraft linerboard being produced by each of the participating mills and by the industry as a whole. Another objective is to provide a procedure whereby the mills have the opportunity to compare their test results with those obtained at the Institute on similar materials, thus providing a convenient system of instrument verification. The first objective mentioned above is implemented by the weekly sampling of the product of each machine manufacturing 42-lb. kraft linerboard and submitting these weekly samples to The Institute of Paper Chemistry where they are evaluated for basis weight, caliper, bursting strength, and Elmendorf tearing strength. The second objective of the continuous baseline study--namely, to provide a convenient system of instrument verification--is achieved by the testing of analogous samples by the mill and the Institute. The mill data are sent to the Institute, and a comparison of Institute and mill test results is included in the monthly reports. In addition to fulfilling the two prime objectives which have been described, the baseline study is accumulating an invaluable ever-growing reserve of background information essential for the intelligent evaluation of specifications of any kind.

The dual objectives of the continuous baseline study on linerboard have been described in the preceding paragraph. The remainder of the report presents the test results for the linerboard samples which were evaluated during the month of August. In line with the dual nature of

the study, the presentation is divided into two parts. Part I presents the results obtained at The Institute of Paper Chemistry, and Part II presents a comparison of results obtained at the Institute with those obtained at the mills. It should be noted that the same code letters are not used to identify the same participants in these reports from month to month. Each participant is privately advised of his own code. Attention is directed to the fact that the bursting strength results presented in these reports have been obtained, beginning in April, with the "new" diaphragm. By "new" diaphragm is meant the composition and style (fillet filled in) introduced by B. F. Perkins and Son, Inc. The same diaphragm distension characteristics, namely, 40-45 p.s.i. at 1.8 cm. distension were used; however, it was necessary to change diaphragms far more frequently than with the old style and composition diaphragm.

PART I: PRESENTATION AND DISCUSSION OF RESULTS OBTAINED AT

THE INSTITUTE OF PAPER CHEMISTRY

During the month of August, eighty-nine different sample lots of 42-lb. fourdrinier kraft linerboard from sixteen different F.K.I. mills were evaluated at The Institute of Paper Chemistry. A tabulation of the number of samples classified according to mill may be seen in Table I.

These sample lots were tested for basis weight, caliper, bursting strength, and Elmendorf tear. The average strength results for each mill may be seen in Table II and are graphically presented in Figures 1 to 5. In addition to a comparison of the current mill averages for the various tests, Table II also shows the current F.K.I. averages, the cumulative F.K.I. averages, and the F.K.I. indexes. The current F.K.I. average represents the average of the current mill averages, whereas the cumulative F.K.I. average represents the average of the current F.K.I. averages for the previous twelve months excluding the current period. Hence, in the case of the current report, the cumulative F.K.I. average covers the period from August 1, 1959, to July 31, 1960. The F.K.I. indexes are obtained as follows:

$$\frac{\text{current F.K.I. average}}{\text{cumulative F.K.I. average}} \times 100 = \text{F.K.I. index (\%)}$$

The F.K.I. index provides a ready means of comparing the current quality with previous results. For example, the current F.K.I. average basis weight is 43.5 lb., and the cumulative F.K.I. average basis weight is 43.5 lb. Hence, the F.K.I. index for basis weight determined in per cent as previously described is 100.0 and indicates that the current F.K.I. average basis weight is the same as the cumulative F.K.I. average.

TABLE I
NUMBER OF SAMPLE LOTS SUBMITTED BY EACH MILL

Mill Code	Number
A	8
B	0
C	8
D	2
E	6
F	8
G	8
H	3
I	7
J	2
K	4
L	8
M	6
N	6
O	4
P	0
Q	7
S	2
T	0
Total	<u>89</u>

TABLE II

SUMMARY OF COMPOSITE MILL AVERAGES--AUGUST 1 THROUGH AUGUST 31, 1960

Mill	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. gage	In Machine	Elmendorf Tear, g./sheet Cross Machine
A	43.7	13.9	116	342	367
B	No samples submitted.				
C	43.7	12.6	115	318	349
D	42.7	12.0	106	352	380
E	43.1	11.8	118	312	362
F	44.0	12.1	114	354	398
G	43.0	12.7	109	315	366
H	43.4	12.4	118	303	364
I	43.3	12.8	104	360	389
J	43.4	12.6	112	361	362
K	43.9	12.4	111	352	381
L	43.7	12.6	116	336	385
M	43.5	12.7	109	277	343
N	43.7	13.0	106	361	404
O	43.6	13.0	112	342	423
P	No samples submitted.				
Q	43.5	12.7	115	355	391
S	43.6	12.9	122	374	398
T	No samples submitted.				
Current FK1 Average:	43.5	12.6	113	338	379
Cumulative FK1 Average:	43.5	12.8	110	330	373
FK1 Index, %	100.0	98.4	102.7	102.4	101.6

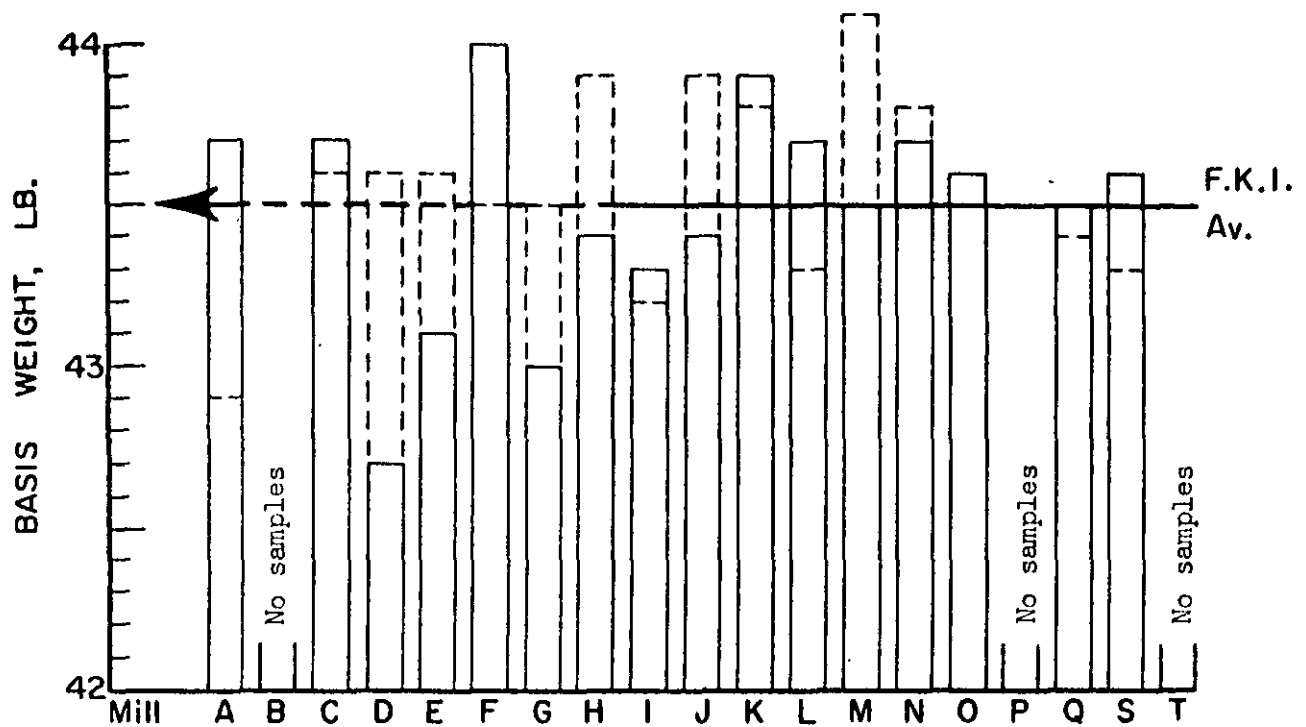


Fig. 1. Comparison of Basis Weight Results for August, 1960

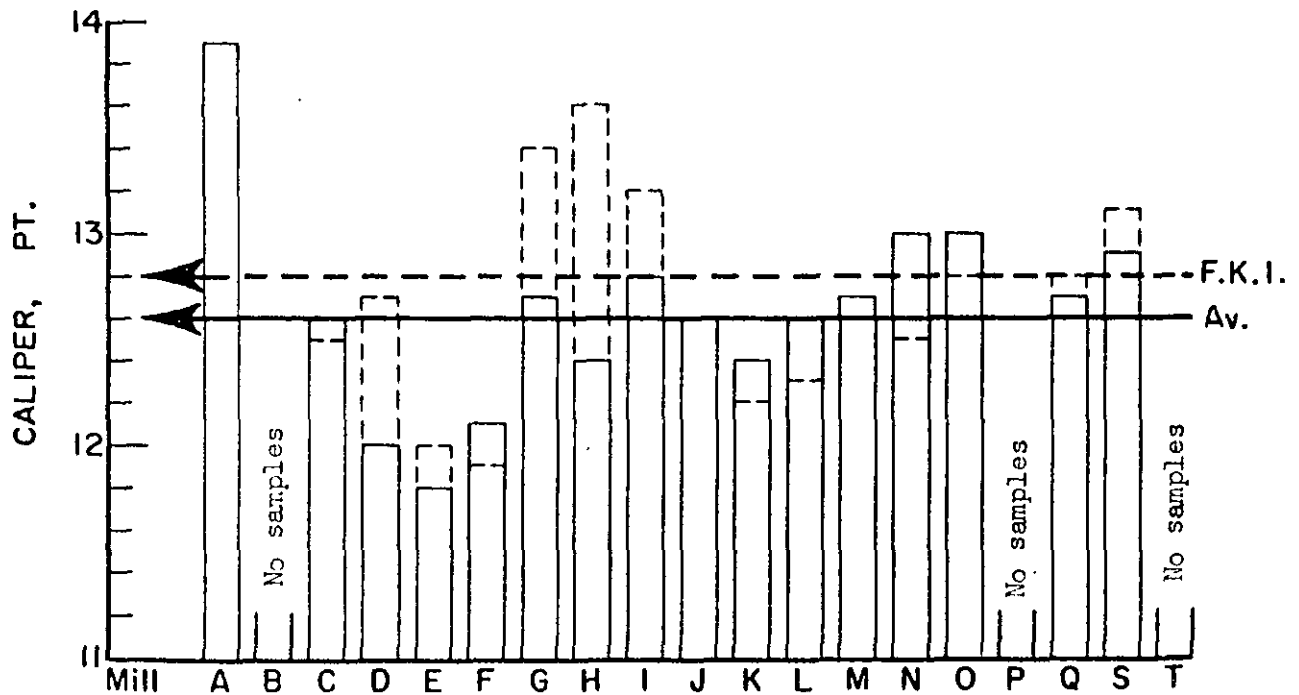


Fig. 2. Comparison of Caliper Results for August, 1960

———— Current mill average
----- Cumulative mill average

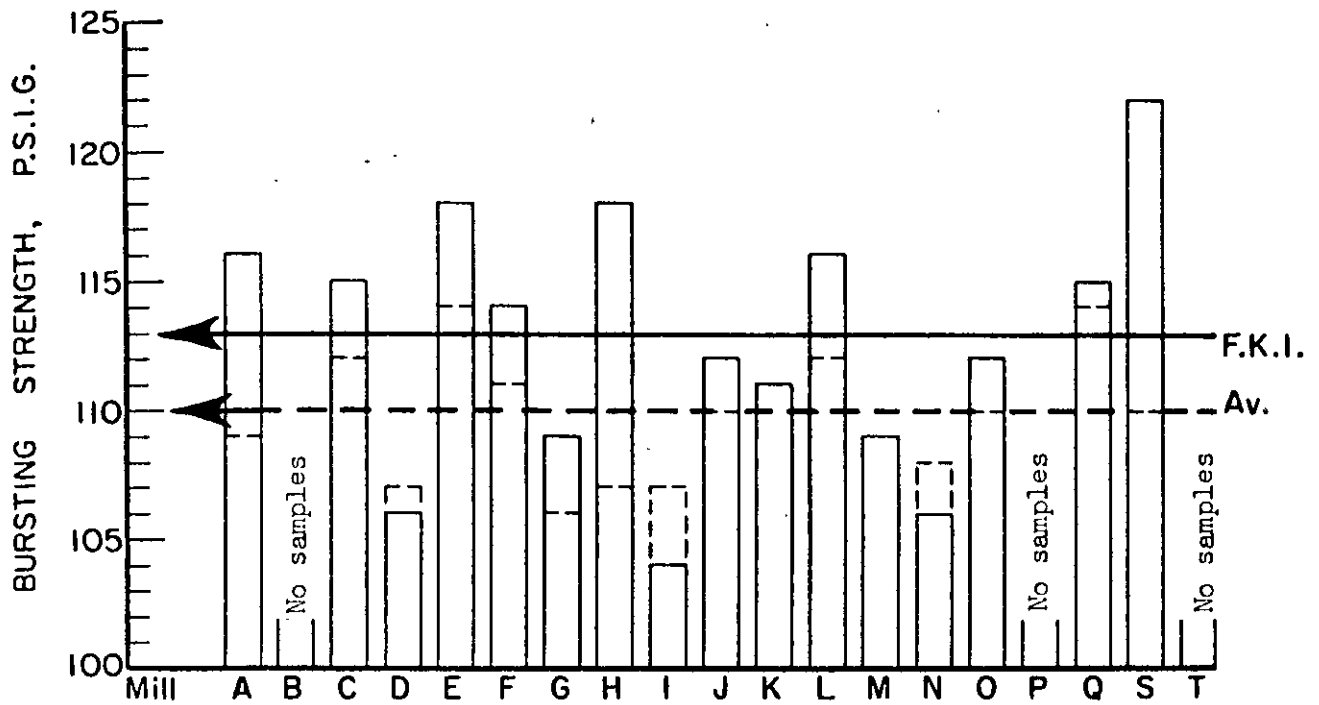


Fig. 3. Comparison of Bursting Strength Results for August, 1960

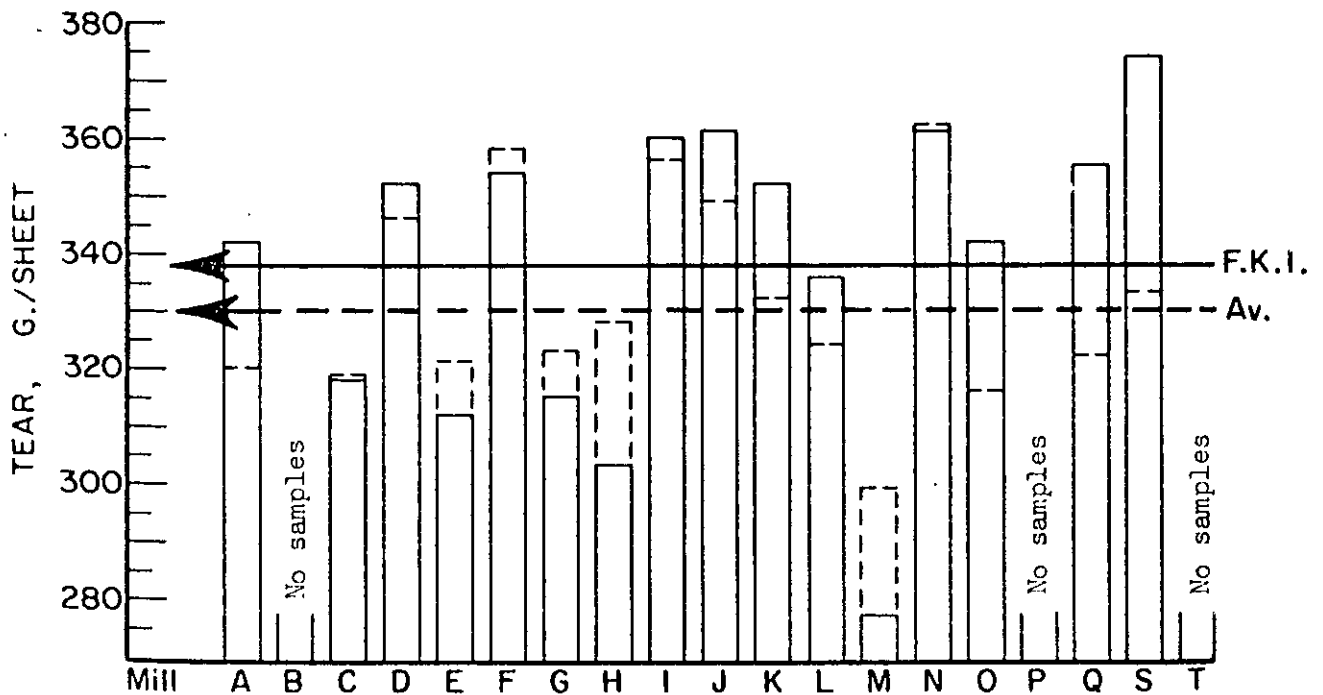


Fig. 4. Comparison of Machine-Direction Tear Results for August, 1960

———— Current mill average
----- Cumulative mill average

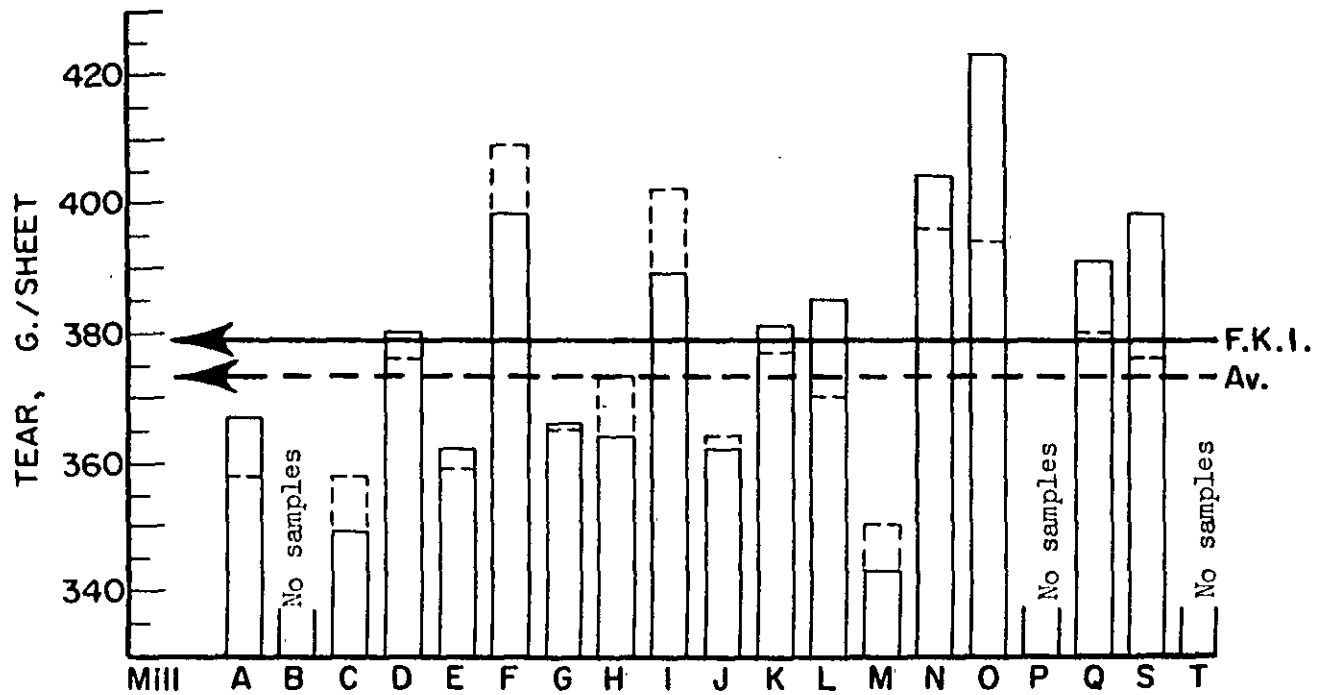


Fig. 5. Comparison of Cross-Machine Direction Tear Results for August, 1960

———— Current machine average
----- Cumulative machine average

A comparison of the current mill averages in Table II and Figure 1 shows that the average basis weight results for all mills conform to the 42-lb. specification set forth in Rule 41. Mill F had the highest average basis weight of 44.0 lb. which was approximately 4.8% higher than the 42-lb. specification. The lowest average basis weight of 42.7 lb. was associated with Mill D. The amount by which the mills vary from the 42-lb. specification is shown in Table II-A. A comparison of the current F.K.I. basis weight average for this period with that for the previous period shows that basis weight has decreased from 43.7 lb. to 43.5 lb.

A comparison of the average caliper values for the various mills (see Figure 2) shows that the current mill averages varied from a low of 11.8 points for Mill E to a high of 13.9 points for Mill A. The current F.K.I. caliper average was 12.6 points, which was slightly lower than the cumulative F.K.I. average of 12.8 points.

The average bursting strength values given in Table II for each mill are graphically presented in Figure 3. It may be observed in Table II and Figure 3 that the current mill averages for bursting strength ranged from a low of 104 for Mill I to a high of 122 for Mill S. The current F.K.I. bursting strength average was 113 p.s.i. gage, which was higher than the cumulative F.K.I. average of 110.

The Elmendorf tear results shown in Table II for the various mills are presented graphically in Figures 4 and 5. From these presentations it may be observed that Mill S had the highest machine direction

TABLE II-A
PERCENTAGE DEVIATION FROM 42-LB. BASIS WEIGHT
SPECIFICATION

Mill Code	Per Cent
A	+4.0
B	--
C	+4.0
D	+1.7
E	+2.6
F	+4.8
G	+2.4
H	+3.3
I	+3.1
J	+3.3
K	+4.5
L	+4.0
M	+3.6
N	+4.0
O	+3.8
P	--
Q	+3.6
S	+3.8
T	--

tear average of 374 g./sheet, and Mill M had the lowest average of 277 g./sheet. It may be further noted that the highest cross-machine direction tear average of 423 g./sheet was associated with Mill O and that the lowest average of 343 g./sheet was associated with Mill M. It may be observed also in Table II and Figures 4 and 5 that the current F.K.I. averages for machine direction and cross-machine direction Elmendorf tear are slightly higher than their respective cumulative F.K.I. averages.

A comparison of the F.K.I. indexes indicates that, for the current period, the current F.K.I. averages for bursting strength, machine direction, and cross-machine direction Elmendorf tear are slightly higher than their respective cumulative F.K.I. averages, the current F.K.I. average for basis weight is the same as its cumulative F.K.I. average, and the current F.K.I. average for caliper is slightly lower than its cumulative F.K.I. average.

In order to compare the variation within a given mill, the test results for the participating mills have been tabulated in Tables III to XXI alphabetically. In addition to the current and cumulative average, a mill factor and mill index are given for each mill. The current mill average represents the average test result obtained for all samples evaluated during the current period. The cumulative mill average for each test, on the other hand, represents the average of the current mill averages for the previous twelve months excluding the current period. The mill

factor and the mill index are obtained as follows:

$$\frac{\text{current mill average}}{\text{cumulative mill average}} \times 100 = \text{mill factor (\%)}$$

$$\frac{\text{current mill average}}{\text{cumulative F.K.I. average}} \times 100 = \text{mill index (\%)}$$

The mill factor and the mill index are a convenient means for comparing the current mill results either with the previous results for that particular mill or with the cumulative F.K.I. results. The reports also present a comparison of the test data obtained at the mills with test data obtained at The Institute of Paper Chemistry. These test data are presented and discussed on subsequent pages of this report.

It may be noted in Tables III through XXI that information is included about the sheet finish. A review of the tables for the mills which supplied this information indicates that some kind of water finish is being used by all.

SUMMARY OF INSTITUTE DATA--AUGUST 1 THROUGH AUGUST 31, 1960

TABLE III

MILL A -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Kch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i. gage			Elmendorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
186605	WFLS	8/ 5/60	7/25/60	2	46.4	42.2	43.5	15.4	13.8	14.6	125	94	109	384	288	339 ^a
186606	WFLS	8/ 5/60	7/30/60	2	44.2	42.8	43.5	13.8	13.0	13.3	137	96	120	368	288	331 ^a
186753	WFLS	8/22/60	8/ 2/60	2	44.4	42.4	43.9	15.1	14.0	14.6	130	87	111	384	296	333 ^a
186754	WFLS	8/22/60	8/ 3/60	2	45.8	44.0	44.6	15.0	14.0	14.5	137	94	119	376	296	335 ^a
186755	WFLS	8/22/60	8/11/60	2	44.0	41.8	42.6	13.4	12.7	13.1	121	91	112	400	296	349 ^a
186756	WFLS	8/22/60	8/15/60	2	45.4	43.8	44.2	13.9	13.0	13.4	133	109	122	416	312	350 ^a
186770	WFLS	8/24/60	8/16/60	2	45.2	43.8	44.2	14.5	13.7	14.1	135	102	118	416	296	346 ^a
186771	WFLS	8/24/60	8/17/60	2	44.2	42.0	43.2	13.9	12.8	13.3	134	104	120	408	320	352 ^a
Current Mill Average:					43.7			13.9			116			342		
Cumulative Mill Average:					42.9			13.9			109			320		
Mill Factor, %					101.9			100.0			106.4			106.9		
Mill Index, %					100.5			108.6			105.5			103.6		

TABLE IV

MILL B -- 42-LB. LINERBOARD

No samples submitted.

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE V

MILL C -- 42-Ld. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gauge		Elmendorf Tear, g./sheet	
					Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
186633	N.F.	8/10/60	8/3/60	-	44.2	43.2	13.2	12.0	130	108	352	272
186634	N.F.	8/10/60	8/4/60	-	44.4	43.4	12.5	12.1	139	100	352	288
186635	N.F.	8/10/60	8/5/60	-	43.2	42.0	12.5	11.5	134	79	368	272
186636	N.F.	8/10/60	8/10/60	-	44.4	43.2	13.9	12.4	138	89	360	272
186637	N.F.	8/15/60	8/11/60	-	44.2	43.4	12.9	11.5	145	86	360	296
186638	N.F.	8/15/60	8/12/60	-	44.2	43.8	12.9	11.9	134	92	384	288
186639	N.F.	8/15/60	8/18/60	-	45.2	43.6	13.5	12.9	138	101	360	256
186640	N.F.	8/22/60	8/19/60	-	43.8	42.8	13.3	12.8	128	93	400	280
Current Mill Average:					43.7		12.6		115		318	
Cumulative Mill Average:					43.6		12.5		112		319	
Mill Factor, %					100.2		100.8		102.7		99.7	
Mill Index, %					100.5		98.4		104.5		96.4	
											97.5	
											93.6	

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE VI

MILL D -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i. Page			Elmendorf Tear, g./sheet					
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.			
186611	S.F.	8/ 8/60	8/ 1/60	7	43.4	40.2	42.0	12.5	11.4	11.9	136	85	107	400	320	345 ^a	416	336	390 ^a
186735	S.F.	8/25/60	8/16/60	7	44.0	42.2	43.4	12.4	11.6	12.1	128	80	106	400	328	358	400	344	369 ^a
Current Mill Average					42.7			12.0			106			352			380		
Cumulative Mill Average.					43.6			12.7			107			346			376		
Mill Factor, %					97.9			94.5			99.1			101.7			101.1		
Mill Index, %					98.2			93.8			96.4			106.7			101.9		

SUMMARY OF INSTITUTE DATA -- AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE VII
MILL 3 -- 42-L5. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Tech. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i.		Elmendorf Tear, g./sheet	
					Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
186607	N.F.	8/5/60	7/28/60	2	43.6	42.8	12.2	11.7	134	99	344	280
186608	N.F.	8/5/60	7/28/60	2	44.0	42.0	12.1	11.3	132	99	368	296
186751	N.F.	8/22/60	8/11/60	2	44.0	42.4	13.0	12.1	128	99	344	272
186732	N.F.	8/22/60	8/11/60	2	43.8	42.4	12.2	11.4	134	90	416	280
186838	N.F.	8/26/60	8/18/60	2	43.6	42.0	11.9	11.0	140	97	352	232
186809	N.F.	8/26/60	8/18/60	2	43.6	41.8	11.9	11.0	140	104	352	272
Current Mill Average:					43.1		11.8		118		312	
Cumulative Mill Average:					43.6		12.0		114		321	
Mill Factor, %					98.9		98.3		103.5		97.2	
Mill Index, %					99.1		92.2		107.3		94.5	
											100.8	
											97.1	

*This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA -- AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE VIII
MILL F -- 42-13. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight,			Caliper, points			Bursting Strength, P.S.I. gage			Elmendorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
186595	W.B.	8/ 3/60	7/25/60	-	44.8	43.4	44.2	13.0	11.8	12.6	139	103	114	448	344	391 ^a
186612	W.B.	8/ 5/60	7/27/60	-	44.2	42.4	43.4	12.8	11.2	11.8	133	90	119	446	320	373 ^a
186679	W.B.	8/16/60	7/31/60	-	44.6	43.2	44.0	12.9	11.8	12.2	143	95	119	368	336	351
186680	W.B.	8/16/60	8/ 3/60	-	45.2	43.2	44.1	12.2	11.4	11.9	126	86	112	368	320	343 ^a
186745	W.B.	8/22/60	8/10/60	-	45.6	43.8	44.7	12.8	11.9	12.2	142	90	117	446	304	361 ^a
186746	W.B.	8/22/60	8/11/60	-	44.0	41.6	42.8	12.4	11.9	12.0	137	98	112	376	256	329 ^a
186764	W.B.	8/23/60	8/15/60	-	45.4	44.0	44.4	12.4	11.9	12.1	125	85	106	368	296	329 ^a
186765	W.B.	8/23/60	8/16/60	-	44.4	43.8	44.1	12.2	11.9	12.0	130	99	114	408	336	357 ^a
Current Mill Average:					44.0			12.1			114			394		
Cumulative Mill Average:					43.5			11.9			111			358		
Mill Factor, %					101.1			101.7			102.7			98.9		
Mill Index, %					101.1			94.5			103.6			107.3		

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE IX

MILL G -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Elmendorf Tear, g./sheet	
					Max.	Min.	Max.	Min.	Max.	Min.	In	Across
186499	M.F.	7/25/60	7/18/60	1	43.6	41.0	12.9	11.9	127	90	368	272
186502	M.F.	8/4/60	7/25/60	1	44.2	42.0	13.3	12.2	117	84	400	264
186603	M.F.	8/4/60	7/26/60	1	44.0	41.6	12.8	11.3	128	97	336	256
186604	M.F.	8/4/60	7/27/60	1	44.4	43.8	13.0	12.2	128	89	384	272
186739	M.F.	8/22/60	8/8/60	1	44.0	42.2	13.0	12.0	127	93	352	280
186740	M.F.	8/22/60	8/10/60	1	43.6	41.6	13.5	12.9	122	86	392	296
186741	M.F.	8/22/60	8/9/60	1	44.0	42.2	13.6	12.7	126	87	368	200
186742	M.F.	8/22/60	8/14/60	1	44.2	41.6	13.8	12.6	122	90	392	272
Current Mill Average:					43.0		12.7		109		315	
Cumulative Mill Average:					43.5		13.4		106		323	
Mill Factor, %					98.9		94.8		102.8		97.5	
Mill Index, %					98.9		99.2		99.1		95.5	
											100.3	
											98.1	

This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE X

MILL H -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Ych. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Elrendorf Tear, g./sheet	
					Max.	Min.	Max.	Min.	Max.	Min.	In	Across
186627	WFLS	8/9/60	7/18/60	2	44.0	43.0	12.9	12.0	136	103	328	248
186628	WFLS	8/9/60	7/18/60	2	44.4	42.6	12.7	12.0	140	92	336	272
186750	WFLS	8/22/60	8/8/60	2	44.0	41.6	13.0	12.2	130	103	328	256
Current Mill Average:					43.4		12.4		118		303	
Cumulative Mill Average:					43.9		13.6		107		328	
Mill Factor, %					98.9		91.2		110.3		92.4	
Mill Index, %					99.8		96.9		107.3		91.8	
											364	
											373	
											373 ^a	
											344	
											368	
											320	
											346 ^a	

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XI
MILL I --42-LE. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Elmendorf Tear, g./sheet	
					Max.	Min.	Max.	Min.	Max.	Min.	In	Across
186574	WELS	8/ 1/60	7/25/60	2	44.6	42.2	13.8	12.8	126	85	424	320
186575	----	8/ 1/60	7/27/60	1	44.6	43.0	12.7	11.8	128	85	368	288
186582	WELS	8/ 3/60	7/28/60	1	43.0	40.0	12.5	11.6	116	85	344	264
186589	----	8/12/60	8/ 2/60	2	44.0	42.0	14.2	13.0	100	78	440	296
186650	----	8/12/60	8/ 4/60	2	44.2	43.0	13.4	12.2	130	88	456	296
186700	----	8/17/60	8/ 5/60	2	44.0	41.4	12.9	12.1	134	83	416	312
186810	----	8/26/60	8/19/60	2	45.4	43.8	14.0	13.0	131	84	480	344
Current Mill Average:					43.3		12.8		104		360	
Cumulative Mill Average:					43.2		13.2		107		356	
Mill Factor, %					100.2		97.0		97.2		101.1	
Mill Index, %					99.5		100.0		94.5		109.1	
											389	
											402	
											96.8	
											104.3	

*This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XII

MILL J -- 42-L. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i. gage			Elmendorf Tear, g./sheet		
					Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.	Max.	Min.	Avg.
186701	W.F.	8/17/60	7/29/60	-	44.4	42.6	43.4	13.2	12.2	12.9	124	103	111	424	312	371 ^a
186702	W.F.	8/17/60	7/29/60	-	44.2	42.6	43.4	13.0	12.0	12.3	129	95	113	408	304	351 ^a
Current Mill Average:					43.4			12.6			112			361		
Cumulative Mill Average:					43.9			12.6			110			349		
Mill Factor, %					98.9			100.0			101.8			103.4		
Mill Index, %					99.8			98.4			101.8			109.4		
														362		
														364		
														99.5		
														97.1		

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

STANDARD OF SPECIFICATIONS FOR LAMINATE 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XIII

MILL 3 -- 42-15, LINERBOARD

File No.	Pinisc	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i.		Tear, g./sheet	
					Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
185576	W.F.	5/ 1/60	5/ 5/60	2	44.6	43.2	12.9	12.3	137	95	448	304
185577	W.F.	5/ 1/60	5/17/60	2	44.4	43.2	12.7	11.8	144	85	400	320
185591	W.F.	5/ 2/60	5/21/60	2	44.4	42.6	13.0	12.2	128	84	400	320
185592	W.F.	5/ 2/60	5/24/60	2	44.4	43.6	12.3	12.0	127	85	368	304
Current Mill Average:					43.9		12.4		111		352	
Cumulative Mill Average:					43.6		12.2		111		332	
Mill Factor, %					100.2		101.6		100.0		106.0	
Mill Index, %					100.9		96.9		100.9		106.7	
											101.1	
											102.1	

apric average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XIV

MILL L -- 42-L3. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Xch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Elmendorf Tear, g./sheet	
					Max.	Min.	Max.	Min.	Max.	Min.	In	Across
186637	W.F.	8/11/60	7/19/60	2	44.4	43.0	13.5	12.5	133	91	432	374
186638	W.F.	8/11/60	7/19/60	2	44.2	43.0	13.0	12.7	131	95	384	374
186643	W.F.	8/12/60	7/25/60	2	44.4	43.4	13.2	12.4	140	105	400	333
186644	W.F.	8/12/60	7/25/60	2	44.2	43.0	13.1	12.2	137	80	440	345a
186645	W.F.	8/12/60	7/27/60	2	43.6	42.2	12.7	11.9	140	82	344	350a
186646	W.F.	8/12/60	7/27/60	2	44.2	42.8	12.5	12.0	134	96	384	307a
186647	W.F.	8/12/60	7/31/60	2	44.0	42.2	12.9	11.8	127	90	384	332a
186648	W.F.	8/12/60	7/31/60	2	44.2	43.6	13.2	12.3	139	96	376	321a
Current Mill Average:					43.7		12.6		116		336	385
Cumulative Mill Average:					43.3		12.3		112		324	370
Mill Factor, %					100.9		102.4		103.6		103.7	104.1
Mill Index, %					100.5		98.4		105.5		101.8	103.2

This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XV

MILL M -- 42-LB. LINERBOARD

File No.	Date Recd.	Date Made	Tech. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Elmendorf Tear, g./sheet		Across	
				Max.	Min.	Max.	Min.	Max.	Min.	In	Max.	Min.	Av.
186681 W.F.	8/16/60	7/13/60	1	44.4	42.6	43.6	13.1	11.8	12.6	128	100	110	272
186682 W.F.	8/16/60	7/18/60	1	44.2	42.2	43.4	13.5	12.1	12.7	127	86	107	267
186683 W.F.	8/16/60	7/21/60	1	44.2	42.2	43.2	13.2	12.4	12.9	131	94	111	270
186684 W.F.	8/16/60	7/30/60	1	44.2	42.0	43.2	13.2	12.3	12.8	127	97	111	271
186749 W.F.	8/22/60	8/ 2/60	1	44.8	42.0	43.3	13.2	12.0	12.7	137	80	107	275
186756 W.F.	8/25/60	8/ 6/60	1	44.2	43.6	44.0	13.1	12.0	12.7	124	86	110	301
Current Mill Average:				43.5					12.7		109		277
Cumulative Mill Average:				44.1					12.7		109		299
Mill Factor, %				96.6					100.0		100.0		92.6
Mill Index, %				100.0					99.2		99.1		83.9
													96.0
													92.0

*This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XVI

MILL N -- 42-13. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, p.s.i. gage			Elmendorf Tear, g./sheet		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
186585	U.F.	8/4/60	7/15/60	-	44.2	42.8	43.7	13.7	12.4	13.1	122	86	104	448	328	389 ^a
186599	U.F.	8/4/60	7/25/60	-	45.2	42.2	44.0	13.8	12.3	13.1	139	89	110	448	312	379 ^a
186600	U.F.	8/4/60	7/21/60	-	44.2	42.4	43.4	13.1	12.2	12.7	140	90	109	384	296	345 ^a
186601	U.F.	8/4/60	7/22/60	-	44.0	42.8	43.6	14.0	12.8	13.5	128	81	103	384	320	356 ^a
186607	U.F.	8/22/60	7/28/60	-	44.6	42.4	43.7	13.5	12.9	13.0	127	92	107	384	288	352 ^a
186648	U.F.	8/22/60	7/29/60	-	45.0	42.6	43.7	13.1	12.0	12.7	127	86	107	392	296	348 ^a
Current Mill Average:					43.7			13.0			106			361		
Cumulative Mill Average:					43.8			12.5			108			362		
Mill Factor, %					99.8			104.0			98.1			99.7		
Mill Index, %					100.5			101.6			96.4			109.4		

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XVII

MILL O -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, P.S.I. gage		Elmendorf Tear, g./sheet								
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.			
186613	WFLS	8/ 8/60	7/19/60	1	44.2	42.2	43.3	13.5	12.3	12.9	130	89	112	408	288	345	448	376	406 ^e
186614	WFLS	8/ 8/60	7/21/60	1	44.4	43.0	43.6	13.5	12.4	13.0	137	93	115	400	288	347	496	384	434 ^a
186685	WFLS	8/16/60	7/26/60	1	44.2	43.2	43.7	13.3	12.5	13.1	132	90	113	376	268	326 ^a	512	368	434 ^a
186686	WFLS	8/16/60	8/ 2/60	1	44.2	43.0	43.7	13.6	12.5	13.0	124	86	110	416	288	348 ^a	464	360	417 ^a
Current Mill Average:					43.6		13.0		112		342		423						
Cumulative Mill Average:					43.6		12.8		110		316		394						
Mill Factor, %					100.0		101.6		101.8		108.2		107.4						
Mill Index, %					100.2		101.6		101.8		103.6		113.4						

TABLE XVIII

MILL P -- 42-LB. LINERBOARD

No samples submitted.

a-This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF TESTS AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XIV

MILL -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date 'ace	No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i.		Elmendorf Tear, g./sheet	
					Max.	Min.	Max.	Min.	Max.	Min.	In	Across
156609	----	8/ 8/60	6/11/60	1	43.0	41.0	42.2	12.8	11.6	12.2	400	304
156610	----	8/ 8/60	6/11/60	1	44.0	42.0	43.1	13.4	12.0	12.8	400	304
156651	----	8/12/60	6/10/60	1	44.4	43.8	44.0	13.2	12.1	12.9	464	344
156652	----	8/12/60	6/15/60	1	44.2	42.2	43.3	13.0	12.0	12.4	392	296
156772	----	8/24/60	6/15/60	1	44.0	42.2	43.6	13.0	12.1	12.4	416	304
156773	----	8/24/60	6/12/60	1	44.4	43.8	44.1	13.8	12.8	13.2	384	296
156774	----	8/24/60	6/15/60	1	44.2	43.8	44.0	13.4	12.8	13.0	408	264
Current Mill Average.					43.5		12.7		115		355	
Cumulative Mill Average:					43.4		12.8		114		322	
Mill Factor, %					100.2		99.2		100.9		110.2	
Mill Index, %					100.0		99.2		104.5		107.6	
											391	
											380	
											102.9	
											104.8	

This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

SUMMARY OF INSTITUTE DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XX

MILL S -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Elmendorf Tear, g./sheet							
					Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	In	Across				
186568	WFIS	8/ 1/60	7/12/60	1	44.6	43.0	13.7	12.2	12.9	140	95	121	424	320	366	408	368	386 ^a
186573	WFIS	8/ 1/60	7/19/60	1	44.0	43.0	13.6	12.5	13.0	148	104	122	448	336	381 ^a	448	352	409 ^a
Current Mill Average:					43.6				12.9	122				374	398			
Cumulative Mill Average:					43.3				13.1	110				333	376			
Mill Factor, %					100.7				98.5	110.9				112.3	105.9			
Mill Index, %					100.2				100.8	110.9				113.3	106.7			

PART II: COMPARISON OF RESULTS OBTAINED AT THE INSTITUTE OF
PAPER CHEMISTRY WITH THOSE OBTAINED AT THE MILLS

As a supplementary part of the Continuous Baseline Study, comparisons of the mill test results with those obtained at The Institute of Paper Chemistry on corresponding samples have been included in this report. Mill test conditions are shown in Table XXII, where it may be noted that the atmospheric conditions used prior to and during the testing period were relatively uniform for the mills which reported this information. However, the preconditioning and conditioning time periods varied considerably.

A summary of the Institute and mill test results for the current period is shown in Table XXIII, and a comparison of percentage differences between Institute and mill test results is given in Table XXIV for the current period and the two previous periods.

A comparison of the test data in Tables XXIII and XXIV reveals the level of agreement between mill and Institute data for basis weight, caliper, bursting strength, and Elmendorf tear. In Table XXIII the over-all average difference between Institute and mill results is shown for each of these tests based on the current mill averages--i.e., based on the data for all sample lots submitted by each mill for the current period. In addition, the maximum difference encountered in comparing the Institute and mill test results for a given sample lot is shown. In Table XXIV, the over-all average differences shown for each test in Table XXIII have been calculated on a percentage basis for each mill. In addition, for purposes of comparison, the average percentage differences for the preceding two periods are shown.

TABLE XXII
PRECONDITIONING AND CONDITIONING DATA FOR MILL TESTS

Mill Code	Preconditioning			Conditioning		
	Relative Humidity, %	Temperature, °F.	Time, hr.	Relative Humidity, %	Temperature, °F.	Time, hr.
A	50	72	24	None		
B			No samples submitted.			
C	34-35	77-78	8	48-52	72-73	16
D	50	73	24	None		
E		None		50	73	24
F		None		50-55	72-74	48
G	50	73	24	50	73	24
H	50	72	120	50	72	120
I		None		50	73	24
J		None		50	73	24
K		None		50	73	24
L	50	73	24	50	73	24
M	42-48	79-84	0.5	50	73	24-48
N	50	73-74	48+	50	73	48+
O		None		55-57	72	---
P		No samples submitted.				
Q	46-50	72-74	48	46-50	72-74	3
S		None		64	88	---
T		No samples submitted.				

TABLE XIII
SUMMARY OF TEST RESULTS (Average Will and Institute Results)

No. of Series Compared		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
		3	0	2	2	2	2	3	3	7	2	4	3	6	6	4	0	7		2	0
		Basis Weight																			
		Caliber																			
		Bursting Strength																			
		Tearing Strength, in																			
		Tearing Strength, across																			
Institute		43.7	42.7	43.1	44.0	43.0	43.4	43.3	43.4	43.3	42.8	43.9	43.7	43.5	43.7	43.6	43.5	43.6	43.5	43.6	
Max. Diff.***		-0.7	-0.9	-0.6	-0.4	-0.7	-0.8	-1.3	-0.6	-1.0	-0.9	+1.0	-1.1	-1.0	-1.3	-0.6	-1.0	-0.6	-1.0	-0.1	
Institute		13.2	12.0	11.8	12.1	12.7	12.4	12.8	12.6	12.4	12.2	12.4	12.6	12.7	13.0	13.0	12.7	12.7	12.7	12.9	
Max. Diff.***		-0.4	-0.2	-0.7	-0.5	-0.3	+0.9	-0.7	-0.2	-0.2	-0.2	-0.2	-0.1	-0.6	-0.4	-0.3	-0.3	-0.3	-0.4	-0.3	
Institute		116	106	118	114	109	118	104	112	111	112	111	116	109	106	112	115	112	115	122	
Max. Diff.***		-15	+2	-8	+5	-4	-3	-10	-5	+4	-4	+1	-6	+4	+5	-3	-5	-15	-9	-9	
Institute		342	352	312	354	315	303	360	361	352	314	358	336	277	361	342	355	374	355	374	
Max. Diff.***		+20	-8	+53	+37	+40	-34	--	-63	+24	-47	+6	-37	+26	+26	-25	-57	+41	-57	+41	
Institute		367	320	362	398	366	364	389	362	381	343	369	385	343	404	423	391	398	391	398	
Max. Diff.***		+25	+16	+22	+20	+41	+31	--	-19	+32	-16	-27	-27	+28	-20	-39	-8	-17	-57	+29	

* Comparisons based on averages involved only those samples on which mill test data were submitted.
 ** Average difference is the difference between the Institute mill average and the mill average based on mill test data.
 *** Maximum difference encountered in comparing the Institute average and the mill averages for any sample submitted by that particular mill.

TABLE XIV

COMPARISON OF STRENGTHS OF DIFFERENT PERIODS
Average Difference, Per Cent

Period	Basic Weight	Cal. Per	Strength	Tear, in	Tear, across	Basic Weight	Cal. Per	Strength	Tear, in	Tear, across
Current	0.0	-2	0.9	+0.0	+7	0.0	-2	0.9	+0.0	+7
160th	+0.0	0	+0.9	+0.3	+10	+0.0	0	+0.9	+0.3	+10
159th	-0.0	-0.1	-1	+3	+8	-0.0	-0.1	-1	+3	+8
Current	0.0	-1	0	0	0	0.0	-1	0	0	0
160th	0.0	-1	0	0	0	0.0	-1	0	0	0
159th	0.0	-1	0	0	0	0.0	-1	0	0	0
Current	0.0	-2	0.9	-12	-7	0.0	-2	0.9	-12	-7
160th	0.0	-2	-0.9	-11	-5	0.0	-2	-0.9	-11	-5
159th	0.0	-2	-0.9	-13	-5	0.0	-2	-0.9	-13	-5
Current	0.0	-0.8	2	-1	+0.3	0.0	-0.8	2	-1	+0.3
160th	0.0	-0.8	3	-5	+2	0.0	-0.8	3	-5	+2
159th	0.0	-2	3	-3	-0.8	0.0	-2	3	-3	-0.8
Current	0.0	-3	3	+5	+6	0.0	-3	3	+5	+6
160th	0.0	-3	3	+2	+4	0.0	-3	3	+2	+4
159th	0.0	-0.9	-0.9	-1	-0.8	0.0	-0.9	-0.9	-1	-0.8
Current	0.0	-2	0	0	+5	0.0	-2	0	0	+5
160th	0.0	-2	0	0	+7	0.0	-2	0	0	+7
159th	0.0	-2	0	0	+3	0.0	-2	0	0	+3
Current	0.0	-0.8	-2	+0	-11	0.0	-0.8	-2	+0	-11
160th	0.0	0	0	-7	+13	0.0	0	0	-7	+13
159th	0.0	-2	-2	-0.1	+6	0.0	-2	-2	-0.1	+6
Current	0.0	2	0	-4	-9	0.0	2	0	-4	-9
160th	0.0	0.9	0	-2	+5	0.0	0.9	0	-2	+5
159th	0.0	-1	-0.9	0	+11	0.0	-1	-0.9	0	+11
Current	0.0	2	0	0	0	0.0	2	0	0	0
160th	0.0	2	0	0	0	0.0	2	0	0	0
159th	0.0	2	0	0	0	0.0	2	0	0	0
Current	0.0	2	0	0	0	0.0	2	0	0	0
160th	0.0	2	0	0	0	0.0	2	0	0	0
159th	0.0	2	0	0	0	0.0	2	0	0	0
Current	0.0	2	0	0	0	0.0	2	0	0	0
160th	0.0	2	0	0	0	0.0	2	0	0	0
159th	0.0	2	0	0	0	0.0	2	0	0	0

It may be noted in Table XXIV that for the current period the largest average percentage difference between the average basis weight results of the Institute and those of a given mill on corresponding samples was two per cent. By comparison, the largest average percentage difference noted for the previous two periods was three per cent. Further, it may be noted that the average basis weight result for Mill K was higher than the result for the Institute, whereas the results for the other mills were lower than the corresponding results for the Institute. In general, agreement between Institute and mill basis weight results was good.

The maximum variation in caliper for the current period was five per cent. This was lower than the maximum variation of seven per cent for the previous two periods. Compared with the Institute's results, the average test result for Mill H was higher, and the average test results for the other mills were lower. Agreement was very good for the majority of comparisons of Institute and mill caliper results. Only the variation for Mill M appeared to be excessive.

It may be noted in Table XXIV that the bursting strength results exhibited a maximum variation of seven per cent for the current period. The maximum variation for the two preceding periods was six per cent. The average bursting strength results for Mills F, H, I, and M were the same as the corresponding results for the Institute, the average results for Mills D, K, and N were higher than those for the Institute, and the average results for the other mills were lower. Agreement between Institute and mill results was very good with the possible exceptions of the variations for Mills A and S.

It may be seen in Tables XXIII and XXIV that the average machine direction tear results for Mills A, E, F, G, K, M, N, and S were higher than those for the Institute, and the average results for the other mills were lower. The maximum variation for the current period was thirteen per cent which was lower than the maximum variation of twenty-one per cent associated with the two preceding periods. Agreement between the Institute and mill results was generally good. However, the variations for Mills C, J, L, and Q appeared to be excessive.

With regard to the cross-machine direction tear results, it may be noted that the average results for Mills A, D, E, F, G, H, K, M, and S were higher than those for the Institute, and the average results for the other mills were lower. The maximum variation for the current period was eleven per cent, which was somewhat lower than the maximum variation of seventeen per cent for the two preceding periods. As in the case of the machine direction results, agreement between Institute and mill results was generally good. However, the variation for Mill G appeared excessive.

The comparisons of Institute and mill data for individual sample lots are given alphabetically in Tables XXV to XLIII for the various mills. In all the comparisons given in Tables XXV to XLIII, the Institute's test values have been used as the reference line.

The reader's attention is directed to page 3 of this report where the comparison of Institute and mill test data is summarized to show the number of mills (and the percentage of all mills which this number represents) whose average test results for the month of August fall within designated percentages from the average test results obtained at the Institute.

COMPARISON OF INSTITUTE AND MILL DATA--AUGUST 1 THROUGH AUGUST 31, 1960

TABLE XXV

MILL A -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i.		Elmendorf Tear, g./sheet		Across						
				IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.			
186605	WFLS	7/25/60	2	43.5	44.0	+0.5	14.6	14.5	-0.1	109	102	-7	339a	338	-1	374a	423	+49
186606	WFLS	7/30/60	2	43.5	43.0	-0.5	13.3	13.2	-0.1	120	115	-5	331a	339	+8	373a	392	+19
186753	WFLS	8/2/60	2	43.9	43.5	-0.4	14.6	14.2	-0.4	111	114	+3	333a	353	+20	373a	389	+16
186754	WFLS	8/3/60	2	44.6	44.0	-0.6	14.5	14.2	-0.3	119	111	-8	335a	346	+11	381a	416	+35
186755	WFLS	8/11/60	2	42.6	42.0	-0.6	13.1	13.0	-0.1	112	102	-10	349a	344	-5	351a	361	+10
186756	WFLS	8/15/60	2	44.2	43.7	-0.5	13.4	13.1	-0.3	122	112	-10	350a	334	-16	363a	386	+23
186770	WFLS	8/16/60	2	44.2	43.5	-0.7	14.1	14.0	-0.1	118	109	-9	346a	340	-6	366a	398	+32
186771	WFLS	8/17/60	2	43.2	43.0	-0.2	13.3	13.0	-0.3	120	105	-15	352a	365	+13	358a	374	+16
Current Mill Average:				43.7	43.3	-0.4	13.9	13.6	-0.3	116	109	-7	342	345	+3	367	392	+25

TABLE XXVI

MILL B -- 42-LB. LINERBOARD

No samples submitted

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.
Note: All "current mill average" data are calculated from the totals of the individual readings.

WILL C -- 42-19. LINEBOARD

File No.	Finish	Date Made	Yen. No.	Basis Weight, lb.			Caliber, points			Bursting Strength, p.s.i.			Elmendorf Tear, g./sheet					
				IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.			
186633	N.F.	8/ 3/60	-	43.9	43.7	-0.2	12.5	12.2	-0.3	117	112	-5	317	285	-32	356a	333	-23
186634	N.F.	8/ 4/60	-	43.9	43.9	-0.1	12.4	12.0	-0.4	121	117	-4	321	273	-48	339a	316	-23
186635	N.F.	8/ 5/60	-	42.7	43.0	+0.3	12.2	12.0	-0.2	114	110	-4	306a	274	-32	335a	315	-22
186663	N.F.	8/10/60	-	43.9	42.6	-1.3	13.0	12.6	-0.4	112	106	-6	315a	281	-34	357a	323	-34
186664	N.F.	8/11/60	-	43.9	42.5	-1.4	12.3	12.1	-0.2	113	106	-7	317a	271	-46	351a	299	-52
186665	N.F.	8/12/60	-	44.0	43.1	-0.9	12.3	12.3	0.0	115	108	-7	316a	276	-38	350a	337	-13
186743	N.F.	2/16/60	-	44.3	43.4	-0.9	13.1	13.0	-0.1	119	112	-7	318a	280	-38	351a	340	-11
186744	N.F.	8/19/60	-	43.3	43.1	-0.2	13.1	13.0	-0.1	112	111	-1	337a	292	-45	351a	344	-7
Current Mill Average:				43.7	43.1	-0.6	12.6	12.4	-0.2	115	110	-5	318	279	-39	349	326	-23

at this average includes the readings for one or more specimens which tore beyond the $3/8$ -inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XXVIII

MILL D -- 42-LF. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, Points		Bursting Strength, D.S.I. gage		Elmendorf Tear, g./sheet							
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In	Across						
126611	S.F.	8/1/60	7	42.0	+0.2	11.9	11.8	-0.1	107	108	+1	345	337	-8	390a	376	-14
126725	S.F.	8/16/60	7	42.4	-0.9	12.1	11.9	-0.2	106	108	+2	358	357	-1	369a	385	+16
Current Mill Average:				42.7	-0.3	12.0	11.9	-0.1	106	108	+2	352	347	-5	380	381	+1

TABLE XXIX

MILL E -- 42-LF. LINERBOARD

186607	N.F.	7/28/60	2	43.2	-0.5	11.8	11.7	-0.1	115	112	-3	317a	320	+3	357a	367	+10
186608	N.F.	7/28/60	2	43.3	-0.4	11.8	11.7	-0.1	114	113	-1	328a	331	+3	370a	374	+4
186751	N.F.	8/11/60	2	43.7	-0.6	12.5	12.1	-0.4	113	117	+4	311a	364	+53	361a	449	+88
186752	N.F.	8/11/60	2	43.4	-0.6	11.9	11.9	0.0	119	113	-6	326a	311	-15	381a	366	-15
186808	N.F.	8/18/60	2	42.8	-0.5	11.4	10.8	-0.6	120	117	-3	291a	324	+33	349a	377	+28
186809	N.F.	8/18/60	2	42.4	-0.1	11.4	10.7	-0.7	124	116	-8	299	317	+18	356a	370	+14
Current Mill Average:				43.1	-0.4	11.8	11.5	-0.3	118	115	-3	312	328	+16	362	384	+22

*This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XXX

MILL F -- 42-13. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Elmendorf Tear, g./sheet								
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In		Across						
										IPC	Mill Diff.	IPC	Mill Diff.					
156595	W.B.	7/25/60	-	44.2	43.9	-0.3	12.6	12.1	-0.5	114	115	+1	391a	387	-4	420a	437	+17
156612	W.B.	7/27/60	-	43.4	43.7	+0.3	11.8	11.7	-0.1	119	121	+2	373a	391	+18	415a	453	+38
156679	W.B.	7/31/60	-	44.0	43.7	-0.3	12.2	12.0	-0.2	119	116	-3	351	388	+37	414a	444	+30
156630	W.B.	8/3/60	-	44.1	43.9	-0.2	11.9	11.6	-0.3	112	109	-3	343a	364	+21	397a	409	+12
156745	W.B.	8/10/60	-	44.7	44.6	-0.1	12.2	12.0	-0.2	117	115	-2	361a	373	+12	413a	433	+20
156746	W.B.	8/11/60	-	42.8	43.0	+0.2	12.0	11.5	-0.4	112	110	-2	329a	340	+11	365a	391	+26
156764	W.B.	8/15/60	-	44.4	44.0	-0.4	12.1	11.7	-0.4	106	111	+5	329a	336	+7	373a	396	+18
156765	W.B.	8/16/60	-	44.1	43.9	-0.2	12.0	11.5	-0.5	114	113	-1	357a	345	-12	380a	377	-3
Current Mill Average:				44.0	43.9	-0.2	12.1	11.8	-0.3	114	114	0	354	366	+12	398	413	+20

a. Basis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XXXI

MILL G -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliber, points		Bursting Strength, p.s.i. gage		Elmendorf Tear, g./sheet	
				IPC	Mill	Diff.	IPC	Mill	Diff.	In	Across
										IPC	Mill
186499	W.F.	7/18/60	1	42.3	42.1	-0.2	12.5	12.2	-0.3	109	109
186602	W.F.	7/25/60	1	43.4	43.0	-0.4	12.8	12.5	-0.3	106	106
186603	W.F.	7/26/60	1	42.5	42.4	-0.1	12.0	12.0	0.0	113	112
186604	W.F.	7/27/60	1	44.0	43.3	-0.7	12.7	12.4	-0.3	109	109
186739	W.F.	8/ 8/60	1	43.1	43.1	0.0	12.3	12.2	-0.1	111	107
186740	W.F.	8/10/60	1	42.6	42.9	+0.3	13.1	13.1	0.0	107	107
186741	W.F.	8/ 9/60	1	43.1	43.4	+0.3	13.2	13.2	0.0	106	105
186742	W.F.	8/14/60	1	43.0	43.2	+0.2	13.2	13.1	-0.1	108	105
Current Mill Average:				43.0	42.9	-0.1	12.7	12.6	-0.1	109	107
										315	334
											+19
										366	407
											+41
										309 ^a	328
										331	318
										293 ^a	325
										306 ^a	346
										316	335
										334	321
										305 ^a	338
										330 ^a	363
											+19
										365 ^a	407
											+42
										373 ^a	393
										353 ^a	433
										361 ^a	415
										353 ^a	401
										373 ^a	395
										365 ^a	399
										381 ^a	414
											+33

TABLE XXXII

MILL H -- 42-LB. LINERBOARD

186627	W.F.S	7/18/60	2	43.6	43.0	-0.6	12.3	12.1	-0.2	119	119	0	303 ^a	306	+3	373 ^a	411	+38
186628	W.F.S	7/18/60	2	43.8	43.0	-0.8	12.2	12.3	+0.1	121	122	+1	303 ^a	309	+1	373 ^a	404	+31
186750	W.F.S	8/ 8/60	2	42.7	42.2	-0.5	12.7	13.6	+0.9	115	112	-3	297 ^a	263	-34	346 ^a	369	+23
Current Mill Average:				43.4	42.7	-0.7	12.4	12.7	+0.3	113	119	0	303	292	-11	364	395	+31

^aThis average includes the readings for one or more specimens which tore beyond the 3/32-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XXXIII
MILL J -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. gage		Elmendorf Tear, g./sheet	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In	Across
186574	WFLS	7/25/60	2	43.4	-1.2	13.3	-0.7	102	+2	379 ^a	404 ^a
186575	----	7/27/60	1	44.0	-0.4	12.1	-0.4	108	+3	323 ^a	364 ^a
186593	WFLS	7/28/60	1	41.7	-0.9	12.1	-0.4	102	-2	306 ^a	348 ^a
186649	----	8/2/60	2	43.2	-1.1	13.4	-0.5	97	+4	371	392 ^a
186650	----	8/4/60	2	43.8	-1.8	12.8	-0.2	111	-10	361 ^a	397 ^a
186700	----	8/5/60	2	42.8	-0.7	12.5	-0.4	113	-2	363 ^a	393 ^a
186810	----	8/19/60	2	44.5	-1.0	13.4	-0.6	107	+1	413 ^a	424 ^a
Current Mill Average:				43.3	-1.0	12.8	-0.5	104	0	360	389

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XXXIV

MILL J -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i., gage		Elmendorf Tear, g./sheet	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In	Across
186701	W.F.	7/29/60	-	43.4	-0.6	12.9	12.5	111	107	371a	308
186702	W.F.	7/29/60	-	43.4	-0.6	12.3	12.2	113	108	351a	319
Current Mill Average:				43.4	-0.6	12.6	12.4	112	108	361	314
										362	343
										-63	339
										-32	347
										-47	-19

TABLE XXXV

MILL K -- 42-LB. LINERBOARD

186576	W.F.	6/5/60	2	44.0	-0.6	12.7	12.5	114	113	348a	372	376a	423	+47
186577	W.F.	6/17/60	2	43.9	-0.1	12.2	12.1	114	114	355a	355	395a	409	+14
186591	W.F.	6/21/60	2	43.6	+1.0	12.5	12.5	108	112	369a	366	379a	419	+40
186592	W.F.	6/24/60	2	44.0	-0.1	12.1	11.9	108	109	338	337	374a	400	+26
Current Mill Average:				43.9	+0.3	12.4	12.2	111	112	352	358	381	413	+32

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSITU AND MILL DATA--AUGUST 1 THROUGH AUGUST 31, 1966 (continued)

PAPER XXVII

MILL L -- 42-15, LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, mils		Bursting Strength, p.s.i. gage		In		g./sheet		Across	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.
186637	N.F.	7/19/60	2	43.9	-0.5	12.0	12.9	-0.1	112	110	-2	374	330	409a	388
186638	N.F.	7/19/60	2	43.8	-0.5	12.7	12.6	-0.1	117	115	-2	333	322	392a	377
186643	N.F.	7/25/60	2	44.0	-0.9	12.8	12.7	-0.1	121	115	-5	345a	314	388a	369
186644	N.F.	7/25/60	2	43.9	-0.7	12.8	12.8	0.0	118	110	-8	350a	316	404a	392
186645	N.F.	7/27/60	2	43.0	-1.1	12.2	12.0	-0.2	112	106	-6	307a	285	357a	343
186646	N.F.	7/27/60	2	43.8	-0.8	12.2	12.1	-0.1	116	107	-9	332a	288	391a	392
186647	N.F.	7/31/60	2	43.0	-1.0	12.3	12.0	-0.3	112	106	-5	321a	259	355a	328
186648	N.F.	7/31/60	2	43.9	-1.0	12.5	12.5	-0.3	117	113	-4	324a	275	385a	362
Current Mill Average:				43.7	-0.9	12.6	12.5	-0.1	116	110	-6	336	299	385	369
															-16

a This average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XXVII

MILL N -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Kch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i. Gage		Elmendorf Tear, g./sheet	
				IPC	Mill	Diff.	IPC	Mill	Diff.	In	Across
186691	W.F.	7/13/60	1	43.6	42.6	-1.0	12.6	12.2	-0.4	110	107
186692	W.F.	7/18/60	1	43.4	42.6	-0.8	12.7	12.1	-0.6	107	111
186693	W.F.	7/21/60	1	43.2	43.1	-0.1	12.9	12.1	-0.8	111	110
186694	W.F.	7/25/60	1	43.2	42.6	-0.6	12.8	11.9	-0.9	111	109
186749	W.F.	8/ 2/60	1	43.3	43.0	-0.3	12.7	12.1	-0.6	107	109
186755	W.F.	8/ 8/60	1	44.0	43.0	-1.0	12.7	12.1	-0.6	110	111
Current Mill Average:				43.5	42.8	-0.7	12.7	12.1	-0.6	109	109
									0	277	293
									+16	343	362
									+19		

TABLE XXVIII

MILL N -- 42-LB. LINERBOARD

186593	W.F.	7/18/60	-	43.7	42.4	-1.3	13.1	12.5	-0.6	104	108	389 ^a	401	+12	423 ^a	412	-11
186599	W.F.	7/20/60	-	44.0	43.5	-0.5	13.1	12.6	-0.5	110	111	379 ^a	405	+26	427 ^a	444	+17
186600	W.F.	7/21/60	-	43.4	43.0	-0.4	12.7	12.4	-0.3	109	111	345 ^a	356	+11	413 ^a	393	-20
186601	W.F.	7/22/60	-	43.5	43.0	-0.5	13.5	13.1	-0.4	103	108	356 ^a	361	+5	379 ^a	363	-16
186747	W.F.	7/28/60	-	43.7	43.4	-0.3	13.0	12.6	-0.4	107	111	352 ^a	352	0	401 ^a	397	-4
186748	W.F.	7/29/60	-	43.7	42.9	-0.8	12.7	12.3	-0.4	107	112	348 ^a	353	+5	382 ^a	396	+14
Current Mill Average:				43.7	43.0	-0.7	13.0	12.6	-0.4	106	110	361	372	+11	404	401	-3

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XXXIX

MILL O -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, p.s.i.		Elmendorf Tear, g./sheet	
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In	Across
186613	WFLS	7/19/60	1	43.3	-0.3	12.9	-0.2	112	-2	345	395
186614	WFLS	7/21/60	1	43.6	-0.6	13.0	-0.3	115	-5	347	395
186685	WFLS	7/26/60	1	43.7	+0.3	13.1	-0.3	113	-5	326a	413
186686	WFLS	8/2/60	1	43.7	-0.6	13.0	-0.3	110	-4	348a	453
Current Mill Average:				43.6	-0.3	13.0	-0.3	112	-3	342	414

TABLE XL

MILL P -- 42-LB. LINERBOARD

No samples submitted

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XII

MILL C -- 42-13. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, P.S.I. Gage		In		Elmendorf Tear, g./sheet		Across	
				IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.
186609	----	6/11/60	1	42.2	42.1	-0.1	12.2	12.0	-0.2	113	114	+ 1	345	317	-28
186610	----	6/11/60	1	43.1	43.0	-0.1	12.8	12.5	-0.3	119	113	- 6	349	323	-26
186651	----	6/10/60	1	44.0	43.5	-0.5	12.9	12.6	-0.3	112	104	- 8	401	356	-45
186652	----	6/15/60	1	43.3	42.7	-0.6	12.4	12.2	-0.2	117	102	-15	350	328	-22
186772	----	6/15/60	1	43.6	42.9	-0.7	12.4	12.3	-0.1	109	114	+ 5	361a	304	-57
186773	----	6/12/60	1	44.1	43.4	-0.7	13.2	12.9	-0.3	115	112	- 3	340a	305	-35
186774	----	6/15/60	1	44.0	43.0	-1.0	13.0	12.6	-0.4	117	114	- 3	337a	298	-39
Current Mill Average:				43.5	42.9	-0.6	12.7	12.4	-0.3	115	110	- 5	355	319	-36
													391	383	- 8

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.

Note: All "current mill average" data are calculated from the totals of the individual readings.

COMPARISON OF INSTITUTE AND MILL DATA--AUGUST 1 THROUGH AUGUST 31, 1960 (continued)

TABLE XLII

MILL S -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Men. No.	Basis Weight, lb		Caliper, points		Bursting Strength, p.s.i.		Elmendorf Tear, g./sheet							
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In	Across	IPC	Mill Diff.				
138568	WFS	7/12/60	1	43.6	-0.1	12.9	12.7	-0.2	121	113	-8	366	407	+41	386 ^a	415	+29
138573	WFS	7/15/60	1	43.5	0.0	13.0	12.7	-0.3	122	113	-9	381 ^a	406	+25	409 ^a	415	+6
Current Mill Average				43.6	-0.1	12.9	12.7	-0.2	122	113	-9	374	407	+33	398	415	+17

TABLE XLIII

MILL T -- 42-LB. LINERBOARD

No samples submitted

^aThis average includes the readings for one or more specimens which tore beyond the 3/8-inch limit.
Note. All "current mill average" data are calculated from the totals of the individual readings.

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