

Institute of Paper, Science and Technology
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CONTINUOUS BASELINE STUDY
Project 1108-13
Progress Report 142
to
FOURDRINIER KRAFT BOARD INSTITUTE, INC.
April 1, 1959

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS BASELINE STUDY

Project 1108-13

Progress Report 142

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

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THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

PART I: PRESENTATION AND DISCUSSION OF RESULTS OBTAINED AT
THE INSTITUTE OF PAPER CHEMISTRY

In conjunction with the F.K.I. Continuous Baseline Study, The Institute of Paper Chemistry has been directed to identify the participating mills by means of a scrambled system of code letters. Under this system, which was initiated in Progress Report 105, each mill is identified by a code letter different from that used for the previous month.

During the month of March, ninety-four different sample lots of 42-lb. Fourdrinier kraft linerboard from seventeen different F.K.I. mills were processed 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 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 cumulative F.K.I. average is based on the results for the previous twelve months excluding the current period. Hence, in the case of the current report, it covers the period from March 1, 1958, to February 28, 1959. The F.K.I. indexes are obtained as follows:

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

TABLE I

NUMBER OF SAMPLE LOTS SUBMITTED BY EACH MILL

Mill Code	Number
A	1
B	4
C	6
D	0
E	4
F	1
G	8
H	8
I	9
J	11
K	8
L	5
M	6
N	6
O	0
P	3
Q	8
S	4
T	<u>2</u>
Total	94

TABLE II

SUMMARY OF COMPOSITE MILL AVERAGES--MARCH 1 THROUGH MARCH 31, 1959

Mill	Basis Weight, lb.	Caliper, points	Bursting Strength, p.s.i. gage	In Machine Cross Machine	Elmendorf Tear, g./sheet
A	43.3	13.7	109	310	375
B	43.9	14.2	110	344	380
C	43.6	12.5	110	359	363
D	No samples submitted.				
E	43.2	12.3	107	300	368
F	42.7	13.0	107	362	389
G	42.8	12.2	113	320	368
H	44.1	12.9	111	310	361
I	44.0	12.5	116	318	365
J	43.0	13.5	114	327	354
K	44.2	12.4	117	349	397
L	43.9	12.4	110	357	403
M	43.9	11.9	113	343	389
N	43.6	12.7	112	332	378
O	No samples submitted.				
P	43.5	12.9	111	335	398
Q	43.8	13.3	117	293	361
S	42.2	12.7	109	336	383
T	43.4	13.2	111	335	372
Current FKI Average:	43.5	12.8	112	331	377
Cumulative FKI Average:	43.3	12.7	112	331	376
FKI Index, %	100.5	100.8	100.0	100.0	100.3

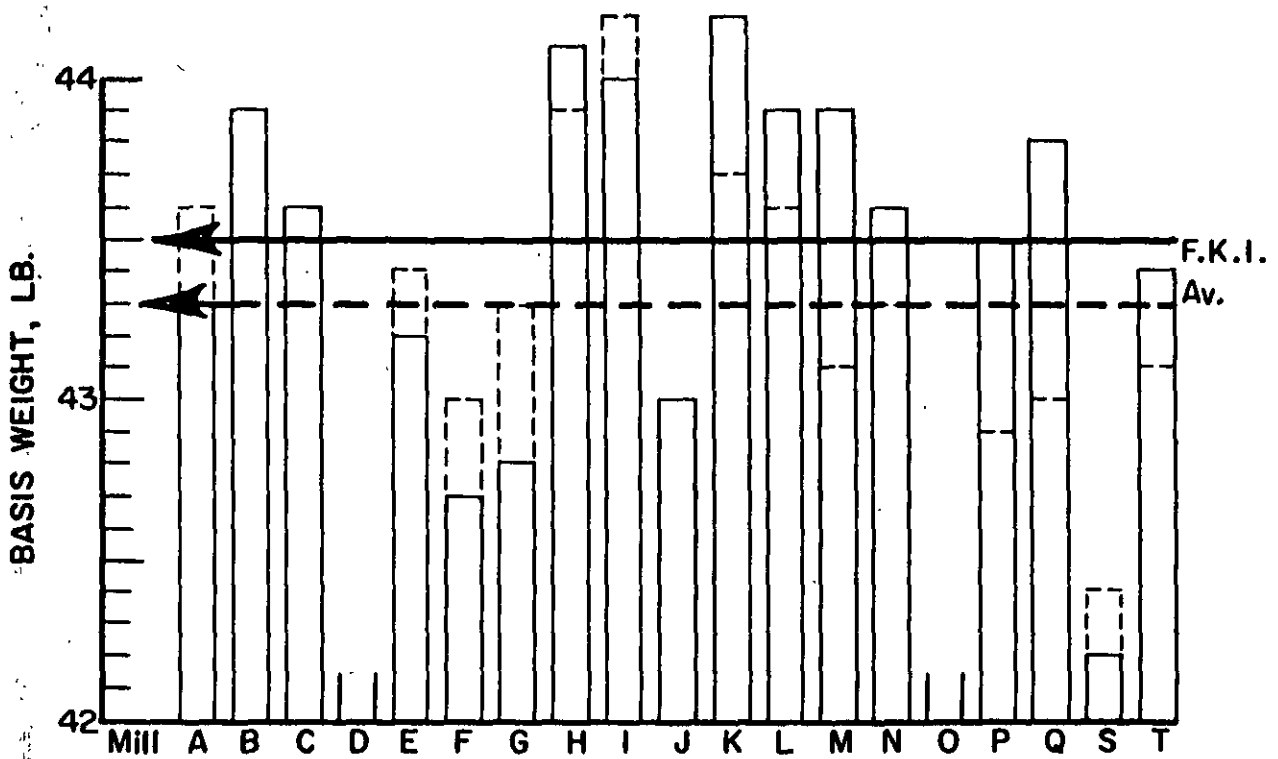


Figure 1

Comparison of Basis Weight Results for March, 1959

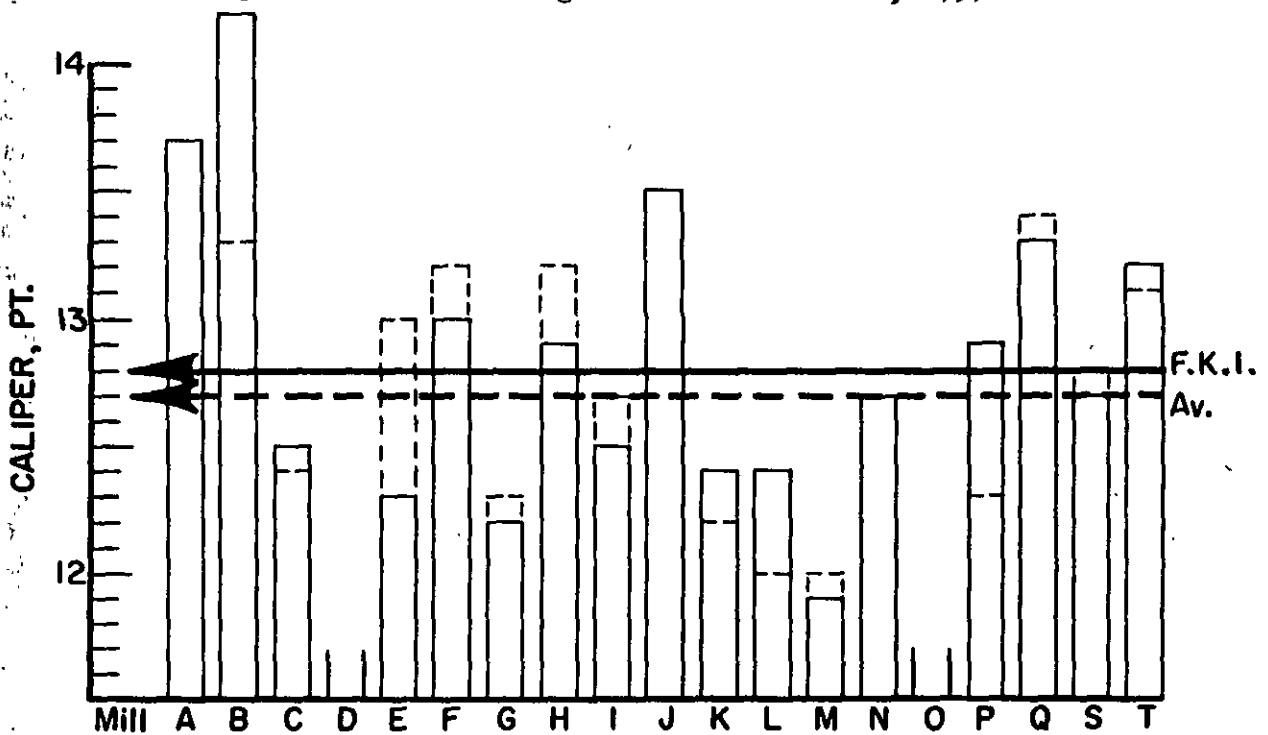


Figure 2

Comparison of Caliper Results for March, 1959

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

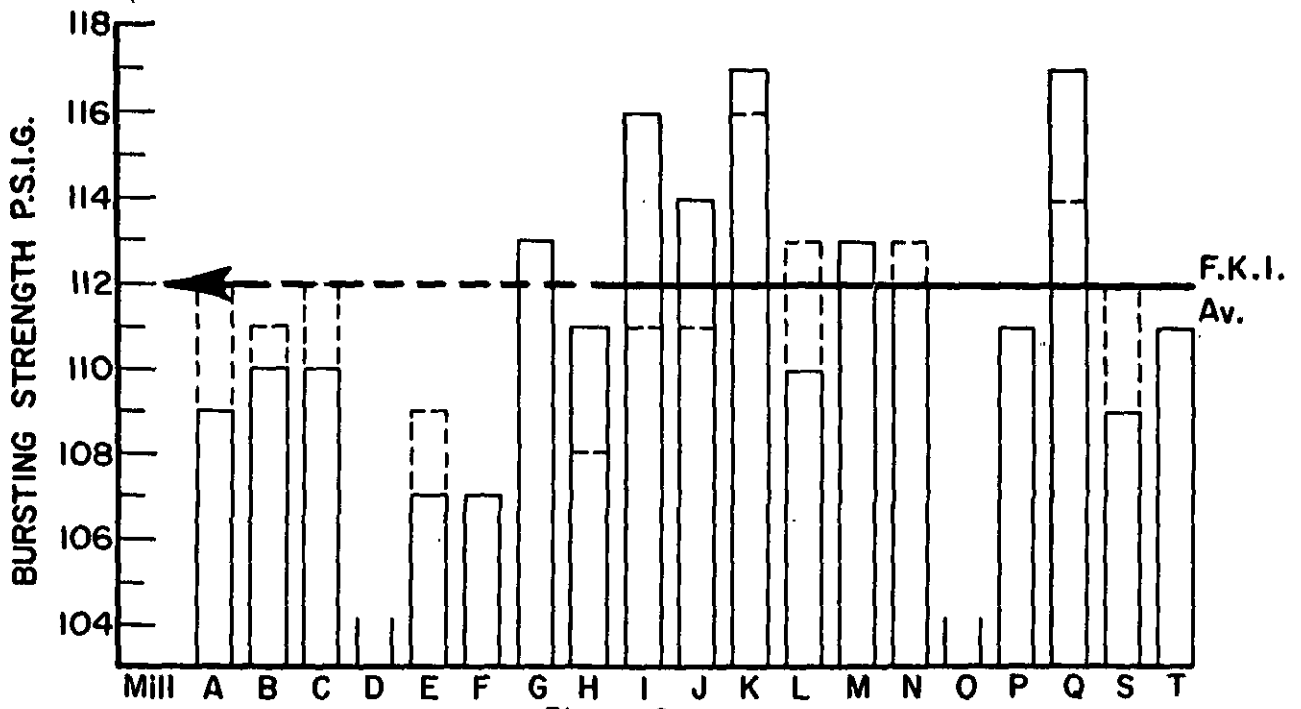


Figure 3

Comparison of Bursting Strength Results for March, 1959

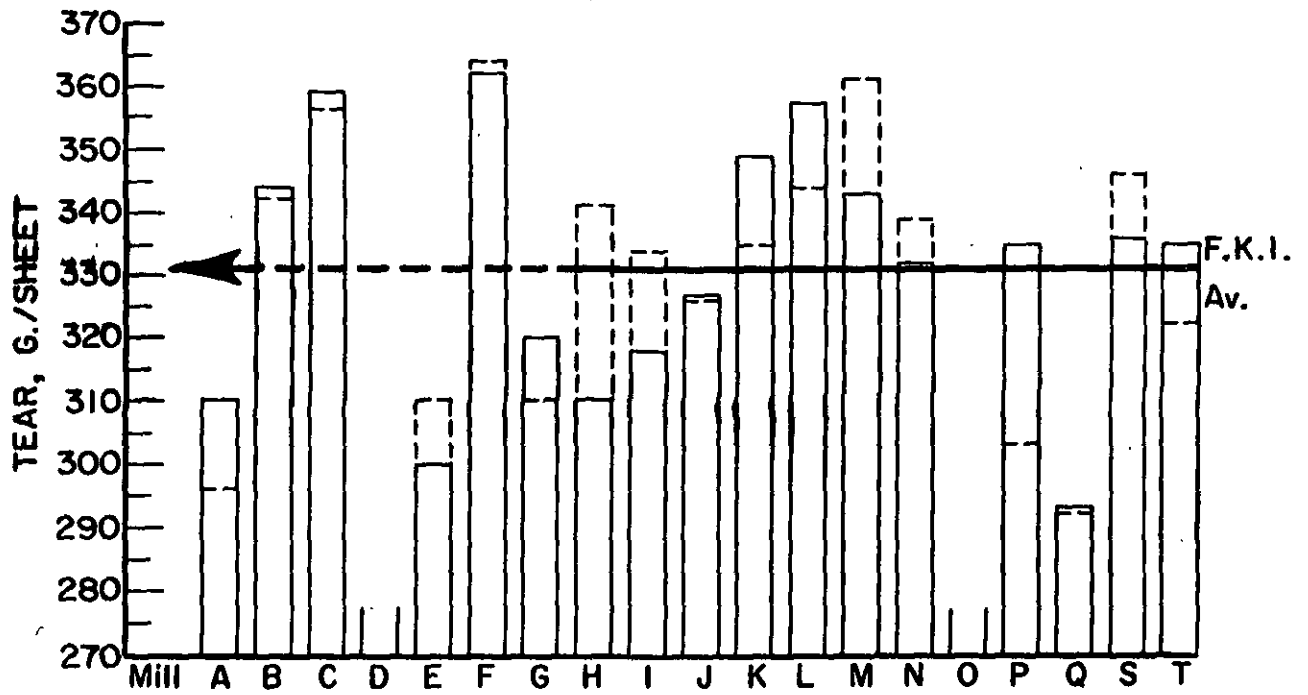


Figure 4

Comparison of Machine-Direction Tear Results for March, 1959

- Current mill average
- Cumulative mill average

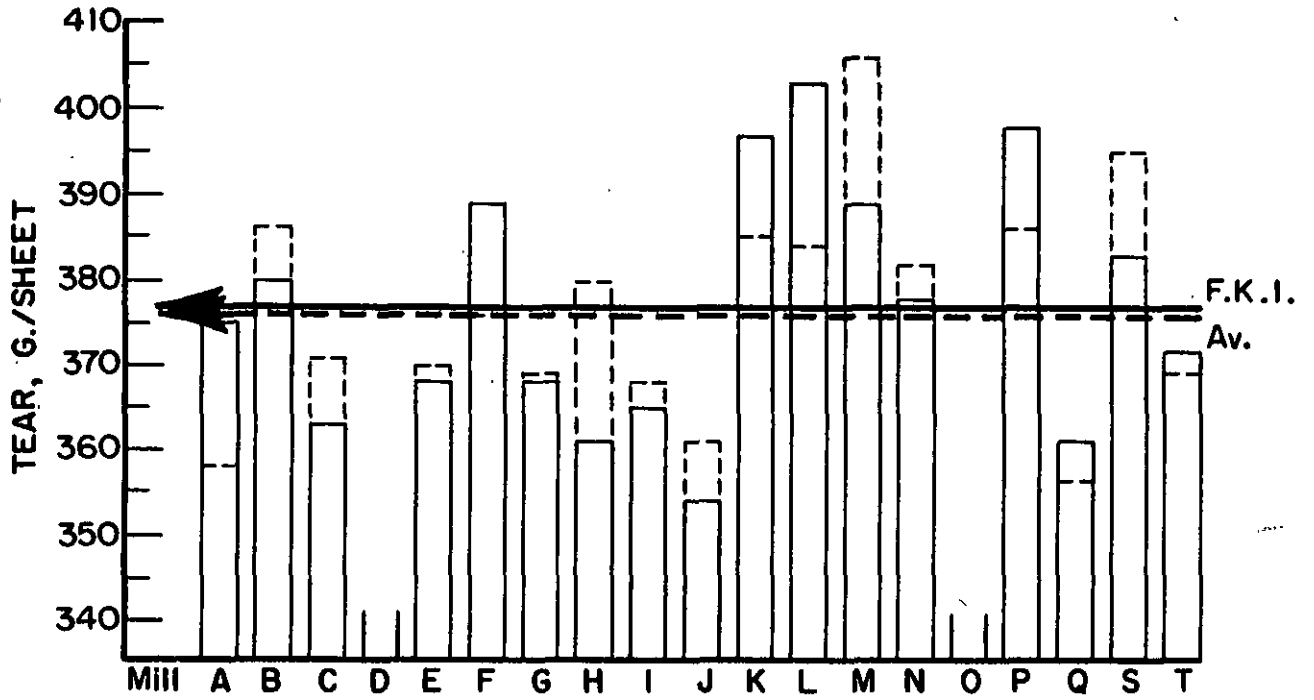


Figure 5

Comparison of Cross-Machine Direction Tear Results for March, 1959

- Current mill average
- - - Cumulative mill average

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 43.3 lb. Hence, the F.K.I. index for basis weight determined in per cent as indicated above is 100.5 and signifies that the current F.K.I. average basis weight is slightly higher than the cumulative F.K.I. average.

A comparison of the results 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 K had the highest average basis weight of 44.2 lb. which was approximately 5.2% higher than the 42-lb. specification. The lowest average basis weight of 42.2 lb., which was approximately 0.5% higher than the 42-lb. specification, was associated with Mill S.

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 increased slightly.

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 11.9 points for Mill M to a high of 14.2 points for Mill B. The current F.K.I. caliper average is 12.8 points, which is slightly higher than the cumulative F.K.I. average of 12.7 points. The F.K.I. index for caliper is 100.8%.

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

Mill Code	Per Cent
A	+3.1
B	+4.5
C	+3.8
D	----
E	+2.9
F	+1.7
G	+1.9
H	+5.0
I	+4.8
J	+2.4
K	+5.2
L	+4.5
M	+4.5
N	+3.8
O	----
P	+3.6
Q	+4.3
S	+0.5
T	+3.3

The average bursting strength values obtained 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 107 for Mills E and F to a high of 117 for Mills K and Q. The current F.K.I. bursting strength average is 112 p.s.i. gage, which is the same as the cumulative F.K.I. average.

A graphic comparison of the Elmendorf tear results shown in Table II for the various mills is given in Figures 4 and 5. These presentations show that Mill F had the highest machine direction tear average of 362 g./sheet, and Mill Q had the lowest average of 293 g./sheet. It may be further noted in Table II that the highest cross-machine direction tear average of 403 g./sheet was obtained on the linerboard from Mill L and that the lowest average of 354 g./sheet was associated with Mill J. It may be observed also in Table II that the current F.K.I. average for machine direction Elmendorf tear is the same as the cumulative F.K.I. average, whereas the current F.K.I. average for cross-machine direction Elmendorf tear is slightly higher than the cumulative F.K.I. average.

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

In order to compare the variation within a given mill, the test results for each particular mill have been tabulated in Tables III to XXI for Mills A through T, respectively.

In addition to the current and cumulative average, the mill factor and mill index are given for each mill. The cumulative mill average is the average test result obtained on the samples submitted by the particular mill 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 the test data include information about the sheet finish. The summarized results for the mills which submitted sample lots during the current period are shown in Table XXI-A.

SUMMARY OF INSTITUTE DATA--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE V

MILL C -- 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		Across						
					Max.	Av.	Max.	Av.	Max.	Av.	Max.	Av.		In	Max.				
181316	W.F.	3/2/59	2/15/59	-	44.0	42.4	43.5	13.1	12.5	12.9	131	86	109	416	304	358 ^a	432	352	385 ^a
181317	W.F.	3/2/59	2/19/59	-	44.4	43.2	43.8	12.3	11.2	11.9	127	96	110	392	312	356 ^a	400	336	362 ^a
181344	W.F.	3/5/59	2/19/59	-	44.6	43.0	43.9	13.2	12.0	12.7	125	73	108	416	336	377 ^a	408	304	353 ^a
181345	W.F.	3/5/59	2/19/59	-	44.2	42.4	43.8	13.2	12.0	12.7	128	90	109	432	344	388 ^a	392	312	351 ^a
181496	W.F.	3/16/59	3/3/59	-	43.6	42.4	42.9	12.9	12.0	12.4	123	89	110	368	304	321	400	328	359 ^a
181497	W.F.	3/16/59	3/3/59	-	44.4	43.6	44.0	12.8	11.9	12.2	130	84	114	392	320	353	384	344	367 ^a
Current Mill Average:							43.6			12.5			110			359			363
Cumulative Mill Average:							43.6			12.4			112			356			371
Mill Factor, %							100.0			100.8			98.2			100.8			97.8
Mill Index, %							100.7			98.4			98.2			108.5			96.5

TABLE VI

MILL D -- 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 INSTITUTE DATA--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE VII

MILL E -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, Points			Bursting Strength, P.S.I. Gage			Eimendorf Tear, g./sheet					
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
181494	WFLS	3/13/59	3/3/59	1	44.4	42.0	43.3	12.6	11.7	12.1	126	78	105	336	248	305	400	352	372 ^a
181495	WFLS	3/13/59	3/3/59	1	43.0	40.6	41.9	13.0	11.5	12.1	125	76	102	400	240	307 ^a	400	336	363 ^a
181597	WFLS	3/24/59	3/9/59	1	44.6	42.4	43.6	12.9	11.6	12.3	138	80	112	336	248	289	448	344	373 ^a
181598	WFLS	3/24/59	3/9/59	1	45.2	43.0	44.0	13.5	12.0	12.6	132	85	110	336	272	299	400	320	363 ^a
Current Mill Average:					43.2			12.3			107			300			368		
Cumulative Mill Average:					43.4			13.0			109			310			370		
Mill Factor, %					99.5			94.6			98.2			96.8			99.5		
Mill Index, %					99.8			96.9			95.5			90.6			97.9		

TABLE VIII

MILL F -- 42-LB. LINERBOARD

181520	W.	3/18/59	3/2/59	2	44.0	42.0	42.7	13.5	12.2	13.0	131	82	107	424	304	362 ^a	472	320	389 ^a
Current Mill Average:					42.7			13.0			107			362			389		
Cumulative Mill Average:					43.0			13.2			107			364			376		
Mill Factor, %					99.3			98.5			100.0			99.5			103.5		
Mill Index, %					98.6			102.4			95.5			109.4			103.5		

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

SUMMARY OF INSTITUTE DATA--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE IX

MILL G -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Calliper, points		Bursting Strength, P. S. I. Gage		Elmendorf Tear, g./sheet		Across						
					Max.	Av.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Av.		
181504	W.F.	3/16/59	3/4/59	2	43.6	42.0	42.9	12.6	11.8	12.2	130	94	111	360	296	327 ^a	392	344	365 ^a
181505	W.F.	3/16/59	3/1/59	1	44.0	43.0	43.4	12.9	12.0	12.4	138	83	110	384	296	345	400	320	362 ^a
181510	W.F.	3/17/59	3/5/59	2	43.8	42.0	42.5	12.8	11.5	12.1	125	95	111	384	280	328 ^a	480	320	381 ^a
181511	W.F.	3/17/59	3/5/59	2	43.0	42.0	42.2	12.8	11.8	12.2	142	101	115	360	280	311 ^a	480	320	376 ^a
181512	W.F.	3/17/59	3/6/59	2	43.8	42.0	42.7	12.8	11.9	12.2	133	93	116	360	272	309	424	320	365 ^a
181513	W.F.	3/17/59	3/6/59	2	44.0	42.0	42.8	13.0	11.9	12.2	136	87	111	352	272	315	448	336	363 ^a
181521	W.F.	3/18/59	3/12/59	2	43.8	42.2	43.3	13.0	12.0	12.3	128	97	114	368	272	312	432	320	367 ^a
181522	W.F.	3/18/59	3/12/59	2	43.6	42.4	42.9	12.3	11.8	12.1	125	103	113	344	272	315 ^a	384	320	361 ^a
Current Mill Average:							42.8			12.2			113			320			368
Cumulative Mill Average:							43.3			12.3			113			310			369
Mill Factor, %							98.8			99.2			100.0			103.2			99.7
Mill Index, %							98.8			96.1			100.9			96.7			97.9

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

SUMMARY OF INSTITUTE DATA--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE X
MILL H -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, P.S.I., gage		In Elmendorf Tear, g./sheet		Across						
					Max.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.				
181372	W.F.	3/9/59	2/3/59	1	45.0	42.8	44.0	14.0	12.7	13.2	137	95	109	384	312	349 ^a	400	328	371 ^a
181373	W.F.	3/9/59	2/17/59	1	46.0	43.0	44.5	13.6	12.7	13.0	126	94	112	352	288	312	448	336	390 ^a
181374	W.F.	3/9/59	2/17/59	1	45.0	43.0	44.2	13.5	12.4	12.9	134	87	112	336	272	309	408	320	363 ^a
181375	W.F.	3/9/59	2/17/59	1	45.6	42.0	44.2	13.0	12.0	12.5	145	84	114	352	264	326	440	328	378 ^a
181376	W.F.	3/9/59	2/18/59	1	44.0	42.0	43.2	13.4	12.3	12.8	135	83	104	320	256	275	352	304	325 ^a
181377	W.F.	3/9/59	2/18/59	1	46.0	44.0	45.3	14.0	13.0	13.4	144	87	113	368	272	313	400	336	367 ^a
181378	W.F.	3/9/59	2/20/59	1	44.0	42.0	42.8	13.9	12.0	12.5	129	80	108	320	264	289	368	320	337 ^a
181379	W.F.	3/9/59	2/20/59	1	45.4	44.0	44.4	13.2	12.2	12.9	136	92	113	368	256	310	384	320	357 ^a
Current Mill Average:							44.1		12.9		111		108	310		341	380		361
Cumulative Mill Average:							43.9		13.2		108		108	341		341	380		361
Mill Factor, %							100.5		97.7		102.8		90.9	90.9		90.9	95.0		95.0
Mill Index, %							101.8		101.6		99.1		93.7	93.7		93.7	96.0		96.0

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

SUMMARY OF INSTITUTE DATA--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XI
MILL I -- 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.			
181318	W.F.	3/2/59	2/25/59	-	44.2	43.0	43.8	13.1	12.0	12.6	125	94	112	400	288	337 ^a	416	320	370 ^a
181319	W.F.	3/2/59	2/26/59	-	43.8	42.6	43.4	13.1	12.1	12.8	130	104	116	360	288	329 ^a	392	344	367 ^a
181320	W.F.	3/2/59	2/27/59	-	44.2	42.6	43.7	12.5	11.9	12.1	130	101	116	368	256	310	400	312	359 ^a
181369	W.F.	3/9/59	3/4/59	-	44.4	43.8	44.1	12.6	11.2	12.1	141	110	124	368	256	313	384	352	371 ^a
181370	W.F.	3/9/59	3/5/59	-	44.0	43.2	43.8	13.0	12.1	12.5	120	97	108	400	272	324	400	320	356 ^a
181371	W.F.	3/9/59	3/6/59	-	45.2	44.0	44.5	13.1	12.3	12.8	131	97	113	320	248	283 ^a	400	320	358 ^a
181566	W.F.	3/19/59	3/11/59	-	45.4	44.2	44.9	13.1	11.4	12.7	133	100	119	352	304	324	416	336	368 ^a
181567	W.F.	3/19/59	3/12/59	-	44.0	44.0	44.0	13.5	12.1	12.9	129	98	116	400	296	327 ^a	416	320	372 ^a
181568	W.F.	3/19/59	3/13/59	-	44.0	43.0	43.8	12.9	11.9	12.4	137	98	116	352	272	312 ^a	416	328	368 ^a
Current Mill Average:					44.0			12.5			116			318			365		
Cumulative Mill Average:					44.2			12.7			111			334			368		
Mill Factor, %					99.5			98.4			104.5			95.2			99.2		
Mill Index, %					101.6			98.4			103.6			96.1			97.1		

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

SUMMARY OF INSTITUTE DATA--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XII
MILL J -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, Points		Bursting Strength, P.S.I. Range		Elmendorf Tear, g./sheet		Across					
					Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		Max.	Min.	Av.		
181346	WFLS	3/ 5/59	2/ 3/59	2	43.0	41.0	13.2	12.0	12.8	133	85	112	336	272	306	400	312	346 ^a
181347	WFLS	3/ 5/59	2/ 5/59	2	42.6	40.0	13.7	12.2	13.1	130	85	112	368	280	321 ^a	384	328	355 ^a
181348	WFLS	3/ 5/59	2/14/59	2	44.2	42.0	14.2	13.2	13.7	131	94	112	360	272	317 ^a	392	320	353 ^a
181349	WFLS	3/ 5/59	2/16/59	2	44.4	41.4	14.2	13.0	13.6	142	83	111	352	288	323 ^a	384	304	339 ^a
181350	WFLS	3/ 5/59	2/18/59	2	44.0	41.6	14.1	12.6	13.4	134	96	114	384	256	326 ^a	384	320	354 ^a
181351	WFLS	3/ 5/59	2/19/59	2	44.2	42.4	14.1	13.0	13.5	138	82	113	392	304	341 ^a	416	320	361 ^a
181352	WFLS	3/ 5/59	2/23/59	2	44.0	42.0	14.5	13.2	13.7	131	90	115	344	264	311 ^a	384	312	343 ^a
181353	WFLS	3/ 5/59	2/27/59	2	46.0	43.0	15.0	13.9	14.4	139	94	115	384	288	343	416	352	384 ^a
181576	WFLS	3/20/59	3/ 1/59	2	44.0	42.4	14.2	13.0	13.8	139	95	114	384	296	333 ^a	376	320	353 ^a
181577	WFLS	3/20/59	3/ 5/59	2	44.0	42.0	13.8	12.8	13.1	137	94	119	416	296	341 ^a	384	336	359 ^a
181578	WFLS	3/20/59	3/ 6/59	2	44.0	43.0	14.1	13.0	13.9	132	90	112	368	288	337	384	320	351 ^a
Current Mill Average:						43.0		13.5				114			327			354
Cumulative Mill Average:						43.0		13.5				111			326			361
Mill Factor, %						100.0		100.0				102.7			100.3			98.1
Mill Index, %						99.3		106.3				101.8			98.8			94.1

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

SUMMARY OF INSTITUTE DATA--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XIII
MILL K -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, P.S.I., Page		In		Across		Elmendorf Tear, g./sheet			
					Max.	Av.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.		Max.	Min.	Av.
181308	W.F.	3/ 2/59	2/15/59	2	46.0	44.4	45.5	13.1	12.1	12.8	134	101	117	424	288	448	400	419 ^a
181309	W.F.	3/ 2/59	2/15/59	2	45.8	44.0	44.6	13.1	12.2	12.7	155	93	119	400	328	448	376	404 ^a
181342	W.F.	3/ 4/59	2/24/59	2	44.0	44.0	44.0	12.5	12.0	12.3	127	95	112	416	240	440	342	385 ^a
181343	W.F.	3/ 4/59	2/24/59	2	44.0	43.0	43.9	12.9	12.0	12.3	125	92	112	400	296	416	352	383 ^a
181381	W.F.	3/ 9/59	3/ 1/59	2	44.2	43.4	43.9	13.0	12.0	12.5	143	110	124	416	320	448	384	405 ^a
181382	W.F.	3/ 9/59	3/ 1/59	2	44.0	43.0	43.8	13.0	12.1	12.6	137	97	118	448	312	440	368	413 ^a
181488	W.F.	3/13/59	3/ 9/59	2	44.0	43.6	44.0	12.1	11.8	12.0	136	102	117	368	280	432	360	389 ^a
181489	W.F.	3/13/59	3/ 9/59	2	45.0	43.0	44.0	12.1	11.8	12.0	129	89	114	440	304	400	336	381 ^a
Current Mill Average:							44.2			12.4			117		349			397
Cumulative Mill Average:							43.7			12.2			116		335			385
Mill Factor, %							101.1			101.6			100.9		104.2			103.1
Mill Index, %							102.1			97.6			104.5		105.4			105.6

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

SUMMARY OF INSTITUTE DATA--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XIV

MILL L -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points			Bursting Strength, P.S.I. Edge			Elmendorf Tear, g./sheet					
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
181587	W.F.	3/23/59	3/1/59	-	44.0	42.8	43.6	13.0	12.0	12.4	135	90	113	400	304	372 ^a	480	360	411 ^a
181588	W.F.	3/23/59	3/4/59	-	44.2	43.2	43.9	12.5	11.9	12.1	128	88	110	392	336	364 ^a	440	384	411 ^a
181589	W.F.	3/23/59	3/5/59	-	44.4	43.0	43.8	12.3	11.2	12.0	138	86	110	392	304	357 ^a	432	360	397 ^a
181590	W.F.	3/23/59	3/17/59	-	45.0	43.2	44.1	13.1	12.0	12.6	128	87	113	376	288	335 ^a	408	352	379 ^a
181600	W.F.	3/24/59	3/17/59	-	45.0	43.0	44.1	13.7	12.1	12.7	121	74	103	384	320	357 ^a	448	384	419 ^a
Current Mill Average:					43.9			12.4			110			357			403		
Cumulative Mill Average:					43.6			12.0			113			344			384		
Mill Factor, %					100.7			103.3			97.3			103.8			104.9		
Mill Index, %					101.4			97.6			98.2			107.9			107.2		

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

SUMMARY OF INSTITUTE DATA--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XV

MILL M -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Caliper, points.			Bursting Strength, p.s.i. range			Elmendorf Tear, g./sheet					
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
181380	W.B.	3/9/59	2/16/59	-	45.2	43.6	44.2	12.1	10.6	11.5	130	92	110	360	296	331	416	368	392 ^a
181490	W.B.	3/13/59	2/19/59	-	44.4	43.4	43.9	13.0	11.7	12.3	132	87	109	360	288	329 ^a	400	344	365 ^a
181491	W.B.	3/13/59	2/20/59	-	44.0	43.0	43.6	12.4	11.2	12.0	128	87	110	376	296	335 ^a	400	328	375 ^a
181592	W.B.	3/23/59	2/21/59	-	44.4	43.0	43.6	12.8	11.6	12.2	132	80	110	384	296	337 ^a	432	360	396 ^a
181593	W.B.	3/23/59	3/5/59	-	45.6	43.6	44.5	12.1	10.7	11.7	141	101	122	424	344	381	448	384	409 ^a
181599	W.B.	3/24/59	3/10/59	-	44.2	42.6	43.6	12.5	11.5	12.0	145	96	114	384	304	345	432	368	397 ^a
Current Mill Average:					43.9			11.9			113			343			389		
Cumulative Mill Average:					43.1			12.0			113			361			406		
Mill Factor, %					101.9			99.2			100.0			95.0			95.8		
Mill Index, %					101.4			93.7			100.9			103.6			103.5		

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

SUMMARY OF INSTITUTE DATA--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XVI

MILL N -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, P.S.I. Range		Elmendorf Tear, g./sheet													
					Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
181383	W.F.	3/9/59	2/16/59	2	43.8	42.8	43.3	13.1	12.3	12.7	136	72	112	368	280	329 ^a	424	328	381 ^a					
181384	W.F.	3/9/59	2/17/59	2	44.2	43.0	43.5	13.0	12.3	12.7	142	102	117	352	296	330 ^a	400	344	366 ^a					
181492	W.F.	3/13/59	2/23/59	2	44.2	43.8	44.0	13.0	12.5	12.8	132	85	110	432	288	348 ^a	432	336	382 ^a					
181493	W.F.	3/13/59	2/24/59	2	44.2	44.0	44.1	13.0	12.3	12.8	136	94	118	352	288	337 ^a	432	344	389 ^a					
181506	W.F.	3/16/59	3/2/59	2	44.0	42.4	43.5	13.0	12.1	12.5	131	91	108	392	280	333 ^f	400	352	379 ^a					
181507	W.F.	3/16/59	3/3/59	2	43.6	42.4	43.0	12.7	12.0	12.3	130	84	109	352	288	318 ^a	408	328	369 ^a					
Current Mill Average:					43.6		12.7		12.7		112		332		378									
Cumulative Mill Average:					43.3		12.7		12.7		113		339		382									
Mill Factor, %					100.7		100.0		100.0		99.1		97.9		99.0									
Mill Index, %					100.7		100.0		100.0		100.0		100.3		100.5									

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

SUMMARY OF INSTITUTE DATA--MARCH 1 THROUGH MARCH 31, 1959 (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		Across	
					Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.

No samples submitted.

TABLE XVIII

MILL P -- 42-LB. LINERBOARD

181596	WFLS	3/24/59	2/26/59	1	43.8	41.0	42.5	13.0	12.0	12.5	132	90	109	360	288	325 ^a	432	352	388 ^a
181385	WFLS	3/10/59	3/2/59	1	44.4	43.8	44.1	13.9	12.9	13.1	126	96	112	376	296	329	448	336	402 ^a
181595	WFLS	3/23/59	3/11/59	1	44.0	43.4	43.9	14.0	12.9	13.2	129	94	111	416	288	351	472	360	405 ^a
Current Mill Average:					43.5			12.9	12.9		111					335			398
Cumulative Mill Average:					42.9			12.3	12.3		111					303			386
Mill Factor, %					101.4			104.9	100.0		100.0					110.6			103.1
Mill Index, %					100.5			101.6	99.1		99.1					101.2			105.9

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

SUMMARY OF INSTITUTE DATA--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XIX

MILL 2 -- 42-LB. LINERBOARD

File No.	Finish	Date Recd.	Date Made	Mch. No.	Basis Weight, lb.			Calliper, points			Bursting Strength, p.s.i. gage			Elmendorf Tear, g./sheet					
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.
181310	W.F.	3/2/59	2/9/59	1	44.0	43.0	43.6	14.1	12.9	13.3	141	92	124	336	272	298 ^a	400	320	357 ^a
181311	W.F.	3/2/59	2/12/59	1	44.0	43.8	44.0	14.0	12.8	13.6	131	89	114	320	264	299	400	336	366 ^a
181476	W.F.	3/12/59	2/17/59	1	44.4	44.0	44.2	13.2	12.9	13.0	142	96	115	352	280	306	376	320	350 ^a
181477	W.F.	3/12/59	2/21/59	1	44.2	43.6	43.9	14.0	12.9	13.3	136	73	111	288	240	267	400	320	353 ^a
181508	W.F.	3/16/59	2/23/59	1	44.4	42.6	43.6	14.1	12.9	13.6	142	96	123	320	256	297	416	344	379 ^a
181509	W.F.	3/16/59	2/27/59	1	44.0	43.0	43.5	13.9	12.1	13.0	137	91	116	320	248	286 ^a	384	320	363 ^a
181622	W.F.	3/27/59	3/3/59	1	44.0	42.4	43.2	14.2	12.9	13.3	132	72	111	304	256	281	384	320	348 ^a
181623	W.F.	3/27/59	3/5/59	1	44.6	44.0	44.1	13.5	13.0	13.1	139	90	125	360	280	311 ^a	408	352	371 ^a
Current Mill Average:							43.8			13.3		117			293				361
Cumulative Mill Average:							43.0			13.4		114			292				356
Mill Factor, %							101.9			99.3		102.6			100.3				101.4
Mill Index, %							101.2			104.7		104.5			88.5				96.0

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

SUMMARY OF INSTITUTE DATA--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XI

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.	Max.	Min.	Av.	Av.			
181314	----	3/2/59	2/23/59	2	43.0	40.0	41.8	13.0	12.0	12.3	128	88	116	376	272	322	416	352	384 ^a
181315	----	3/2/59	2/19/59	1	44.2	42.0	42.9	13.1	12.1	12.8	125	85	108	384	320	351 ^a	448	352	390 ^a
181594	----	3/23/59	3/12/59	2	42.2	40.8	41.8	13.0	12.2	12.8	126	92	109	472	304	354 ^a	432	352	395 ^a
181573	----	3/20/59	3/6/59	1	43.0	41.6	42.1	13.8	12.2	13.1	118	82	103	376	264	316	384	336	365 ^a
Current Mill Average:							42.2			12.7		109				336			383
Cumulative Mill Average:							42.4			12.8		112				346			395
Mill Factor, %							99.5			99.2		97.3				97.1			97.0
Mill Index, %							97.5			100.0		97.3				101.5			101.9

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

SUMMARY OF INSTITUTE DATA--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XXI

MILL T -- 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.	Av.	Max.	Av.	Max.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
181574	WF1S	3/20/59	3/17/59	1	44.0	43.1	13.9	12.9	130	89	112	368	272	326 ^a	448	320	368 ^a
181575	WF1S	3/20/59	3/17/59	1	44.0	43.6	13.9	13.0	127	89	110	384	296	344	448	320	377 ^a
Current Mill Average:						43.4			13.2		111			335			372
Cumulative Mill Average:						43.1			13.1		111			322			369
Mill Factor, %						100.7			100.8		100.0			104.0			100.8
Mill Index, %						100.2			103.9		99.1			101.2			98.9

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

TABLE XXI-A
 SUMMARY OF SHEET FINISH DATA

Mill Code	Number of Sample Lots		
	Water Finish	Water Finish One Side	Other
A	1		
B		4	
C	6		
D	No samples submitted		
E		4	
F	1		
G	8		
H	8		
I	9		
J		11	
K	8		
L	5		
M	6		
N	6		
O	No samples submitted.		
P		3	
Q	8		
S			4 ^a
T		2	
Totals	66	24	4

^a Unidentified.

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 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. Table XXIII shows the over-all average difference between Institute and mill results for each of these tests 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 THE MILL TESTS

Mill Code	R _o H _o , %	Preconditioning Temperature, °F.	Time, hr.	R _o H _o , %	Conditioning Temperature, °F.	Time, hr.
A	41	70	0.5	50	73	48
B	50	70-72	120	50	70-72	120
C		None		50	73	0.5
D			No samples submitted.			
E	50	73	50-90	50	73	2
F		None		53	73	--
G	50	73	24	50	73	24
H	50	73	24	50	73	24
I	35-36	77-78	8	48-52	72-73	16
J	50	72	24		None	
K		None		50	73	24
L	50	73	48	50	73	--
M		None		46-58	71-73	48
N		None		50	73	24
O		None	No samples submitted.			
P		None		50-53	66-71	--
Q		None		43-62	76-86	--
S	50	72	24-120	50	72-73	24-120
T		None		39	80	--

TABLE XXIII
SUMMARY OF TEST RESULT COMPARISONS (AVERAGE MILL AND INSTITUTE RESULTS)

Mills*	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	S	T
No. Samples Compared	1	4	6	0	4	1	8	8	9	11	8	5	6	6	0	3	8	4	2
Institute	43.3	43.9	43.6	43.6	43.2	42.7	42.8	44.1	44.0	43.0	44.2	43.9	43.9	43.6	43.5	43.8	42.2	43.4	43.7
Mill	42.9	43.7	42.5	42.5	42.8	42.4	42.4	43.7	43.4	43.0	43.3	43.8	43.3	43.3	42.6	42.5	41.6	42.7	42.7
Av. Diff.**	-0.4	-0.2	-1.1	-0.4	-0.4	-0.3	-0.4	-0.4	+0.4	+0.4	-0.9	-0.1	-0.6	-0.3	-0.9	-1.3	-0.6	-0.7	-0.7
Max. Diff.***	-0.4	-0.3	-2.0	-0.8	-0.3	-0.9	-0.9	-0.7	-1.0	+1.0	-1.7	+0.6	-1.0	-0.7	-1.5	-2.0	-1.1	-0.7	-0.7
Institute	13.7	14.2	12.5	12.3	13.0	12.2	12.2	12.9	12.5	13.5	12.4	12.4	11.9	12.7	12.9	13.3	12.7	13.2	13.2
Mill	13.2	13.9	12.1	11.9	13.2	11.9	12.4	12.4	12.2	12.9	11.9	12.2	11.6	12.4	12.5	12.9	12.2	12.7	12.7
Av. Diff.**	-0.5	-0.3	-0.4	-0.4	+0.2	-0.3	-0.5	-0.5	-0.3	-0.6	-0.5	-0.2	-0.3	-0.3	-0.4	-0.4	-0.5	-0.5	-0.5
Max. Diff.***	-0.5	-0.5	-0.8	-0.5	+0.2	-0.4	-0.7	-0.7	-0.7	-1.5	-0.8	-0.3	-0.6	-0.3	-0.7	-1.2	-0.7	-0.6	-0.6
Institute	109	110	110	107	107	107	113	111	116	114	117	110	113	112	111	117	109	111	111
Mill	111	107	107	105	103	103	110	110	116	108	115	109	111	111	110	116	105	113	113
Av. Diff.**	+2	-3	-3	-2	-4	-4	-3	-1	0	-6	-2	-1	-2	-3	-1	-1	-4	+2	+2
Max. Diff.***	+2	-7	-10	-3	-4	-4	-8	-4	+6	-11	-7	-6	-3	-6	-2	-12	-6	+3	+3
Institute	310	344	359	300	362	320	310	310	318	327	349	357	343	332	335	293	336	335	335
Mill	312	328	306	258	358	286	283	283	309	306	341	375	321	340	331	222	---	325	325
Av. Diff.**	+2	-16	-53	-42	-4	-34	-27	-27	-9	-21	-8	+18	-22	+8	-4	-71	---	-10	-10
Max. Diff.***	+2	-30	-80	-61	-4	-49	-63	-63	+42	-47	-28	+42	-48	+20	-26	-113	---	-13	-13
Institute	375	380	363	368	389	368	361	361	365	354	397	403	389	378	398	361	383	372	372
Mill	373	335	337	345	377	348	358	358	359	365	393	398	394	387	405	312	---	373	373
Av. Diff.**	-2	+5	-26	-23	-12	-20	-3	-3	-6	+11	-4	-5	+5	+9	+7	-49	---	+1	+1
Max. Diff.***	-2	+42	-42	-33	-12	-27	-25	-25	-17	+25	-23	-47	+31	+29	+14	-90	---	+3	+3

* Comparison 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 XXIV
COMPARISON OF INSTITUTE-MILL DIFFERENCES BY PERIODS
Average Difference, Per Cent

Mill	Period	Basis Weight	Caliper	Bursting Strength	Tear, in	Tear, across	Mill	Period	Basis Weight	Caliper	Bursting Strength	Tear, in	Tear, across
A	Current	-0.9	-4	+2	+0.6	-0.5	K	Current	-2	-4	-2	-2	-1
	141st	-1	+0.8	+5	-0.6	+2		141st	-2	-2	0	-4	+0.5
	140th	-0.9	0	+4	+2	+2		140th	-2	-4	+2	-3	+2
B	Current	-0.5	-2	-3	-5	+1	L	Current	-0.2	-2	-0.9	+5	-1
	141st	-1	-3	-0.9	-9	-4		141st	-0.7	-0.8	+0.9	+6	+4
	140th	-0.7	-3	+2	-3	+1		140th	-0.7	-2	+3	+1	+2
C	Current	-3	-3	-3	-15	-7	M	Current	-1	-3	-2	-6	+1
	141st	-4	-2	0	-2	+2		141st	-2	-4	+5	-11	-3
	140th	-0.2	-3	+3	-5	-3		140th	-3	-4	+2	-13	-5
D	Current	--	--	--	--	--	N	Current	-0.7	-2	-0.9	+2	+2
	141st	--	--	--	--	--		141st	-0.5	-2	-2	+3	+5
	140th	--	--	--	--	--		140th	-2	-2	-0.9	+6	+4
E	Current	-0.9	-3	-2	-14	-6	O	Current	--	--	--	--	--
	141st	-1	-4	-4	-10	-2		141st	--	--	--	--	--
	140th	--	--	--	--	--		140th	--	--	--	--	--
F	Current	-0.7	+2	-4	-1	-3	P	Current	-2	-3	-0.9	-1	+2
	141st	-0.9	-4	+4	+2	-3		141st	--	--	--	--	--
	140th	--	--	--	--	--		140th	-2	-3	-3	-20	-2
G	Current	-0.9	-2	-3	-11	-5	Q	Current	-3	-3	-0.9	-24	-14
	141st	-0.2	-2	-0.9	-9	-4		141st	-3	-2	0	-23	-7
	140th	-0.7	-2	-0.9	-11	-7		140th	-2	-4	-0.9	-6	+5
H	Current	-0.9	-4	-0.9	-9	-0.8	S	Current	-1	-4	-4	--	--
	141st	-1	-4	0	-13	-2		141st	-2	-7	-3	--	--
	140th	-0.5	-3	+2	-5	+3		140th	-2	-3	+0.9	--	--
I	Current	-0.7	-2	0	-3	-2	T	Current	-2	-4	+2	-3	+0.3
	141st	0	-2	+2	-4	-3		141st	-1	-5	+0.9	+3	+8
	140th	-0.5	-3	0	-6	-7		140th	-3	-5	0	-6	+2
J	Current	+0.9	-4	-5	-6	+3		Current	--	--	--	--	--
	141st	+2	-4	+4	-0.3	+6		141st	--	--	--	--	--
	140th	+2	-3	+2	+1	+6		140th	--	--	--	--	--

It may be noted in Table XXIV that for the current period the largest average difference (per cent) between the average basis weight results of the Institute and those of a given mill on corresponding samples was three per cent. By comparison, the largest average difference (per cent) noted for the previous two periods was four per cent. Further, it may be noted that the average basis weight result for Mill J was higher than that for the Institute, and the average results for the other mills were lower. The variations of more than 1 lb. for Mills C and Q may be excessive.

The maximum variation in caliper for the current period was four per cent. This was smaller 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 F was higher, and the average test results for the other mills were lower. The variations of 0.5 point or more for Mills A, H, J, K, S, and T may be excessive.

It may be noted in Table XXIV that the bursting strength results exhibited a maximum variation of five per cent for the current period. The average results for Mills A and T were higher than those for the Institute, the average result for Mill I was the same, and the average results for the other mills were lower. None of the variations appear to be exceptionally large. Agreement between Institute and mill results is very good.

It may be seen in Tables XXIII and XXIV that the average machine direction tear results for Mills A, L, and N 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 twenty-four per cent. Agreement between the Institute and mill results was good in most cases. However, several mills--namely, C, E, G, and Q--were associated with differences greater than ten per cent which may be excessive.

With regard to the cross-machine direction tear results, it may be noted that the average results for Mills B, J, M, N, P, and T 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 fourteen per cent. As in the case of the machine direction results, agreement between Institute and mill results was good. The only difference greater than ten per cent was associated with Mill Q.

The comparisons of Institute and mill data for individual sample lots are given 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.

COMPARISON OF INSTITUTE AND MILL DATA--MARCH 1 THROUGH MARCH 31, 1959

TABLE XXV

MILL A -- 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.	IPC	Mill Diff.	In	IPC	Mill Diff.	Across	IPC	Mill Diff.
181313	W.F.	2/ 3/59	1	43.3	42.9 -0.4	13.7	13.2 -0.5	109	111 + 2	310	312 + 2	375 ^a	373 - 2				
Current Mill Average:				43.3	42.9 -0.4	13.7	13.2 -0.5	109	111 + 2	310	312 + 2	375	373 - 2				

TABLE XXVI

MILL B -- 42-LB. LINERBOARD

181312	WFLS	2/16/59	2	43.5	43.6 +0.1	14.3	14.0 -0.3	112	106 - 6	359	376 +17	385 ^a	427 +42				
181503	WFLS	3/ 9/59	2	44.4	44.1 -0.3	14.5	14.3 -0.2	102	103 + 1	353 ^a	326 -27	365 ^a	339 -26				
181591	WFLS	3/12/59	2	44.4	44.2 -0.2	13.9	13.4 -0.5	112	111 - 1	322	292 -30	375 ^a	349 -26				
181621	WFLS	3/17/59	2	43.3	43.0 -0.3	14.1	13.8 -0.3	113	106 - 7	343	318 -25	395 ^a	424 +29				
Current Mill Average:				43.9	43.7 -0.2	14.2	13.9 -0.3	110	107 - 3	344	328 -16	380	385 + 5				

^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--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XXVII

MILL C -- 42-LB. LINERBOARD

File No.	Finish	Date Made	Mch. No.	Basis Weight, lb.		Caliper, points		Bursting Strength, P.s.i. Page		Elmendorf Tear, g./sheet							
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.				
181316	W.F.	2/15/59	-	43.5	-1.4	12.9	12.1	-0.8	109	100	-9	358 ^a	312	-46	385 ^a	347	-38
181317	W.F.	2/19/59	-	43.8	-1.2	11.9	11.7	-0.2	110	112	+2	356 ^a	305	-51	362 ^a	324	-38
181344	W.F.	2/19/59	-	43.9	-1.5	12.7	12.0	-0.7	108	108	0	377 ^a	312	-65	353 ^a	339	-14
181345	W.F.	2/19/59	-	43.8	-1.3	12.7	12.3	-0.4	109	106	-3	388 ^a	308	-80	351 ^a	341	-10
181496	W.F.	3/ 3/59	-	42.9	+0.6	12.4	12.1	-0.3	110	110	0	321	309	-12	359 ^a	348	-11
181497	W.F.	3/ 3/59	-	44.0	-2.0	12.2	12.2	0.0	114	104	-10	353	290	-63	367 ^a	325	-42
Current Mill Average:				43.6	-1.1	12.5	12.1	-0.4	110	107	-3	359	306	-53	363	337	-26

TABLE XXVIII

MILL D -- 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--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XXIX

MILL E -- 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.	IPC	Mill	Diff.			
181494	WFLS	3/ 3/59	1	43.3	42.9	-0.4	12.1	11.7	-0.4	105	102	- 3	305	275	-30	372 ^a	359	-13
181495	WFLS	3/ 3/59	1	41.9	41.9	0.0	12.1	11.6	-0.5	102	99	- 3	307 ^a	271	-36	363 ^a	346	-17
181597	WFLS	3/ 9/59	1	43.6	43.0	-0.6	12.3	12.0	-0.3	112	111	- 1	289	247	-42	373 ^a	343	-30
181598	WFLS	3/ 9/59	1	44.0	43.2	-0.8	12.6	12.4	-0.2	110	107	- 3	299	238	-61	363 ^a	330	-33
Current Mill Average:				43.2	42.8	-0.4	12.3	11.9	-0.4	107	105	- 2	300	258	-42	368	345	-23

TABLE XXX

MILL F -- 42-LB. LINERBOARD

181520	W.	3/ 2/59	2	42.7	42.4	-0.3	13.0	13.2	+0.2	107	103	- 4	362 ^a	358	- 4	389 ^a	377	-12
Current Mill Average:				42.7	42.4	-0.3	13.0	13.2	+0.2	107	103	- 4	362	358	- 4	389	377	-12

^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--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XXXI

MILL G -- 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		Across					
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In	Diff.	IPC	Mill Diff.		
181504	W.F.	3/4/59	2	42.9	-0.3	12.2	11.9	-0.3	111	110	-1	327 ^a	297	-30	365 ^a	338	-27
181505	W.F.	3/1/59	1	43.4	-0.8	12.4	12.0	-0.4	110	111	+1	345	296	-49	362 ^a	343	-19
181510	W.F.	3/5/59	2	42.5	-0.4	12.1	11.7	-0.4	111	110	-1	328 ^a	284	-44	381 ^a	360	-21
181511	W.F.	3/5/59	2	42.2	0.0	12.2	11.8	-0.4	115	111	-4	311 ^a	279	-32	376 ^a	359	-17
181512	W.F.	3/6/59	2	42.7	-0.3	12.2	11.9	-0.3	116	109	-7	309	285	-24	365 ^a	351	-14
181513	W.F.	3/6/59	2	42.8	-0.3	12.2	12.0	-0.2	111	111	0	315	286	-29	363 ^a	348	-15
181521	W.F.	3/12/59	2	43.3	-0.9	12.3	12.0	-0.3	114	106	-8	312	273	-39	367 ^a	340	-27
181522	W.F.	3/12/59	2	42.9	-0.4	12.1	12.0	-0.1	113	109	-4	315 ^a	286	-29	361 ^a	349	-12
Current Mill Average:				42.8	-0.4	12.2	11.9	-0.3	113	110	-3	320	286	-34	368	348	-20

^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--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XXXII
MILL H -- 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		Across						
				IPC	Mill Diff.	IPC	Mill Diff.	IPC	Mill Diff.	In	Diff.	IPC	Mill Diff.	IPC	Mill Diff.			
181372	W.F.	2/3/59	1	44.0	43.5	-0.5	13.2	12.5	-0.7	109	110	+1	349 ^a	286	-63	371 ^a	361	-10
181373	W.F.	2/17/59	1	44.5	44.1	-0.4	13.0	12.5	-0.5	112	111	-1	312	305	-7	390 ^a	379	-11
181374	W.F.	2/17/59	1	44.2	43.8	-0.4	12.9	12.4	-0.5	112	110	-2	309	280	-29	363 ^a	368	+5
181375	W.F.	2/17/59	1	44.2	43.8	-0.4	12.5	12.3	-0.2	114	111	-3	326	293	-33	378 ^a	353	-25
181376	W.F.	2/18/59	1	43.2	42.9	-0.3	12.8	12.4	-0.4	104	105	+1	275	254	-21	325 ^a	341	+16
181377	W.F.	2/18/59	1	45.3	44.6	-0.7	13.4	12.7	-0.7	113	109	-4	313	295	-18	367 ^a	367	0
181378	W.F.	2/20/59	1	42.8	43.1	+0.3	12.5	12.2	-0.3	108	111	+3	289	272	-17	337 ^a	338	+1
181379	W.F.	2/20/59	1	44.4	44.2	-0.2	12.9	12.4	-0.5	113	110	-3	310	275	-35	357 ^a	354	-3
Current Mill Average:				44.1	43.7	-0.4	12.9	12.4	-0.5	111	110	-1	310	283	-27	361	358	-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--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XXXIII

MILL I -- 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		Across						
				IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.			
181318	W.F.	2/25/59	-	43.8	43.8	0.0	12.6	12.4	-0.2	112	118	+6	337 ^a	304	-33	370 ^a	353	-17
181319	W.F.	2/26/59	-	43.4	43.6	+0.2	12.8	12.4	-0.4	116	110	-6	329 ^a	323	-6	367 ^a	357	-10
181320	W.F.	2/27/59	-	43.7	42.9	-0.8	12.1	12.0	-0.1	116	116	0	310	313	+3	359 ^a	356	-3
181369	W.F.	3/4/59	-	44.1	44.3	+0.2	12.1	11.8	-0.3	124	128	+4	313	315	+2	371 ^a	357	-14
181370	W.F.	3/5/59	-	43.8	43.1	-0.7	12.5	12.0	-0.5	108	107	-1	324	299	-25	356 ^a	342	-14
181371	W.F.	3/6/59	-	44.5	44.1	-0.4	12.8	12.1	-0.7	113	114	+1	283 ^a	325	+42	358 ^a	355	-3
181566	W.F.	3/11/59	-	44.9	44.8	-0.1	12.7	12.4	-0.3	119	118	-1	324	283	-41	368 ^a	376	+8
181567	W.F.	3/12/59	-	44.0	43.0	-1.0	12.9	12.4	-0.5	116	114	-2	327 ^a	304	-23	372 ^a	371	-1
181568	W.F.	3/13/59	-	43.8	43.3	-0.5	12.4	12.1	-0.3	116	115	-1	312 ^a	315	+3	368 ^a	361	-7
Current Mill Average:				44.0	43.7	-0.3	12.5	12.2	-0.3	116	116	0	318	309	-9	365	359	-6

^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--MARCH 1 THROUGH MARCH 31, 1959 (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		Across						
				IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.			
181346	WFLS	2/ 3/59	2	42.0	42.3	+0.3	12.8	12.2	-0.6	112	112	0	306	280	-26	346 ^a	360	+14
181347	WFLS	2/ 5/59	2	41.8	42.8	+1.0	13.1	12.5	-0.6	112	111	-1	321 ^a	312	-9	355 ^a	368	+13
181348	WFLS	2/14/59	2	43.2	43.3	+0.1	13.7	12.2	-1.5	112	107	-5	317 ^a	280	-37	353 ^a	336	-17
181349	WFLS	2/16/59	2	42.8	43.2	+0.4	13.6	13.0	-0.6	111	105	-6	323 ^a	309	-14	339 ^a	334	-5
181350	WFLS	2/18/59	2	42.6	42.8	+0.2	13.4	13.0	-0.4	114	104	-10	326 ^a	288	-38	354 ^a	376	+22
181351	WFLS	2/19/59	2	43.6	44.0	+0.4	13.5	13.2	-0.3	113	110	-3	341	359	+18	361 ^a	369	+8
181352	WFLS	2/23/59	2	43.1	42.7	-0.4	13.7	13.0	-0.7	115	104	-11	311 ^a	312	+1	343 ^a	368	+25
181353	WFLS	2/27/59	2	43.9	44.2	+0.3	14.4	13.5	-0.9	115	110	-5	343	296	-47	384 ^a	384	0
181576	WFLS	3/ 1/59	2	43.4	43.7	+0.3	13.8	13.0	-0.8	114	104	-10	333 ^a	304	-29	353 ^a	376	+23
181577	WFLS	3/ 5/59	2	43.3	44.0	+0.7	13.1	13.0	-0.1	119	119	0	341 ^a	304	-37	358 ^a	376	+18
181578	WFLS	3/ 6/59	2	43.4	44.0	+0.6	13.9	13.0	-0.9	112	106	-6	337	320	-17	351 ^a	368	+17
Current Mill Average:				43.0	43.4	+0.4	13.5	12.9	-0.6	114	108	-6	327	306	-21	354	365	+11

^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--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XXXV

MILL K -- 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	IPC	Mill Diff.					
181308	W.F.	2/15/59	2	45.5	43.8	-1.7	12.8	12.0	-0.8	117	118	+1	359	365	+6	419 ^a	404	-15
181309	W.F.	2/15/59	2	44.6	43.7	-0.9	12.7	12.0	-0.7	119	118	-1	364 ^a	361	-3	404 ^a	414	+10
181342	W.F.	2/24/59	2	44.0	43.2	-0.8	12.3	12.0	-0.3	112	111	-1	340 ^a	333	-7	385 ^a	382	-3
181343	W.F.	2/24/59	2	43.9	43.1	-0.8	12.3	12.0	-0.3	112	112	0	337 ^a	328	-9	383 ^a	381	-2
181381	W.F.	3/ 1/59	2	43.9	42.9	-1.0	12.5	11.9	-0.6	124	117	-7	358 ^a	330	-28	405 ^a	396	-9
181382	W.F.	3/ 1/59	2	43.8	42.9	-0.9	12.6	12.0	-0.6	118	116	-2	357	332	-25	413 ^a	390	-23
181488	W.F.	3/ 9/59	2	44.0	43.5	-0.5	12.0	11.7	-0.3	117	112	-5	327	339	+12	389 ^a	389	0
181489	W.F.	3/ 9/59	2	44.0	43.6	-0.4	12.0	11.7	-0.3	114	113	-1	351 ^a	339	-12	381 ^a	392	+11
Current Mill Average:				44.2	43.3	-0.9	12.4	11.9	-0.5	117	115	-2	349	341	-8	397	393	-4

^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--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XXXVI

MILL L -- 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.	IPC Mill	Diff.	IPC Mill	Diff.				
181587	W.F.	3/ 1/59	-	43.6	+0.6	12.4	12.1	-0.3	113	110	-3	372 ^a	384	+12	411 ^a	423	+12
181588	W.F.	3/ 4/59	-	43.9	-0.3	12.1	12.0	-0.1	110	110	0	364 ^a	375	+11	411 ^a	404	-7
181589	W.F.	3/ 5/59	-	43.8	-0.5	12.0	11.9	-0.1	110	113	+3	357 ^a	371	+14	397 ^a	400	+3
181590	W.F.	3/17/59	-	44.1	-0.2	12.6	12.6	0.0	113	107	-6	335 ^a	377	+42	379 ^a	391	+12
181600	W.F.	3/17/59	-	44.1	-0.2	12.7	12.4	-0.3	103	105	+2	357 ^a	369	+12	419 ^a	372	-47
Current Mill Average:				43.9	-0.1	12.4	12.2	-0.2	110	109	-1	357	375	+18	403	398	-5

TABLE XXXVII

MILL M -- 42-LB. LINERBOARD

181380	W.B.	2/16/59	-	44.2	-1.0	11.5	11.2	-0.3	110	109	-1	331	292	-39	392 ^a	373	-19
181490	W.B.	2/19/59	-	43.9	-0.3	12.3	11.7	-0.6	109	106	-3	329 ^a	307	-22	365 ^a	380	+15
181491	W.B.	2/20/59	-	43.6	-0.7	12.0	11.7	-0.3	110	107	-3	335 ^a	332	-3	375 ^a	383	+8
181592	W.B.	2/21/59	-	43.6	-0.6	12.2	11.7	-0.5	110	108	-2	337 ^a	321	-16	396 ^a	427	+31
181593	W.B.	3/ 5/59	-	44.5	-1.0	11.7	11.3	-0.4	122	121	-1	381	333	-48	409 ^a	393	-16
181599	W.B.	3/10/59	-	43.6	0.0	12.0	11.8	-0.2	114	115	+1	345	344	-1	397 ^a	409	+12
Current Mill Average:				43.9	-0.6	11.9	11.6	-0.3	113	111	-2	343	321	-22	389	394	+5

^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--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XXXVIII

MILL N -- 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	IPC	Mill Diff.				
181383	W.F.	2/16/59	2	43.3	43.3	0.0	12.7	12.5	-0.2	112	112	0	329 ^a	347	381 ^a	384	+ 3
181384	W.F.	2/17/59	2	43.5	43.4	-0.1	12.7	12.5	-0.2	117	115	-2	330 ^a	347	366 ^a	384	+18
181492	W.F.	2/23/59	2	44.0	43.9	-0.1	12.8	12.5	-0.3	110	112	+2	348 ^a	342	382 ^a	392	+10
181493	W.F.	2/24/59	2	44.1	44.1	0.0	12.8	12.5	-0.3	118	112	-6	337 ^a	342	389 ^a	392	+ 3
181506	W.F.	3/ 2/59	2	43.5	42.8	-0.7	12.5	12.4	-0.1	108	108	0	333 ^a	325	379 ^a	373	- 6
181507	W.F.	3/ 3/59	2	43.0	42.4	-0.6	12.3	12.2	-0.1	109	107	-2	318 ^a	338	369 ^a	398	+29
Current Mill Average:				43.6	43.3	-0.3	12.7	12.4	-0.3	112	111	-1	332	340	378	387	+ 9

TABLE XXXIX

MILL O -- 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--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XI

MILL P -- 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		Across					
				IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.	IPC	Mill	Diff.		
181596	W.F.S	2/26/59	1	42.5	42.5	0.0	12.5	12.3	-0.2	109	109	0	325 ^a	325	388 ^a	387	- 1
181385	W.F.S	3/ 2/59	1	44.1	42.6	-1.5	13.1	12.6	-0.5	112	112	0	329	342	402 ^a	416	+14
181595	W.F.S	3/11/59	1	43.9	42.5	-1.4	13.2	12.5	-0.7	111	109	-2	351 ^a	325	405 ^a	411	+ 6
Current Mill Average:				43.5	42.6	-0.9	12.9	12.5	-0.4	111	110	-1	335	331	398	405	+ 7

TABLE XII

MILL Q -- 42-LB. LINERBOARD

181210	W.F.	2/ 9/59	1	43.6	42.1	-1.5	13.3	12.8	-0.5	124	117	- 7	298 ^a	219	357 ^a	303	-54
181311	W.F.	2/12/59	1	44.0	42.4	-1.6	13.6	13.0	-0.6	114	108	- 6	299	218	366 ^a	315	-51
181476	W.F.	2/17/59	1	44.2	43.0	-1.2	13.0	12.9	-0.1	115	123	+ 8	306	240	350 ^a	318	-32
181477	W.F.	2/21/59	1	43.9	42.6	-1.3	13.3	13.1	-0.2	111	119	+ 8	267	238	353 ^a	323	-30
181508	W.F.	2/23/59	1	43.6	41.6	-2.0	13.6	12.4	-1.2	123	111	-12	297	184	379 ^a	289	-90
181509	W.F.	2/27/59	1	43.5	42.4	-1.1	13.0	13.0	0.0	116	109	- 7	286 ^a	200	363 ^a	306	-57
181622	W.F.	3/ 3/59	1	43.2	42.6	-0.6	13.3	13.1	-0.2	111	118	+ 7	281	238	348 ^a	323	-25
181623	W.F.	3/ 5/59	1	44.1	43.0	-1.1	13.1	12.9	-0.2	125	121	- 4	311 ^a	240	371 ^a	319	-52
Current Mill Average:				43.8	42.5	-1.3	13.3	12.9	-0.4	117	116	- 1	293	222	361	312	-49

^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--MARCH 1 THROUGH MARCH 31, 1959 (continued)

TABLE XLII

MILL S -- 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	IPC	Mill Diff.	
181314	----	2/23/59	2	41.8	41.4	-0.4	12.3	11.8	-0.5	116	111	- 5	322	384a
181315	----	2/19/59	1	42.9	42.7	-0.2	12.8	12.1	-0.7	108	106	- 2	351a	390a
181594	----	3/12/59	2	41.8	41.3	-0.5	12.8	12.1	-0.7	109	103	- 6	354a	395a
181573	----	3/ 6/59	1	42.1	41.0	-1.1	13.1	12.8	-0.3	103	99	- 4	316	363a
Current Mill Average:				42.2	41.6	-0.6	12.7	12.2	-0.5	109	105	- 4	336	383

TABLE XLIII

MILL T -- 42-LB. LINERBOARD

181574	WF1S	3/17/59	1	43.1	42.5	-0.6	13.2	12.6	-0.6	112	114	+ 2	326a	368a	371	+ 3
181575	WF1S	3/17/59	1	43.6	42.9	-0.7	13.3	12.8	-0.5	110	113	+ 3	344	377a	376	- 1
Current Mill Average:				43.4	42.7	-0.7	13.2	12.7	-0.5	111	113	+ 2	335	372	373	+ 1

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.

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