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CONTINUOUS BASE-LINE STUDY

✓ Project 1108-13

Report 186

A Progress Report

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

December 1, 1963

THE INSTITUTE OF PAPER CHEMISTRY

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Appleton, Wisconsin

CONTINUOUS BASE-LINE STUDY

Project 1108-13

Report 186

A Progress Report

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

December 1, 1963

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THE INSTITUTE OF PAPER CHEMISTRY

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Appleton, Wisconsin

CONTINUOUS BASE-LINE STUDY

INTRODUCTION

As requested by the Technical Committee of the Fourdrinier Kraft Board Institute, Inc., the reports pertinent to the continuous base-line study on 42-lb. fourdrinier kraft linerboard have been prepared by The Institute of Paper Chemistry on a bimonthly basis instead of the previous monthly basis since August 1, 1961. The current report presents results obtained during the months of October and November, 1963.

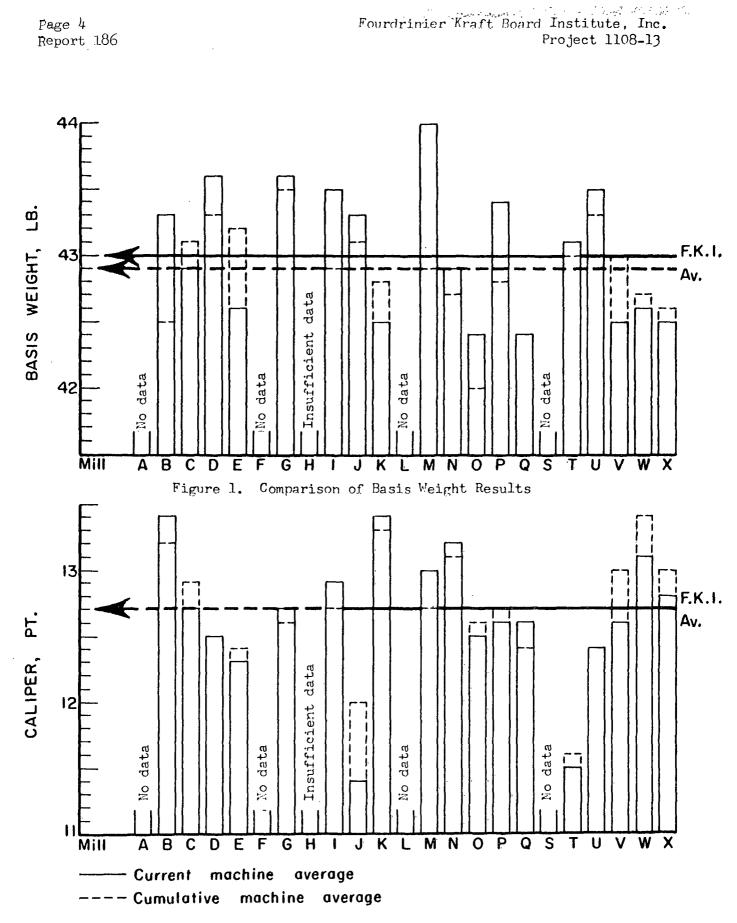
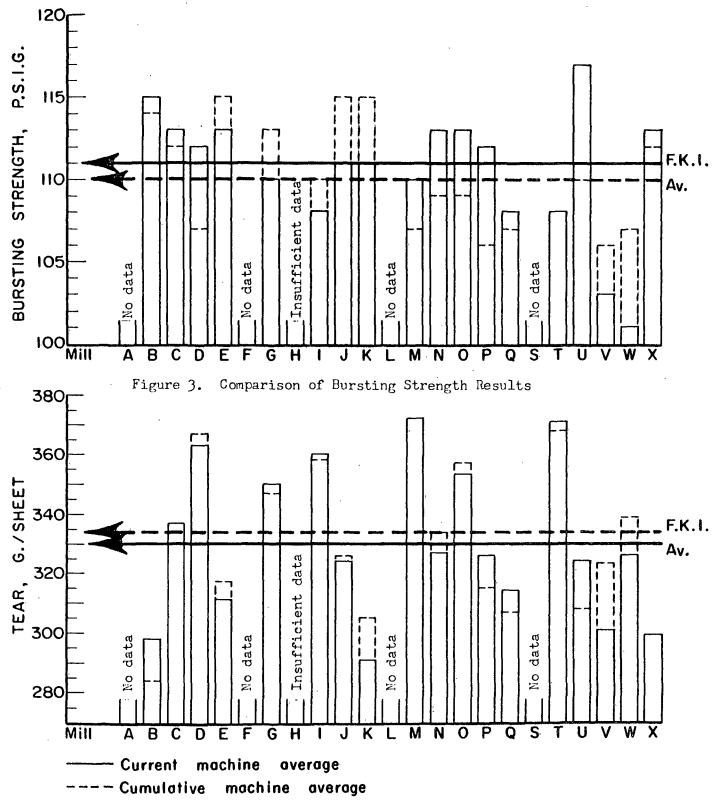


Figure 2. Comparison of Caliper Results

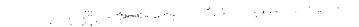
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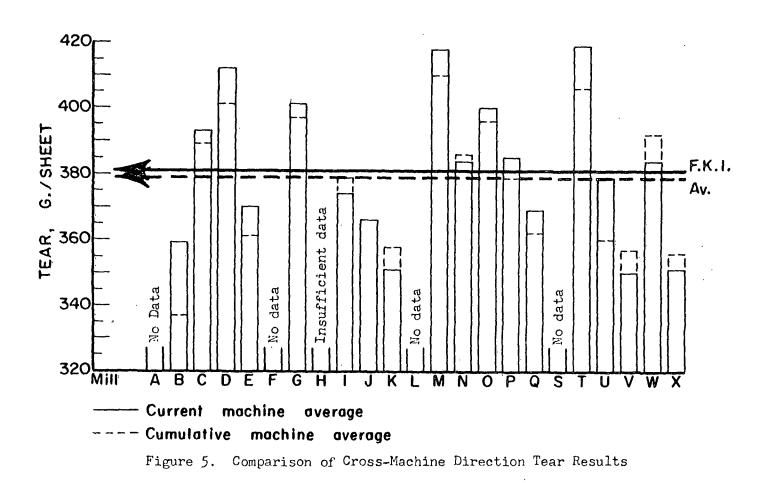
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Figure 4. Comparison of Machine-Direction Tear Results



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TABLE II

NUMBER OF SAMPLE LOTS SUBMITTED BY EACH MILL

DURING OCTOBER AND NOVEMBER, 1963

Mill Code

Number of Sample Lots

. . . .

A	0
B	8
C	14
D	12
E	8
F	0
G	4
H	2
I	4
J	3
K	8
L	0
M	3
N	8
O	3
P	8
Q	16
S	0
T	7
U	3
V	6
W	7
X	6
Total	130

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TABLE III

PERCENTAGE DEVIATION OF CURRENT MILL AVERAGES FROM 42-LB. BASIS WEIGHT SPECIFICATION

Mill Code

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Percentage Deviation

A B C D	+3.1 +2.1 +3.8
E	+1.4
F	
G	+3.8
H	+0.2
I J K L	+3.6 +3.1 +1.2
M	+4.8
N	+2.1
O	+1.0
P	+3.3
Q	+1.0
S	
T	+2.6
U	+3.6
V	+1.2
W	+1.4
X	+1.2

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	Curr Mill Av		F.K.I. Av	verages
Test	Max.	Min.	Current	Cumulative
Basis weight, lb.	44.0	42.1	43.0	42.9
Caliper, points	13.4	11.4	12.7	12.7
Bursting strength, p.s.i. gage	117	101	111	110
Machine direction Elmendorf tear, g./sheet	374	291	, 330	334
Cross-machine direction Elmendorf tear, g./sheet	419	350	381	379

The test results obtained at the Institute and at the mill during October and November are given alphabetically in Tables IV to XXVI for each mill. Included in each of these tables are the maximum, minimum, and average test data obtained at the Institute on each sample lot of linerboard. The data obtained at the Institute include also for each test the calculation of (1) a current mill average that represents the mean of the averages obtained on the individual sample lots of linerboard evaluated during the current period, (2) a cumulative mill average that represents the mean of the current mill averages for the previous twelve months excluding the current period, (3) a mill factor expressed in per cent that represents the ratio of the current mill average to the cumulative mill average, and (4) a mill index expressed in per cent that represents the ratio of the current mill average to the cumulative F.K.I. average. The term "mean" in the preceding discussion is synonymous with the simple arithmetic average. As mentioned above, the results presented in Tables IV to XXVI also include data obtained at the mills. The mill data include for each test (1) the average result obtained on each sample lot of linerboard and (2) a current mill average (calculated at the Institute) that represents the mean of the averages obtained on the individual sample lots of linerboard. In addition to the presentations of Institute and mill data described above, Tables IV through

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SUPPARY OF INSTITUTE AND MILL DATA FOR MILL &

October and November, 1963

Elmendorf Tear, g./sheet Cross Machine Institute Mill Max. Min. Av. Mif.
Elmendorf Tear, 6./sheet In Kachine Institute .311 Max. Sn. Av. Diff.
Bursting Strength, D.s.i. Z. Institute Max. Min. Av. Av. Diff.
Caliper, points Institute Mail Max. Min. Av. Diff.
Baeis Weight, 10. Institute Mail Max. Mar. Av. Nv. Diff.
Ych. Finish No.
Date Xace

No samples submitted.

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DATA
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INSTITUTE
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SUPLICATION

9-10-63	STTN.	-	7 0.14	12.2	42.9	41.0 42.2 42.9 42.7 -0.2	-0.2	13.6	3.21	13.3	13.1	-c.2	134	9E 116	3TT 9	42	00†	260	320	564 .	-36	376	320	345a	368	+23
69-61-6	WF1S	м	7 0 77	43.0 43.5		43.2	6.0-	14.1	13.4	13.8	13.4	† •0-	129	85 LLI	1 77	ţ	368	256	305	289	-i6	392	320	353 ^a	374	+21
10-14-63	ST III	7	45.6 44.2 44.9	1 2.4		г. Т	-0.8	0.41	3.61	0° 17	13.5	-0-5	138	211 Z6	311 '	Ţ	ŧ	272	305	58	6 -	ŧ	368	4 03ª	386	-17
10-16-63	STT.	ч	44.0 42.2	42.2	43.2	43.2	0.0	13 . 4	12.2	13.0	८ रा	-0.3	161	105 120	021 0	0	360	256	3c8	299	6 -	31	336	391 ^a	366	-25
10-15-63	STTN.	м	0.44 0.64 4.44	1 9.Et		43.3	-0.7	0.41	13.2	13.5	13.2	-0-3	131	22 117	911 /	-1	352	232	263 ^a	300	1 21+	001	320	353 ^ª	387	去+
10-20-63	SLT.	4	43.6 42.4 43.1	1 7.24	43.1	42.5	-0.6	13.9	4.51	13.3	13.1	-0.2	621	97 LL2	108	Ŧ	328	248	269	276 .	1 -	352	320	341ª	356	+15
10-25-63	SLLY.	-1	7 7.64	42.0 1	43.4 42.0 42.4	42.2	-0.2	4.EI	3.21	13.0	12.5	-0.5	129	5tr 58	105	Ŷ	336	248	285	306	+21	ಕ್ಷ	320	349ª	355	+ 6
10-31-63	ST IN	ч	43.4 42.0 42.8 42.1	12.0 1	42.8		-0.7	13.7	12.3	13.1	13.0	-0.1	124	85 LLI	Ħ	0	326	248	285	278 -	- 2	368	ត្ថ	337 ^a	367	+30
Current mill average:	l avera	:. 86		4	43 . 3	43.3 42.9	4.0-			† •€€	13.1	-6.3		ц	777 9	1			298	- 162	۷.			359	370	ц.
Cumulative mill average	rill av	erage:		~	42.5					13.2				17	_					284				337		
Mill factor, 5	١₽.			Ч	9.IOI				-1	101.5				100	100.9					104.9				106.5		
Mill index, S	NR.			Ā	100.9				Ч	105.5				10 1	104.5					5.2				5.2		
^a This average includes the readings for one or more specimens which	ge incl	udes t	he readin	ngs fo]	r one (лг шоге	specimen	s which	tore	beyond	the 3/E	tore beyond the 3/5-inch limit.	mit.	•												

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

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SUMMARY OF INSTITUTE AND MILL DATA FOR MILL C

October and November, 1963

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F- 10	tute n. Av	36E 418a	368 413 ^a	50 388 ^a	352 387 ^a	360 405 ^a	50 404 ^a	0 366 ^a	50 14 09 ²⁸	2 378 ^a	2 400 ^a	2 384ª	4 368 ^a	6 378 ^a	0 369 ^a	393	389	101	103.7	
lmend	Institute Max, Min. A	464 36	496 36	140 360	424 35	472 36	450 360	416 360	464 360	416 352	464 352	4C8 352	192 Jul	454 336	1448 360					
¹¹⁴	13	ž	4	3	4	÷	7	a	ž	<u>-</u>	3	4	Ϋ́,	4	1					
teet	Diff.	0) 1	-16	+15	-18	-17	- 7	÷2-	-28	- 2	-1 +	1	1	<u>51</u> +	-10	۰ ،				
g./st ne	• A Ÿ	319	327	330	319	339	377	335	328	327	345	¥3	314	327	331	330				
Elmencorf Tear, g./sheet In Machine	a) . 4	327	343 ^a	315	337	356	346 ^a	359 ^a	356 ^a	334ª	341a	332 ^a	316 ^a	315 ^a	341 ^a	337	337	100.0	100.5	
anciorí Ir	511 191	256	272	264	296	320	312	268	288	260	272	272	272	264	272					
ELE	Lux al	360	732	368	35	432	²⁰⁰	432	811	424	001;	914	368	376	408					
	Diff.	ጥ	Ţ.	5	7	ዋ	2-	42	7	÷	Ŷ	5-	ŧ	Ŷ	45	2-				
Bursting Strength, p.s.i.z.	TTE	2115	911	114	† T	108	107	2112	ţ	Ĩ	H	III	109	106	Ħ	ੜ				
ing Stre		115	ĴΠ	911	Ξĩ	77	4TT	011	211	<u>115</u>	711	911	105	נו	109	Ĥ	21	100.9	1.201	
hurstíu D	Institute Max. Min. Av.	001	£	33	62	8	8	8	ц	ま	8	ま	38	8	83					
m.	Ins Max.	94I	24ť	142	138	130	164	132	125	138	135	132	128	921	135					
	Diff.	-0.2	-0.1	0.0	0.0	-0.2	0.0	0.0	0.0	0.0	0.0	+0,1	0.0	0.0	1.0-	1.0-				
coints	LLEX VA	2.21	12.7	7.21	9.21	0.EI	13.1	8. टा	12.8	5.51	९-ध	9.21	2.21	2.21	12.7	9"रा				
er. coj	- A -	6.21	12.3	2.2	12.6	13.2	13.1	3.21	12.8	2.5L	2.5	.21	2.21	12.2	12.8	7.21	5.51	38 . 4	100.0	
Caliper.	Institute 6. Min.	12.2	12.3	1.21	1.51	12.7	+• 27	12.4	1.21	12.1	12.1	0.21	6.11	0.51	4°21				Ч	
	Inst 	13.5	1.61	13.2	13.0 I	13.8	13.8	13.1	1.64	6.21	. 6.21	. 6. टा	12.7	12.5	13.0					
							0.0	-6.3	-0.6	+0.5		+0.4			-0.3	1.0+				
	Diff	1.0- 0	£.0-	3 ±0.2	s. +0.2	1.01					+0.4 5		1 -0.2	1.0+ 0						
ht. 1t	AV.	43.0	43.2	43.8	43.6	43.5	43.5	43.1	43.0	42.5	42.6	9*2+	42.1	42.0	43.3	43.0				
Basis Weight. 10.	e Av.	13.1	42.9	43.6	43.6	れ。それ	43.5	43.4	43.6	42.0	43.0 H1.6 42.2	42.2	41.9	41.9	4 3.6	42.9	43.1	5. 66	100.0	
Casi	Institute x. Ain.	43.8 42.4	42.0	44.2 42.6	44.0 42.5	42.6	tr" 5 t5"t	43.8 42.8	14.0 43.0	8°.14	41.6	41.2	7.14	41.E	43.2					
	.xeX	49. C	43.8	i4: .2	0.44	2.44	5° -5	43.8	0.44	† 5.4	43.0	42.8	42.2	42.2	43.8					
	Nch. No.	N	2	N	5	~	2	8	5	2	01	2	8	8	N	: = 5	erage:			
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	Date Kade	7-22-63	7-22-63	E-15-63	8-19 - 63	9-12-63	9-12-63	10- 1-63 .	1c- 1-63	11- 1-63	11- 1-63	11- 1-63	11- 5-63	11- 5-63	11- 7-63	Current mill average:	Cumulative mill average:	Mill factor, ≸	Mill index, §	

Fourdrinier Kraft Board Institute, Inc. Project 1108-13

Diff.

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Tear, g./sheet

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^aThis average includes the readings for one on more specimens which tore beyond the 3/6-inch limit. Note: All "current mill average" data are calculated from the totals of the individual reacings. 1.14

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sheet Diff.	i		1	1	ł	1	ľ	ł	I	ł	ł	1				
ilrendorf Tear, g./sheet <u>Jross Machine</u> Listiute Mill AX. Min. AV. Dif	ł	Ì	ł	1		1		ł	1	ł	ł	1				
rt Tea ross X ute	±09ā	t, C, Gâ	410a	4:06 ^a	426 ^a	52474	:13g	375 ^a	+18 3	4:13	e 404	4I3ª	;12	101	102.7	203.7
Elrendorf Tea Tross ? Trute Tax. Min. Av.	358	356	0 336	1 36ē	135	376	366	336	384	336	336	368				
ल नि	432	9115	07:1	1 91	96 t	512	450	9T4	たさ	472	191.	5				
heet Diff.	I	!		1	1	l	!	ł	ł	ļ		ł				
<pre>Slrendorf Tear, g,/sheet In Nachine Institute All A. A. A. Dif A. A. Dif</pre>		ļ	!	l	ļ	1	1		!	ł	!	ł				
rf Tear, g In Machine Mite Mi	332	367	369ª	いた	341	362 ^a	405 ^a	369 ^a	5	375a	359 ^a	175	363	367	Şč.9	1.8.1
Elmendorf (In) Institute Max. Mn.	272	216	콠	ğ	ŝ	326	368	336	296	296	326	ŧ				
TE XES	376	432	132	368	のす	004	024	÷ 32	392	カごっ	392	50 5				
n, Diff.	4	2	ኖ	7	۳	1+	0	۲-1 +	.0 +	Ϋ́	Ŷ	ŝ	7			
Jursting Strength, 2.5.1.5. Stitute Mail	211	30£	106	1c5	109	109	εn	ətı	911	715	ម្ព	011	H,			
ng 3t) . s. i .	cĦ	108	109	107	21	106	113	117	OTT	211	911	116	211	107	104.7	101.8
Bursting 3 Distitute Max. Mar.	36	03	వే	67	Ъ	61	お	101	ŝ	22	103	36				
CT CT	132	131	135	127	150	125	140	138	130	245	てわて	346				
	1.0+	-0.2	1.0-	0.0	-0.1	-0.2	0.0	0.0	-0.3	-0.2	-0.3	-0.3	0.0			
ELLS.	2.2	<u>5.51</u>	13.5	ខ ដ	2.21	5.5L	13.0	12.4	ः स	ि स	г. н 1	េភ	2.5			
Caliper, coints itute Will in, iv, iv.	12.1	ೇಷ	33.6	5.21	1.1	इ.ध) , 81	12.4	12.6	5.52	 21	t' 21	2.5	32.5	100.0	96.4
Calipe Institute	10.51	5 0' ZZ	13.2	21	3.1.	12.5	12.5 1	1 0.51	: T'21	7 0.21	12.0 1	। १. ०. २१	r-1	r 1	0 r1	6
Jax. A	1 + 21	1 5-21	1 6.61	10.01	7 7 77	12.9 1	13.3 I	् 9.टा	13.0 1	1 6.21	1 6° स	T 6.21				
1.15		i-l						ล		51	ы					
Diff.	-0.9	1.1-	-0.6	-0.8	-2.0	4.1-	-0-6	1-1-	-0.6	-0.5	÷0.5	-c.9	5.0-			
1111 1111	42.9	1.64	£3.3	÷1.6	42.5	42.6	43.5	42.1	42.8	1.54	42.6	42.7	42.7			
Basis Veight, 10 Stute II112 Sin, Av. Av.	43.8	14.2	43.9	† 2 †	43.5	0.44	г. 1 4	43.2	4 ⁻ 64	43.6	₽°€†	43.6	43.ó	43.3	100.7	161.6
Basis Institute (. Min.	73°C	6. 9. 61	7.24	42.0	42.6	0.54	7°27	75.2	42.2	7 8•14	42.C	12.2			Ä	1
Ins.	1 1 11	45.8	7 7,57	43.2 4	7 0.44		45.4 4	1 0.44	43.6	4 0.11	1 2 T	1 2° 11				
Men.	ה. 2	11 7	-1	а 	4 2	т. сч	-1	-1 r-1	т сі	۲۰. ۲۱	;; c1			: 253		
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Tinish		÷	÷		- i					ľ	1	ļ	111 av	e mill	cr. ۳	
Date Jace	5-17-63	9-18-63	9-13-63	5-26 <u>+</u> ć3	IC- 3-63	£9-4-0I	1č- 4-63	10-23-63	11- 1-65	11- 5-63	11- 6-63	11-12-63	Current mill average:	Cumulative mill average:	Mill factor, S	Mill index.

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October and November, 1963

"This average includes the reachings for one or more specimens which tore beyond the 3/E-inch limit. Note: All "current mill average" data are caliniated from the totals of the individual readings.

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Cctcber and November, 1963

biff.	-15	ส	-25	41-	Ŧ	Ŧ	÷.	-57	-22				
llmendorf Tear, g./sneet Cross Machine Institute Mill ax. Min. Av. Av. Dif	399	356	85	329	317	242	£	542	3#8				
äorf Tear, g./ <u>Oross Xachine</u> <u>Liute Millin</u> , Äv.	384ª	368 ^a	373 ^a	343 ^a	358ª	388ª	346 ^a	404a	370	361	102.5	9 7. 6	
Elmendorf Tea Cross X Institute Eax. Xin. Av.	352	ŧ,	326	320	320	352	312	352					
Elm Ex.	424	400	014	368	ま	419	384	÷.					
Diff.	22-	69 1	켞	-10	2.5-	-53	τ	27-	-22				
llmendorf Tear, g./sneet In <u>geophre</u> Institute ax. Hin. Av. Av. Dif	301	309	295	264	257	276	361	2E5	269				
rf Tear, 5 In Kachine Ute Mil	316	317	3c9a	5,7	ġ;	529	267	327	311	317	96.1	53.1	
Elmendorf Tea In <u>Eac</u> Institute Eax. Min. Av.	260	272	256	272	256	255	240	256					
ale Alexan	376	368	Ŧ	336	352	376	336	ġ.					
Diff.	\$ 1	2 +	ŗ	-۲	Ŧ	ŝ	7	-5	7				
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1.12 5t	ส	109	911	311	भ	211	108	III	ति	511	98.3	102.7	
Bursting 3 <u>p.s.1</u> <u>Institute</u> (ax. Min. Av.	55	35	TOT	Ę	95	55	76	6				•	
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Diff.	-0.2	-0.3	1.0-	-0.3	-0.3	4.0-	0.0	+°-0-	-0.2				1.5.4 1.5.4
points Till	र रा	2.5	0.21	11.7	9'11	11.6	3.21	12.4	स			•	
	12.3	32.8	1.21	<u>ः</u>	6.11	12.2	9. LI	9.07	ំង	12.1	5.2	ç . 9	
Caliper, titute An. Av	3.11	2.21	12.0	5.11	9.LL	0.51	12.0	2.21					
Calipe Institute Max. An.	12.9	13.2	िय	2.21	12.2	2.5	13.7	13.1					
		c.0					-6.2	e.o-					
l. Diff.	-0.1		1.0- 5	2.0 - C - V	-0.2	7 ÷0.5			5 -0.1				
Jasis Meight, lo. <u>Stute X</u> ill in. Av. Av.	43.2	42.3	42.2	9°7#	42.5	12.7	43.1	43.2	10. 11. 12.				
<u>Basis Api</u> Institute Eax, Nin, Av.	43.8 42.4 43.3	41.6 42.3	1.54 8.14	12.0 42.0	6.14	42.2	0. 19	44.0 42.8 43.5	42.6	43.2	5 8.6	6.99	
<u>Basis</u> Institute X. Min.	t: 2 t	9.14 9	5.14	12.0	:: ;;	±2.6 ¥2.0	42.2	42.5					
In .ax.	43.E	43.C	7,54	42.2	42.2	42.6	0 m	0. H					
Mch.	ı	•	•	1	ı	I		۱	: 69	verage:			
.0 	i.	5	[4]	(r	1., ;-:	. J. N.	f.,	ін. .×	11 aver:	mill a	<u>بع</u> ب	\ •	
다. Ante Ade	10- 3-63	10- 4-63	16-11-63	1c-1E-63	10-31-65	:9-1 -tt	11- E-63	11-15-63	Current mill average:	Cumulative mill average:	Mill factor. §	Mill index. 🤅	

No samples submitted.

S THE AGA MINT THE AND AND ALL DATA FOR MILL ?

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

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TABLE X

SUPPORT OF LISTITUTE AND MILL BATH FOR MILL G

Cotober and November, 1963

set Diff.	т с 5 - 5 - + + +	N			
e l	+ + + 395 + 1 399 - 1	1			
iorf Tear, g.// Cross <u>Nachine</u> tute Xill n. Av. Av.	398 ^a 417 ^a 387 ^a 387 ^a	4c1 397 101.c 1c5.8		381 ^a 371 ^a	376 375 99.2 99.2
Slmendorf Tea Cross <u>} Institute</u> Xex. Xin. Av.	440 360 464 366 432 344 512 368			336 320	
1.13				416 150	
/sheet 1 Diff.	9 + 7 26 26 + -36				
rf Tear, g./ In Nachine ute Hill	2 369 5 332 322 3 32	350 352 347 100.9 104.8		a,	4. 0
Ilmendorf Tear, g./sheet In lachine All Institute All Av. Av. Diff	320 362 288 342 286 346 264 346 264 346	350 347 100.		3c4 375 296 374 ^a	374 355 105.4 112.0
Elme Ins Kax.	392 400 400			1000 1000 1000 1000 1000 1000 1000 100	
ength, All Av. Diff.	° † † °	1-		φ γ + +	Ŷ
5 9	108 108 108	109	ж Н	911 718	911
Bursting Strength, D.S.1.2. <u>Institute</u> Nax. Sin. Av. D.	83 110 87 109 94 112 76 105	110 113 97.3 100.0	EV NOS	60 1.06 90 1.20	113 106 106.6 102.7
Buu Insti Nax. (S	136 8 138 8 136 9 129 7		IL DATA	124 60 138 90	ن بر
Diff.	-0.1 -0.1	-0.1	TIEN NON VERT XI SUPPLY OF INSTITUTE AND ALLE ATA FOR ANTA	-0.3 -0.6	13.3 12.9 -0.4 13.5 97.6 104.7 tore beyond the J/5-inch limit.
	8.51 8.51 8.51 8.51 8.51	9.77	INTITUT	- 6.65 - 7.21	12.9 -
Caliper, points <u>itute</u> Xill An. Av. Av.	12.9 13.0 12.5 12.6	12.5 12.6 100.8 100.0	ARY CF 1	13.6 13.1	13.3 1 13.5 57.8 104.7 beyond t
Calip Institute Max. Min.	२.ध २.ध २.ध	·H /H	SUMA	12.9	1 10 10 10 10
LI Vax	13.6 13.7 13.0 13.1			24.2 13.5	י.
Liff.	-0.0 0.0 +0.1 +0.1	¢.°3+		-0.2	-0.3 specime
<u>sht. lo.</u> Mill 4v.	主 ま ち ら ち ち ち ち	43.6 43.9 43.5 00.2 01.6		9°14 1°24	41.5 or more
<u>Basis Weight, lb.</u> <u>4tute</u> Mill 4n. Av. Av.	44.2 43.0 43.7 45.4 44.0 44.6 43.4 42.0 42.8 43.4 42.2 43.4	43.6 43.5 100.2 101.6		42.3 41.9	42.1 42.0 100.2 58.1 58.1
Basis Institute Max. Min.	44.2 43.0 43.7 45.4 44.0 44.6 43.4 42.0 42.8 43.8 42.2 43.4			43.2 40.6 42.3 42.4 41.6 41.9	ecings f
Mch. No. <u>Va</u>		 ອີລີ			Current mill average: 42.1 41.5 -0.3 Cumulative mill average: 42.0 Mill factor, à 100.2 Mill index, à 96.1 ^a fnis average includes the readings for one or more specimens which
Tinish No	ы ж. ж. ж. 	Current mill average: Cumulative mill average: Xill factor, š Xill index, š			Current mill average: Cumulative mill average: Xill factor, بُ Mill index, بُ afris average includes ti
Tir.		Current mill a' Cumulative míl Vill factor, § Vill index, §			Current mill average: Cumulative mill avera; Xill factor, بُ Mill index, بُ arnis average includes
Date	9-22-63 9-29-63 10- 1-63 10- 2-63	Current mill , Cumulative mi Xill factor, f Xill index, %		10- 9-63 10-31-63	Ourrent mill (Oumulative mi Mill factor,) Mill index, p ^a This average

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

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		Celiper, points Institute Vil	5 "	न म	ear : :'ac
Made Finish No.	4v.	ÄV.	Max. Yin. Av. Av. Diff.	<u>Institute</u> Al. Diff. Max. Min. Av. Av. Diff.	<u>Institute</u> Mill Nax. Min. AV. Av. Diff.
9-20-63 w.F	1.0- 8.64 9.64 0.64 2.44	13.5 12.2 13.0 12.7 -0.3	125 84 106 104 -2	460 368 395 ^a 357 - 38	472 336 415 ^a 396 -1 9
9-20-63 W.F	43.6 41.2 42.6 42.4 -0.2	13.4 11.8 12.7 12.6 -0.1	125 90 105 104 -1	326	352 373 ^a 364
10-22-63 X.F	44.4 42.4 43.8 43.6 -0.2	13.2 12.8 13.1 13.0 -0.1	128 86 111 106 -5	320 356	328 357 ^a 377 ±2
10-23-63 x.F	47°C 42.2 43.7 43.3 -0.44	13.2 12.5 13.0 13.0 0.0	130 E0 108 109 +1	296 338 327	320 353 ^a 353
Current mill average:	43.5 43.3 -0.2	12.9 12.9 0.0	108 106 -2	360 336 -24:	ς - ςΔε η Δε
Cumulative mill average:	42.9	7.51			1
Will factor, 6	101.4	101,6	6	2001	
🕺 , xəbni llü	101.4	101.6	98.2 28.2	107.8	90.7 98.7
					-
		IIIX EIEAT	III		
		TILE BUS STREET THE GAY SILLING A STREET	Γ ΤΠΗ ΣΟΥ ΥΙΝΈ ΤΙΙΝ		
9-20-63 WEIS 2	43.8 43.6 43.7 42.9 -0.8	4°0- 1.11 5.11 1.11 6.11	0 III TTI 16 0£1		
10-17-63 W.F. 2	43.6 42.8 43.3 42.9 -0.4	2.0- 2.11 4.11 1.11 8.11	130 95 114 115 +1		
11-11-63 x.f. 2	43.6 42.0 42.7 43.6 -0.9	2.3- I.LI 6.LI 0.LI 7.LI	611 601 06	272 327	400 320 30/ 362 - 5 400 320 3748 357 -37
Current mill average:	43.3 43.1 -0.2	11.4 11.1 -0.3			
Cumulative mill averade:	43.1	12.0	Ì	17- (1(72(35:	366 352 -14
Hill factor, E	100.5	55.0	% 	معر 1 00	00
All index, f	100.9	89.8	100.9	97.C	100.0 96.6
^a This average includes t	te readings for one or more specime	athis average includes the readings for one or more specimens which tore beyond the $3/\mathcal{E}$ -inch limit	imit.		

TABLE XII

I TILN NON YANYI TILU UNU YALILISHI NO NUNUNUS

October and November, 1963

Fourdrinier Kraft Board Institute, Inc. Project 1108-13

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

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Fourdrinier Kraft Board Institute, Inc. Project 1108-13

heet Diff.	5+		80 1	<u></u> ,	+35	5 c .		ţţ	105	Ş		
Elmendorf Tear, g./sheet Cross Machine Erstitute Aill äx. Min. Av. Av. Dif	98r	392	379	£	368	186	i y	392	742			
iorf Tear, g./ <u>Cross Machine</u> tute ::111 n. Av. Av.	335 8	355ª	387 ²	3772	333ª	-42ª	335ª	3478	151	1 856	6	32.6
Elmendorf Tea Cross <u>W</u> Lrstitute Max, Min, Av.	120								,	• •		
립 HX	368	914	084	424	376	368	360	st.				
heet Diff.	ţċţ	- 19	ਸ਼	, v +	+25	+53	0	+50	+21			
. 5./s	332	587	266	300	302	358	319	313	312			
Limendorf Tear, z./sheet In <u>Xachine</u> Institute Xill ax. Min. Av. Av. Diff	271	303	2978	295	273	305	319ª	263 ^a	291	305	95.4	87.1
З]mendorf Tea In <i>Vac</i> Institute Max, Min, Av.	208		200	256	240	564	256	192 2	(v			
	ŧ	360	368	336	320	352	00t	<u>3</u> 6				
ength, An Diff.	ເບ 1	47 -	۰ د	-10	7 -	អុ	- 5	- 2	5			
Bursting Strength, <u> stitute</u> <u> ith</u> Av. 2v. Di	104	86	101	66	102	102	101	107	102			
ting Stre	ਸ਼ੋ	ंग	109	109	Ê	717	109	109	E	511	8.5	100.5
Bursting S E.s.i Institute	8	&	82	8	16	80	85	62				
T XE	130	139	132	135	130	143	132	132				
Diff.	-0.5	-0.8	-1.4	-1.1	-0.2	-1.2	1.1-	+°	-0.6			
ints LLE: .v.	13.0	5.51	टा १.२१	6.51	13.0	† ' 21	5° 21	7.21	9° 21			
Caliper, points titute XV. XV.	2.5	13.3	13.7	13.4	13.2	13 . 6	13.6	13.8	13.4	13.3	100.8	105.5
Calip Institute . Min.	12.2	13.0	т. Ст	13.0	12.9	13.0	1.U	13.3 1			10	IO
Lnst Max.	.S.SI	0° †T	[0.4[13-9 I	13.7	14.1]	1.1.1	14.5 1				
								•				
Arr.	+0.2	+0*0	†° 0+	+0.7	0°0	0.0	1.0+	+0.4	+0.2			
<u>Basis Weight, lo.</u> <u>tute</u> XII in. Av. Av.	42.2	43.5	42.7	42.5	42.5	42.8	43.0	43.0	42.7			
s Xeigh	42.C	42.7	42.3	41,8	42.5	42.8	42.9	42.6	42.5	42.8	6.9	1.66
Basis Institute C. Min.	42.0	42.0	4J.B	2.14	t. L4	42.2	42.0	42.0 42.6				
Basis Institute Min.	42.2 42.0 42.0	43.8 42.0 42.7	43.0	42°C	43.8	1 8.64	44.0 42.0 42.9	43.5 2				
No.	~	5	\$	2	2	N	2	N	0)	: əf eı		
Finish	STTN	NTIS .	WF1S	STAR	STAN	VEIS	NFIS	SLTW	l averag	mill ave.	¥2.	<i>14</i>
Date Nace	10-1-63	10- 7-63	10-11-63	1c-18-63	10-25-63	li- 1-63	11- 5-63	11-12-63	Current mill average:	Cumulative mill average:	Mill factor, §	Mill index, §

^aThis average includes the readings for one or more spectrens which tore beyond the 3/5-inch limit. Note: All "current mill average" data are calculated from the totels of the individual readings.

TABLE XIV

SUMMARY OF INSTITUTE AND MILL DATA FOR MILL &

Cctober and November, 1963

	Elmendorf Tear, g./sneet Cross Kachine Institute Ku, Av, Diff.	•		512 366 421 ^a 429 - 8	456 368 415 ^a 415 0	4E0 368 417 ^a 463 -46	418 436 +18	014	102.0	5.0LL
	Slaendorf Tear, g./sheet In Machine Institute Max. Hin. Av. Av. Diff.			456 352 395 393 - 2	416 272 355 383 -28	406 336 366 ^a 436 -70	372 404 +32	372	1cc.c	+ , 111
<u>ember, 1963</u>	Bursting Strength. <u>Institute</u> X111 Nax. Ain. Av. Av. Diff.	ted.	N TILS EDS EAVE TILS IN	130 85 ⁽ 138 1C8 0	127 92 112 10E J	139 83 110 110 0	1- 1C6 -1	107	102.8	100.0
October and November, 1963	Galiper, points Institute Mill Eax. Mir. Av. Av. Diff.	No samples submitted.	TABLE XVI SUPERX OF LISTITUTE AND MILL DATE FOR MILL &	13.5 12.6 13.1 12.9 -0.2	13.0 12.4 12.6 12.5 -0.3	13.3 12.5 13.0 12.5 -0.2	13.0 12.6 -0.2	12.7	102.4	4°201
	Basis Neight, 10. Institute AV. AV. Diff.			4.2 43.6 44.2 42.6	44.0 43.0 43.6 42.6 -1.2	45.6 42.2 44.0 42.8 -1.2	44°C 42.8 -1.2	42.9	102.6	162.6
	Late Hansh Mch. Made Finish No.			10-9-63 3.3.	9-23-63 X.3 4	10- 9-63 X.3	Current <u>mill</u> average:	Cumulative mill average:	Will factor, S	Aill index, §

^aThis average includes the readings for one or more specimens which tore beyond the 3/2-inch limit. Mote: All "current mill average" data are calculated from the cotals of the individual readings.

Fourdrinier Kraft Board Institute, Inc. Project 1108-13

SUPLICY OF INSTITUTE AND MILL DATA FOR MILL I

TABLE XV

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IINI EIEYL

NUTITA FOR DATE AND MILL DATA FOR MILL N

	170	
Number of the second seco	'ovenuer	
1		
	LPOC100	

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piff.	۵0 ۲	- 1	+15	- 7	t r	- 2	+	+16	- 2				
Elmendorf Tear, g./sheet Cross Machine Institute Mill ax. Au. Dif	395	360	393	383	370	396	356	384	382				
dorf Tear, g./s <u>Cross Nachine</u> <u>itute <u>Sill</u> in. Av. Av.</u>	387ª	361 ^a	378 ^a	390 ^a	etit	398 ^a	360 ^a	366 ^a	384	366	39.5	101.3	
Elmendorf Tea Cross <u>N</u> Institute Max. Ain. Av.	352	352	336	336	368	352	दार्ट	336					
년 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	907	424	405	077	480	967	0017	흃					
heet Diff.	6 -	+15	ţ	0,1	-12	† +	-10	+25	۴ ۲				
Elmendorf Tear, g./sheet In <u>Kachine</u> Institute Mill ax. Min. Av. Mif.	356	326	342	320	321	336	295	338	330		-	~	
orf Tear, g <u>In Machine</u> ute Mi	5.K	μ	337	330	336	334	305	313	327	334	97.9	6.72	
Elmendorf Tea In Mac Institute Max. Min. Av.	265	567	268	272	296	312	272	256					
	408	368	368	367	376	368	360	36					
engtin, Av. Diff.	2 †	5	1 +	7	ç	မှ	4	Ŷ	Ŷ				
Bursting Strength, p.s.i.f. stitute Mar, Dr Min, Av, Dr	Ę	109	77	115	Ħ	107	109	105	ĨĨĨ		~	0.	
ting Stre D.s.i.E. M.	110	7 17	E11	9 [1	711	ŚTÍ	511	177	113	109	103.7	102.7	
Bursting S D.s.i Institute Max. Min. Av.	ድ	66	ጽ	66	8	95	8	8					
	¥1	130	130	138	126	130	126	Ę.					
Diff.	-0.6	4.0-	-0.7	-0.6	-0.5	-0.5	-0.7	-0.E	-0.5				
oints Xill ÅV.	75.4	12.6	12.6	4.51	2.21	12.6	22.5	1 3 .3	12.7				
Caliper, points <u>Stute</u> in. Av. Av.	0.EL	9.61	13.3	13.C	13.2	1.61	2.61	14.1	13.2	13.1	100.6	103.9	
Calip Institute X. Min.	9 [.] त	9.21	ਮ	2.5	6. ST	? ম	12.7	6.CI					
Instruction	13.2	13.2	14 .2	9.E	13.6	13.5	J.4.C	34.6					
.Jiff.	† •1−	6.0-	-0.2	-1.4	-c.6	-0.6	-0.1	-0.1	-0.7				
4, 1b. M11 AV.	42.1	42.5	42.9	42.2	42.0	742.0	42.0	42.2	42.2				
Basis Keight, Ib. <u>itute Xill</u> in. Av. Av.	43.5	4°C7 7.2 7.3.4	43.1	9°£†	9.24	42.6	42.1	42.3	42.9	42.7	100.5	100.0	
Basis Institute (, Nin.	12.2	12.2	12.2	63.0	12.0	9.1.	41.4 42.1	12.0			e=1	-1	
Basis Net Institute Max. Nin. Av.	44.0 42.2 43.5	-7 0.7	43.8 42.2 43.1	44.0 43.0	43.6 42.0 42.6	43.0 41.8	42.8 4	43.6 42.0 42.3					
Nch. No.	1 17	-1	т Т	t. ب	+ 	1 t	-1 -1	- 1		156:			
		Ś							อริธมอ	aver			
Thish	SLTN.	SLEY	SLTN.	SLTV.	AF15	SLT.	STIN	AFLS	ve tri	e mill	or, 🖇	X , ^K .	
Cate Nace	9- 6 - 63	9-15-63	5-24-63	10- 3-63	10-10-63	10-22-63	1c-28-63	11- 6-63	Current mill average:	Cumulative mill average:	All factor, §	Xill index, x	

^aThis average includes the readings for one or more specimens which tore beyond the 3/S-inch limit. Note: All "current mill average" data are daiculated from the totals of the individual readings. Fourdrinier Kraft Board Institute, Inc. Project 1108-13

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TABLE	

SUBGRAF OF INSTITUTE AND MILL DATA FOR MILL O

Cctober and November, 1963

1.4	ч о ч	0
3lmendorf Tear, g./sheet <u>Cross Nachine</u> <u>Institute</u> AN, AV, D1ff. ax, Min, AV, AV, D1ff.	9 46 8 -19 7 -51	-39
dorf Tear, g./; <u>Cross Nachine</u> <u>itute</u> AV. AV.	a 329 a 378 a 377	361
<u> Slmendorf Tea</u> <u>Cross </u>	336 375 ^a 352 397 ^a 368 428 ^a	400 396 101.0 105.5
lmendo Instit	408 336 472 352 504 368	
	24 25	
heet Diff.	-28 -18 -50	- 32
Elmendorf Tear, g./sheet In Nachine Institute Xill ax. Kin. Av. Av. Diff	302 335 325	125
dorf Tear, g. In <u>Nachine</u> <u>itute</u> <u>Mil</u>	330 353 375	353 357 96.9 205.7
Elmendorf Tee In Nac Institute Max. Min. Av.	288 288 304	
E Nax.	384 426 424	
1.J	÷ 4 ÷	4 +
Bursting Strength, <u>p.s.i.g.</u> <u>stitute</u> Mill Min. Av. äv. Diff.	ा रेन भ	5TI
ting Streng P.s.i.g. ute Mil	601 116	113 109 103,7 102.7
Bursting S D.s.i Institute Max. Min. Av.	8 8 8 8 8	
Lax.	137 140	
Diff.	1.0- 1.0- 1.0-	- 0.2
1	12.6 11.9	C. 21
<mark>Callper, points</mark> Litute (41) Sin, Av, Av,	े. १.ध १.ध	12.5 12.6 95.2 95.2
Calip titute	12.5 12.5 12.5 12.9 11.4 12.3	
Calipe Institute Max. Min. A	13.1	
		N
Dire.	-C.6 + -C.6	Ç. Ç.
at. 10. 24.11 54.	41.C 43.1 42.5	42.2
<u>Basis Neignt 15.</u> Institute Mar. Mall Max. Min. Av. Av.	41.6 42.2	42.4 42.0 101.0 98.8
Basi Stitut Min.	40.6 42.2 41.8	
In. Nax.	41.6 40.6 41.6 41.0 -C.6 44.2 42.2 43.3 43.1 -C.2 42.8 41.8 42.2 42.5 40.3	
Mch. No.	रणे रूप रहा	: = 5: :
Finish	SITS	l avera, mill ave . 6
0 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	9-25-63 16-31-65 11-14-63	Ourrent mill average: Cumulative mill average: Mill factor, & Mill index, &

^{arin}is average includes the readings for one or more specirens which tore beyond the J/ú-inch limit. Note: Ail "current mill average" date are calculated from the totals of the indivioual redings. Page 19 Report 186 Page 20 Report 186

Fourdrinier Kraft Board Institute, Inc. Project 1108-13 ۰,

beet	135		27 F	92+	¥	964) o +	, t <u>t</u>	12+	1		
g./sh hine Xill Av.	425	(11 11)	1 1	161		114	104	397	904	2		
H .g	390 ⁸	с) tuna	368ª	363 ^a	396 ^a	385 ^a	292 ^a	3ĉ3 ^a	365	379	3.IO1	icı.6
Elmendorf Tea Cross h Institute Vax. Min. Av.	352											
E EX	432	t 35	6 4	4C0	456	432	011	3111				
biff.	+21	+22	4Ľ+	-16	ц) Н	5 7+	ч Г	-19	นา +			
Elmendorf Tear, g./sheet In <u>Machine</u> Institute 2x. Min. Av. Av. Dif.	356	337	328	313	ц ж	337	321	216	IEC			
rf Tear, g <u>In Nachine</u> ute X <u>1</u>	335	315	314	331	533	315	3274	336 ^a	326	315	103.5	97.6
Elmendorf Tea In <u>Yac</u> Institute Max. Min. Åv.	268		272	260	258	256	260	30				
ELC NE	376	352	352	368	368	352	3 6 †	914				
ength, <u>Mill</u> Av. Diff.	o	Ŷ	ŝ	0	Ŷ	ና	ę,	-5	ŋ			
Bursting Strength, <u> 0.5.1.g.</u> <u> Stitute</u> <u> Xinv.</u> Av. D	106	106	109	Ħ	TT	106	211	ŝ	109			
ting Strey <u> 0-5-1-6</u> <u> 1te</u> X	106	211	711	111	911	109	109	117	211	106	105.7	101.8
Bursting S <u>p.s.i</u> Institute Xax. Xinv.	20		105	100	<u>8</u> 8	8	ê7	66				
F XEX	421	140	130	130	137	047	131	135				
Diff.	+-0-	۰. ۲۰5	-0.2	±0.1	-0.5	0.0	-0.2	0.0	-0.2			
points Mill	<u>२</u> .घ	4.51	า ส	32.6	<u>०</u> टा	12.7	12.7	12.3	† स			
	12.9	12.9	12.3	12.5	2.5	7.21	6.51	£.4	12.6	12.7	99.2	99.2
Caliper. Institute Gan: Av.	12.5	3. SI	12.0	2.2.	0.51 2	ħ. 51	† . 21	11.9				
Cali Institut Yax. Xan.	1.61	13.1	8.21	13.0	22.9	13.0	13.3	22.9				
Diff.	-0.5	1.1-	-c.5	-0.4	-0.7	-1.1	-0.3	£.0+	-0.5			
<u> </u>	43.3	42.8	42.5	4 3. 0	42.9	42.6	43.1	42.8	42.9			
<u>Basis Weight, Ib.</u> <u>Stute</u> Av. Av.	t3.ε		43.C	43.4	¢3.6	43.7	ħ.64		4.54	42.8	101.4	101.2
Basis Institute	42.6 43.5	43.0 43.9	42.2 4	7 7.27	# + ° 2 +	42.5 4	ti ti Cti	2°C 7	-1	.1	10	10
Basi Institut Wex. Kin.	17 2° 17		1 0 H	77 0° 171	17°5	14 <u>1</u>	17 0° 171	43.6 42.0 42.5				
Mo.		ri	ہ ۲	7	7 7	य त्न	7 ~!	а , 1	•• P1	: 98 e :		
finish	ZLTX	SLT.	WFLS	ELT.	SI IN	VELS	<u>टा ग</u> .	VF1S	averad	üll ave:	••	18
Date Made	9-24-63	10- 1-63	10- 8-63	10-15-63	10-23-63	10-28-63	11- 5-63	11-12-63	Current mill average:	Cumulative mill average	Mill factor, S	Nill index, 6

^{arm}ths average includes the readings for one or more specimens which tore beyond the 3/5-inch limit. Note: All "current mill average" data are calculated from the totals of the individual readings.

XIX SIENI

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SUMMARY OF INSTITUTE AND MILL DATA FOR MILL P October and November, 1963

TABLE XX

SUPPRASE OF LUSTIFUTE AND MILL LATA FOR WILL O

Cotober and November, 1963

ort 106				•											·					Project	1108-
				bet Diff.				97+	-15	-20	កុ	-28	-20	्रा ।	27-						
				g./si dine dine div.				333	£14	404	367	355	ίţ	419	:05						
				iori Tear, Cross Mach tute : . Av.	• •			411 ⁴	42E ^a	427 ^a	<u> 3</u> 58ª	÷13ª	433 ^a	423 ^a	0. r1 t1	901;	103.2	9.0L			
				Slmendort 1 Oross Institute Max. Min. Av				365	384	75	368	376	4 CC	38							
								432	528	ŧò:	れこむ	95. 1	± 96	~56							
				leet D≜ff.		•		ດມ 	-26	-27	-28	ц С	24	ел 1	-25						
				Slmendorf Tear, g./sheet In Yachine Institute [iil] Ax. Min. AV. AV. Dif				361	337	Ŧ,	356	326	331	363	Ę						
				crf Tear, In Vachine tute 11 n. Av.				369	363	tic	384:4	373 ^a	373	366 ^a	371	368	100.8				
			•	<u>Slmendorf 1 In Va Max. Min. A</u>				320	320	320	त्र	320	336	296							
								432	t 32	914	51	9T4	31/1:	416							
				, Diff.				-	4	Ŷ	Ŷ	ç t	ŧ	÷	7						
		s H		itil v.			۴ ب	109	108	Ħ	501	101	ដ	গন	109						
		CCR LIT	m	Bursting Stre <u> Destitute</u> <u> Mar. Mn.</u>			OR MII	OIL	101	717	211	105	107	105	108	106	100.0	96.2			
		DATA 1	. 196	Burst Institu	ted.		DiTA B	78 -	20	ж	89	31	6	87							
	K	SUCCARY OF INSTITUTE AND MILL DATA FOR MILL S	October and November, 1963	[~]@	No samples submitted.	IIXX	1 TIIN NOS VITO TIIN ONY EINIISHI SO AFRANS	137	221	13C	321	125	221	ध्य					limit.	ings.	
	TABLE ADT	NY ELO	r and N	Diff.	samples	TABLE XXII	NY ELLI	-0-5	-0.2	-0.4	-0-3	6.0-	1 .0-	-0.5	-0-3				/ê-inch	of the individual readings.	
		HISNI .	October	ints Xill Av.	o N		LISHI .	10.9	2.11	о.ц	6.14	6.11	1.11	⊅ .म	11.2				the 3/	di vi duz	
		1377 C3		alicer, points tute Xil A. Av. Av.			50 A E	† .11	*'11	* * 1	ц. 6	9 . 11	11.5	6.11	5 . 11	9.11	1.96	30.5	beyond	the in	
		SUIS		Calic stitute			CADS	0	J1. C	0.म	0.11	0.11	0.11						tore	ls of	
				Calicer Institute Maxin. A				3.1.	1.1	9 [.] ग	12.2	1.21	0.21	1.21					s which	he tota	
				Sire.				-0.5	5.1-	-1.1	-0.5	-0.3	-0.3	-1 - C) 1	-0.5				^{ar} ihis average includes the readings for one or more specimens which tore beyond the 3/6-inch limit.	Note: All "current mill average" data are calculated from the totals	
				.1				4.54	41-9	45°0	42.6	5.3 #5	43.1	4.24	21.24				r more	lculate	
				<u>Basis Weight, 1b</u> <u>itute Xill</u> fin. iv. iv.				ó.54	43.2	6.64	#3.2	42.6	4.5.4	42.8	43.1	43.0	100.2	100.5	o aue .	91. 9	
				Basis Wei Institute (, Min, Av,				t 17°2†	42°C 1	7 7.27	#5.0 #	42.0 4	42.2 4	42.C	t:	t	10	DI	zs for	cia ta	
,				Inst Max. N				t: €7 57	43.8 t	1, 2, 1 ,	43.64	43.8 4	3 0.14 3	43.64					readin	rerage"	
				.o.					1	.1	~		•			age:			es the	ntil ar	
				Y Yinîsh Y				5	m	v. m.	m	n .	: 10		Current mill average:	Curulative mill average:	10		includ	urrent	
				ŝ'n											, Llin	ive mi.	Xill factor, 🖇	Mill index, §	verage	5" 10"	
				Jate ∴ace				10- ĉ-63	10-20-63	10-21-63	10-25-65	10-31-63	11-10-63	11-17-63	Jurrent	Jurulat	GLL fa	411 In	trhis a	Note:	
								1-1	7	-1		-	1-1		0	0	· · ·	<i>~</i> .	ty	<i>c</i> ,	

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Fourdrinier Kraft Board Institute, Inc. Project 1108-13

Fourdrinier Kraft Board Institute, Inc. Project 1108-13

UNEXARY OF INSTITUTE AND MILL DATA FOR ALLI U

TIBLE XXIII

October and November, 1963

Finish

Da te Made

L. í. N

10- 2-63 10- 6-63 10-23-63 Will factor, 5 Xill index, §

Diff. -16 0F+ ۲ ۱ ĥ Elmendorf Tear, g./sheet Cross Machine ÷ΛΥ 377 ß 376 369 5 Institute Max. Nin. Av. 105.3 100.0 385^a 367^a 385^a 379 360 336 336 36C 432 384 40Ε Diff. 5 9 -16 -21 Elmendorf Tear, g./sheet In Machine 11 F. 291 Ħ 30 33 Institute Nax. Min. Av. 105.2 97.0 325^a 322^a 36 325 324 260 260 280 360 ģ 360 Diff. 0 Ŷ ř ř Bursting Strength, THE . ณ H 677 917 <u>Institute</u> 106.4 106.4 55 118 ัก 0TT ħ 100 8 3 ដ 135 136 -0.2 -0.3 1.0ŝ Diff. Caliber, points ititute Xill Nin. Av. Av. 2.21 1.1 12.0 าะก 100.0 4°21 I'21 6'21 12.4 12.4 9.6 13.0 12.0 12.4 12.8 12.0 12.4 Institute -Nax. £.0--0.2 e... Diff. -0.4 Basis Neight, 10. stitute Mill ÅV. 1.64 43.4 43.0 43.2 t. C4 2.24 0.44 44.2 42.6 43.6 43.5 43.3 100.5 Institute Nin. AV. 4.5 42.2 43.4 101.4 ax. Curulative mill average: No. -1 rri i -1 Current mill average:

^{ern}tis average includes the readings for one or nore specimens which tore beyond the 3/G-inch limit. All "current mill average" dats are calculated from the totals of the individurl reacings. :ote:

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leet	Diff.	0	н +	• •	418	ជ្	10 -1	۲ ۲				
g./st hine		343	36 4	368	337	379	351	752				
Slmendorf Tear, g./sheet Gross Machine	AV.	34:3ª	363 ^a	362 ^a	319 ^a	368 ²	343ª	350	357	9 6. 0	92.3	
endorf Cro	Institute Max. Min. Av.	320	320	320	255	336	ŝ					
SI .	ці хе	376	384	914	352	392	364					
seet	Diff.	-15	۲ - ۲	-16	ר י	- 6	N 1	ø				
Elmendorf Tear, g./sheet In Machine	ττ ι . .Α.	268	દાર્	319	280	317	289	301				
orf Tear, g In Machine	AV.	303	305	303	182	323	291	301	323	3 3.2	1.02	
endorí <u>T</u>	Institute Wax. Win. Av.	264	272	256	248	ş	224					
6	Nax.	376	352	368	320	360	ŧ					
.	Diff.	5	r† T	0	\$9 +	o	-2	2+				
Bursting Strength. 2.s.i.g.	Av. Diff.	105	103	102	OTT	108	101	105				
ing Stre	٩. ۲.	to3	104	102	10r	106	66	103	106	97.2	93.6	
Bursti	Institute Max. Min. Av.	2	81	85	85	8	80					
	H XE	120	126	021	ħ ZT .	021	121					
	Diff.	-0.1	-0.4	1.0-	-0.6	-0.2	-0.2	£.9+				
ints	4 v .	† 21	12.2	12.6	11.7	ţ. 21	12.6	ંસ				
Caliper, points	• • •	12.5	12.6	12.7	22.3	32.56	3.21	3.51	13.0	96.9	2. 6	
Calip	ωj	ા સ	12.0		0.21	12.1	1.2					
	lax. Min.	12.9	13.6	t.SL 0.EI	12.9	13.1	13.5					
	Diff.	-c.s	0.0	+C.4	+0.2	+0.1	1.0+	0.0+				
10.	.vs	-: ;;	42.6	42.7	42.2	43.1	4 1 .E	42,8				
Basis Neight, 1b.	Ϋ́ν.	÷3.3	12.8	42.3	12.0	43.0	1.1	42.5	0.64	95.8	1.96	
Basis	3	5.6	2.2	42.0 1	7 7 7	42.C 1	1.0.1		1			
ŀ	Max. Min.	44.0 42.6 43.3	43.5 42.2 42.8	43.0 4	43.0 41.4 42.0	7 0.11	45.0 41.0 41.7					
	No.	-1	-7 -1	~	-J rl	~			35e:			
:	Tinish X		1	ł				verage	ll aver			
	μi.							mill a	ve pril	tor, ž	ex, é	
ļ	uate ∷ade	9-26-65	10- 2-63	10- 9-63	10-19 - 63	11- 3-63	11- 6-63	Current mill average:	Jumulative mill average:	Mill factor, §	Mill index, 🖟	

VICARY OF INSTITUTE AND MILL DATA FOR MILL V

TLALE XXIV

October and November, 1963

^aTris average includes the readings for one or nore spectrens which tore beyond the 3/5-inch limit. Note: All "current mill average" data are calumlated from the totals of the incividual readings.

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surgater of institute and mill date for alli N October and November, 1963

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et.	Diff.	57 t	416	+31	+27	+21	÷25	0 17 1	+23				
5		399	399	907	114	57.7	014	1	401				
iorf Tear, g./ Cross Machine Litie		397 ^a	383 ^a	377 ^a	384ª	391 ^a	385 ^a	371 ^a	ŝ	392	0.36	C 101	
Slmendorf Tean Cross Ma Institute	lax. Kin. av.	ŧ	336	328	Ŧ	352	336	336		C I		1.1	
	x	071	797	432	432	#32	£64	007					
teet	Liff.	1 (¢	ц:-	÷10	+ 1	-30 +	ະ ເ	2Ê	ני				
51mencorf Tear, g./sheet In Machine Institute Mill	٠v،	329	368	332	319	356	326	340	336				
rf Tear, g. In Machine ute Mi	• A F	335	337	322 ^a	315 ^a	326 ^a	334	312 ^a	326	339	36.2 3	37.6	
5laendorf 7 In 2 Institute	Nax. Min. Av.	268	304	256	280	296	296	272					
1 1	Kax.	35	376	376	352	384	376	360					
.	żv. Diff.	+ +	∿0 +	t; t	+10	۳ ۲	ר-ז +	÷	ېر +				
Bursting Strength, D.S.i.E. Stitute Mill	• A -	ELI	108	109	201	51	103	100	106				
ng St S.S.J.	Åv.	109	102	Ж	8	101	102	26	101	1ċ2	さま	9.12	
Burstin P.: Institute	ax. Xin. Av.	69	80	51	76	33	35	82					
II	Max.	:26	121	ħ	011	EZT	311	122	•				
	Diff.	-0.1	-0.2	-0.3	-0.2	-0.1	+0.1	t.0-	-0.2				
points (111	40.	12.7	9.21	3.51	9.21	13.3	3.51	13.0	6.51				
រ	• 4 5	3.51	13.1	1.61	13.1	† •€1	12.7	4°61	13.1	13.4	3.76	103.1	
Caliver, Institute	.afX	12.4	2.21	2.21	4° 21	13.0	0.21	12.9				**	
10S	ax.	13.2	13.4́	13.8	13.9	13.7	13.3	13 . 9					
	Diff.	L.5-	÷0.5	-0.2	-0.2	-0.6	1.0+	+0.3	0.0				
t, 16. 2411	۰. ۲	43.3	42.5	6.14	8.L4	42.8	42.9	42.8	42.6				
<u> 3asis veight. lb.</u> ******	. A.	43 . 4	43.2 42.0 42.4	6.1t	42.0	44.5 42.0 43.4	42.B	43.8 41.8 42.5	42.6	72.7	99.6	6.99	
Jasis Tostitute	Max. Min.	4°C 75°E 43°4	42.0	42.4 41.2	43.0 41.2 42.0	42.0	44.0 42.0 42.8	41.B					
Tne	iax.	0.44 1	43.2	45.4	43.0	5.44	0.11	43.8					
	0	2	5	N	<i>`</i> م	N	۲۷	ŝ	: 83	erage:			
	Finish	STAN	ST.M	2131	SLEY	н. К	SITA	SLIS	il avera	ve įlim	\.P. 1.	1.0	
((Made	9 -9-63	9-16-53	9-20 - 63	9-21-63	9-21-63	9-25-63	10- 2-63	Jurrent mill average:	Curulative mill average:	Mill factor, §	111 index, 2	

^aThis average includes the reacings for one or nore specimens which tore beyond the 3/5-inch limit. Note: All "current mill average" data are calculated from the totals of the individual reacings.

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		Elmendorf Tear, z./ sheet In Rachine
SUPPLIER OF INSTITUTE AND NILL DATA FOR MILL T	October and November, 1963	Galiper, points 9.5.1.2.

TABLE XXVI

heet Diff.	01+	2 4) (j ;	-10	9 C		+				
ilmenaorf Tear, g./sheet <u>Cross Jachine</u> <u>Institute (111</u> ax. Nin, av. biff	175		1 83 E		£ ;	0()		352				
orf Tear, g./s <u>Cross Echine</u> ute 111 1. av. av.	Etti	367 ²	19135	- Contraction	- YCC	310 3308		351	356	5.50	22.6	
≟lmenaorí Tea <u>Cross</u> <u>Institute</u> ≅ax. Xin. ∧v.	320	336										
	63	400	0 1	007	201		Ŕ					
leet Diff.	-21	녂	- ¹	Ş) r 7 r			<u> [[</u>				
3lmendorf Tear, g./sheet In Machine Institute Max. Min. av. av. Diff	263	262	200	355	5			2027				
orf Tear, g In Zachine tute	564	313	305	Ţ,	64.0	566		££.,	299	100.0	3.95	
Elmendorf Tea In Mac Institute Max. Min. Av.	256	250	272	272	240	256						
ELE TAX	320	360	336	384		336			•			
ength, Mail Av. Diff.	1+	\$ +	6+	Ţ	` ²	0	c	f				
Bursting Strength, <u> 0.5.1.5.</u> <u> Stitute</u> 311 Xin, Av. 34	Ħ	114	<u>१</u> २२	Ħ	ਮੱ	i 16	211	0 1 1				
ting Stre	Ħ	109	911	108	113	611	сt,	1	Ħ	100.9	102.7	
Bursting S 0.s.i Institute Max. Nin, Av.	8	35	8	82	80	62						
王 王 王 王 王 王	133	125	さ	126	5	150						
Diff.	+C.6	1.0-	-0.2	-0.2	-0.3	0.0	2.0+					
2ints All AV.	1.51	13.0	2.51	13.1	6.ST	13.1	0.01	,				
Caliber, points bitute AV. AV.	12.5	13.1	6'रा	9.21	12.6	1.65	8.21	0	2.0	96.5	100.5	
Caliv Institute Xin.	2.21	12.8	12.6							-	Ā	
Call Institute Xax. iin.	12.9 12.2 12.5	13.3	5. 5. 5.	3.SI 0.EI	13.0 12.2	13.5 12.7						
.lff.	0.0	-0.3	-1.C	+0.1	+0.4	+C.3	-0.1					
<u>Basis Weight, lo.</u> <u>itute Sill</u> in. Av. Av.	0°24	4 2.3	÷2.3	42.2	42.7	43.2	4 . 24					
14. 14.	12.0		13.3		6.3		42.5	42.6		99.8	1.96	
Basis Institute X. Min.	2.0 4	5.5	2.2	5.0 4	1.8	2.2	-1	-7		U.	U.	
Zasis <i>Nei</i> Institute .ax. Xin. Av.	42.2 42.0 42.0	43.0 42.2 42.6	43.8 42.2 43.3	45.4 42.0 42.1	43.0 41.8 42.3	43.4 42.2 42.9						
No.	~	~	 			न्य त्य		: 926	I			
inist.	ja V		L.,	۲. ۲.		.н. Х	avêrage	ll aver	`	ĸ		
						3	mill.	lve zi		ctor.	iex, ž	
Da te Made	6-19-63	9-27-63	IC- 3-63	10-12-63	10-19-63	10-24-63	Current mill avérage:	Cumulative mill average:		MILL Lactor, >	Mill index, ž	

^aThis average includes the readings for one or more specimens which tore beyond the 3/2-inch limit. Note: All "current mill average" data are calculated from the totals of the individual readings.

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Fourdrinier Kraft Board Institute, Inc. Project 1108-13

XXVI also include under each test heading a column labeled "Diff." This column shows the differences between averages obtained at the Institute and those obtained at the mills. The data obtained at the Institute are used as the reference in calculating these differences.

The average test results obtained at the Institute and at the mills are summarized in Table XXVII for the current period. Shown in this table for each mill is the difference for each test between the current mill average based on Institute data and the current mill average based on mill data. In addition, for each test the maximum difference encountered in comparing Institute and mill averages for individual sample lots is shown. In Table XXVIII, the differences for each test between the current mill averages based on Institute data and those based on mill data shown in Table XXVII have been converted to per cent (based on Institute data as a reference). In addition, for purposes of comparison, the percentage differences from the previous bimonthly report are shown in Table XXVIII.

A summary of the agreement obtained in the comparisons of Institute and mill test data for the current period is shown in Table XXIX. This summary is based on the results given in Table XXVIII. The tabulated data show the number of mills, and the percentage of all mills which this number represents, whose average test results for the current period fall within designated percentages from the average test results obtained at the Institute. It may be noted from this summary that agreement between the results obtained at the Institute and those obtained at the mills was generally very good.

Preconditioning and conditioning data pertinent to the test results obtained at the mills during the current period are given in Table XXX.

	×	9	54 4.04 4.0-1-	12.0 13.0 6 6 6 7 6	511 84 84	266 266 - 53 - 53	351 352 +11 +30	
	3	2	5.0 6.0 6.0 6.0	1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	101 106 +15	326 + + 512 - 512	486 486 764 764 764 764	
	>	9	42.5 42.8 50.3 6.03	9.54.0 9.44.0 9.44.0	103 + + + + + 65	301 301 +16	350 357 +7 +18	
	D	· Μ	43.5 +43.5 -0.3 -0.4	4.4.6.4. 4.4.0.4.	11 11 11	324 324 121-3324 121-121-121-121-121-121-121-121-121-121	379 376 -16	
ŝ	E	7	43.1 42.5 -1.3	11. 2.11 2.0- 2.0- 2.0-	108 + 1 + 1	346 346 - 45 - 45	419 402 -17 -28	
в, 196	S	0						
ARISONS (AVERAGE MILL AND INSTITUTE RESULTS) FOR OCTOBER AND NOVEMBER, 1963	G	16	- + + + + + + + + + + + + + + + + + + +	9.91 4.90- 4.00-	108 -1 -1	314 289 - 25 - 43	-1-1-369 369 369	•
er and	μ,	Ø	43.44 42.9 -1-15.5	9.91 9.91 4.00 	112 109 109 109	326 331 +5 +22	385 +21 +35	e submitted. BVerBJe hased on mill teet dote
OCTOBE	0	Μ	4 4 6 6 7 6 7 7 7 7 7 7 7 7 7 7 7 7 7 7	રા દા દા દા ૨.૨.૨.૨	11 8 11 8 11 8 11 8 11 8 11 8 11 8 11	353 321 - 50	+00 - 39 - 39	+
s) for	N	Ø	40.9 -0.7 -1.4	13.2 13.2 10.0 10.0 10.0	11 8 8 8	327 330 +3 +3	384 382 2 382 2	ېر م
RESULTS	W	Μ	44 42.0 1-1-2 1.2 1-1-2	13.0 12.8 -0.2 -0.3	011 100 14	372 +04 +70	+ + + + + + + + + + + + + + + + + + +	uitted.
TUTE I	н	0			عا	ui	CLOSS	re subr
LINSTI (м	ю	eight 42.5 42.7 40.2 40.2		Bursting Strength 108 111 111 106 115 102 -2 +4 -9 -5 +10 -14	Strength, 224 291 313 312 11 +21 14 +61		ch mill test data vere submitted average and the mill evenes he
ILL ANI	Ŀ	, M	Basis Weight 43.3 42.5 43.1 42.7 43.1 42.7 43.1 42.7 40.2 40.7	Caliper 11.4 1 11.1 1.1 11.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1	111 115 ++4 +10	14 11 33 37 17 17 17 17 17 17 17 17 17 17 17 17 17	Strength, 366 35 352 37 -14 +2 -21 +5	est da and th
NAGE MI	н	4	а 6,6,6,5 6,6,5,5,5 7,6,5,5,5,5,5,5,5,5,5,5,5,5,5,5,5,5,5,5,	6.91 6.91 6.00-	Burs 106 -2 -5	Tearing 360 336 -24 -38	Tearing 374 372 -2 +20	mill t erage
S (AVEE	Ħ	N	42.1 41.8 -0.3 -0.3	13.3 12.9 -0.4	110 110 110 110 110	374 	376 	es on which mill tute mill average
ART SONS	Ċ	4	43.6 43.9 40.3	200-4- 200-4-4- 200-4-4-	110 101 14-	350 352 +36	104 1068 108 108 108 108 108 108 108 108 108 10	
COMP /	لتب	0						: sampl
RESULT	(FC)	Ø	42.6 42.5 10.1 70.1	5.51 6.51 6.0- 7.0-	113 113 -1 -1	311 289 - 53	348 348 - 57 - 57	r those en the
TEST	A	ង		र वा २.वा २.०० २.००	211	363	214	d only betwe
SUMMARY OF TEST RESULT COMPA	U	14	44.9 44.0 10.0 10.0	2.55 2.56 2.56 2.50 2.50 2.50 2.50 2.50 2.50 2.50 2.50	111 111 2- 7-	337 330 -7 -28	393 390 - 24 - 24	involve ference
SUN	ല	ω	50.0 10 10 10 10 10 10 10 10 10 10 10 10 10	110 	-11 -11 -11	291 291 - 36	359 370 + 111 + 34	erages the dif
	4	0						on ave 3e is t
	asılım	No. of samples compared	Institute Mill Av. diff.c Max. diff.c	Institute Mill Av. diff. ^b Max. diff. ^c	Institute Mill Av. diff. ^b Max. diff. ^c	Institute Míll Av. diff. ^b Max. diff.c	Institute Mill Av. diff. ^b Max. diff. ^c	^a Comparison based on averages involved only those sampl ^b Average difference is the difference between the Insti

TABLE XXVII

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TABLE XXVIII

COMPARISON OF INSTITUTE-MILL DIFFERENCES FOR OCTOBER AND NOVEMBER, 1963 (Average Difference, Per Cent)

Tear, cross	5 n n + 1 +	-1- -0.8 -0.5	 9 8 0 0	+ + + NØ N	10.6		2.04	۰.4 6.6	6.0 + 0.4	9+ 100+ 110	φ. φ. φ. φ. φ.	
Tear, in	6+ +10 +	404 000	-10 -10	+ + + H \$ \$	201.		~~~~ 	မိုမိုမို	~~0	÷ + + - 0 • 3	न् न	
Bursting Strength	6. 0 6. 0 9. 0	4- + - 9-	+10 +10 +	ၛႍႜၯႜၯ	6.0 0 0 0 0 0		000 6.0	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	ግ ባ ባ + + +	9 4 4 9 ww	იკო + + + + +	
Cal- iper	<u>ភ្</u> លុំ ថ្	404	ធុតុត	မုဝမု	ង់សំសុំ		ពុកុក្	ញ្ហ ស្ម	9.4 Q	ካሳት	φ. φ. φ. φ	
Basis Weight	0-0- 0-0-0-	9 9 9 9 9 9	-1-5 -0.5	-1-20	2.0+ 0 7.0+	1 1 1 1 1 1 1 1 1 1 1 1 1 1	0.4 0.4	2.0- 2.0-	+2 +0.5	-0-7 -00+	000 000 000	
Period	June-July Aug-Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	June - July Aug- Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	
LLiM	M	N	0	û.	ъ	ß	E-I	U	Λ	м	х	
Tear, cross			5+ -0.8		4-1-0	54	4 0 0 0 0		4.00 v.		++8 +13 +7	
Tear, in		5 4 4 1 4 1			 2 - 5	 LT+ 9+	- 20 - 0 - 0 - 0		855	400 111	087	
Bursting Strength		ښۀ <u>.</u> و.	0 1 1 1 1	0.0 0.0 0.0	۳-0-6 6.0	1 1 1 1	- 0.9 - 0.9	τ υ τ υ τ υ τ	0 0 0 1 1 4	6.0+ ++++	က္ဂဲ့ထို	
Cal. iper		ង់បំងំ	0.8	400	ဖုံကိုဖု	0.4 8.0 1	-0-1-5 -0-8	4 m m	000	9 9 9	က္ဝဖ္	
Basis Weight		0000	+0.5 	កុលុល	000 000	+1 +0.2	5.01 7.01 7.01	0.0 0.0 1.0	-0.5 -0.5	+0.7 -0.7 -0.5	-2 + 5 + + +	
Period	June -July Aug - Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	June-July Aug-Sept Current	
LLin	⊲,	മ	O	A	ឝា	ſz,	Ċ	ш	ы	ŧۍ	х	ਮੋ

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SUMMARY OF AGREEMENT BETWEEN INSTITUTE AND MILL RESULTS FOR OCTOBER AND NOVEMBER, 1963^a

	d				17 100.0					
	+17				ч о Ч					
	01+1			19 100.0	16 94.1	17 100.0				
Between sults	+7.5		19 100.0	18 94.7	13 76.5	16 94.1				
Average Percentage Difference Between Institute and Mill Test Results	1 		18 94.7	18 94.7	8 47.1	13 76.5				
	+1+	I		¢		α		17 89.5	8 47.1	12 70.6
	۲. + ۱	19 100.0	17 89.5	16 84.2	7 . 14	9 52.9				
	N +1	18 94.7	14 73.7	13 68.4	6 35.3	8 47.1				
	 +	16 84.2	4 21.1	7 36.8	3 17.6	7 41.2				
	+0.5	8 42.1	2 10.5	0.0	1 5.9	4 23.5				
		Basis weight Number of mills Percentage of mills	Caliper Number of mills Percentage of mills	Bursting strength Number of mills Percentage of mills	Tearing strength, in Number of mills Percentage of mills	Tearing strength, cross Number of mills Percentage of mills				

a Based on the average percentage differences between Institute and mill data given in Table XXVIII.

T. C. STRATT

TABLE XXX

PRECONDITIONING AND CONDITIONING DATA FOR MILL TESTS

October and November, 1963

	Pi	reconditioning	Conditioning				
Mill Code	R.H., %	Temp., °F.	Time, hr.	R.H., %	Temp., °F.	Time, hr.	
Aa	50	-					
B C D	50 50	73 73	48-96 24 	50 50 50	73 73 72-73	48-96 24 24-264	
$_{ m F}^{ m E}$ a	33-34	77-78	8	48-52	71-73	16	
G H				50 52-60	73 72	24 1-2	
I J Ka L	50-62 50	72-74 72	24 24	50 49-62 	73 72-74	24 24	
M N O P	50 50	73 72-73	24 24-240	50 50 55	73 73 71-72	48 24 	
Q _a S	30-35	73	48	50	73	48	
- 'T U	 30-38	84-86	0.5	44-76 .50	42-75 70-73	48 24	
V W X	50 50	71-76 70-72 	3-96 120	50 50 30-62	71-76 70-72 68-85	3-48 120	

a No samples were submitted for evaluation during the current period.

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THE INSTITUTE OF PAPER CHEMISTRY

W. N. Hubert, Research Aide

R.C. mc Kee / wh

R. C. McKee Senior Research Associate Chairman, Container Section