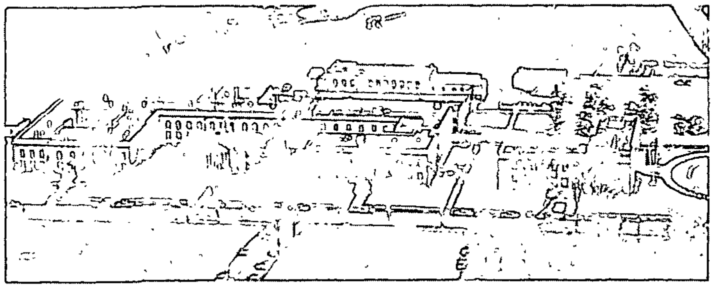

THE INSTITUTE OF PAPER CHEMISTRY, APPLETON, WISCONSIN

CONTINUOUS BASE-LINE STUDY (MODIFIED)
(MILL CORRUGATING MEDIUM DATA FOR JULY AND AUGUST, 1975)

Project 2694-2

Report Sixteen

A Progress Report

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

October 22, 1975

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

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THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS BASE-LINE STUDY (MODIFIED)
(MILL CORRUGATING MEDIUM DATA FOR JULY AND AUGUST, 1975)

SUMMARY OF 26-LB CORRUGATING MEDIUM DATA
(MAY-AUGUST, 1975)

Test		May	June	July	August
Moisture content, %	Max.[a]	9.1	9.0	9.0	9.2
	Min.[a]	3.6	3.7	3.3	3.6
	Av.[b]	6.1 (30)	6.1 (28)	6.2 (28)	6.2 (29)
Adj. basis weight, lb/M ft^2	Max.[a]	27.3	27.6	27.6	27.6
	Min.[a]	25.7	25.9	25.7	25.7
	Av.[b]	26.5 (30)	26.5 (28)	26.5 (27)	26.5 (29)
Caliper, pt	Max.[a]	11.8	11.6	11.7	11.7
	Min.[a]	8.7	8.7	8.8	9.0
	Av.[b]	9.9 (30)	9.9 (28)	9.9 (28)	9.9 (29)
Concora, psi	Max.[a]	48.6	45.8	47.8	45.4
	Min.[a]	35.8	33.0	35.0	35.6
	Av.[b]	39.0 (30)	38.6 (28)	38.9 (28)	38.6 (29)

[a]Current machine average.

[b]Current F.K.I. average, number of machines is indicated in parentheses.

INTRODUCTION

The continuous-based line study (modified) is a compilation of monthly averages of mill test data obtained routinely on 26-lb corrugating medium manufactured in the members mills of F.K.B.I., Inc. Mill data are included for moisture content, basis weight, caliper, and Concora made on the production of individual machines which produced at least 500 tons of this grade weight during a given month.

PRESENTATION OF DATA

For the 26-lb grade weight of corrugating medium referred to earlier, data on conditioning and testing environments, mill test averages for moisture content, adjusted basis weight, caliper, and concora results are compiled in the following tables.

Table Number	Description
I	Data on Conditioning and Testing Environments
II-III	Mill Test Averages on 26-lb Corrugating Medium

The procedures used in calculating cumulative machine averages, machine factors, machine indexes, and F.K.I. indexes are described in the Appendix.

It should be explained that the number of machines for which data are compiled in each table for a specified month varies for these reasons: a machine must have (a) produced at least 500 tons of 26-lb corrugating medium during the specified month, or (b) produced 500 tons of 26-lb corrugating medium during <u>any one or more</u> of the 12 months prior to the specified month (so that a cumulative average is available), to be included in a given table.

TABLE I

DATA ON CONDITIONING AND TESTING ENVIRONMENTS

JULY AND AUGUST, 1975

Code	Conditioning Environment: Are Quality Samples Conditioned Before Testing?	Procedure: Time	Procedure: Temp., °F	Procedure: RH, %	Testing Environment: Are Quality Samples Tested Under Controlled Conditions of Temperature and Humidity?
A1	No	--	--	--	Yes: 73 ± 3.5°F; 50 ± 2% RH
B1	No	--	--	--	Yes: 73 ± 1°F; 50 ± 2% RH
C1	No	--	--	--	No
D1	No data submitted for July and August				
E1	No	--	--	--	No
F1	No data submitted for July and August				
G1	No	--	--	--	No
H1	No	--	--	--	No
I1	No	--	--	--	Yes: 73 ± 3°F; 50 ± 2% RH
J1	No	--	--	--	No
K1	No data submitted for July and August				
L1	No	--	--	--	Yes: 73 ± 1°F; 50 ± 2% RH
M1	No	--	--	--	No
N1	No	--	--	--	No
O1	No	--	--	--	Yes: 73 ± 2°F; 50 ± 2% RH
P1	No	--	--	--	No
Q1	No	--	--	--	Yes: 73 ± 2°F; 50 ± 2% RH
R1	No	--	--	--	No
S1	No	--	--	--	No
T1	No	--	--	--	Yes: 73 ± 3°F; 50 ± 2% RH
U1	No	--	--	--	Yes: 72 ± 5°F; 60 ± 5% RH
V1	No	--	--	--	No
W1	No	--	--	--	Yes: 73 ± 2°F; 50 ± 2% RH
X1	Yes	20 Min	--	--	Yes: 72 ± 2°F; 50 ± 2% RH
Y1	No	--	--	--	No
Z1	No	--	--	--	Yes: 72 ± 2°F; 50 ± 2% RH
A2	No	--	--	--	No
B2	Yes	--	73	50	Yes: 73°F; 50 ± 2% RH
C2	No	--	--	--	Yes: 73 ± 2°F; 50 ± 2% RH
D2	No	--	--	--	Yes: 73 ± 2°F; 50 ± 5% RH
E2	No data submitted for July and August				
F2	No data submitted for July and August				
G2	No	--	--	--	Yes: 73 ± 3°F; 50 ± 2% RH
H2	No	--	--	--	No

TABLE II

AVERAGES OF ROUTINE MILL QUALITY CONTROL DATA FOR 26 LB. CORRUGATING MEDIUM

JULY, 1975

	MOISTURE CONTENT, PERCENT				ADJ. BASIS WT.,*A LB./M SQ. FT.				CALIPER, PT.				CONCORA TEST, P.S.I.			
	MACHINE DATA				MACHINE DATA				MACHINE DATA				MACHINE DATA			
CODE	CUR. AV.	CUM. AV.	FACT. *B	IND. *C	CUR. AV.	CUM. AV.	FACT. *B	IND. *C	CUR. AV.	CUM. AV.	FACT. *B	IND. *C	CUR. AV.	CUM. AV.	FACT. *B	IND. *C
A1	5.5	5.8	94.8	88.7	26.9	26.4	101.9	101.9	8.8	9.4	93.6	88.9	41.2	37.6	109.6	110.2
B1	6.9	6.9	100.0	111.3	26.1	26.2	99.6	98.9	10.0	9.8	102.0	101.0	41.9	41.9	100.0	112.0
C1	6.3	5.8	108.6	101.6	26.5	26.6	99.6	100.4	9.7	9.4	103.2	98.0	40.3	37.8	106.6	107.8
D1		4.7				26.2				9.6				37.4		
E1	5.6	6.0	93.3	90.3	26.1	26.1	100.0	98.9	9.5	9.6	99.0	96.0	40.8	40.0	102.0	109.1
F1		6.8				25.9				10.8				34.8		
G1	5.6	6.0	93.3	90.3	27.2	27.1	100.4	103.0	10.1	10.0	101.0	102.0	37.2	36.6	101.6	99.5
H1	7.9	7.6	103.9	127.4	25.7	26.0	98.8	97.3	10.5	10.3	101.9	106.1	36.6	36.5	100.3	97.9
I1	5.8	5.8	100.0	93.5	26.3	26.3	100.0	99.6	9.5	9.7	97.9	96.0	42.2	41.5	101.7	112.8
J1	9.0	9.1	98.9	145.2	25.8	25.8	100.0	97.7	10.5	11.0	95.4	106.1	41.8	40.3	103.7	111.8
K1		6.0				26.2				9.7				33.2		
L1	5.8	5.2	111.5	93.5	26.2	26.2	100.0	99.2	11.2	10.8	103.7	113.1	38.3	38.3	100.0	102.4
M1	6.6	6.7	98.5	106.4	26.0	26.0	100.0	98.5	10.4	10.2	102.0	105.0	40.8	41.2	99.0	109.1
N1		6.2				26.4				9.7				37.7		
O1	6.8	7.2	94.4	109.7	26.4	26.6	99.2	100.0	10.2	9.9	103.0	103.0	38.0	37.2	102.2	101.6
P1	3.3	3.7	89.2	53.2	27.6	27.4	100.7	104.5	9.5	9.8	96.9	96.0	37.7	33.6	112.2	100.8
Q1	6.0	6.1	98.4	96.8	27.1	27.2	99.6	102.6	9.9	9.8	101.0	100.0	37.3	37.5	99.5	99.7
R1	6.6	5.7	115.8	106.4	26.2	26.5	98.9	99.2	9.4	9.2	102.2	94.9	47.8	45.3	105.5	127.8
S1	6.9	7.1	97.2	111.3	26.3	26.4	99.6	99.6	9.1	9.4	96.8	91.9	38.6	38.7	99.7	103.2
T1	6.1	6.1	100.0	98.4	26.4	26.6	99.2	100.0	9.2	9.3	98.9	92.9	37.3	37.7	98.9	99.7
U1	6.5	6.7	97.0	104.8	26.5	26.5	100.0	100.4	9.0	9.0	100.0	90.9	39.0	38.5	101.3	104.3
V1	4.1	3.8	107.9	66.1	26.9	26.9	100.0	101.9	9.1	9.3	97.8	91.9	37.2	33.3	111.7	99.5
W1	6.8	7.0	97.1	109.7	26.5	26.4	100.4	100.4	10.4	10.8	96.3	105.0	38.0	35.9	105.8	101.6
X1	6.6	6.2	106.4	106.4	26.5	26.2	101.1	100.4	10.0	9.7	103.1	101.0	35.7	36.2	98.6	95.4
Y1	6.0	6.2	96.8	96.8	26.4	26.5	99.6	100.0	11.7	11.5	101.7	118.2	36.7	35.4	103.7	98.1
Z1	7.2	7.4	97.3	116.1	26.2	26.4	99.2	99.2	10.5	11.0	95.4	106.1	38.5	38.4	100.3	102.9
A2	6.0	5.4	111.1	96.8	26.7	26.9	99.2	101.1	10.2	9.9	103.0	103.0	37.2	37.8	98.4	99.5
B2	5.3	5.4	98.1	85.5		26.7			8.8	9.2	95.6	88.9	39.9	37.4	106.7	106.7
C2	6.8	7.2	94.4	109.7	26.5	26.2	101.1	100.4	10.2	10.7	95.3	103.0	39.0	35.7	109.2	104.3
D2	6.6	6.1	108.2	106.4	26.6	26.6	100.0	100.8	10.2	10.1	101.0	103.0	37.0	37.6	98.4	98.9
E2		6.0				26.3				9.6				34.3		
F2		6.8				26.4								37.4		
G2	3.8	3.7	102.7	61.3	26.8	27.6	97.1	101.5	9.0	9.1	98.9	90.9	38.1	38.4	99.2	101.9
H2	6.5	6.4	101.6	104.8	26.4	26.1	101.1	100.0	10.6	10.8	98.1	107.1	35.0	33.0	106.1	93.6

FKI DATA	MOISTURE CONTENT	ADJ. BASIS WT.	CALIPER	CONCORA TEST
CUR. AV.	6.2	26.5	9.9	38.9
CUM. AV.	6.2	26.4	9.9	37.4
IND. *D	100.0	100.4	100.0	104.0

NOTE- NOTES A, B, C, AND D, ARE GIVEN IN APPENDIX.

TABLE III

AVERAGES OF ROUTINE MILL QUALITY CONTROL DATA FOR 26 LB. CORRUGATING MEDIUM

AUGUST, 1975

	MOISTURE CONTENT, PERCENT				ADJ. BASIS WT.,*A LB./M SQ. FT.				CALIPER, PT.				CONCORA TEST, P.S.I.			
	MACHINE DATA				MACHINE DATA				MACHINE DATA				MACHINE DATA			
CODE	CUR. AV.	CUM. AV.	FACT. *B	IND. *C	CUR. AV.	CUM. AV.	FACT. *B	IND. *C	CUR. AV.	CUM. AV.	FACT. *B	IND. *C	CUR. AV.	CUM. AV.	FACT. *B	IND. *C
A1	5.6	5.7	98.2	90.3	26.9	26.4	101.9	101.9	9.0	9.3	96.8	90.9	40.3	38.0	106.0	107.2
B1	6.9	6.9	100.0	111.3	26.1	26.2	99.6	98.9	10.0	9.9	101.0	101.0	41.5	41.9	99.0	110.4
C1	6.1	5.8	105.2	98.4	26.5	26.6	99.6	100.4	9.4	9.4	100.0	94.9	39.9	38.0	105.0	106.1
D1		4.8				26.2				9.6				37.6		
E1	5.7	5.9	96.6	91.9	26.1	26.1	100.0	98.9	9.6	9.6	100.0	97.0	40.2	39.9	100.8	106.9
F1		6.8				25.9				10.8				34.8		
G1	5.7	5.9	96.6	91.9	27.6	27.1	101.8	104.5	10.3	10.0	103.0	104.0	37.8	36.8	102.7	100.5
H1	7.6	7.6	100.0	122.6	25.9	26.0	99.6	98.1	10.7	10.3	103.9	108.1	37.4	36.6	102.2	99.5
I1	6.0	5.8	103.4	96.8	26.4	26.3	100.4	100.0	9.0	9.7	92.8	90.9	42.6	41.6	102.4	113.3
J1	9.2	9.1	101.1	148.4	25.7	25.8	99.6	97.3	10.7	10.9	98.2	108.1	40.5	40.4	100.2	107.7
K1		6.0				26.2				9.6				33.4		
L1	5.7	5.3	107.5	91.9	26.1	26.2	99.6	98.9	11.2	10.8	103.7	113.1	38.1	38.2	99.7	101.3
M1	6.5	6.7	97.0	104.8	26.0	26.0	100.0	98.5	10.3	10.2	101.0	104.0	40.8	41.3	98.8	108.5
N1	5.6	6.2	90.3	90.3	26.5	26.4	100.4	100.4	9.3	9.7	95.9	93.9	37.7	37.7	100.0	100.3
O1	6.9	7.1	97.2	111.3	26.4	26.5	99.6	100.0	9.9	9.9	100.0	100.0	38.0	37.4	101.6	101.1
P1	4.3	3.6	119.4	69.4	27.3	27.4	99.6	103.4	9.1	9.8	92.8	91.9	37.3	34.0	109.7	99.2
Q1	6.0	6.1	98.4	96.8	27.2	27.2	100.0	103.0	9.7	9.8	99.0	98.0	38.4	37.4	102.7	102.1
R1	6.5	6.0	108.3	104.8	26.9	26.5	101.5	101.9	9.7	9.3	104.3	98.0	45.4	45.3	100.2	120.7
S1	6.9	7.1	97.2	111.3	26.3	26.4	99.6	99.6	9.8	9.4	104.2	99.0	38.6	38.6	100.0	102.6
T1	6.0	6.1	98.4	96.8	26.3	26.6	98.9	99.6	9.1	9.3	97.8	91.9	36.4	37.5	97.1	96.8
U1	6.5	6.6	98.5	104.8	26.6	26.6	100.0	100.8	9.0	9.0	100.0	90.9	39.0	38.7	100.8	103.7
V1	3.6	3.8	94.7	58.1	27.4	26.9	101.8	103.8	9.0	9.3	96.8	90.9	36.5	33.8	108.0	97.1
W1	6.8	7.0	97.1	109.7	26.5	26.4	100.4	100.4	10.6	10.8	98.1	107.1	36.6	36.2	101.1	97.3
X1	6.9	6.2	111.3	111.3	26.1	26.2	99.6	98.9	10.0	9.7	103.1	101.0	35.8	36.1	99.2	95.2
Y1	6.0	6.1	98.4	96.8	26.4	26.5	99.6	100.0	11.7	11.5	101.7	118.2	36.6	35.7	102.5	97.3
Z1	7.0	7.3	95.9	112.9	26.3	26.4	99.6	99.6	10.8	11.1	97.3	109.1	38.6	38.4	100.5	102.6
A2	5.4	5.6	96.4	87.1	26.7	26.8	99.6	101.1	9.8	10.0	98.0	99.0	37.8	37.6	100.5	100.5
B2	5.3	5.4	98.1	85.5	27.0	26.7	101.1	102.3	9.2	9.2	100.0	92.9	39.5	37.6	105.0	105.0
C2	6.8	7.1	95.8	109.7	26.4	26.2	100.8	100.0	10.4	10.6	98.1	105.0	37.0	36.2	102.2	98.4
D2	6.4	6.1	104.9	103.2	26.6	26.6	100.0	100.8	10.3	10.1	102.0	104.0	38.0	37.4	101.6	101.1
E2		6.1				26.3				9.6				34.4		
F2		6.7				26.4								37.3		
G2	4.5	3.7	121.6	72.6	26.6	27.4	97.1	100.8	9.0	9.1	98.9	90.9	37.7	38.4	98.2	100.3
H2	6.3	6.4	98.4	101.6	26.2	26.1	100.4	99.2	10.3	10.8	95.4	104.0	35.6	33.4	106.6	94.7
FKI DATA																
CUR. AV.	6.2				26.5				9.9				38.6			
CUM. AV.	6.2				26.4				9.9				37.6			
IND. *D	100.0				100.4				100.0				102.6			

NOTE- NOTES A, B, C, AND D, ARE GIVEN IN APPENDIX.

THE INSTITUTE OF PAPER CHEMISTRY

R. C. McKee /gjo

R. C. McKee
Chairman
Container Section

APPENDIX

NOTES A, B, C, AND D, USED IN TABULATIONS OF MILL DATA

Notes A, B, C, and D, used in the tables of mill data are given below; these notes define the procedure used in calculating adjusted basis weight, machine factor, machine index, and F.K.I. index. It should be stressed that each formula is applicable only to a specific physical property of a specific grade weight of linerboard.

Note A: Adjusted basis weight (ABW) = reported weight (RBW) adjusted to moisture content of 7.8%:

$$\text{ABW} = \text{RBW}\left[\frac{(100 - \text{reported moisture content, \%})}{(100 - 7.8)}\right]$$

Note B: $$\text{Machine factor (\%)} = \left[\frac{\text{Current machine average}}{\text{Cumulative machine average}}\right] \cdot 100 \ \underline{\text{where}}$$

$$\text{Cumulative machine average} = \sum \frac{\text{CMA's}^{a} \text{ for previous 12 months excluding CMA for current month}}{12}$$

Note C: $$\text{Machine index (\%)} = \left[\frac{\text{Current machine average}}{\text{Cumulative F.K.I. average}}\right] \cdot 100 \ \underline{\text{where}}$$

$$\text{Cumulative F.K.I. average} = \sum \frac{\text{CFKIA's}^{b} \text{ for previous 12 months excluding CFKIA for current month}}{12}$$

Note D: $$\text{F.K.I. index (\%)} = \left[\frac{\text{Current F.K.I. average}}{\text{Cumulative F.K.I. average}}\right] \cdot 100 \ \underline{\text{where}}$$

$$\text{Current F.K.I. average} = \sum \frac{\text{CMA's}^{a} \text{ for current month for all machines}}{\text{Number of machines}}$$

---

[a]CMA = current machine average for a specific physical property of 26-lb corrugating medium obtained during a given month on a specific machine.

[b]CFKIA = current F.K.I. average for a specific physical property of 26-lb corrugating medium obtained during a given month.