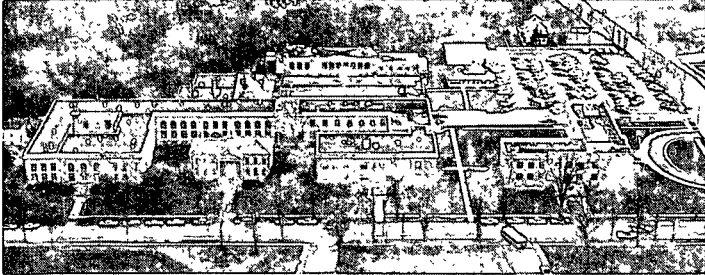


BASE-LINE  
SEPTEMBER-OCTOBER, 1977



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THE INSTITUTE OF PAPER CHEMISTRY, APPLETON, WISCONSIN

CONTINUOUS BASE-LINE STUDY (MODIFIED)  
(MILL CORRUGATING MEDIUM DATA FOR SEPTEMBER AND OCTOBER, 1977)

Project 2694-2

Report Twenty-Nine

A Progress Report

to

FOURDRINIER KRAFT BOARD GROUP

OF THE

AMERICAN PAPER INSTITUTE

December 28, 1977

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THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS BASE-LINE STUDY (MODIFIED)  
(MILL CORRUGATING MEDIUM DATA FOR SEPTEMBER AND OCTOBER, 1977)

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December 28, 1977

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THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS BASE-LINE STUDY (MODIFIED)  
 (MILL CORRUGATING MEDIUM DATA FOR SEPTEMBER AND OCTOBER, 1977)

SUMMARY OF 26-LB CORRUGATING MEDIUM DATA  
 (JULY-OCTOBER, 1977)

Test	July		August		September		October	
	Total	Recycled	Total	Recycled	Total	Recycled	Total	Recycled
Moisture content, %	Max. <sup>a</sup>	9.6	6.9	6.9	9.7	6.9	9.4	7.0
	Min. <sup>a</sup>	4.1	4.1	4.1	4.3	4.3	4.3	4.3
	Av. <sup>b</sup>	6.3(34)	5.7(8)	6.3(33)	5.6(7)	6.2(35)	5.6(8)	6.2(36)
Adj. basis weight, lb/M ft <sup>2</sup>	Max. <sup>a</sup>	27.2	27.0	27.3	27.3	27.5	27.3	27.3
	Min. <sup>a</sup>	25.6	25.6	25.8	26.1	25.6	25.9	26.1
	Av. <sup>b</sup>	26.5(34)	26.5(8)	26.4(33)	26.7(7)	26.5(35)	26.8(8)	26.5(36)
Caliper, pt.	Max. <sup>a</sup>	11.3	10.0	10.9	10.0	10.9	11.2	10.0
	Min. <sup>a</sup>	7.9	7.9	8.7	8.9	8.0	7.9	7.9
	Av. <sup>b</sup>	9.5(33)	9.1(8)	9.7(32)	9.2(7)	9.6(34)	9.1(8)	9.7(35)
Concora, lb	Max. <sup>a</sup>	70.3	70.3	73.8	70.7	71.3	73.0	70.0
	Min. <sup>a</sup>	53.0	58.7	59.7	59.7	59.8	58.3	59.8
	Av. <sup>b</sup>	63.0(34)	62.5(8)	63.8(33)	62.7(7)	63.6(35)	62.9(8)	63.3(36)

<sup>a</sup>Current machine average.

<sup>b</sup>Current F.K.B.G. average, number of machines is indicated in parentheses.

## INTRODUCTION

The continuous-base line study (modified) is a compilation of monthly averages of mill test data obtained routinely on 26-lb corrugating medium manufactured in the member mills of F.K.B.G. 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.B.G. 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 any one or more 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  
SEPTEMBER AND OCTOBER, 1977

Code	Conditioning Environment			Testing Environment	
	Are Quality Samples Conditioned Before Testing?	Procedure			Are Quality Samples Tested Under Controlled Conditions of Temperature and Humidity?
		Time	Temp., °F	RH, %	
A1	No	--	--	--	No
B1	No	--	--	--	Yes: 73 ± 3.5°F; 50 ± 2% RH
C1	No	--	--	--	Yes: 72 ± 1°F; 50 ± 2% RH
D1	Yes	20 Min	--	--	Yes: 72 ± 2°F; 50 ± 2% RH
E1	No	--	--	--	No
F1	No	--	--	--	No
G1	No	--	--	--	Yes: 73 ± 2°F; 50 ± 2% RH
H1	No	--	--	--	Yes: 73 ± 2°F; 50 ± 2% RH
I1	No	--	--	--	No
J1	Yes	20 Min	--	--	Yes: 73 ± 2°F; 50 ± 2% RH
K1	No	--	--	--	No
L1	No	--	--	--	No
M1	No	--	--	--	Yes: 73 ± 2°F; 50 ± 2% RH
N1	No	--	--	--	Yes: 73 ± 2°F; 50 ± 2% RH
O1	No	--	--	--	Yes: 73 ± 1°F; 50 ± 1% RH
P1	No	--	--	--	No
Q1	No	--	--	--	Yes: 73 ± 2°F; 50 ± 2% RH
R1	No	--	--	--	Yes: 73 ± 2°F; 50 ± 5% RH
S1	No	--	--	--	No
T1	No	--	--	--	No
U1	No data submitted for September and October				
V1	No	--	--	--	No
W1	Yes	--	--	--	Yes: 73 ± 2°F; 50 ± 5% RH
X1	No	--	--	--	No
Y1	No	--	--	--	Yes: 73 ± 2°F; 50 ± 2% RH
Z1	No	--	--	--	Yes: 72 ± 2°F; 50 ± 5% RH
A2	No	--	--	--	No
B2	No	--	--	--	Yes: 73 ± 2°F; 50 ± 2% RH
C2	No	--	--	--	Yes: 73 ± 2°F; 50 ± 2% RH
D2	No	--	--	--	No
E2	No	--	--	--	Yes: 72 ± 2°F; 50 ± 3% RH
F2	No	--	--	--	No
G2	No	--	--	--	Yes: 72 ± 1°F; 50 ± 2% RH
H2	No	--	--	--	No
I2	No	--	--	--	Yes: 72 ± 2°F; 50 ± 2% RH
J2	Yes	--	--	--	Yes: 70 ± 2°F; 50 ± 2% RH
K2	No	--	--	--	No
L2	No	--	--	--	Yes: 73 ± 2°F; 50 ± 2% RH
M2	No	--	--	--	No

TABLE II  
AVERAGES OF ROUTINE MILL QUALITY CONTROL DATA FOR 26 LB. CORRUGATING MEDIUM  
SEPTEMBER, 1977

CODE *E	MOISTURE CONTENT, PERCENT				ADJ. BASIS WT.,*A LB./ M SQ. FT.				CALIPER, PT.				CONCORDA TEST, LB.			
	MACHINE DATA				MACHINE DATA				MACHINE DATA				MACHINE DATA			
	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(R)	5.1	5.5	92.7	81.0	27.3	26.8	101.9	103.4	9.0	9.0	100.0	92.8	62.2	60.9	102.1	97.0
B1	5.9	5.5	107.3	93.6	26.9	26.8	100.4	101.9	8.7	8.8	98.9	89.7	67.5	65.8	102.6	105.3
C1	5.6	5.5	101.8	88.9	26.3	26.3	100.0	99.6	10.4	10.2	102.0	107.2	65.0	64.7	100.5	101.4
D1	7.1	7.0	101.4	112.7	26.3	26.2	100.4	99.6	9.7	10.1	96.0	100.0	60.3	60.4	99.8	94.1
E1	6.1	6.2	98.4	96.8	26.3	26.3	100.0	99.6	9.2	9.2	100.0	94.8	71.3	75.0	95.1	111.2
F1	4.8	6.0	80.0	76.2	27.0	26.3	102.7	102.3	9.2	10.2	90.2	94.8	65.3	62.6	104.3	101.9
G1																
H1	6.8	7.0	97.1	107.9	26.1	26.1	100.0	98.9	10.2	10.2	100.0	105.2	61.7	61.2	100.8	96.2
I1	5.2	6.7	77.6	82.5	26.5	26.3	100.8	100.4	9.8	9.6	102.1	101.0	62.8	66.1	95.0	98.0
J1	6.1	6.1	100.0	96.8	27.0	26.9	100.4	102.3	9.5	9.6	99.0	97.9	61.0	60.8	100.3	95.2
K1	6.4	6.2	103.2	101.6	26.3	26.4	99.6	99.6	9.7	9.6	101.0	100.0	64.2	64.1	100.2	100.2
L1	5.6	5.9	94.9	88.9	26.6	26.5	100.4	100.8	9.3	9.4	98.9	95.9	68.7	69.6	98.7	107.2
M1	8.1			128.6	26.0			98.5	9.6			99.0	65.0			101.4
N1(R)	4.3	4.1	104.9	68.2	26.9	27.0	99.6	101.9	9.0	9.0	100.0	92.8	59.8	60.8	98.4	93.3
O1(R)	6.9	6.8	101.5	109.5	26.2	26.2	100.0	99.2	9.7	9.9	98.0	100.0	70.7	70.0	101.0	110.3
P1		6.3			26.3					10.2			64.4			
Q1	7.0	7.6	92.1	111.1	26.0	25.9	100.4	98.5	10.4	10.4	100.0	107.2	60.0	60.8	98.7	93.6
R1(R)	5.5	5.3	103.8	87.3	27.2	26.9	101.1	103.0	8.0	8.2	97.6	82.5	60.0	61.9	96.9	93.6
S1	6.0	5.8	103.4	95.2	26.4	26.3	100.4	100.0	9.2	9.6	95.8	94.8	66.0	65.0	101.5	103.0
T1(R)	6.5	6.4	101.6	103.2	26.6	26.7	99.6	100.8	9.0	9.0	100.0	92.8	64.0	65.6	97.6	99.8
U1		4.6			26.2					9.7			61.7			
V1	5.1	6.6	77.3	81.0	26.5	26.4	100.4	100.4	10.7	10.0	107.0	110.3	64.3	65.8	97.7	100.3
W1	6.2	6.1	101.6	98.4	26.7	26.6	100.4	101.1	10.0	10.4	96.2	103.1	61.0	61.2	99.7	95.2
X1	6.2	6.3	98.4	98.4	26.4	26.3	100.4	100.0	8.7	9.1	95.6	89.7	65.5	64.7	101.2	102.2
Y1	7.0	7.2	97.2	111.1	26.0	26.2	99.2	98.5	10.2	9.7	105.2	105.2	61.7	63.5	97.2	96.2
Z1	6.9	6.8	101.5	109.5	26.4	26.5	99.6	100.0					65.0	66.2	98.2	101.4
A2	5.5	5.3	103.8	87.3	26.9	26.8	100.4	101.9	10.7	11.4	93.8	110.3	61.3	61.3	100.0	95.6
B2(R)	6.0	6.0	100.0	95.2	25.7	26.4	97.3	97.3	9.0	9.0	100.0	92.8	61.3	60.8	100.8	95.6
C2	6.6	6.1	108.2	104.8	26.2	26.4	99.2	99.2	10.9	10.5	103.8	112.4	64.0	64.7	98.9	99.8
D2	9.7	9.3	104.3	154.0	25.6	25.8	99.2	97.0	9.8	10.2	96.1	101.0	60.0	65.8	91.2	93.6
E2(R)	5.7	5.8	98.3	90.5	26.7	26.4	101.1	101.1	10.0	10.0	100.0	103.1	63.7	64.7	98.4	99.4
F2	7.2	6.9	104.3	114.3	26.2	27.0	97.0	99.2	9.2	9.0	102.2	94.8	62.8	63.8	98.4	98.0
G2	5.3	6.0	88.3	84.1	26.6	26.4	100.8	100.8	10.4	10.1	103.0	107.2	63.0	63.3	99.5	98.3
H2	6.6	6.4	103.1	104.8	26.3	26.2	100.4	99.6	10.6	10.4	101.9	109.3	61.7	59.0	104.6	96.2
I2	6.8	6.5	104.6	107.9	26.2	26.5	98.9	99.2	9.6	9.9	97.0	99.0	60.0	62.6	95.8	93.6
J2	6.5	6.9	94.2	103.2	26.7	26.9	99.2	101.1	8.5	8.5	100.0	87.6	66.2	65.2	101.5	103.3
K2	7.0	6.7	104.5	111.1	25.8	25.9	99.6	97.7	10.3	10.0	103.0	106.2	67.0	68.8	97.4	104.5
L2																
M2(R)	4.8	5.5	87.3	76.2	27.5	26.7	103.0	104.2	9.0	9.0	100.0	92.8	61.7	60.7	101.6	96.2

FKBG DATA

	TOTAL	RECYCLED	TOTAL	RECYCLED	TOTAL	RECYCLED	TOTAL	RECYCLED
CUR. AV	6.2	5.6	26.5	26.8	9.6	9.1	63.6	62.9
CUM. AV	6.3	5.6	26.4	26.6	9.7	9.1	64.1	62.8
IND. *D	98.4	100.0	100.4	100.8	99.0	100.0	99.2	100.2

(\*)-- NOTES A, B, C, D, AND E, ARE GIVEN IN APPENDIX.

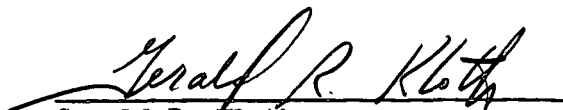
TABLE III  
AVERAGES OF ROUTINE MILL QUALITY CONTROL DATA FOR 26 LB. CORRUGATING MEDIUM  
OCTOBER, 1977

CODE *E	MOISTURE CONTENT, PERCENT				ADJ. BASIS WT.,*A LB./ M SQ. FT.				CALIPER, PT.				CONCORA TEST, LB.			
	MACHINE DATA				MACHINE DATA				MACHINE DATA				MACHINE DATA			
	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(R)	5.0	5.4	92.6	79.4	27.3	26.8	101.9	103.4	9.0	9.0	100.0	93.8	60.7	61.0	99.5	94.8
B1	5.9	5.5	107.3	93.6	26.8	26.8	100.0	101.5	8.7	8.8	98.9	90.6	64.0	65.9	97.1	100.0
C1	5.6	5.5	101.8	88.9	26.4	26.3	100.4	100.0	10.7	10.2	104.9	111.4	63.0	64.8	97.2	98.4
D1	6.9	7.0	98.6	109.5	26.3	26.3	100.0	99.6	9.7	10.0	97.0	101.0	59.9	60.4	99.2	93.6
E1	5.9	6.2	95.2	93.6	26.2	26.3	99.6	99.2	9.6	9.2	104.3	100.0	73.0	74.4	98.1	114.1
F1	4.8	5.8	82.8	76.2	26.9	26.4	101.9	101.9	10.2	10.1	101.0	106.2	62.8	63.0	99.7	98.1
G1	6.9			109.5	26.1			98.9	8.9			92.7	65.0			101.6
H1	6.7	7.0	95.7	106.3	26.0	26.1	99.6	98.5	10.7	10.2	104.9	111.4	60.0	61.1	98.2	93.8
I1	5.0	6.6	75.8	79.4	27.1	26.3	103.0	102.6	10.0	9.6	104.2	104.2	61.7	65.8	93.8	96.4
J1	6.0	6.1	98.4	95.2	27.2	27.0	100.7	103.0	9.7	9.6	101.0	101.0	60.8	60.8	100.0	95.0
K1	6.3	6.2	101.6	100.0	26.3	26.4	99.6	99.6	9.7	9.6	101.0	101.0	64.1	64.0	100.2	100.2
L1		5.9				26.5				9.4			69.5			
M1	7.5	8.1	92.6	119.0	26.3	26.0	101.2	99.6	9.2	9.6	95.8	95.8	65.0	65.0	100.0	101.6
N1(R)	4.3	4.0	107.5	68.2	26.7	27.0	98.9	101.1	9.0	9.0	100.0	93.8	59.8	60.7	98.5	93.4
O1(R)	7.0	6.8	102.9	111.1	26.1	26.2	99.6	98.9	9.6	9.8	98.0	100.0	70.0	70.0	100.0	109.4
P1	6.0	6.3	95.2	95.2	26.7	26.3	101.5	101.1	10.7	10.2	104.9	111.4	67.4	64.4	104.6	105.3
Q1	6.9	7.6	90.8	109.5	26.1	25.9	100.8	98.9	10.7	10.4	102.9	111.4	58.3	60.7	96.0	91.1
R1(R)	5.4	5.3	101.9	85.7	26.5	26.9	98.5	100.4	7.9	8.1	97.5	82.3	60.3	61.8	97.6	94.2
S1	5.9	5.8	101.7	93.6	26.5	26.3	100.8	100.4	9.3	9.6	96.9	96.9	66.0	64.9	101.7	103.1
T1(R)	6.5	6.4	101.6	103.2	26.8	26.7	100.4	101.5	9.0	9.0	100.0	93.8	64.0	65.3	98.0	100.0
U1		4.6				26.2				9.8			61.6			
V1	4.9	6.5	75.4	77.8	26.6	26.4	100.8	100.8	10.0	10.0	100.0	104.2	62.9	65.7	95.7	98.3
W1	6.3	6.1	103.3	100.0	26.6	26.6	100.0	100.8	10.0	10.4	96.2	104.2	63.3	61.3	103.3	98.9
X1	6.2	6.3	98.4	98.4	26.4	26.3	100.4	100.0	9.1	9.0	101.1	94.8	64.4	65.1	98.9	100.6
Y1	6.7	7.2	93.0	106.3	26.2	26.2	100.0	99.2	10.5	9.8	107.1	109.4	60.0	62.9	95.4	93.8
Z1	6.8	6.8	100.0	107.9	26.5	26.5	100.0	100.4					65.0	66.0	98.5	101.6
A2	5.3	5.3	100.0	84.1	26.8	26.9	99.6	101.5	11.2	11.3	99.1	116.7	61.2	61.3	99.8	95.6
B2(R)	6.0	6.0	100.0	95.2	26.4	26.4	100.0	100.0	9.0	9.0	100.0	93.8	60.5	60.8	99.5	94.5
C2	6.6	6.2	106.4	104.8	26.3	26.4	99.6	99.6	10.8	10.6	101.9	112.5	64.1	64.7	99.1	100.2
D2	9.4	9.4	100.0	149.2	26.0	25.7	101.2	98.5	10.5	10.2	102.9	109.4	63.0	65.1	96.8	98.4
E2(R)	5.7	5.8	98.3	90.5	26.7	26.5	100.8	101.1	10.0	10.0	100.0	104.2	65.3	64.6	101.1	102.0
F2		6.9				26.9				9.1			63.7			
G2	5.4	6.0	90.0	85.7	26.6	26.5	100.4	100.8	10.4	10.1	103.0	108.3	62.0	63.2	98.1	96.9
H2	6.6	6.5	101.5	104.8	26.3	26.2	100.4	99.6	10.5	10.4	101.0	109.4	60.7	59.1	102.7	94.8
I2	6.8	6.5	104.6	107.9	26.2	26.5	98.9	99.2	9.9	9.9	100.0	103.1	62.0	62.3	99.5	96.9
J2	6.7	6.9	97.1	106.3	27.1	26.9	100.7	102.6	8.5	8.5	100.0	88.5	62.5	64.9	96.3	97.6
K2	6.7	6.8	98.5	106.3	25.9	25.9	100.0	98.1	10.3	10.1	102.0	107.3	67.0	68.7	97.5	104.7
L2	7.7			122.2	26.1			98.9	8.4			87.5	70.0			109.4
M2(R)	5.3	5.4	98.1	84.1	27.0	26.7	101.1	102.3	9.0	9.0	100.0	93.8	60.0	60.7	98.8	93.8

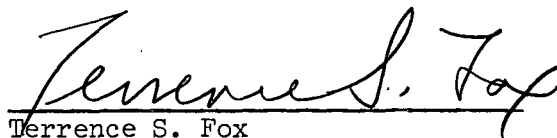
FKBG DATA	TOTAL	RECYCLED	TOTAL	RECYCLED	TOTAL	RECYCLED	TOTAL	RECYCLED
	CUR. AV	6.2	5.6	26.5	26.7	9.7	9.1	63.3
CUM. AV	6.3	5.6	26.4	26.7	9.6	9.1	64.0	62.8
IND. *D	98.4	100.0	100.4	100.0	101.0	100.0	98.9	99.7

(\*)-- NOTES A, B, C, D, AND E, ARE GIVEN IN APPENDIX.

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APPENDIX

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

Notes A, B, C, D, and E, 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.B.G. index. It should be stressed that each formula is applicable only to a specific physical property of corrugating medium.

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

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

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

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

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

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

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

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

Note E: (R) - Indicates a medium manufactured from recycled fibers.

<sup>a</sup>CMA = current machine average for a specific physical property of 26-lb corrugating medium obtained during a given month on a specific machine.

<sup>b</sup>CFKBGA = current F.K.B.G. average for a specific physical property of 26-lb corrugating medium obtained during a given month.

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