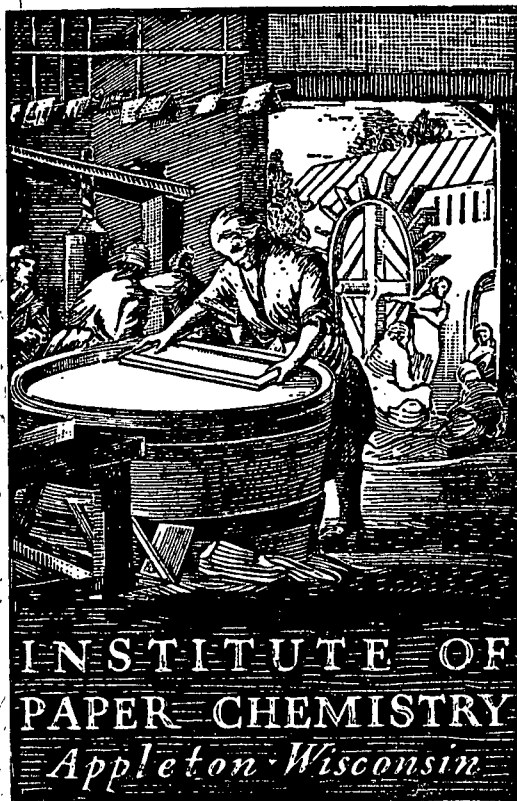




**CONTINUOUS EVALUATION OF
CORRUGATING MEDIUM**

Project 1108-17

Progress Report 41

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

April 1, 1959

SCRAMBLED CODE LETTERS FOR PROGRESS REPORT 41
PROJECT 1108-17

Company - Mill	Machine No.	Code Letter
The Chesapeake Corporation - West Point	1	P
Continental Can Company, Inc. - Hopewell	1	D
Gaylord Container Corporation - Bogalusa	4	--
International Paper Company		
Bastrop	1	K
Bastrop	2	--
Georgetown	1	A
Georgetown	2	--
The Mead Corporation		
Sylva	1	C
Lynchburg	2	B
Harriman	1	R
Muskingum Fibre Products Company - Coshocton	1	E
North Carolina Pulp Company - Plymouth	3	Q
Olin Mathieson Chemical Corporation		
Monroe	1	--
Monroe	2	H
Owens-Illinois Glass Company		
Tomahawk	1	O
Tomahawk	2	G
Tomahawk	3	M
Big Island	1	J
Big Island	2	F
St. Joe Paper Company - Port St. Joe	1	N
Union Bag-Camp Paper Corporation - Savannah	2	I
West Virginia Pulp and Paper Company		
Covington	6	L
Covington	7	--
Hinde and Dauch of Canada - Trenton	1	--
Charleston	--	--

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

Project 1108-17

Progress Report 41

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

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THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

PURPOSE OF THIS STUDY

The purpose of this study is to provide a continuous evaluation of the quality and runability of corrugating medium produced by members of the Fourdrinier Kraft Board Institute. The study, as it progresses, is accumulating a backlog of data and experience which provides two important benefits. First, it enables each participant to evaluate his position in relation to the rest of the industry. Second, it provides background information essential for the judicious interpretation of any proposed specifications on corrugating medium (on either a company or industry basis).

PROCEDURE FOR PARTICIPATING

The procedure for participating in this study involves the submission of two rolls of corrugating medium per week from each machine to The Institute of Paper Chemistry. These rolls are taken from regular production runs on different days. Each roll is 10 to 12 inches wide and contains approximately 5,000 lineal feet of medium (approximately 30 inches in diameter). When received by the Institute, each roll is assigned a code letter and number. The rolls are numbered in the sequence in which they are received. Code letters are assigned on the basis of machines, and a given machine is assigned a different code letter each month in order to mask the identity of the mills. For purposes of reference, an outline of this program which describes the necessary instructions for sampling was appended to Progress Report One in this series.

PRESENTATION AND DISCUSSION OF TEST RESULTS OBTAINED AT
THE INSTITUTE OF PAPER CHEMISTRY

During the month of March, one hundred and twenty sample lots of corrugating medium were selected from the production of eighteen machines and submitted to The Institute of Paper Chemistry for evaluation. A tabulation of the number of rolls submitted from each machine is given in Table I. It may be noted that the number of rolls submitted from Machines G, M, and O was larger than usual. The evaluation of some of these rolls was sponsored independently and was not charged to the baseline study.

Each sample of corrugating medium was evaluated for basis weight, caliper, Concora flat crush, H. and D. flat crush (single-faced board), and runability. Runability was measured by corrugating each roll under standardized conditions on the Institute's corrugator into A-flute board at 600 feet per minute with minimum tension. If unsatisfactory runability occurred at this speed, the corrugator was slowed down in increments of 25 f.p.m. until satisfactory runability was obtained (no ruptured flutes). If the medium fabricated satisfactorily at 600 f.p.m. with minimum tension, further runs were made at higher tensions to determine when cracking occurred. The higher tensions used were 0.5 lb. per inch, 1.0 lb. per inch, and 1.5 lb. per inch. Maximum speed at minimum tension was also determined, the greatest speed being 1000 f.p.m.

Flat crush was determined on the board obtained at a speed of 600 f.p.m. with minimum tension. In addition to information about quality, these results will provide data which may be useful in studying the relationship between Concora flat crush and combined board flat crush for each participant's medium.

TABLE I
NUMBER OF ROLLS OF CORRUGATING MEDIUM SUBMITTED
FOR EVALUATION FROM EACH MACHINE

Machine Code	Number of Rolls
A	8
B	2
C	2
D	9
E	6
F	8
G	13
H	4
I	13
J	8
K	8
L	4
M	10
N	2
O	13
P	1
Q	5
R	<u>4</u>
Total	120

As requested by members of the F.K.B.I., the Concora medium test results are calculated on the basis of pounds of load per unit area rather than on the basis of the formula suggested by the Concora manufacturer and are reported as Concora flat crush test results. In Progress Reports One and Two, the Concora medium test results were reported on the basis of the formula suggested by the Concora manufacturer.

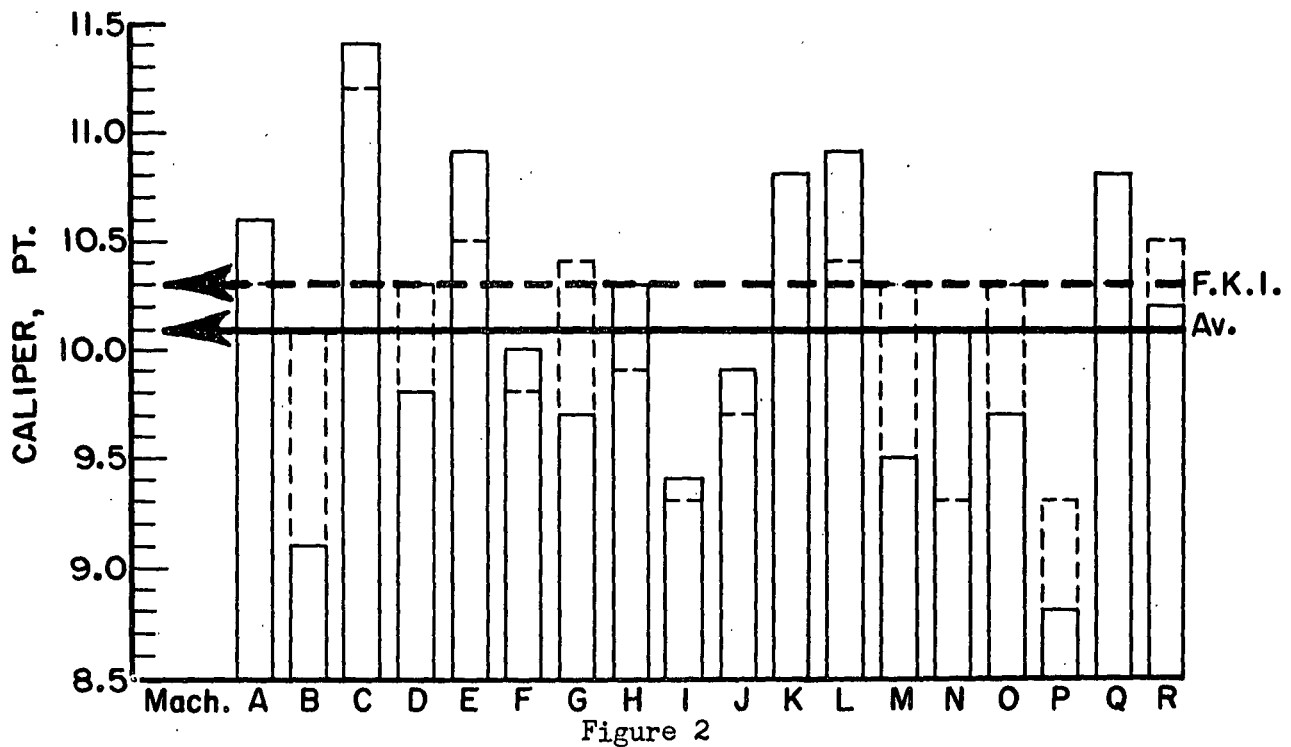
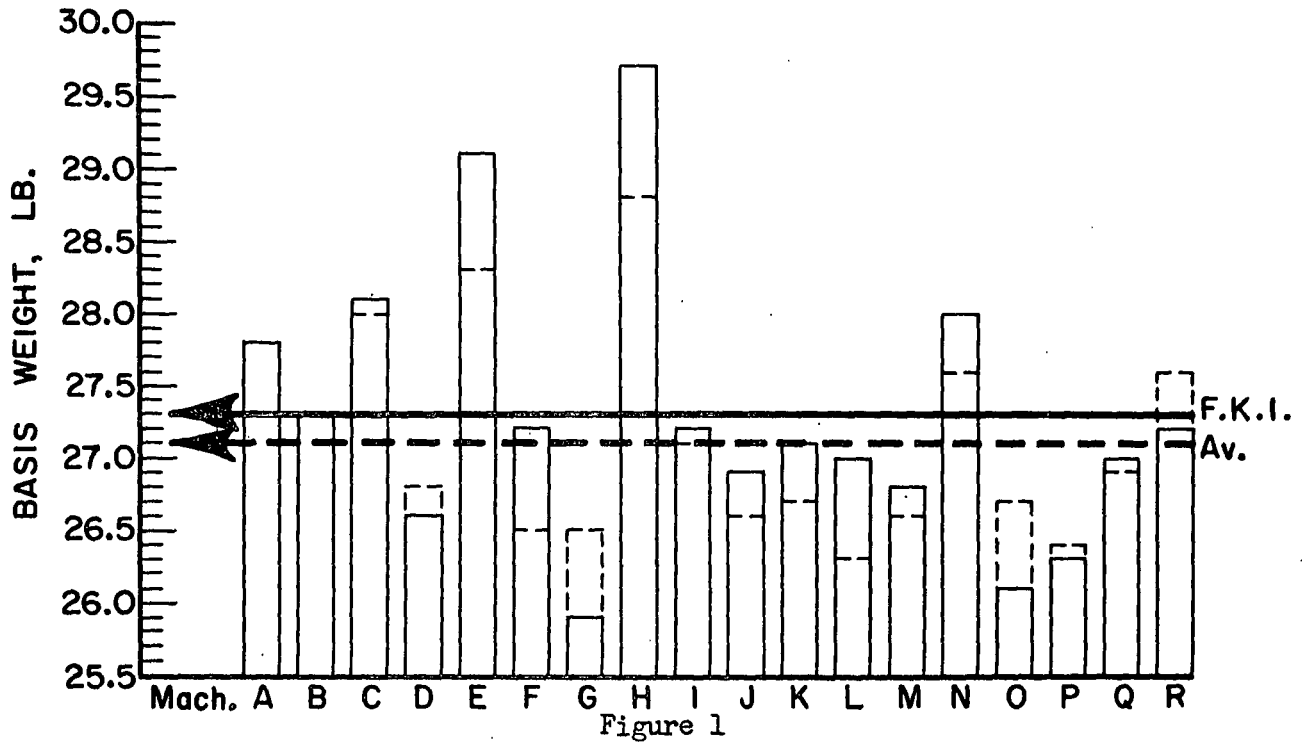
The average test results obtained on the samples of corrugating medium submitted by each participant (current machine averages) are shown in Table II and graphically presented in Figures 1 to 4. In addition to a comparison of the test data obtained for the various machines, Table II also presents the current F.K.I. averages, cumulative F.K.I. averages, and the F.K.I. indexes. The current F.K.I. average is the average of test results for all machines participating in the study during the current month. The cumulative F.K.I. average is based on the results for the previous twelve-month period excluding the result for the current period. The F.K.I. index is obtained as follows:

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

The F.K.I. index provides a ready means of comparing the current quality with previous results. An index greater than 100% indicates that current quality is higher than the average result for the previous twelve periods; an index below 100% indicates that current quality is lower than the average result for the previous twelve periods.

TABLE II
SUMMARY OF CURRENT MACHINE AVERAGES
March, 1959

Machine Code	Basis Weight, lb.	Caliper, points	Concora Flat Crush, p.s.i.	Single-Face Flat Crush, p.s.i.
A	27.8	10.6	40.6	36.2
B	27.3	9.1	36.9	33.3
C	28.1	11.4	36.3	30.9
D	26.6	9.8	34.5	31.4
E	29.1	10.9	36.5	30.3
F	27.2	10.0	35.0	32.0
G	25.9	9.7	33.5	30.2
H	29.7	10.3	42.4	36.3
I	27.2	9.4	37.1	32.6
J	26.9	9.9	33.1	29.9
K	27.1	10.8	40.2	35.7
L	27.0	10.9	36.3	31.8
M	26.8	9.5	35.2	31.9
N	28.0	10.1	34.9	25.1
O	26.1	9.7	34.2	30.5
P	26.3	8.8	29.9	---
Q	27.0	10.8	38.4	33.1
R	27.2	10.2	30.3	27.6
Current F.K.I. Average	27.3	10.1	35.8	31.7
Cumulative F.K.I. Average	27.1	10.3	35.8	33.1
F.K.I. Index, %	100.6	98.4	100.0	95.8



— Current machine average
- - - Cumulative machine average

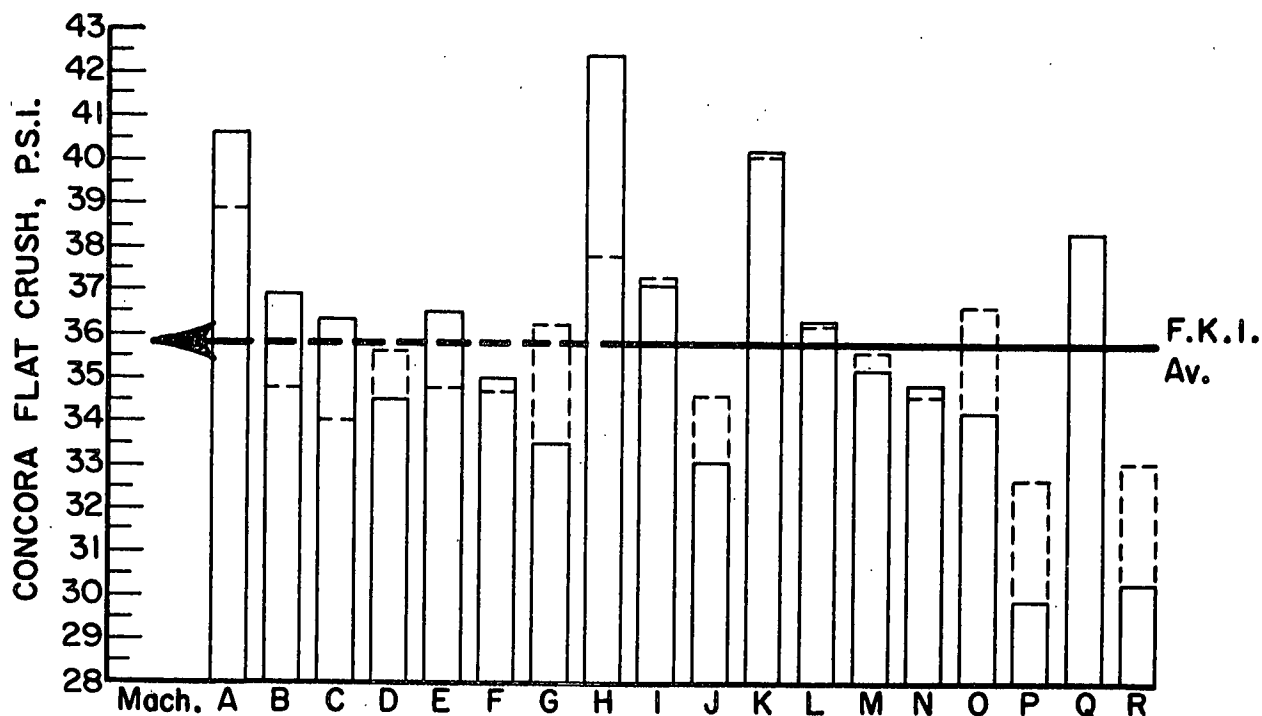


Figure 3
Comparison of Concora Flat Crush Results for March, 1959

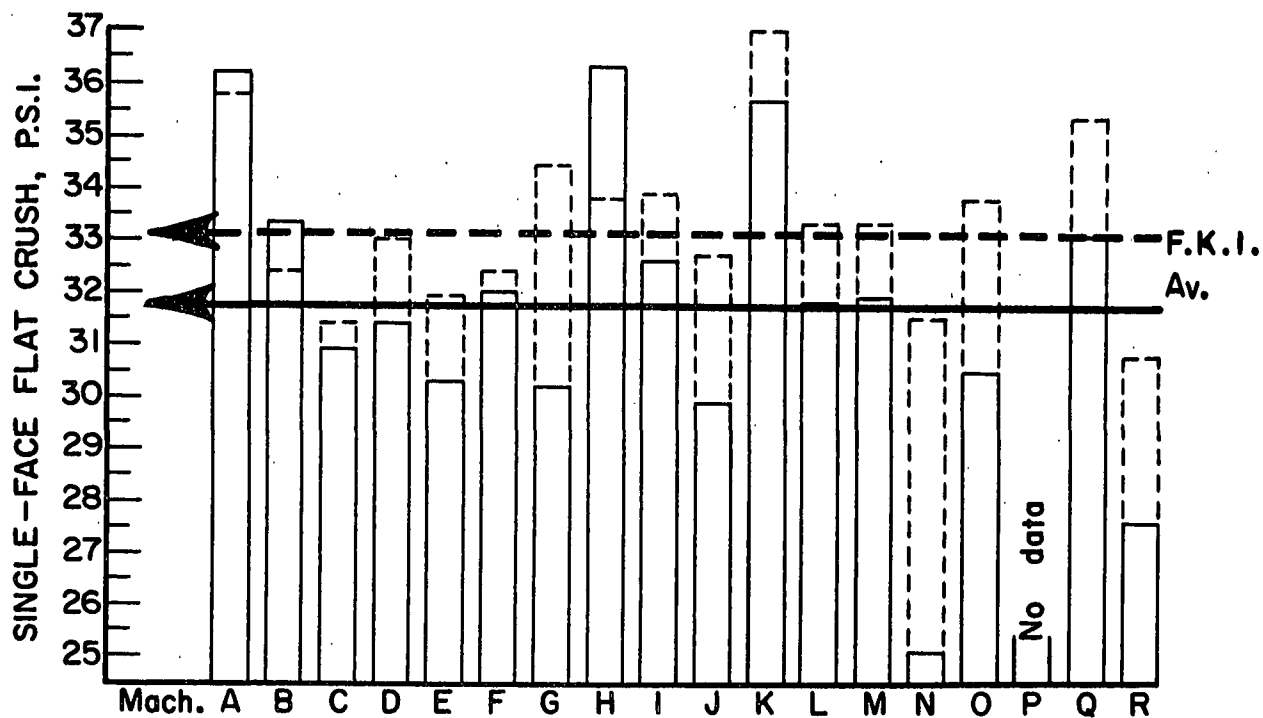


Figure 4
Comparison of Single-Face Flat Crush Results for March, 1959

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

In Table II the current machine averages for the month of March are summarized. It may be noted in Table II and Figure 1 that basis weight varied from a low of 25.9 lb. for Machine G to a high of 29.7 lb. for Machine H. The current F.K.I. average for basis weight was 27.3 lb. and the cumulative F.K.I. average was 27.1 lb. The fact that the current F.K.I. average was slightly higher than the cumulative F.K.I. average is reflected by the F.K.I. index of 100.6%. Only the average basis weight value for Machine G was below the 26-lb. minimum requirement of Rule 41.

With regard to the caliper results for the current period, it may be seen in Table II and also in Figure 2 that the lowest average caliper data of 8.8 points was associated with Machine P and the highest average of 11.4 points with Machine C. The current F.K.I. average of 10.1 points was slightly lower than the cumulative F.K.I. average of 10.3 points, the F.K.I. index being 98.4%. The minimum caliper requirement of 9 points specified in Rule 41 was met by all participants except Machine P.

The Concora flat crush averages for March are presented graphically in Figure 3 and in tabular form in Table II. An inspection of these results reveals that 42.4 p.s.i. was the highest average and 29.9 p.s.i. the lowest. Machine H was associated with the highest average and Machine P with the lowest. The current F.K.I. average of 35.8 p.s.i. was the same as the cumulative F.K.I. average.

The highest single-face flat crush average of 36.3 p.s.i. was obtained for Machine H and the lowest of 25.1 p.s.i. for Machine N. These data

are shown in Table II and presented graphically in Figure 4. The current F.K.I. average was 31.7 p.s.i., whereas the cumulative F.K.I. average was 33.1 p.s.i. The F.K.I. index was 95.8%.

For the current period, the current F.K.I. average for basis weight was higher than the cumulative F.K.I. average, the current F.K.I. averages for caliper and single-face flat crush were lower than their cumulative F.K.I. averages, and the current F.K.I. average for Concora flat crush was the same as the cumulative F.K.I. average.

The test results obtained on the sample lots submitted from the production of each of the machines are shown in Tables III through XX for Machines A through R, respectively. The maximum, minimum, and average test results obtained on each sample lot are shown for all tests except basis weight for which only the average is shown; in addition, the over-all average result for all sample lots submitted from a given machine is shown for each test. The latter over-all averages are reported as "current machine averages." A cumulative machine average is also shown and is calculated by averaging the current machine averages for the previous twelve periods (excluding the current period). Also shown for each machine in Tables III to XX are the machine factor and machine index which are defined as follows:

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

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

The machine factor and machine index provide a means for comparing the current machine average with either the previous results for that particular machine or with the cumulative results for all machines--i.e., the cumulative F.K.I. average.

TABLE III
SUMMARY OF TEST RESULTS FOR MACHINE A
March, 1959

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Max. Speed at Min. Tension, f.p.m.	Runability		
					Max.	Min.	Av.	Max.	Min.	Av.		Max.	Min.	Av.
A-1	2-19-59	2-27-59	291	27.9	10.2	10.0	10.2	44.4	40.2	42.6	37.0	35.0	35.8	1-1/2
A-2	2-24-59	3-4-59	292	27.4	10.9	10.2	10.5	39.6	34.2	36.6	35.0	32.6	33.7	1-1/2
A-3	2-26-59	3-10-59	293	27.6	11.0	10.3	10.7	43.8	37.2	40.3	36.4	35.0	35.7	1-1/2
A-4	3-4-59	3-12-59	294	27.9	11.8	10.4	11.2	42.6	38.4	41.5	38.6	36.2	37.6	1-1/2
A-5	3-5-59	3-16-59	295	28.0	11.0	10.5	10.7	41.4	38.4	40.1	39.4	35.8	37.6	1-1/2
A-6	3-12-59	3-23-59	296	28.1	11.0	10.1	10.8	45.6	37.8	42.1	36.6	33.4	35.4	1-1/2
A-7	3-14-59	3-24-59	297	28.1	10.9	10.2	10.5	43.2	40.2	41.6	37.0	34.4	36.0	1-1/2
A-8	3-18-59	3-25-59	298	27.3	10.8	10.0	10.3	42.0	37.8	39.7	39.2	36.8	38.0	1-1/2
Current Machine Average														
				27.8	10.6		40.6		36.2		900		1-1/2	
Cumulative Machine Average														
				27.3	10.3		38.9		35.8		1000		1-1/2	
Machine Factor, %														
				101.7	103.2		104.4		101.1		1000		1-1/2	
Machine Index, %														
				102.4	103.3		113.3		109.4		1000		1-1/2	

TABLE IV
SUMMARY OF TEST RESULTS FOR MACHINE B
March, 1959

B-1	3- 5-59	3-10-59	127	27.4	9.9	8.0	9.2	37.8	36.0	36.7	35.6	31.0	33.7	1000	1-1/2
B-2	3- 5-59	3-10-59	128	27.1	9.8	8.0	9.0	39.0	34.2	37.1	35.2	30.6	32.9	1000	1-1/2
Current Machine Average															
				27.3			9.1			36.9			33.3		
Cumulative Machine Average				27.3			10.1			34.8			32.4		
Machine Factor, %				100.0			90.1			105.9			102.6		
Machine Index, %				100.5			88.9			103.1			100.6		

TABLE V
SUMMARY OF TEST RESULTS FOR MACHINE C
March, 1959

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Max. Speed at Min. Tension, f.p.m.	Max. Tension lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
C-1	3-11-59	3-16-59	129	28.2	11.7	10.8	11.3	39.6	33.6	37.0	32.2	30.2	31.6	1000	1-1/2
C-2	3-11-59	3-16-59	130	28.0	11.9	11.1	11.5	38.4	33.0	35.6	31.8	28.4	30.2	1000	1-1/2
Current Machine Average															
Cumulative Machine Average				28.1			11.4			36.3			30.9		
Machine Factor, %				28.0			11.2			34.0			31.4		
Machine Index, %				100.4			102.0			106.9			98.6		
				103.5			111.0			101.4			93.4		

TABLE VII
SUMMARY OF TEST RESULTS FOR MACHINE E
March, 1959

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Max. Speed at Min. Tension, f.p.m.	Runability Max. Tension at 600 f.p.m. lb./in.		
					Max.	Min.	Max.	Min.	Max.	Min.			Max.	Min.
E-1	2-20-59	3-2-59	220	28.7	11.3	10.8	10.9	37.2	31.2	34.7	28.4	27.6	28.0	1
E-2	2-25-59	3-2-59	221	29.7	11.5	10.7	11.0	40.8	33.6	36.8	31.8	29.0	30.2	1000
E-3	2-27-59	3-10-59	222	29.3	11.0	10.3	10.8	40.2	34.8	38.3	32.0	31.2	31.5	1000
E-4	3-4-59	3-10-59	223	28.2	10.8	10.0	10.4	37.8	34.2	35.9	30.6	29.2	29.8	1000
E-5	3-10-59	3-16-59	224	29.8	11.5	10.9	11.1	38.4	36.6	37.7	33.6	31.2	32.4	1000
E-6	3-14-59	3-19-59	225	28.8	11.4	10.7	11.0	36.6	34.8	35.6	30.6	28.0	29.7	1000
Current Machine Average														
Cumulative Machine Average				29.1			10.9			36.5			30.3	
Machine Factor, %				102.8			103.5			104.8			94.9	
Machine Index, %				107.2			106.1			101.9			91.5	

TABLE VIII
SUMMARY OF TEST RESULTS FOR MACHINE F
March, 1959

F-1	1-25-59	2-27-59	1620	26.9	10.0	9.3	9.7	37.8	33.6	35.0	33.6	30.8	32.5	1-1/2
F-2	1-30-59	2-27-59	2013	25.8	10.1	9.7	9.9	33.6	30.0	31.8	30.4	27.2	28.7	1-1/2
F-3	2-1-59	2-27-59	56	26.7	10.4	9.9	10.1	37.2	30.6	33.4	32.8	29.6	30.9	1-1/2
F-4	2-4-59	2-27-59	322	27.4	9.9	9.3	9.7	36.6	32.4	34.1	31.6	29.6	30.7	1-1/2
F-5	2-7-59	3-10-59	516	28.0	10.2	9.5	10.0	40.8	36.0	38.0	34.6	32.8	34.0	1-1/2
F-6	2-12-59	3-10-59	883	27.3	10.1	9.7	9.9	34.8	33.0	34.1	34.4	31.4	32.7	1-1/2
F-7	2-23-59	3-24-59	1632	28.0	10.5	10.0	10.3	42.6	36.6	40.2	36.4	34.4	35.3	1-1/2
F-8	2-25-59	3-24-59	1775	27.4	10.3	9.9	10.1	34.8	30.0	33.0	33.2	29.6	31.6	1-1/2
Current Machine Average														
Cumulative Machine Average				27.2		10.0			35.0				32.0	
Machine Factor, %				26.5		9.8			34.7				32.4	
Machine Index, %				102.5		101.2			100.7				98.8	
				100.2		97.1			97.6				96.8	

TABLE IX
SUMMARY OF TEST RESULTS FOR MACHINE G^a

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points	Concora Flat Crush, p.s.i.	Single-Face Flat Crush, p.s.i.	Max. Speed at Min. Tension, f.p.m.	Runability Max. Tension at 600 f.p.m. lb./in.
					Min. Av.	Max. Min.	Max. Min. Av.		
G-1	2-11-59	2-25-59	44	26.0	9.2	9.8	29.2 27.4 28.2	900	1/2
G-2	2-20-59	2-25-59	2-G-RP	25.6	9.0	9.6	30.2 28.6 29.5	850	1/2
G-3	2-20-59	2-25-59	2-G-HP	25.8	9.3	9.6	31.6 29.0 30.5	1000	1/2
G-4	2-23-59	2-25-59	2-H-RP	26.2	9.0	9.8	31.4 28.8 29.7	1000	1/2
G-5	2-23-59	2-25-59	2-H-HP	25.8	9.2	9.4	30.8 28.8 30.1	1000	1
G-6	2-24-59	2-27-59	2-I-HP	26.0	9.0	9.3	32.8 31.0 31.8	750	min.
G-7	2-24-59	2-27-59	2-I-RP	26.1	9.3	9.6	32.4 29.8 30.8	700	1/2
G-8	2-25-59	3-2-59	2-J-GL	26.5	9.2	9.7	32.6 31.5 31.5	1000	1
G-9	2-26-59	3-2-59	2-K-HR	26.0	9.0	9.3	32.0 31.0 31.3	1000	1
G-10	3-3-59	3-16-59	45	25.6	9.3	9.8	31.2 29.0 30.1	750	min.
G-11	3-4-59	3-16-59	46	25.7	9.5	9.8	29.6 28.6 28.9	650	1/2
G-12	3-20-59	3-25-59	2-M	25.2	9.2	9.7	30.6 28.2 29.5	1000	1
G-13	3-21-59	3-25-59	2-N	26.0	9.3	9.8	32.2 29.6 30.7	1000	1-1/2
Current Machine Average				25.9	9.7		30.2		
Cumulative Machine Average				26.5	10.4		34.4		
Machine Factor, %				97.5	92.6		87.8		
Machine Index, %				95.4	94.1		91.3		

^a The evaluation of some of these rolls was sponsored independently and was not charged to the baseline study.

TABLE X
SUMMARY OF TEST RESULTS FOR MACHINE H
March, 1959

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Max. Speed at Min. Tension, f.p.m.	Max. Tension at 600 f.p.m., lb./in.			
					Max.	Min.	Max.	Min.	Max.	Min.					
H-1	2-27-59	3-10-59	165	28.3	10.1	9.5	9.8	44.4	37.2	41.3	37.8	35.6	37.1	300	—
H-2	3-2-59	3-10-59	166	29.5	11.0	10.1	10.5	43.8	37.2	40.8	36.0	34.0	35.5	200	—
H-3	3-5-59	3-16-59	167	29.8	10.7	9.7	10.1	43.2	39.6	41.5	Note a	Note a	Note a	Note a	Note a
H-4	3-10-59	3-16-59	168	31.3	11.2	10.7	10.9	49.8	40.8	46.0	Note a	Note a	Note a	Note a	Note a
Current Machine Average				29.7	10.3		10.3		42.4		36.3				
Cumulative Machine Average				28.8	9.9		9.9		37.8		33.8				
Machine Factor, %				103.4	103.8		103.8		112.2		107.3				
Machine Index, %				109.6	100.6		100.6		118.4		109.7				

^a Single-face flat crush could not be determined because the medium fractured even at a speed of less than 100 f.p.m.

TABLE XI
SUMMARY OF TEST RESULTS FOR MACHINE I
March, 1959

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points			Concora Flat Crush, p.s.i.			Single-Face Flat Crush, p.s.i.			Max. Speed at Min. Tension, at 600 f.p.m., f.p.m.		Runability Max. Tension at 600 f.p.m., lb./in.	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Max.	Min.
I-1	2-12-59	2-27-59	248	27.1	9.6	9.0	9.2	40.2	35.4	38.3	36.2	34.0	34.9	1000		1-1/2	
I-2	2-18-59	2-27-59	249	28.2	9.5	8.7	9.0	38.4	36.6	37.9	36.0	33.4	34.5	1000		1-1/2	
I-3	2-21-59	2-27-59	250	26.2	9.9	9.2	9.6	37.8	34.2	35.9	31.8	30.2	31.1	Note a		1/2	
I-4	2-21-59	3-10-59	251	27.6	9.9	9.1	9.6	38.4	35.4	37.0	32.8	30.8	31.6	1000		1-1/2	
I-5	2-22-59	3-10-59	252	27.1	9.7	8.8	9.4	38.4	34.8	36.0	32.4	30.2	31.6	1000		1-1/2	
I-6	2-22-59	3-10-59	253	26.9	9.6	9.0	9.3	40.8	35.4	38.3	33.6	30.6	32.3	1000		1-1/2	
I-7	2-23-59	3-10-59	254	27.6	9.5	9.0	9.2	37.8	33.6	35.9	34.6	32.8	33.7	600		1-1/2	
I-8	2-26-59	3-10-59	255	27.5	9.8	9.0	9.4	42.6	33.6	37.9	33.2	31.0	32.2	1000		1-1/2	
I-9	2-28-59	3-10-59	256	27.1	10.3	9.8	10.0	40.2	33.6	37.2	33.4	30.4	32.2	1000		1-1/2	
I-10	3-12-59	3-23-59	257	27.8	9.9	9.1	9.6	40.8	35.4	38.2	33.4	31.6	32.4	1000		1-1/2	
I-11	3-14-59	3-23-59	258	27.2	9.4	8.6	9.0	40.8	35.4	37.4	33.6	32.6	33.2	1000		1-1/2	
I-12	3-15-59	3-23-59	259	26.9	10.0	9.0	9.5	40.2	34.8	37.1	35.0	32.0	33.0	1000		1-1/2	
I-13	3-16-59	3-23-59	260	26.3	9.4	8.9	9.1	36.6	33.0	34.8	32.8	30.0	31.1	1000		1-1/2	
Current Machine Average					27.2		9.4			37.1			32.6				
Cumulative Machine Average					27.1		9.3			37.3			33.9				
Machine Factor, %					100.3		100.6			99.3			96.1				
Machine Index, %					100.2		91.4			103.5			98.5				

^a Insufficient material was available to evaluate the runability at speeds above 600 f.p.m.

TABLE XII
SUMMARY OF TEST RESULTS FOR MACHINE J
March, 1959

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Max. Speed at Min. Tension, f.p.m.	Runability at 600 f.p.m., lb./in.			
					Max.	Min.	Max.	Min.	Max.	Min.					
J-1	1-27-59	2-27-59	1736	27.2	10.1	9.9	10.0	34.8	32.4	33.8	32.0	30.2	30.7	1000	1-1/2
J-2	1-29-59	2-27-59	1852	28.1	9.9	9.4	9.7	34.2	30.6	32.4	30.8	29.2	29.8	1000	1-1/2
J-3	1-31-59	2-27-59	1994	26.8	10.2	9.9	10.0	33.6	31.2	32.0	31.0	27.8	28.5	1000	1-1/2
J-4	2-2-59	2-27-59	75	27.1	9.8	9.4	9.7	34.8	31.2	33.1	31.0	29.2	30.4	1000	1-1/2
J-5	2-6-59	3-10-59	407	26.6	10.2	9.8	10.0	36.6	30.6	33.8	32.2	28.4	29.7	1000	1-1/2
J-6	2-8-59	3-10-59	554	26.5	10.0	9.8	9.9	36.0	31.8	33.6	32.0	30.0	30.8	1000	1-1/2
J-7	2-26-59	3-24-59	1653	26.2	10.1	9.8	10.0	34.2	33.0	33.6	28.6	27.2	27.9	1000	1
J-8	2-28-59	3-24-59	1795	26.7	10.2	9.9	10.0	33.6	31.2	32.6	31.6	30.0	31.1	1000	1-1/2
Current Machine Average				26.9	9.9						33.1			29.9	
Cumulative Machine Average				26.6	9.7						34.6			32.7	
Machine Factor, %				101.2	102.0						95.8			91.3	
Machine Index, %				99.2	96.6						92.5			90.2	

TABLE XIII
SUMMARY OF TEST RESULTS FOR MACHINE K
March, 1959

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Runability	
					Max.	Min.	Max.	Min.	Max.	Min.	Max. Speed at Min. Tension, f.p.m.	Max. Tension at 600 f.p.m., lb./in.
K-1	2-24-59	3-3-59	448	27.2	11.0	9.8	42.0	37.8	37.6	35.0	1000	1-1/2
K-2	2-27-59	3-4-59	449	26.8	11.1	10.2	39.6	37.2	36.8	34.4	1000	1-1/2
K-3	3-3-59	3-10-59	450	26.9	11.0	10.3	42.6	37.8	40.0	36.8	1000	1-1/2
K-4	3-6-59	3-10-59	451	27.1	11.8	10.6	43.8	38.4	40.1	36.8	1000	1-1/2
K-5	3-10-59	3-16-59	452	27.0	11.7	10.6	44.4	38.4	39.5	36.6	1000	1-1/2
K-6	3-13-59	3-20-59	453	27.6	11.7	10.6	44.4	40.2	42.7	38.0	1000	1-1/2
K-7	3-17-59	3-20-59	454	27.5	11.7	10.4	44.4	39.0	42.2	36.0	1000	1-1/2
K-8	3-20-59	3-24-59	455	26.7	10.9	10.0	39.6	36.0	37.9	36.8	1000	1-1/2
Current Machine Average				27.1	10.8		40.2		35.7			
Cumulative Machine Average				26.7	10.8		40.1		37.0			
Machine Factor, %				101.7	100.0		100.1		96.4			
Machine Index, %				100.0	105.2		112.2		107.9			

TABLE XIV
SUMMARY OF TEST RESULTS FOR MACHINE L
March, 1959

L-1	2-24-59	3-2-59	18	26.9	11.0	10.4	10.7	39.6	34.8	37.0	32.4	31.2	31.7	1000
L-2	2-27-59	3-2-59	20	28.0	11.7	10.8	11.3	42.0	36.6	38.4	33.8	32.8	33.2	1000
L-3	3-3-59	3-12-59	24	26.8	11.1	10.7	10.9	37.2	33.6	35.3	32.6	30.6	31.9	1000
L-4	3-11-59	3-20-59	29	26.3	10.9	10.5	10.7	37.2	31.8	34.4	31.4	29.8	30.6	1000
Current Machine Average				27.0			10.9			36.3			31.8	
Cumulative Machine Average				26.3			10.4			36.2			33.3	
Machine Factor, %				102.7			104.2			100.2			95.6	
Machine Index, %				99.5			106.1			101.3			96.2	

TABLE XV
SUMMARY OF TEST RESULTS FOR MACHINE M^a
March, 1959

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Max. Speed at Min. Tension, f.p.m.	Runability Max. Tension at 600 f.p.m., lb./in.			
					Max.	Min.	Max.	Min.	Max.	Min.					
M-1	2-20-59	2-25-59	3-G-RP	27.4	9.8	9.2	9.5	38.4	35.4	36.7	32.8	31.2	32.2	1000	1
M-2	2-20-59	2-25-59	3-G-RP	26.7	9.9	9.0	9.3	36.0	33.0	34.6	32.0	30.8	31.4	1000	1
M-3	2-23-59	2-25-59	3-H-RP	26.7	10.0	9.4	9.6	34.8	30.6	33.1	31.8	30.2	30.8	900	1
M-4	2-23-59	2-25-59	3-H-RP	28.1	10.0	9.3	9.8	37.8	32.4	35.4	36.0	33.6	35.1	950	1
M-5	2-24-59	2-27-59	3-I-RP	26.1	9.2	9.0	9.1	38.4	34.8	36.4	35.0	30.8	32.8	1000	1
M-6	2-24-59	2-27-59	3-I-RP	26.1	9.7	9.1	9.4	33.0	30.6	31.8	31.8	29.6	30.8	1000	1
M-7	2-25-59	3-2-59	3-J-CL	27.2	10.0	9.3	9.8	37.8	36.0	37.2	32.8	30.0	31.3	1000	1-1/2
M-8	2-26-59	3-2-59	3-K-HR	26.4	9.9	9.4	9.7	39.0	34.2	37.4	32.6	30.4	31.4	1000	1-1/2
M-9	3-20-59	3-25-59	3-M	26.6	9.9	8.8	9.5	36.0	31.8	34.1	30.6	28.6	29.7	1000	1-1/2
M-10	3-21-59	3-25-59	3-M	27.0	9.6	8.8	9.2	38.4	33.0	35.3	33.6	32.6	33.1	1000	1-1/2
Current Machine Average				26.8			9.5			35.2			31.9		
Cumulative Machine Average				26.6			10.3			35.6			33.3		
Machine Factor, %				100.9			91.9			98.7			95.8		
Machine Index, %				98.9			92.6			98.3			96.3		

TABLE XVI
SUMMARY OF TEST RESULTS FOR MACHINE N
March, 1959

N-1	3-11-59	3-18-59	7	28.5	10.7	9.8	10.2	33.6	35.8	27.2	25.6	26.2	1000	1-1/2
N-2	3-11-59	3-18-59	8	27.5	10.3	9.4	10.0	32.4	34.1	25.0	22.2	23.9	1000	1-1/2
Current Machine Average				28.0			10.1		34.9			25.1		
Cumulative Machine Average				27.6			9.3		34.6			31.5		
Machine Factor, %				101.6			107.9		100.8			79.5		
Machine Index, %				103.2			98.1		97.5			75.8		

^a The evaluation of some of these rolls was sponsored independently and was not charged to the baseline study.

TABLE XVII
SUMMARY OF TEST RESULTS FOR MACHINE O^a
March, 1959

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Max. Speed at Min. Tension		Runability		
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.		Av.	Max. Speed at 600 f.p.m., lb./in.
0-1	2-20-59	2-25-59	1-G-RP	26.0	10.1	9.3	9.9	36.6	31.2	34.6	30.0	29.0	29.7	1000	1
0-2	2-20-59	2-25-59	1-G-RP	26.7	9.9	9.3	9.6	34.8	33.0	33.7	31.6	27.4	29.3	1000	1/2
0-3	2-23-59	2-25-59	1-H-RP	26.3	10.0	9.5	9.8	36.0	31.8	34.1	32.4	31.0	31.6	1000	1-1/2
0-4	2-23-59	2-25-59	1-H-RP	25.7	10.0	9.3	9.8	35.4	33.0	34.7	33.0	28.6	30.8	1000	1-1/2
0-5	2-24-59	2-27-59	1-I-RP	25.7	10.2	9.0	9.6	39.0	32.4	36.0	32.4	29.2	30.4	1000	1-1/2
0-6	2-24-59	2-27-59	1-I-RP	25.7	9.8	8.9	9.3	36.6	32.4	34.4	31.4	29.6	30.5	1000	1-1/2
0-7	2-25-59	3-2-59	1-J-GL	25.7	9.9	8.8	9.4	36.0	31.8	34.0	31.0	29.4	30.3	1000	1-1/2
0-8	2-26-59	3-2-59	1-K-HR	26.2	10.0	9.0	9.5	37.8	30.6	34.6	31.8	30.6	31.3	1000	1-1/2
0-9	3-3-59	3-16-59	29	26.7	10.2	9.6	10.0	36.6	32.4	34.8	32.2	29.4	30.6	900	1/2
0-10	3-4-59	3-16-59	30	26.5	10.4	9.9	10.0	35.4	33.0	34.0	33.0	29.0	31.4	900	1/2
0-11	3-12-59	3-19-59	38	26.0	10.2	9.7	10.0	35.4	31.8	34.2	32.4	30.6	31.8	1000	1-1/2
0-12	3-20-59	3-25-59	1-M	25.7	10.3	9.4	9.8	34.2	32.4	33.2	31.8	27.8	29.5	1000	1-1/2
0-13	3-21-59	3-25-59	1-N	26.0	10.2	9.3	9.8	34.8	29.4	32.4	31.6	26.8	29.5	1000	1-1/2
Current Machine Average															
Cumulative Machine Average				26.1	9.7		34.2		30.5		30.5		30.5		
Machine Factor, %				97.6	10.3		36.6		33.8		33.8		33.8		
Machine Index, %				96.1	94.9		93.5		90.3		90.3		90.3		
					94.9		95.5		92.2		92.2		92.2		

TABLE XVIII
SUMMARY OF TEST RESULTS FOR MACHINE P
March, 1959

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concore Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Max. Speed		Runability
					Max.	Min.	Max.	Min.	Max.	Min.	Av.	at Min. f.p.m.	
P-1	1-15-59	2-27-59	26	26.3	8.9	8.5	8.8	31.8	27.6	29.9	29.9	29.9	Note b
Current Machine Average													
Cumulative Machine Average				26.3	8.8		29.9		29.9		29.9		29.9
Machine Factor, %				26.4	9.3		32.7		32.7		32.7		32.7
Machine Index, %				99.7	94.1		91.3		91.3		91.3		91.3
				97.1	85.4		83.5		83.5		83.5		83.5

^a The evaluation of some of these rolls was sponsored independently and was not charged to the baseline study.

^b Single-face flat crush could not be determined because the medium fractured even at a speed of less than 100 f.p.m.

TABLE XIX
SUMMARY OF TEST RESULTS FOR MACHINE Q
March, 1959

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Max. Speed at Min. tension, f.p.m.		Runability Max. Tension at 600 f.p.m., lb./in.	
					Max.	Min.	Max.	Min.	Max.	Min.	Av.	Av.	Min.	Max.
Q-1	2-26-59	3-11-59	581	27.2	11.7	10.0	11.1	40.8	33.6	36.5	32.2	29.0	30.5	1000
Q-2	3-9-59	3-24-59	266	28.0	11.0	10.2	10.7	44.4	34.8	40.6	36.2	33.4	34.1	900
Q-3	3-10-59	3-25-59	299	26.8	11.0	9.6	10.7	39.6	37.8	38.9	35.4	33.4	34.1	650
Q-4	3-11-59	3-25-59	326	27.7	11.3	10.1	10.7	40.8	37.8	39.4	37.6	35.6	36.6	650
Q-5	3-12-59	3-25-59	358	25.6	11.3	10.7	11.0	39.0	34.2	36.6	32.0	28.4	30.3	650
Current Machine Average				27.0			10.8			38.4			33.1	
Cumulative Machine Average				26.9			10.8			38.4			35.4	
Machine Factor, %				100.5			100.0			100.0			93.6	
Machine Index, %				99.7			105.4			107.2			100.0	

TABLE XX
SUMMARY OF TEST RESULTS FOR MACHINE R
March, 1959

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Caliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Max. Speed at Min. tension, f.p.m.		Runability Max. Tension at 600 f.p.m., lb./in.	
					Max.	Min.	Max.	Min.	Max.	Min.	Av.	Av.	Min.	Max.
R-1	2-26-59	3-4-59	125	28.2	11.3	10.5	10.9	33.6	30.6	32.6	29.8	27.2	28.6	1000
R-2	2-26-59	3-4-59	126	28.3	11.3	10.2	10.9	32.4	30.0	31.4	29.2	27.8	28.4	1000
R-3	3-18-59	3-25-59	131	26.1	9.7	8.3	9.1	31.8	24.6	28.4	27.8	24.6	26.3	1000
R-4	3-18-59	3-25-59	132	26.2	10.1	9.2	9.8	33.0	26.4	28.6	28.6	26.2	27.2	1000
Current Machine Average				27.2			10.2			30.3			27.6	
Cumulative Machine Average				27.6			10.5			33.1			30.8	
Machine Factor, %				98.6			96.9			91.4			89.8	
Machine Index, %				100.4			99.2			84.5			83.6	

DISCUSSION OF CONCORA FLAT CRUSH TEST RESULTS OBTAINED AT
THE INSTITUTE OF PAPER CHEMISTRY AND THOSE OBTAINED AT THE MILLS

In Table XXI a comparison of I.P.C. and mill Concora flat crush test results is given for the month of March. These comparisons were initiated in Progress Report 30 and permit interested participants to submit their Concora flat crush test results to The Institute of Paper Chemistry so that comparative results may be included in the monthly reports. Data sheets for supplying this information may be obtained from the Institute. Comparisons of this kind are a helpful adjunct to other calibration procedures. It may be noted in Table XXI that fifteen of the eighteen participating machines are included in this comparison of Concora flat crush data. Shown in Table XXI are the I.P.C. and mill Concora averages for each roll included in this comparison. In a few cases mill averages were not submitted for all rolls. In these instances, the current machine average based on I.P.C. data included only those rolls for which mill data were received. The average difference between the current machine average based on I.P.C. data and that based on mill data is shown in Table XXI for each machine. For each roll the difference between the average Concora result based on I.P.C. data and that based on mill data is also shown. The plus or minus sign denotes whether the mill average was higher or lower than the I.P.C. average.

TABLE XXI
COMPARISON OF INSTITUTE AND MILL CONCORA FLAT CRUSH TEST RESULTS ON INDIVIDUAL ROLLS FOR MARCH, 1959

Machine A				Machine B				Machine C			
Code	Roll No.	Date Made	Concora Flat Crush, P.s.i. Difference	Code	Roll No.	Date Made	Concora Flat Crush, P.s.i. Difference	Code	Roll No.	Date Made	Concora Flat Crush, P.s.i. Difference
A-1	291	2-19-59	42.6	B-1	127	3- 5-59	36.7	C-1	129	3-11-59	37.0
A-2	292	2-24-59	40.8	B-2	128	3- 5-59	37.1	C-2	130	3-11-59	35.6
A-3	293	2-26-59	40.3								
A-4	294	3- 4-59	41.5								
A-5	295	3- 5-59	40.1								
A-6	296	3-12-59	42.1								
A-7	297	3-14-59	41.6								
A-8	298	3-18-59	39.7								
Current Machine Av.	40.6		40.6	0.0	Current Machine Av.	36.9	36.1	-0.8	Current Machine Av.	36.3	38.6
											+2.3
Machine D				Machine E				Machine F			
Code	Roll No.	Date Made	Concora Flat Crush, P.s.i. Difference	Code	Roll No.	Date Made	Concora Flat Crush, P.s.i. Difference	Code	Roll No.	Date Made	Concora Flat Crush, P.s.i. Difference
D-1	150	2-17-59	36.8	F-1	1620	1-25-59	35.0	G-1	44	2-11-59	33.0
D-2	151	2-19-59	34.6	F-2	2013	1-30-59	31.8	G-10	45	3- 3-59	31.7
D-3	152	2-21-59	36.0	F-3	36	2- 1-59	33.4	G-11	46	3- 4-59	31.8
D-4	153	2-22-59	37.4	F-4	322	2- 4-59	34.1				
D-5	154	2- 28-59	31.2	F-5	516	2- 7-59	38.0				
D-6	155	3- 3-59	34.9	F-6	883	2-12-59	34.1				
D-7	156	3- 9-59	34.0	F-7	1632	2-23-59	40.2				
D-8	157	3-15-59	31.8	F-8	1775	2-25-59	33.0				
D-9	158	3-16-59	33.7								
Current Machine Av.	34.5		37.3	+2.8	Current Machine Av.	35.0	38.7	+3.7	Current Machine Av.	32.2	39.4
											+7.2

a. The difference given here is the amount in p.s.i. units by which the mill result is higher or lower than the Institute result.

TABLE XXI--Continued
COMPARISON OF INSTITUTE AND MILL CONCORDA FLAT CRUSH TEST RESULTS ON INDIVIDUAL ROLLS FOR MARCH, 1959

Machine H				Machine I				Machine J			
Code	Roll No.	Date Made	Concorda Flat Crush, P.s.i. Difference ^a	Code	Roll No.	Date Made	Concorda Flat Crush, P.s.i. Difference ^a	Code	Roll No.	Date Made	Concorda Flat Crush, P.s.i. Difference ^a
H-1	165	2-27-59	41.3	I-1	248	2-12-59	38.3	J-1	1736	1-27-59	33.8
H-2	166	3-2-59	40.8	I-2	249	2-18-59	37.9	J-2	1832	1-29-59	32.4
H-3	167	3-5-59	41.5	I-3	250	2-21-59	35.9	J-3	1994	1-31-59	32.0
H-4	168	3-10-59	46.0	I-4	251	2-21-59	37.0	J-4	75	2-2-59	33.1
				I-5	252	2-22-59	36.0	J-5	407	2-6-59	33.8
				I-6	253	2-22-59	38.3	J-6	554	2-8-59	33.6
				I-7	254	2-23-59	35.9	J-7	1653	2-26-59	33.6
				I-8	255	2-26-59	37.9	J-8	1795	2-28-59	32.6
				I-9	256	2-28-59	37.2				
				I-10	257	3-12-59	38.2				
				I-11	258	3-14-59	37.4				
				I-12	259	3-15-59	37.1				
				I-13	260	3-16-59	34.8				
Current Machine Av.	42.4	37.7	-4.7	Current Machine Av.	37.1	38.4	+1.3	Current Machine Av.	33.1	35.9	+2.8
Machine K				Machine L				Machine M			
Code	Roll No.	Date Made	Concorda Flat Crush, P.s.i. Difference ^a	Code	Roll No.	Date Made	Concorda Flat Crush, P.s.i. Difference ^a	Code	Roll No.	Date Made	Concorda Flat Crush, P.s.i. Difference ^a
K-1	448	2-24-59	40.1	L-1	18	2-24-59	37.0	M-1	7	3-11-59	35.8
K-2	449	2-27-59	38.9	L-2	20	2-27-59	38.4	M-2	8	3-11-59	34.1
K-3	450	3-3-59	40.0	L-3	24	3-3-59	35.3				
K-4	451	3-6-59	40.1	L-4	29	3-11-59	34.4				
K-5	452	3-10-59	39.5								
K-6	453	3-13-59	42.7								
K-7	454	3-17-59	42.2								
K-8	455	3-20-59	37.9								
Current Machine Av.	40.2	42.0	+1.8	Current Machine Av.	36.3	37.6	+1.3	Current Machine Av.	34.9	36.2	+1.3
Machine O				Machine P				Machine R			
Code	Roll No.	Date Made	Concorda Flat Crush, P.s.i. Difference ^a	Code	Roll No.	Date Made	Concorda Flat Crush, P.s.i. Difference ^a	Code	Roll No.	Date Made	Concorda Flat Crush, P.s.i. Difference ^a
O-9	29	3-3-59	34.8	P-1	581	2-26-59	36.5	R-1	125	2-26-59	32.6
O-10	30	3-4-59	34.0	P-2	266	3-9-59	40.6	R-2	126	2-26-59	31.4
O-11	38	3-12-59	34.2	P-3	299	3-10-59	38.9	R-3	131	3-18-59	28.4
				P-4	326	3-11-59	39.4	R-4	132	3-18-59	28.6
				P-5	358	3-12-59	36.6				
Current Machine Av.	34.3	42.7	+8.4	Current Machine Av.	38.4	36.5	-1.9	Current Machine Av.	30.3	30.6	+0.3

The data shown in Table XXI are summarized in Part I of Table XXII where for each machine the following information is given: (1) Current machine average based on I.P.C. data, (2) current machine average based on mill data, (3) the average difference--that is, the difference between the current machine average based on I.P.C. data and that based on mill data and (4) the maximum difference encountered in comparing I.P.C. and mill test averages for individual rolls. In Part II of Table XXII the average difference of Part I has been converted to per cent by dividing it by the I.P.C. average and multiplying the result by 100. The average differences in per cent for the current report and the two preceding reports are shown. It may be seen that the highest average difference of 24.5% was associated with Machine O for the current period and the lowest of 0% with Machine A. Differences greater than ten per cent were noted for Machines F, G, H, and O. The differences associated with Machines G and O may be accounted for in part by the fact that the results were obtained on specimens which had not been conditioned after they were fluted. The differences for Machines F and H, however, may not be accounted for in this way.

TABLE XXII
PART I: A COMPARATIVE SUMMARY FOR EACH MACHINE OF THE CONCORDA FLAT CRUSH AVERAGES BASED ON
I.P.C. DATA AND THOSE BASED ON MILL DATA

Machine Code	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
No. of Rolls Compared	8	2	2	9	0	8	3	4	13	8	8	4	0	2	3	0	5	4
Concorda Flat Crush, p.s.i.																		
Current Machine Av. (I.P.C.) ^a	40.6	36.9	36.3	34.5	--	35.0	32.2	42.4	37.1	33.1	40.2	36.3	--	34.9	34.3	--	38.4	30.3
Current Machine Av. (Mill) ^a	40.6	36.1	38.6	37.3	--	38.7	39.4	37.7	38.4	35.9	42.0	37.6	--	36.2	42.7	--	36.5	30.6
Average Difference ^b	0.0	-0.8	+2.3	+2.8	--	+3.7	+7.2	-4.7	+1.3	+2.8	+1.8	+1.3	--	+1.3	+8.4	--	-1.9	+0.3
Maximum Difference ^c	+4.2	-0.9	+2.8	+7.4	--	+7.9	+8.6	-8.2	+3.2	+6.1	+4.1	+3.1	--	+2.9	+11.4	--	-5.5	+4.1

PART II. A TABULATION FOR EACH MACHINE OF THE AVERAGE DIFFERENCE (PER CENT) BETWEEN THE CONCORDA
FLAT CRUSH AVERAGE BASED ON I.P.C. DATA AND THAT BASED ON MILL DATA

Average Difference, % ^d	0	-2.2	+6.3	+8.1	--	+10.6	+22.4 ^e	-11.1	+3.5	+8.5	+4.5	+3.6	--	+3.7	+24.5 ^e	--	-4.9	+1.0
Current Report	-4.4	-5.3	+17.4	+8.5	--	+8.2	+20.7 ^e	-11.0	+4.3	+8.5	+2.5	-1.1	+36.7 ^e	+2.4	+21.8 ^e	--	+2.2	-4.3
39th Report	-2.4	+3.5	+10.1	-2.1	--	+2.4	+23.4 ^e	-10.7	-0.5	+4.7	+3.7	-0.6	+22.2 ^e	+1.1	--	--	+12.6	-5.3

^a Comparisons based on current machine averages include only those rolls for which mill data were submitted.

^b Average difference is the difference between the current machine average based on I.P.C. test results and that based on mill test results with the I.P.C. test results used as the reference. See Table XXI.

^c Maximum difference is the greatest difference encountered in comparing I.P.C. and mill test averages for individual rolls. See Table XXI.

^d Average difference (per cent) is computed by dividing the average difference in P.S.I. (shown above in Part I of this table) by the I.P.C. current machine average and multiplying the result by 100 to obtain the average difference in per cent.

^e Concorda specimens evaluated by this mill were not conditioned.

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