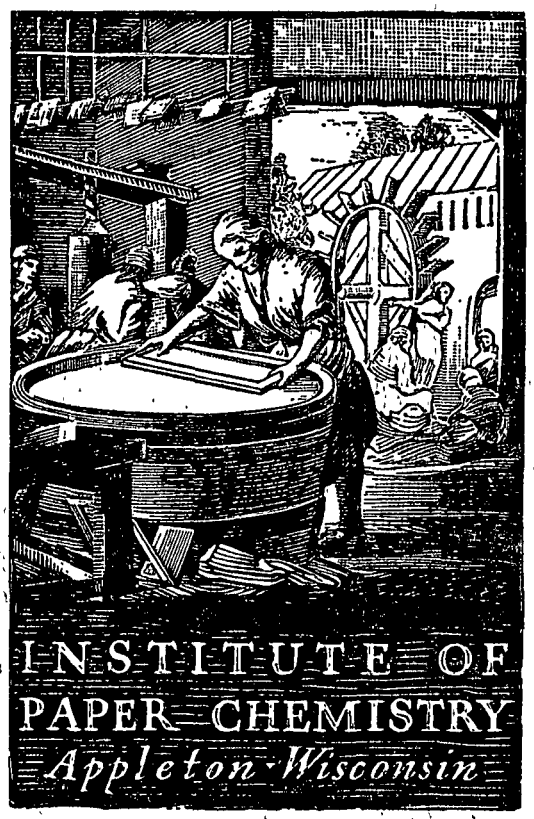


CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

Project 1108-17

Progress Report Thirty-four

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

October 1, 1958

SCRAMBLED CODE IDENTITIES FOR THE CONTINUOUS EVALUATION OF CORRUGATING MEDIUM, PROGRESS REPORT 34, PROJECT 1108-17

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

* This machine was identified as No. 1 in some of the previous reports.

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

Project 1108-17

Progress Report Thirty-four

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

October 1, 1958

TABLE OF CONTENTS

TABLE OF CONTENTS--Continued

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 <u>different</u> days. Each roll is 10 to 12 inches wide and contains approximately 2,500 lineal feet of medium (approximately 20 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 September, ninety-four 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.

Six machines did not submit any rolls for evaluation during the current period and therefore are not included in any of the tabulations. Four of these six machines have not submitted rolls for a period of six months or longer.

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

TABLE I

NUMBER OF ROLLS OF CORRUGATING MEDIUM SUBMITTED

FOR EVALUATION FROM EACH MACHINE

Machine Code	Number of Rolls
A	4
B	5
C	4
D	6
E	9
F	11
G	8
H	5
I	2
J	2
K	2
L	10
M	1
N	5
O	9
P	1
Q	9
R	1
Total	94

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.

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.

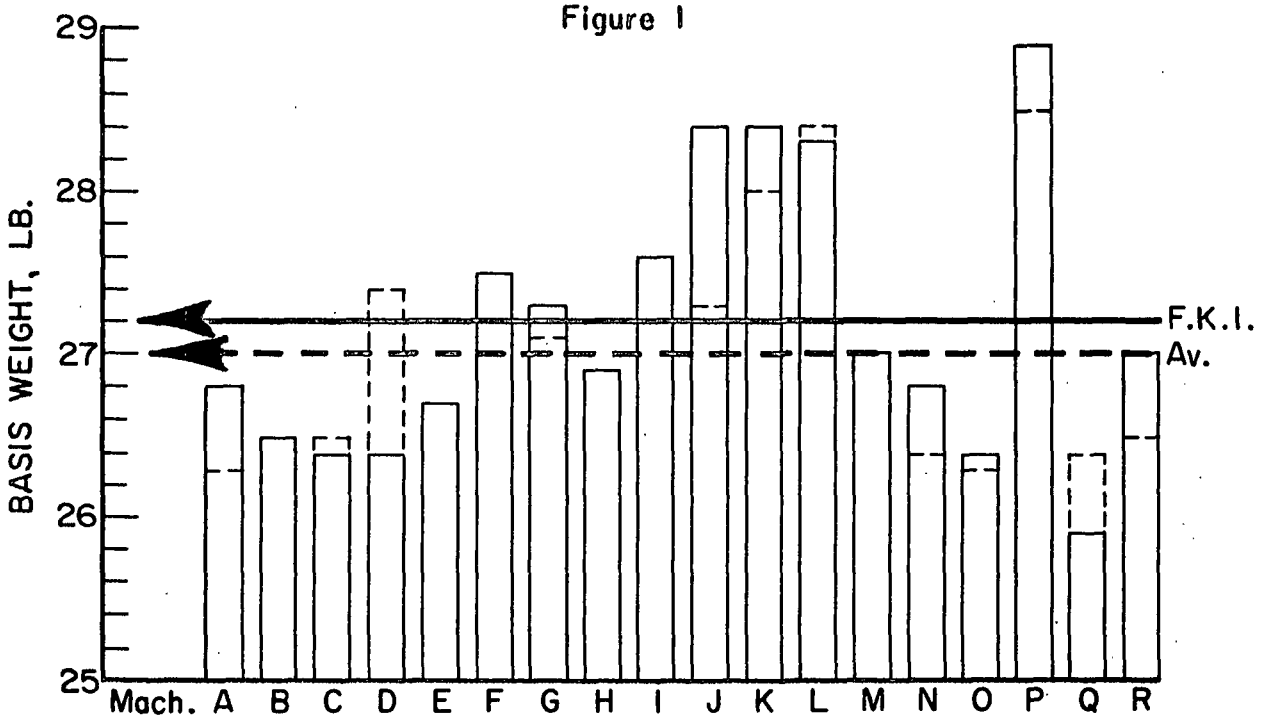
The average test results obtained on the samples of corrugating medium submitted by each participant (current machine averages) are shown in Table II and graphically presented in Figures 1 to 4. In addition to a comparison of the test data obtained for the various machines, Table II also presents the 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

TABLE II

SUMMARY OF CURRENT MACHINE AVERAGES
September, 1958

Machine Code	Basis Weight, lb.	Caliper, points	Concora Flat Crush, p.s.i.	Single-Face Flat Crush, p.s.i.
A	26.8	10.4	37.4	35.7
B	26.5	10.7	34.8	31.4
C	26.4	10.8	33.7	33.3
D	26.4	10.2	30.2	29.3
E	26.7	10.8	38.5	36.1
F	27.5	9.2	33.0	32.5
G	27.3	10.2	36.9	34.9
H	26.9	9.1	35.7	33.6
I	27.6	10.3	36.6	33.1
J	28.4	10.7	33.0	32.8
K	28.4	11.6	33.5	31.6
L	28.3	10.4	32.6	32.1
M	27.0	10.4	34.0	35.1
N	26.8	10.4	37.5	34.5
O	26.4	9.8	32.4	31.7
P	28.9	9.9	34.8	32.8
Q	25.9	9.9	32.6	31.7
R	27.0	10.2	38.0	34.0
Current F.K.I. Average	27.2	10.3	34.7	33.1
Cumulative F.K.I. Average	27.0	10.3	35.0	34.7
F.K.I. Index, %	100.6	100.0	99.1	95.4

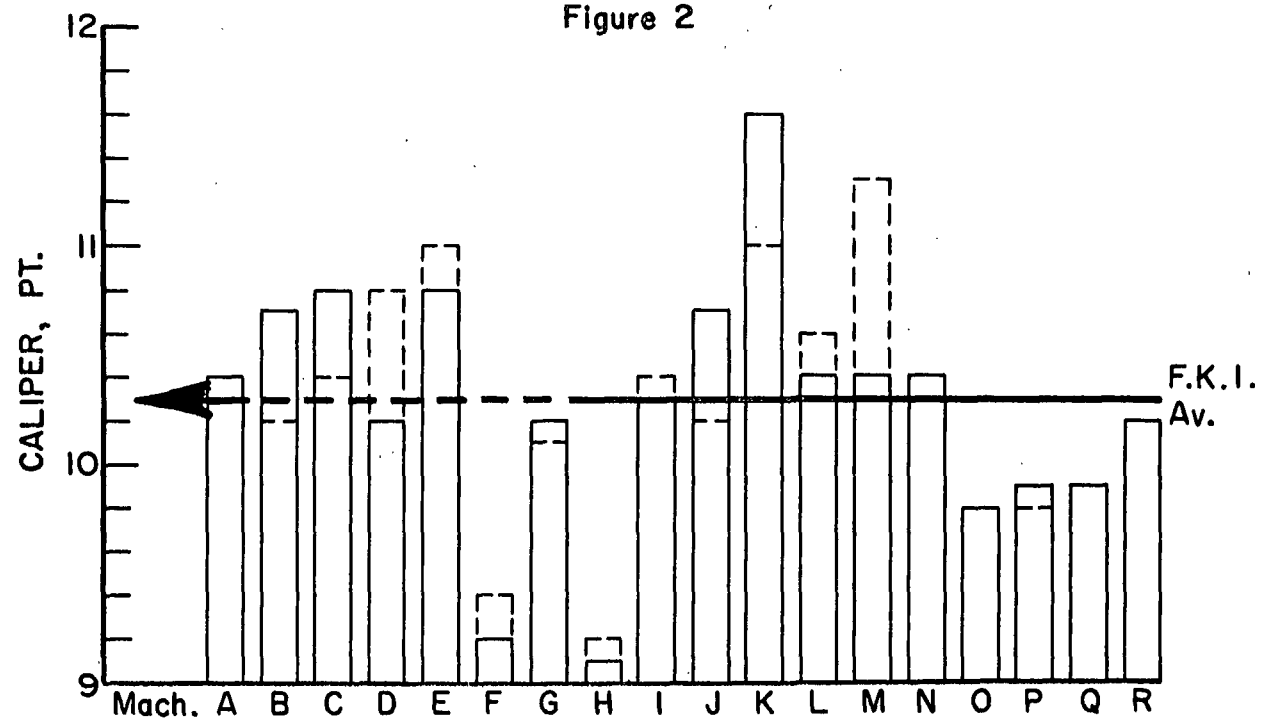
Figure 1



COMPARISON OF BASIS WEIGHT RESULTS

September, 1958

Figure 2



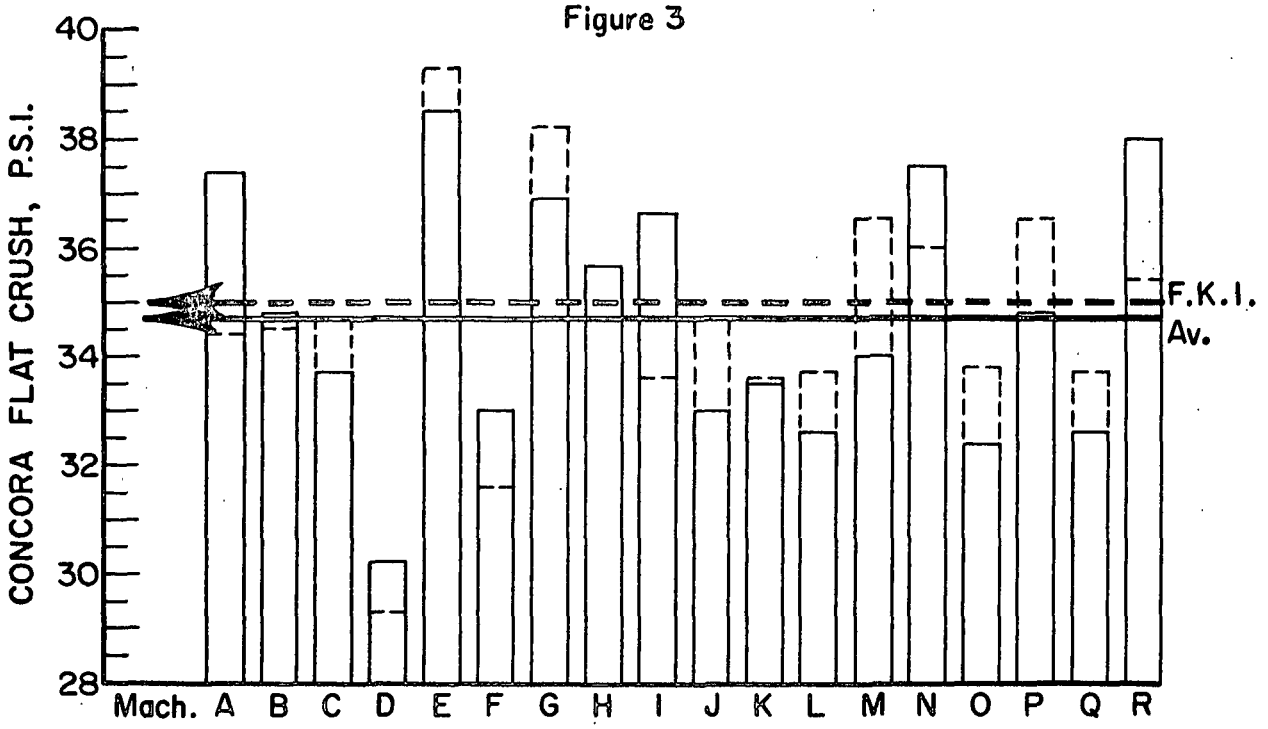
COMPARISON OF CALIPER RESULTS

September, 1958

——— Current machine average

– – – – – Cumulative machine average

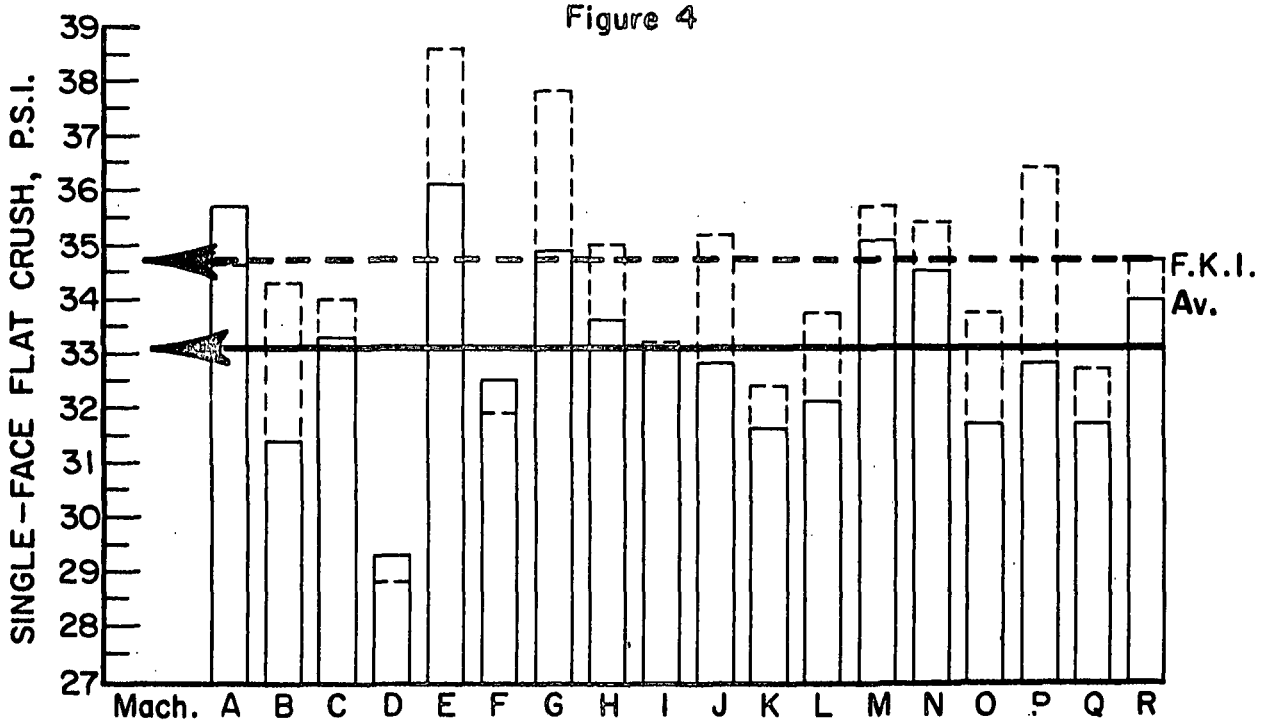
Figure 3



COMPARISON OF CONCORA FLAT CRUSH RESULTS

September, 1958

Figure 4



COMPARISON OF SINGLE-FACE FLAT CRUSH RESULTS

September, 1958

——— Current machine average

- - - - - Cumulative machine average

obtained as follows:

$$\frac{\text{current } F_oK_oI_o \text{ average}}{\text{cumulative } F_oK_oI_o \text{ average}} \times 100 = F_oK_oI_o \text{ index } (\%)$$

The $F_oK_oI_o$ 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.

In Table II the current machine averages for the month of September 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 Q to a high of 28.9 lb. for Machine P. The current $F_oK_oI_o$ average for basis weight was 27.2 lb. and the cumulative $F_oK_oI_o$ average was 27.0 lb. The relationship between these two results is described by the $F_oK_oI_o$ index which was 100.6% and indicates that the current $F_oK_oI_o$ average is slightly higher than the cumulative $F_oK_oI_o$ average. With the one exception of Machine Q, the average basis weight value for each of the eighteen machines was above 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 9.1 points was associated with Machine H and the highest average of 11.6 points with Machine K. The current $F_oK_oI_o$ average of 10.3 points was the same as the cumulative $F_oK_oI_o$ average. The $F_oK_oI_o$ index, therefore, was 100.0%. The minimum caliper requirement of 9 points specified in Rule 41 was met by all participants.

The Concora flat crush averages for September are presented graphically in Figure 3 and in tabular form in Table II. An inspection of these results reveals that 38.5 p.s.i. was the highest average and 30.2 p.s.i. the lowest. Machine E was associated with the highest average and Machine D with the lowest. The current F.K.I. average of 34.7 p.s.i. was slightly lower than the cumulative F.K.I. average of 35.0 p.s.i. The F.K.I. index was 99.1%.

The highest single-face flat crush average of 36.1 p.s.i. was obtained for Machine E and the lowest of 29.3 p.s.i. for Machine D. These data are shown in Table II and presented graphically in Figure 4. The current F.K.I. average was 33.1 p.s.i., whereas the cumulative F.K.I. average was 34.7 p.s.i. The F.K.I. index was 95.4%.

For the current period, the current F.K.I. average for basis weight was higher than its cumulative F.K.I. average, the current F.K.I. averages for Concora flat crush and single-face flat crush were lower than their respective cumulative F.K.I. averages, and the current F.K.I. average for caliper was the same as its 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
September, 1958

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. Speed at Min. Tension, f.p.m.	Runability: Max. Tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
A-1	8-22-58	8-29-58	17	26.6	11.0	9.9	10.3	37.8	34.8	36.1	36.8	35.2	36.0	800	1/2
A-2	8-26-58	8-29-58	18	26.7	10.6	10.1	10.4	36.6	33.6	35.6	36.4	34.2	35.3	1000	1
A-3	8-29-58	9-12-58	19	27.1	10.8	10.2	10.6	39.6	36.0	37.7	38.2	34.0	35.8	Note a.	1/2
A-4	9-4-58	9-12-58	20	26.7	10.8	10.1	10.4	42.0	37.8	40.0	36.6	33.2	35.7	Note a.	1/2
Current Machine Average				26.8			10.4			37.4			35.7		
Cumulative Machine Average				26.3			10.4			34.4			34.6		
Machine Factor, %				101.7			100.0			108.6			103.2		
Machine Index, %				99.0			101.4			106.6			102.9		

TABLE IV

SUMMARY OF TEST RESULTS FOR MACHINE B
September, 1958

B-1	8-22-58	9- 3-58	108	26.2	10.9	10.3	10.6	37.8	34.2	36.1	33.2	30.4	31.6	1000	1
B-2	8-23-58	9- 3-58	109	25.8	10.6	10.1	10.3	37.2	34.2	36.4	32.8	31.4	32.3	1000	1
B-3	8-26-58	9- 3-58	110	26.8	11.9	10.2	11.2	36.0	32.4	34.0	30.6	28.6	29.8	1000	1
B-4	8-27-58	9- 3-58	111	26.7	11.1	9.8	10.7	42.6	30.6	36.0	36.4	33.0	35.0	1000	1
B-5	9- 4-58	9-12-58	112	26.9	10.9	10.0	10.6	34.2	30.0	31.8	29.0	28.0	28.4	950	1
a-															
Current Machine Average				26.5			10.7			34.8			31.4		
Cumulative Machine Average				26.5			10.2			34.5			34.3		
Machine Factor, %				100.0			104.9			101.1			91.5		
Machine Index, %				98.0			104.0			99.4			90.5		

[a] Insufficient paper was available to evaluate this roll for maximum speed.

TABLE V

SUMMARY OF TEST RESULTS FOR MACHINE C
September, 1958

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. Speed at Min. Tension, f.p.m.	Runability: Max. Tension at 600 f.p.m. lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
C-1	8-20-58	8-29-58	18	26.3	11.1	10.2	10.7	33.0	30.6	31.8	36.0	32.6	34.6	Note a.	Min.
C-2	8-26-58	9-12-58	19	26.2	11.1	10.2	10.6	36.0	30.0	33.0	35.0	31.4	33.2	Note a.	Min.
C-3	8-28-58	9-12-58	20	26.6	11.6	10.8	11.2	35.4	33.6	34.6	33.4	29.2	31.8	Note a.	Min.
C-4	9- 3-58	9-15-58	21	26.4	11.2	10.3	10.8	38.4	33.0	35.4	34.4	32.8	33.6	Note a.	Min.
Current Machine Average				26.4			10.8			33.7			33.3		
Cumulative Machine Average				26.5			10.4			34.7			34.0		
Machine Factor, %				99.6			103.7			97.1			97.8		
Machine Index, %				97.6			105.3			96.1			95.9		

TABLE VI

SUMMARY OF TEST RESULTS FOR MACHINE D
September, 1958

D-1	—	8-29-58	27	26.9	10.8	10.4	10.6	32.4	28.2	30.5	32.4	29.8	31.1	Note a.	1-1/2
D-2	—	8-29-58	28	25.5	10.7	9.9	10.3	30.0	26.4	27.6	30.4	25.6	27.8	1000	1/2
D-3	—	8-29-58	29	27.4	10.6	10.0	10.3	33.0	30.0	31.8	30.4	26.0	28.8	1000	1
D-4	—	8-29-58	30	26.1	10.4	9.6	9.8	31.8	29.4	30.6	29.8	27.6	28.9	1000	1/2
D-5	—	9-12-58	31	26.4	10.5	10.0	10.3	32.4	29.4	30.6	30.8	28.6	29.9	1000	1-1/2
D-6	—	9-12-58	32	26.2	10.2	9.7	9.9	31.2	29.4	30.2	29.6	28.2	29.0	1000	1-1/2
Current Machine Average				26.4			10.2			30.2			29.3		
Cumulative Machine Average				27.4			10.8			29.3			28.8		
Machine Factor, %				96.4			94.6			103.1			101.5		
Machine Index, %				97.7			99.3			86.2			84.3		

[a] Insufficient paper was available to evaluate this roll for maximum speed.

TABLE VII

SUMMARY OF TEST RESULTS FOR MACHINE E
September, 1958

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 at Min. Tension, Max. Speed f.p.m.	Runability at 600 f.p.m., Max. Tension lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
E-1	8-19-58	8-22-58	397	26.9	11.0	10.0	10.6	42.0	36.6	40.1	40.4	37.0	38.7	1000	1
E-2	8-22-58	8-29-58	398	26.9	12.6	10.3	11.2	42.6	38.4	40.8	38.0	35.6	37.2	1000	1
E-3	8-26-58	9- 2-58	399	26.7	12.1	10.3	10.9	37.2	34.8	36.1	36.2	32.4	34.2	1000	1
E-4	8-29-58	9-12-58	400	26.6	11.3	10.4	10.8	46.2	37.2	39.6	38.8	33.2	35.8	Note a.	Min.
E-5	9- 3-58	9-12-58	401	26.5	11.1	10.6	10.8	39.0	34.2	36.6	36.8	35.6	36.1	Note a.	1
E-6	9- 6-58	9-15-58	402	26.4	11.4	10.2	10.8	42.0	36.6	39.6	37.0	35.8	36.3	Note a.	1-1/2
E-7	9- 9-58	9-17-58	403	26.6	10.9	10.0	10.4	39.0	36.6	37.2	36.0	33.6	34.9	1000	1
E-8	9-12-58	9-22-58	404	27.1	11.0	10.3	10.7	44.4	36.0	40.4	39.2	36.8	38.0	1000	1
E-9	9-16-58	9-22-58	405	26.5	11.0	10.5	10.8	36.6	33.0	35.6	34.2	33.4	33.8	1000	1
Current Machine Average				26.7			10.8			38.5			36.1		
Cumulative Machine Average				26.7			11.0			39.3			38.6		
Machine Factor, %				100.0			98.3			97.7			93.6		
Machine Index, %				98.7			105.0			109.7			104.1		

[a] Insufficient paper was available to evaluate this roll for maximum speed.

TABLE VIII

SUMMARY OF TEST RESULTS FOR MACHINE F
September, 1958

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.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	Max. Speed at Min. Tension, f.p.m.	Max. Tension at 600 f.p.m., lb./in.
F-1	8-13-58	9- 2-58	199	26.9	9.8	9.2	9.6	39.0	34.8	37.9	35.0	33.8	34.3	800	1/2
F-2	8-24-58	9- 2-58	200	26.8	9.7	9.2	9.4	40.2	35.4	37.7	37.8	31.6	33.9	1000	1
F-3	8-22-58	9- 2-58	62	27.4	9.2	8.8	9.1	32.4	30.0	31.8	34.6	32.2	33.6	Note a.	1-1/2
F-4	8-22-58	9- 2-58	63	27.2	9.3	8.8	9.1	36.6	32.4	34.3	34.4	32.6	33.3	1000	1
F-5	8-22-58	9- 2-58	64	27.1	9.6	8.8	9.1	35.4	30.6	32.6	34.4	33.2	33.7	Note a.	1/2
F-6	9- 3-58	9-15-58	65	26.6	9.4	8.9	9.2	34.2	25.8	28.0	28.8	27.6	28.3	600	Min.
F-7	9- 3-58	9-15-58	66	27.6	9.2	8.9	9.0	34.8	30.0	32.3	31.6	29.0	30.2	700	Min.
F-8	9- 3-58	9-15-58	67	27.1	9.2	8.8	9.0	33.6	30.6	31.8	31.2	28.4	30.1	750	1
F-9	9- 8-58	9-22-58	68	28.8	9.7	9.0	9.4	35.4	27.0	31.6	35.2	31.6	33.6	950	1
F-10	9- 8-58	9-22-58	69	28.5	9.3	9.0	9.2	33.6	30.6	32.4	33.6	30.6	32.2	750	Min.
F-11	9- 8-58	9-22-58	70	28.9	9.8	9.0	9.3	34.2	30.6	32.8	34.4	33.4	33.9	1000	1
Current Machine Average				27.5			9.2			33.0			32.5		
Cumulative Machine Average				27.2			9.4			31.6			31.9		
Machine Factor, %				101.1			98.6			104.5			101.7		
Machine Index, %				101.8			89.7			94.2			93.5		

[a] Insufficient paper was available to evaluate this roll for maximum speed.

TABLE IX

SUMMARY OF TEST RESULTS FOR MACHINE G
September, 1958

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. Speed at Min. Tension, f.p.m.	Runability: Max. Tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
G-1	8-12-58	8-22-58	242	26.7	10.2	9.6	9.9	40.2	34.8	37.9	34.0	32.8	33.5	Note a.	1-1/2
G-2	8-15-58	8-22-58	243	26.5	10.4	9.7	10.0	38.4	35.4	36.7	32.0	31.0	31.7	1000	1
G-3	8-19-58	8-25-58	244	28.0	10.9	10.2	10.4	40.8	36.0	37.4	36.6	34.4	35.6	1000	1
G-4	8-27-58	9- 3-58	245	26.7	10.6	9.6	10.1	39.0	33.0	35.9	36.2	34.6	35.4	Note a.	1-1/2
G-5	9- 2-58	9-12-58	246	28.0	10.3	9.9	10.1	43.8	37.8	41.5	39.6	36.8	38.2	900	1
G-6	9- 4-58	9-15-58	247	27.6	10.7	10.0	10.2	38.4	34.2	36.4	35.8	33.4	34.7	1000	1
G-7	9-10-58	9-22-58	248	27.7	10.8	10.2	10.5	34.8	33.0	34.2	36.0	34.6	35.5	1000	1
G-8	9-12-58	9-22-58	249	27.4	11.0	10.0	10.3	36.6	33.0	35.3	34.6	34.0	34.3	800	1
Current Machine Average				27.3			10.2			36.9			34.9		
Cumulative Machine Average				27.1			10.1			38.2			37.8		
Machine Factor, %				100.8			100.6			96.5			92.1		
Machine Index, %				101.1			99.2			105.3			100.4		

[a] Insufficient paper was available to evaluate this roll for maximum speed.

TABLE X

SUMMARY OF TEST RESULTS FOR MACHINE H
September, 1958

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. Speed at Min. tension f.p.m.	Runability Max. Tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
H-1	8-24-58	9- 2-58	201	27.5	9.1	8.3	8.7	43.2	36.0	39.8	36.0	34.0	35.0	1000	1
H-2	8-28-58	9-15-58	202	26.5	9.8	9.1	9.4	36.0	30.0	32.0	34.0	32.2	33.1	900	1/2
H-3	9- 9-58	9-22-58	203	26.9	9.5	8.8	9.1	39.0	33.0	36.4	35.4	31.4	33.5	900	1/2
H-4	9-14-58	9-22-58	204	27.0	10.2	9.0	9.7	38.4	29.4	35.6	34.4	32.8	33.6	950	1
H-5	9-14-58	9-22-58	205	26.7	9.0	8.0	8.7	37.2	31.8	34.8	33.4	32.0	32.6	1000	1/2
Current Machine Average				26.9			9.1			35.7			33.6		
Cumulative Machine Average				26.9			9.2			35.7			35.0		
Machine Factor, %				100.0			99.7			100.0			95.8		
Machine Index, %				99.6			88.8			102.0			96.7		

TABLE XI

SUMMARY OF TEST RESULTS FOR MACHINE I
September, 1958

I-1	8-20-58	8-28-58	71	28.2	10.4	10.0	10.2	39.6	37.2	37.8	35.4	32.2	33.8	750	Min.
I-2	8-22-58	8-28-58	72	27.0	10.8	10.2	10.4	37.2	32.4	35.4	33.2	31.6	32.5	850	Min.
Current Machine Average				27.6			10.3			36.6			33.1		
Cumulative Machine Average				27.6			10.4			33.6			33.2		
Machine Factor, %				100.0			99.2			108.8			99.8		
Machine Index, %				102.2			100.5			104.4			95.5		

TABLE XII

SUMMARY OF TEST RESULTS FOR MACHINE J
September, 1958

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. Speed at Min. Tension f.p.m.	Runability: Max. Tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
J-1	8-29-58	9- 3-58	73	28.6	11.2	10.6	10.9	33.0	27.6	31.4	34.8	31.0	32.8	Note a.	1-1/2
J-2	8-29-58	9- 3-58	74	28.1	10.9	10.4	10.6	36.6	31.8	34.6	34.2	31.6	32.7	1000	1
Current Machine Average				28.4			10.7			33.0			32.8		
Cumulative Machine Average				27.3			10.2			34.7			35.2		
Machine Factor, %				103.9			105.6			95.2			93.1		
Machine Index, %				104.9			104.5			94.2			94.5		

TABLE XIII

SUMMARY OF TEST RESULTS FOR MACHINE K
September, 1958

K-1	9- 3-58	9-12-58	75	27.9	11.8	11.0	11.5	36.6	33.6	35.2	29.8	27.6	29.0	Note a.	1-1/2
K-2	9- 3-58	9-12-58	76	29.0	12.2	11.5	11.8	34.2	28.8	31.9	35.8	33.2	34.3	1000	1-1/2
Current Machine Average				28.4			11.6			33.5			31.6		
Cumulative Machine Average				28.0			11.0			33.6			32.4		
Machine Factor, %				101.4			106.2			99.9			97.7		
Machine Index, %				105.1			113.4			95.7			91.1		

[a] Insufficient paper was available to evaluate this roll for maximum speed.

TABLE XIV

SUMMARY OF TEST RESULTS FOR MACHINE L
September, 1958

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. Speed at Min. Tension, f.p.m.	Runability: Max. Tension at 600 f.p.m. lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
L-1	8-19-58	8-25-58	184	28.5	10.8	10.2	10.4	34.8	33.0	34.1	34.8	30.2	32.5	Note a.	Min.
L-2	8-21-58	8-28-58	185	28.3	10.7	10.0	10.5	34.8	33.0	33.8	32.4	30.2	31.4	1000	1
L-3	8-26-58	9- 2-58	186	28.7	10.7	9.8	10.3	34.2	31.8	33.1	35.8	32.2	34.6	1000	1
L-4	8-28-58	9- 3-58	187	28.2	10.4	9.8	10.2	39.0	30.6	33.8	37.0	34.6	35.6	Note a.	1/2
L-5	9- 3-58	9-12-58	188	29.2	11.3	10.1	10.5	36.0	32.4	34.0	34.4	32.8	33.6	Note a.	1/2
L-6	9- 5-58	9-12-58	189	28.4	10.8	9.9	10.3	33.6	30.6	32.5	33.8	31.0	32.4	Note a.	1/2
L-7	9- 9-58	9-15-58	190	28.3	10.9	9.8	10.5	35.4	29.4	32.2	32.4	28.8	31.0	1000	1-1/2
L-8	9-11-58	9-22-58	191	28.2	10.9	10.3	10.6	32.4	30.6	31.1	31.4	29.6	30.4	950	1
L-9	9-16-58	9-22-58	192	27.4	10.5	10.0	10.2	31.8	29.4	30.7	31.6	29.8	30.8	900	1
L-10	9-18-58	9-22-58	--	28.0	10.8	10.0	10.4	31.8	29.4	31.1	29.8	28.0	28.8	950	1/2
Current Machine Average				28.3			10.4			32.6			32.1		
Cumulative Machine Average				28.4			10.6			33.7			33.7		
Machine Factor, %				99.6			97.9			96.8			95.4		
Machine Index, %				104.7			101.0			93.1			92.6		

[a] Insufficient paper was available to evaluate this roll for maximum speed.

TABLE XV

SUMMARY OF TEST RESULTS FOR MACHINE M
September, 1958

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. Speed at Min. Tension, f.p.m.	Runability: Max. Tension at 600 f.p.m. lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
M-1	8-22-58	9-12-58	532	27.0	10.8	10.0	10.4	35.4	31.8	34.0	36.2	34.6	35.1	Note a	1/2
Current Machine Average				27.0			10.4			34.0			35.1		
Cumulative Machine Average				27.0			11.3			36.5			35.7		
Machine Factor, %				100.0			92.4			92.9			98.5		
Machine Index, %				99.9			101.5			96.9			101.2		

TABLE XVI

SUMMARY OF TEST RESULTS FOR MACHINE N
September, 1958

N-1	8-19-58	8-25-58	183	26.5	10.3	9.8	10.1	39.6	37.2	38.4	36.4	31.6	34.3	900	1-1/2
N-2	8-21-58	8-29-58	184	26.4	10.6	10.1	10.4	39.0	34.8	37.2	--	Note b	--	--	--
N-3	--	9- 2-58	185	27.8	10.3	9.8	10.1	41.4	34.8	38.8	35.0	32.4	33.8	950	1-1/2
N-4	8-27-58	9-12-58	186	26.2	11.0	10.4	10.7	36.6	31.8	34.2	35.2	33.0	34.2	1000	1-1/2
N-5	9-16-58	9-22-58	187	27.0	10.8	10.1	10.5	40.2	37.8	39.0	37.8	34.8	35.6	1000	1-1/2
Current Machine Average				26.8			10.4			37.5			34.5		
Cumulative Machine Average				26.4			10.4			36.0			35.4		
Machine Factor, %				101.3			100.0			104.3			97.3		
Machine Index, %				99.1			100.7			107.0			99.4		

[a] Insufficient paper was available to evaluate this roll for maximum speed.

[b] This roll was inadvertently destroyed prior to fabrication.

TABLE XVII

SUMMARY OF TEST RESULTS FOR MACHINE O
September, 1958

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. Speed at Min. Tension, f.p.m.	Runability Max. Tension at 600 f.p.m. lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
O-1	8- 8-58	8-29-58	--	26.0	9.6	9.2	9.4	34.8	30.6	32.6	30.2	29.0	29.4	1000	1-1/2
O-2	8- 9-58	8-29-58	--	26.5	10.4	9.9	10.0	34.8	31.8	32.9	32.2	30.0	31.0	1000	1-1/2
O-3	8-14-58	9-12-58	--	26.6	9.9	9.6	9.8	36.6	30.6	32.8	34.6	31.4	33.0	1000	1-1/2
O-4	8-15-58	9-12-58	--	26.3	10.1	9.8	10.0	33.0	25.8	29.6	31.2	29.0	30.5	1000	1-1/2
O-5	8-15-58	9-12-58	--	26.3	10.2	9.7	10.0	36.6	28.2	33.6	33.8	30.2	31.3	1000	1-1/2
O-6	8-18-58	9-12-58	--	26.2	9.8	9.1	9.4	34.8	27.6	30.1	31.6	30.0	31.0	Note a.	1/2
O-7	8-27-58	9-23-58	--	26.5	10.0	9.7	9.8	36.0	30.6	33.0	33.2	31.8	32.5	1000	1-1/2
O-8	8-28-58	9-23-58	--	26.9	10.0	10.0	10.0	36.0	33.0	34.3	36.4	30.6	33.6	1000	1-1/2
O-9	9- 2-58	9-23-58	--	26.5	9.8	9.0	9.4	34.8	31.2	33.0	34.6	31.2	32.8	1000	1-1/2
Current Machine Average				26.4			9.8			32.4			31.7		
Cumulative Machine Average				26.3			9.8			33.8			33.7		
Machine Factor, %				100.5			100.0			96.1			94.1		
Machine Index, %				97.7			95.0			92.5			91.3		

TABLE XVIII

SUMMARY OF TEST RESULTS FOR MACHINE P
September, 1958

P-1	8-26-58	9-12-58	11	28.9	10.1	9.3	9.9	36.6	30.0	34.8	35.8	31.0	32.8	100	--
Current Machine Average:				28.9			9.9			34.8			32.8		
Cumulative Machine Average				28.5			9.8			36.5			36.4		
Machine Factor, %				101.3			100.4			95.3			90.1		
Machine Index, %				106.9			95.9			99.3			94.6		

[a] Insufficient paper was available to evaluate this roll for maximum speed.

TABLE XIX

SUMMARY OF TEST RESULTS FOR MACHINE Q
September, 1958

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. Speed at Min. Tension, f.p.m.	Runability: Max. Tension at 600 f.p.m. lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
Q-1	8- 7-58	8-29-58	377	25.4	9.9	9.3	9.6	36.6	30.6	33.8	31.0	29.4	30.3	1000	1-1/2
Q-2	8-10-58	8-29-58	—	25.4	9.7	9.2	9.4	38.4	31.2	34.1	34.0	31.0	31.9	1000	1-1/2
Q-3	8-11-58	9-12-58	719	25.7	10.3	9.8	10.0	30.4	30.0	31.3	30.4	29.4	29.8	1000	1
Q-4	8-13-58	9-12-58	906	26.9	10.3	10.0	10.2	30.0	25.8	27.8	33.2	32.4	32.9	1000	1-1/2
Q-5	8-19-58	9-12-58	1443	25.7	10.0	8.8	9.6	37.8	28.8	33.4	33.8	30.4	31.5	1000	1-1/2
Q-6	8-20-58	9-12-58	—	26.2	10.1	9.9	10.0	36.0	30.6	33.8	35.6	33.6	34.9	1000	1-1/2
Q-7	8-24-58	9-24-58	1811	26.8	10.5	10.0	10.2	36.6	31.2	33.8	33.6	31.6	33.0	1000	1-1/2
Q-8	8-27-58	9-23-58	2244	26.0	10.8	10.0	10.3	36.6	31.2	34.0	30.8	28.2	29.7	1000	1-1/2
Q-9	8-29-58	9-23-58	2225	25.4	10.7	10.1	10.3	34.2	28.2	31.7	33.0	30.6	31.5	1000	1-1/2
Current Machine Average				25.9			9.9			32.6			31.7		
Cumulative Machine Average				26.4			9.9			33.7			32.7		
Machine Factor, %				98.1			100.0			96.8			96.9		
Machine Index, %				95.9			96.8			93.1			91.4		

TABLE XX

SUMMARY OF TEST RESULTS FOR MACHINE R
September, 1958

R-1	8-24-58	8-29-58	15	27.0	10.6	10.0	10.2	39.0	37.2	38.0	34.6	33.0	34.0	Note a	1/2
Current Machine Average				27.0			10.2			38.0			34.0		
Cumulative Machine Average				26.5			10.2			35.4			34.7		
Machine Factor, %				102.1			100.0			107.4			98.0		
Machine Index, %				100.0			99.3			108.5			98.0		

[a] Insufficient paper was available to evaluate this roll for maximum speed.

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 September. 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 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 submitted for evaluation. 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 includes 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 SEPTEMBER, 1958

Machine A

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
A-1	17	8-22-58	36.1	47.4	+11.3
A-2	18	8-26-58	35.6	46.2	+10.6
A-3	19	8-29-58	37.7	45.4	+ 7.7
A-4	20	9- 4-58	40.0	51.0	+11.0
Current machine av.			37.4	47.5[b]	+10.1

Machine B

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
B-1	108	8-22-58	36.1	38.6	+2.5
B-2	109	8-23-58	36.4	39.2	+2.8
B-3	110	8-26-58	34.0	39.0	+5.0
B-4	111	8-27-58	36.0	40.3	+4.3
B-5	112	9- 4-58	31.8	35.0	+3.2
Current machine av.			34.8	38.4	+3.6

Machine C

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
C-1	18	8-20-58	31.8	--	--
C-2	19	8-26-58	33.0	--	--
C-3	20	8-28-58	34.6	42.4	+ 7.8
C-4	21	9- 3-58	35.4	46.0	+10.6
Current machine av.[c]			35.0	44.2[b]	+ 9.2

Machine E

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
E-1	397	8-19-58	40.1	--	--
E-2	398	8-22-58	40.8	43.4	+2.6
E-3	399	8-26-58	36.1	40.3	+4.2
E-4	400	8-29-58	39.6	40.9	+1.3
E-5	401	9- 3-58	36.6	41.2	+4.6
E-6	402	9- 6-58	39.6	41.8	+2.2
E-7	403	9- 9-58	37.2	42.1	+4.9
E-8	404	9-12-58	40.4	43.4	+3.0
E-9	405	9-16-58	35.6	39.8	+4.2
Current machine av.[d]			38.2	41.6	+3.4

Machine F

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
F-1	199	8-13-58	37.9	--	--
F-2	200	8-24-58	37.7	--	--
F-3	62	8-22-58	31.8	40.6	+8.8
F-4	63	8-22-58	34.3	40.2	+5.9
F-5	64	8-22-58	32.6	40.6	+8.0
F-6	65	9- 3-58	28.0	31.8	+3.8
F-7	66	9- 3-58	32.3	35.5	+3.2
F-8	67	9- 3-58	31.8	35.6	+3.8
F-9	68	9- 8-58	31.6	36.7	+5.1
F-10	69	9-8- 58	32.4	41.2	+8.8
F-11	70	9- 8-58	32.8	38.9	+6.1
Current machine av.[e]			32.0	37.9	+5.9

Machine G

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
G-1	242	8-12-58	37.9	37.6	-0.3
G-2	243	8-15-58	36.7	36.5	-0.2
G-3	244	8-19-58	37.4	37.0	-0.4
G-4	245	8-27-58	35.9	36.8	+0.9
G-5	246	9- 2-58	41.5	42.5	+1.0
G-6	247	9- 4-58	36.4	37.3	+0.9
G-7	248	9-10-58	34.2	37.7	+3.5
G-8	249	9-12-58	35.3	36.2	+0.9
Current machine av.			36.9	37.7	+0.8

Machine H

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
H-1	201	8-24-58	39.8	37.7	-2.1
H-2	202	8-28-58	32.0	37.5	+5.5
H-3	203	9- 9-58	36.4	39.9	+3.5
H-4	204	9-14-58	35.6	37.3	+1.7
H-5	205	9-14-58	34.8	37.2	+2.4
Current machine av.			35.7	37.9	+2.2

Machine I

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
I-1	71	8-20-58	37.8	32.5	-5.3
I-2	72	8-22-58	35.4	35.8	+0.4
Current machine av.			36.6	34.2	-2.4

Machine J

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
J-1	73	8-29-58	31.4	41.6	+10.2
J-2	74	8-29-58	34.6	41.6	+7.0
Current machine av.			33.0	41.6	+8.6

TABLE XXI--Continued

COMPARISON OF INSTITUTE AND MILL CONCORA FLAT CRUSH TEST RESULTS ON INDIVIDUAL ROLLS FOR SEPTEMBER, 1958

Machine K

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
K-1	75	9- 3-58	35.2	35.9	+0.7
K-2	76	9- 3-58	31.9	37.6	+5.7
Current machine av.			33.5	36.8	+3.3

Machine M

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
M-1	532	8-22-58	34.0	35.0	+1.0
Current machine av.			34.0	35.0	+1.0

Machine N

Code	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Institute	Mill	Difference[a]
N-1	183	8-19-58	38.4	41.0	+2.6
N-2	184	8-21-58	37.2	39.7	+2.5
N-3	185	--	38.8	40.6	+1.8
N-4	186	8-27-58	34.2	37.7	+3.5
N-5	187	9-16-58	39.0	41.8	+2.8
Current machine av.			37.5	40.2	+2.7

Machine O

O-1	--	8- 8-58	32.6	35.6	+3.0
O-2	--	8- 9-58	32.9	30.8	-2.1
O-3	--	8-14-58	32.8	34.2	+1.4
O-4	--	8-15-58	29.6	32.7	+3.1
O-5	--	8-15-58	33.6	37.0	+3.4
O-6	--	8-18-58	30.1	31.2	+1.1
O-7	--	8-27-58	33.0	34.4	+1.4
O-8	--	8-28-58	34.3	36.4	+2.1
O-9	--	9- 2-58	33.0	39.4	+6.4
Current machine av.			32.4	34.6	+2.2

Machine Q

Q-1	377	8- 7-58	33.8	36.7	+2.9
Q-2	--	8-10-58	34.1	34.6	+0.5
Q-3	719	8-11-58	31.3	34.0	+2.7
Q-4	906	8-13-58	27.8	34.4	+6.6
Q-5	1443	8-19-58	33.4	34.7	+1.3
Q-6	--	8-20-58	33.8	39.6	+5.8
Q-7	1811	8-24-58	33.8	38.6	+4.8
Q-8	2244	8-27-58	34.0	38.1	+4.1
Q-9	2225	8-29-58	31.7	33.2	+1.5
Current machine av.			32.6	36.0	+3.4

Machine R

R-1	15	8-24-58	38.0	43.7	+5.7
Current machine av.			38.0	43.7[b]	+5.7

Notes:

[a] The difference given here is the amount in p.s.i. units by which the mill result is higher or lower than the I.P.C. result.

[b] Specimens tested by the mill were not conditioned after they were fluted.

[c] This comparison involves only two rolls.

[d] This comparison involves eight rolls.

[e] This comparison involves nine rolls.

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 which 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 which is the greatest 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 period and the two preceding periods are shown. It may be seen that the highest average difference (+27.0%) was associated with Machine A for the current period and the lowest (+2.2%) with Machine G. Large differences were also noted for Machines C, F, J, and R. Of these machines it may be noted that Machines A, C, and R have been associated with large differences not only for the current period but also for the two preceding periods. These large differences 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. In the cases of Machines F and J, however, the high percentage differences for the current period represent sizable increases over the differences for the previous period and hence may be indicative that their testing conditions should be checked.

TABLE XXII

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

Machine Code	A	B	C	E	F	G	H	I	J	K	M	N	O	Q	R
No. of Rolls Compared	4	5	2	8	9	8	5	2	2	2	1	5	9	9	1
Concora Flat Crush, p.s.i.															
Current machine av.(I.P.C.)[a]	37.4	34.8	35.0	38.2	32.0	36.9	35.7	36.6	33.0	33.5	34.0	37.5	32.4	32.6	38.0
Current machine av. (Mill)[a]	47.5	38.4	44.2	41.6	37.9	37.7	37.9	34.2	41.6	36.8	35.0	40.2	34.6	36.0	43.7
Average difference[b]	+10.1	+3.6	+9.2	+3.4	+5.9	+0.8	+2.2	-2.4	+8.6	+3.3	+1.0	+2.7	+2.2	+3.4	+5.7
Maximum difference[c]	+11.3	+5.0	+10.6	+4.9	+8.8	+3.5	+5.5	-5.3	+10.2	+5.7	+1.0	+3.5	+6.4	+6.6	+5.7

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

Average difference, %[d]															
Current period	+27.0[e]	+10.3	+26.3[e]	+8.9	+18.4	+2.2	+6.2	-6.6	+26.1	+9.9	+2.9	+7.2	+6.8	+10.4	+15.0[e]
33rd period	+29.6[e]	+9.3	+24.6	0	+10.5	+0.3	+1.8	-12.2	+10.2	+6.6	-6.7	+9.1	+14.1	+7.6	+23.2
32nd period	+21.8[e]	+5.0	+32.3	+4.6	--	-0.3	--	-11.8	+0.3	+12.7	-9.9	+9.0	+4.3	+2.9	+27.3

Notes:

[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] Concora specimens evaluated by this mill were not conditioned.