

CODE LETTERS FOR PROGRESS REPORT 91
PROJECT 1108-17

Company - Mill	Machine No.	Code Letter
The Chesapeake Corporation - West Point	1	--
Continental Can Company, Inc. - Hopewell	1	G
- Hodge	1	A
Crown Zollerbach Corporation - Baltimore	1	V
- Baltimore	2	T
- Bogalusa	4	S
- Lebanon	2	I
International Paper Company - Arcoibo	F	C
- Bantrop	1	M
- Georgetown	1	F
The Mead Corporation--Harriman	1	C
- Knoxville	1	H
- Lynchburg	2	E
- Sylva	1	O
St. Regis Container Corporation Mill Division - Coshocton	1	U
North Carolina Pulp Company - Plymouth	3	N
Weyerhaeuser Company, North Carolina Div.		
Clin Mathieson Chemical Corporation - Monroe	1	--
- Monroe	2	--
Owens-Illinois Glass Company - Tomahawk	1	B
- Tomahawk	2	D
- Tomahawk	3	P
- Big Island	3	K
St. Joe Paper Company - Port St. Joe	1	R
Union Bag-Camp Paper Corporation - Savannah	2	L
West Virginia Pulp and Paper Company - Covington	6	J
- Covington	7	--
- Charleston	--	--

THE INSTITUTE OF PAPER CHEMISTRY

Appleton, Wisconsin

CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

Project 1108-17

Report 91

A Progress Report

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

October 1, 1961

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Appleton, Wisconsin

CONTINUOUS EVALUATION OF CORRUGATING MEDIUM

INTRODUCTION

As requested by the Technical Committee of the Fourdrinier Kraft Board Institute, Inc., the reports pertinent to the continuous evaluation of corrugating medium are now being prepared by The Institute of Paper Chemistry on a bimonthly basis instead of the previous monthly basis. This new system was initiated on August 1, 1961. Hence, this first report under the new system presents results obtained during the months of August and September.

During this first bimonthly period, 98 rolls of corrugating medium representing the production of nineteen machines were evaluated in August and 83 rolls of corrugating medium representing the production of twenty machines were evaluated in September. A tabulation of the number of rolls submitted from each machine during the months of August and September is given in Table I.

Each sample of corrugating medium was evaluated for basis weight, caliper, Concora flat crush (conditioned after fluting), H. and D. flat crush on single-faced board, and runnability. Runnability 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 runnability occurred at this speed, the corrugator was slowed down in increments of 25 f.p.m. until satisfactory runnability was obtained--i.e., no ruptured flutes. If the medium fabricated satisfactorily

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

Machine Code	Number of Rolls	
	August	September ^a
A	3	2
B	6	4
C	6	6
D	6	4
E	4	4
F	5	6
G	5	2
H	2	4
I	6	0
J	3	7
K	9	4
L	7	4
M	4	4
N	10	4
O	4	2
P	6	4
Q	4	4
R	6	2
S	2	0
T	0	6
U	0	4
V	<u>0</u>	<u>6</u>
Total	98	83

^a Effective September 1, at the request of the Technical Committee, the limit on the number of rolls submitted for evaluation from each machine has been reduced from six to four. Where more than four rolls are indicated, it means that some of the rolls were received too late for evaluation during the previous month.

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.

Flat crush was determined on the single-faced board obtained at a speed of 600 f.p.m. with minimum tension. The flat crush results, in addition to supplying information about quality, 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.

The average test results obtained on the rolls of corrugating medium submitted by each participant during August and September (current machine average) are shown in Table II and graphically presented in Fig. 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 a given 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
August, 1961

Mill Code	Basis Weight, lb.	Caliper, points	Concora Flat Crush, p.s.i.	Single-Face Flat Crush, p.s.i.
A	26.9	10.6	41.5	38.3
B	27.3	10.2	39.2	36.5
C	27.1	9.6	34.3	34.0
D	26.9	10.2	39.7	36.8
E	27.2	10.2	37.6	33.5
F	26.7	9.9	38.1	35.5
G	28.6	10.4	44.7	40.9
H	27.7	12.0	37.9	35.8
I	28.0	9.9	38.3	37.2
J	26.1	10.2	36.1	33.5
K	27.1	10.4	38.1	35.3
L	26.9	9.5	36.3	34.7
M	26.9	10.8	39.6	37.2
N	27.0	9.8	38.7	38.2
O	27.3	10.5	36.7	34.0
P	27.5	10.2	39.3	36.2
Q	28.2	10.8	37.3	34.6
R	27.7	9.7	29.9	28.1
S	25.6	10.0	31.9	28.6
Current F.K.I. Average	27.2	10.3	37.6	35.2
Cumulative F.K.I. Average	27.3	10.3	36.4	33.5
F.K.I. Index, %	99.5	100.0	103.6	105.2

TABLE II (Continued)

SUMMARY OF CURRENT MACHINE AVERAGES
 September, 1961

Mill Code	Basis Weight, lb.	Caliper, points	Concora Flat Crush, p.s.i.	Single-Face Flat Crush, p.s.i.
A	26.3	10.2	38.9	33.4
B	26.8	10.4	36.0	32.8
C	27.1	9.6	32.6	28.8
D	26.4	10.3	37.5	33.8
E	27.8	10.3	37.1	31.4
F	27.3	10.5	37.9	35.2
G	28.6	10.6	45.6	40.6
H	27.0	11.4	34.9	31.7
I			No samples submitted.	
J	26.8	10.3	35.6	31.8
K	26.6	10.2	35.2	32.7
L	26.3	9.1.	35.6	30.8
M	27.0	11.0	40.0	36.6
N	26.9	9.5	37.9	35.8
O	27.8	11.0	35.8	31.6
P	27.2	10.3	38.7	34.8
Q	28.0	10.8	36.7	33.4
R	28.0	9.3	33.1	28.7
S			No samples submitted.	
T	28.2	9.9	33.9	32.3
U	27.9	10.1	37.3	33.8
V	27.6	10.3	33.2	29.4
Current F.K.I. Average	27.3	10.3	36.7	33.0
Cumulative F.K.I. Average	27.3	10.3	36.5	33.6
F.K.I. Index, %	100.0	100.0	100.6	98.2

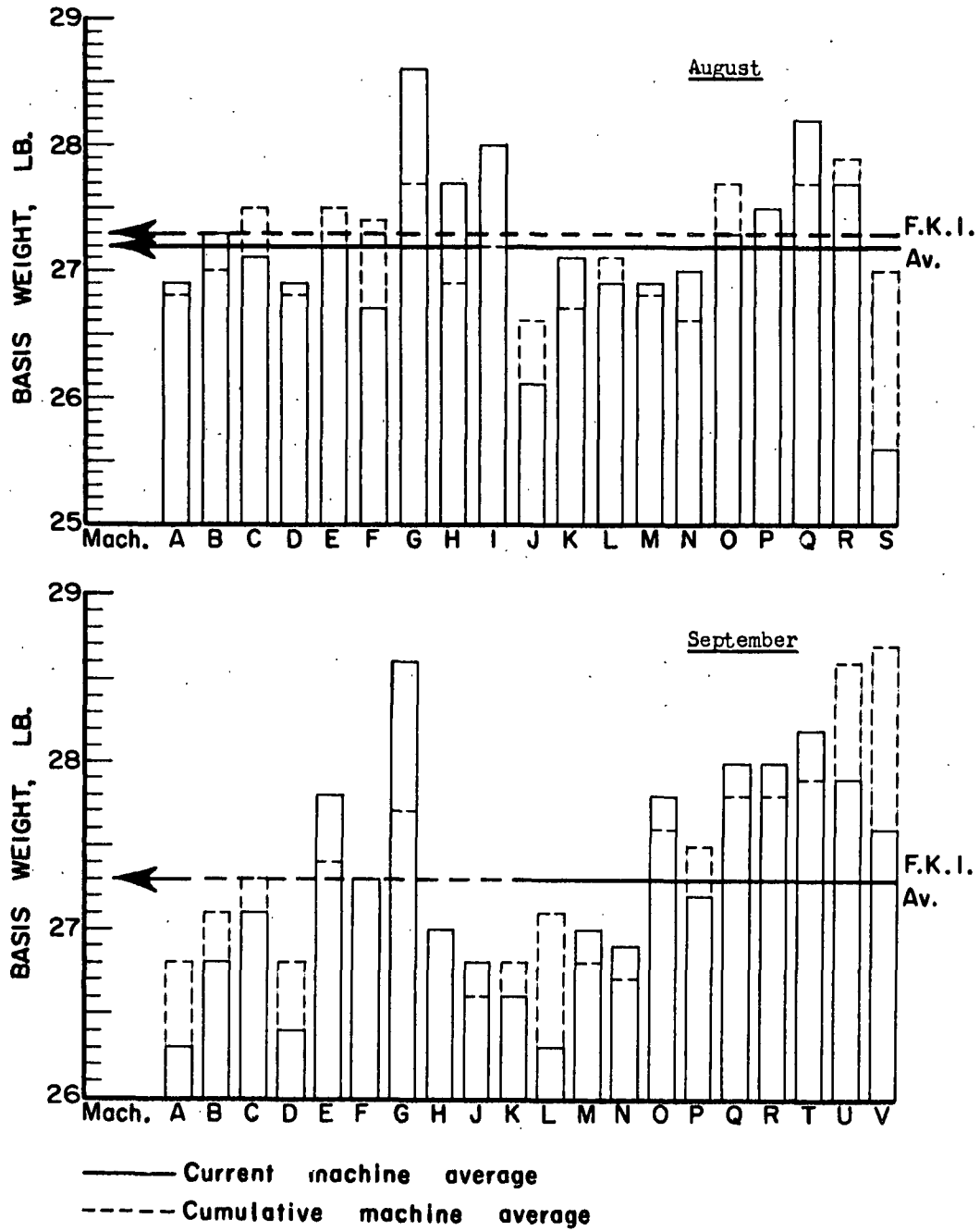


Figure 1. Comparison of Basis Weight Results

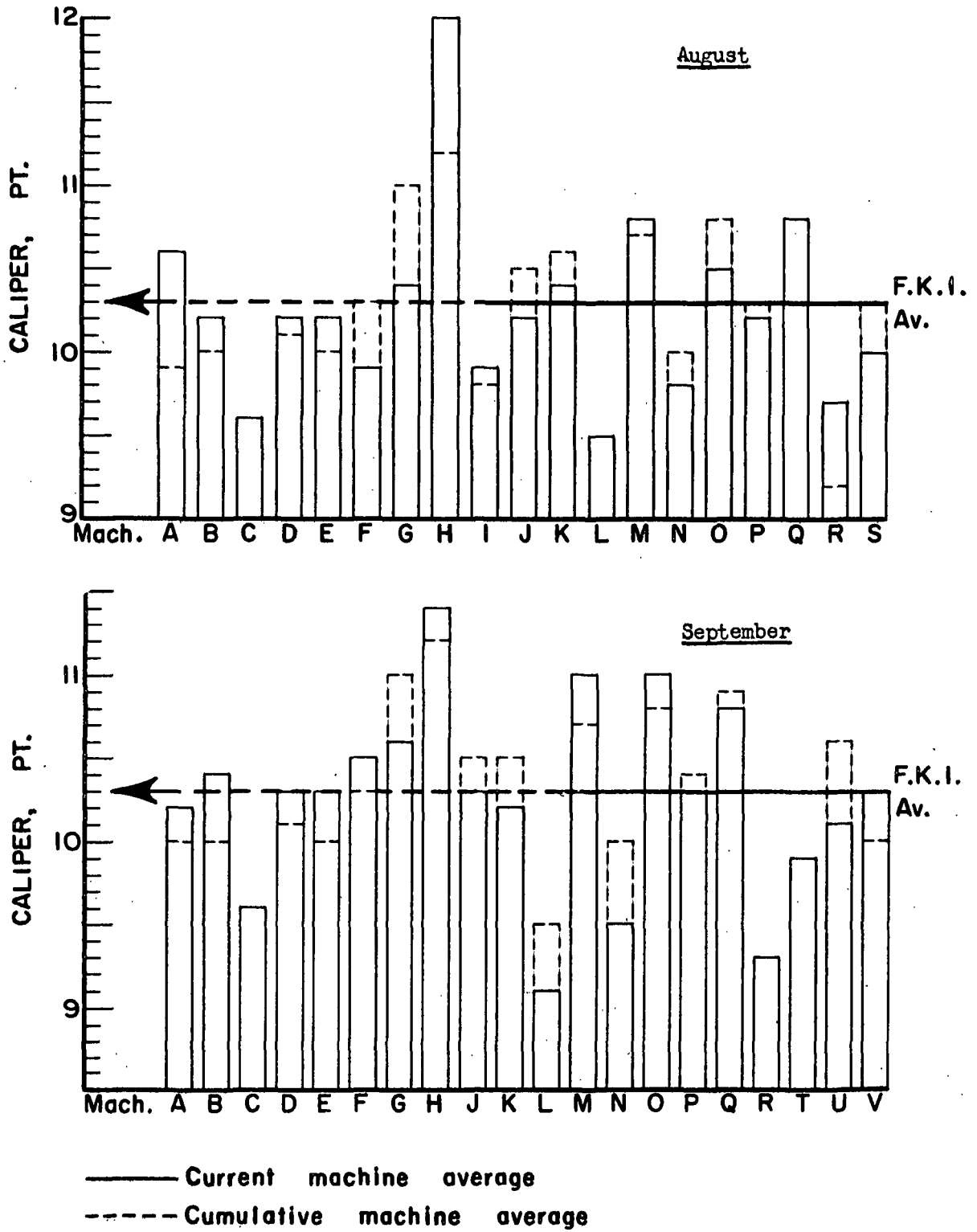
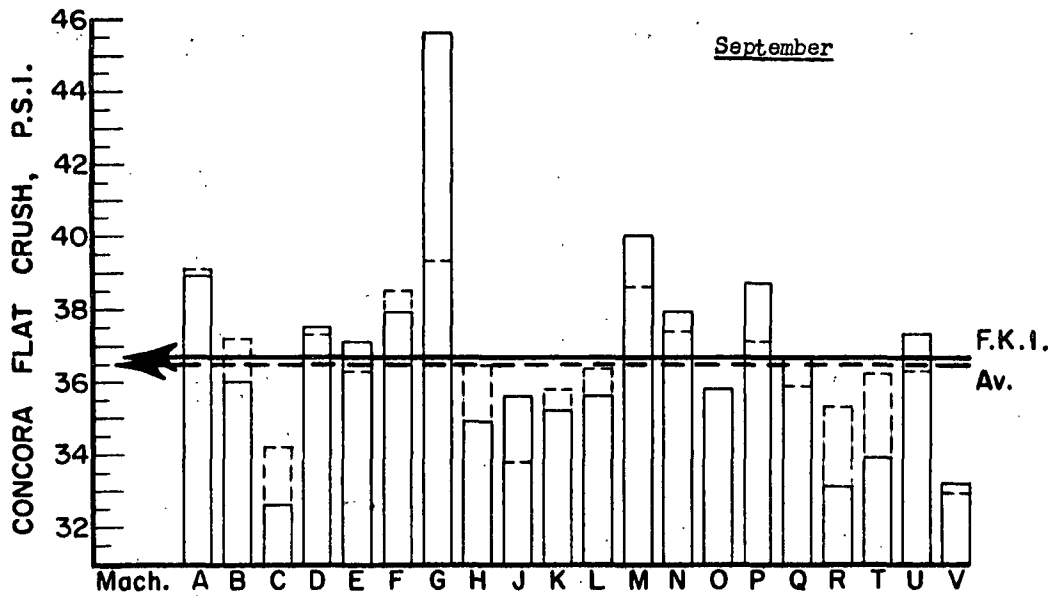
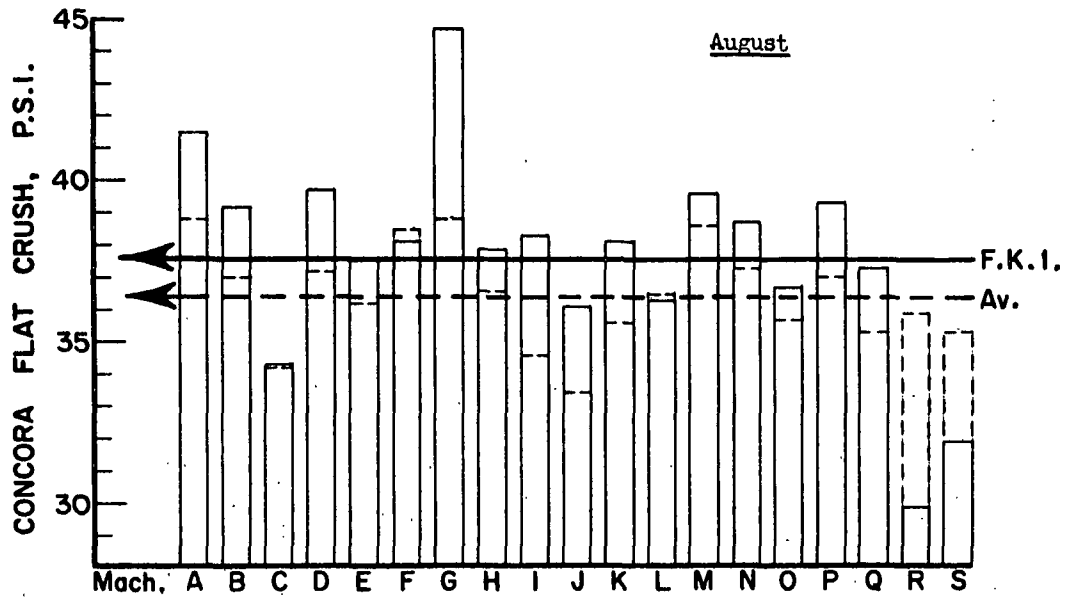
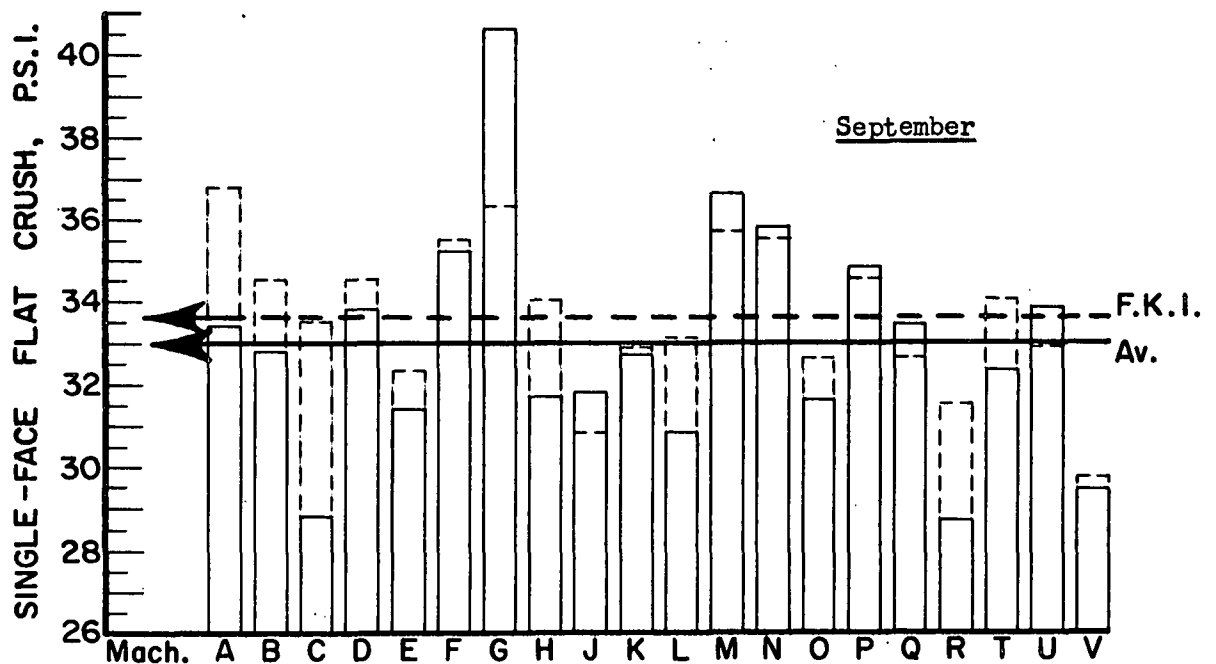
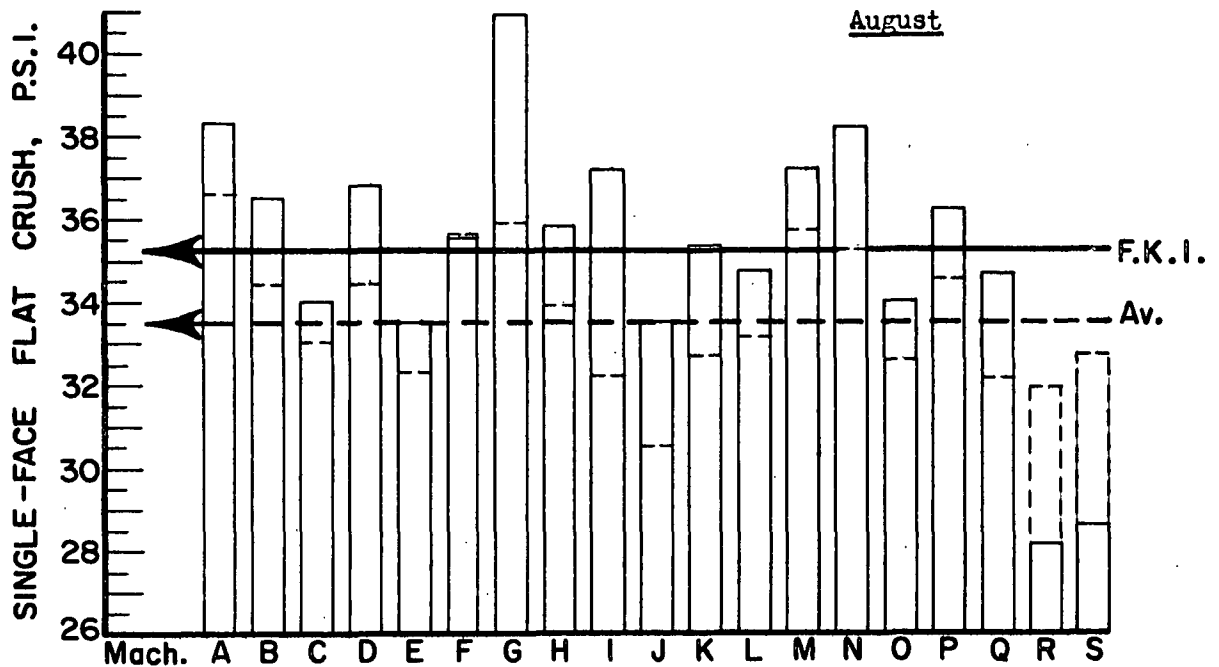


Figure 2. Comparison of Caliper Results



— Current machine average
 - - - Cumulative machine average

Figure 3. Comparison of Concora Flat Crush Results



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

Figure 4. Comparison of Single-Face Flat Crush Results

The test results obtained on the sample lots submitted from the production of each of the machines during August and September are shown in Tables III through XXIV for Machines A through V, 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 average for the previous twelve periods (excluding the current period). Also shown for each machine in Tables III to XXIV 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

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.			Runnability, Maximum Tension at 600 f.p.m., lb./in.	
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.		
<u>August, 1961</u>															
A-1	7-14-61	8-7-61	32	27.4	11.3	10.5	10.9	42.6	40.2	42.0	39.2	36.6	38.1	1	
A-2	7-15-61	8-7-61	33	27.6	11.0	10.5	10.8	45.6	42.6	43.6	43.0	40.2	41.6	1	
A-3	8-1-61	8-14-61	34	25.7	10.7	10.0	10.2	40.2	37.8	39.0	36.6	33.6	35.3	Min.	
				26.9				10.6				41.5			
Current Machine Average				26.8				9.9				38.8			
Cumulative Machine Average				100.3				107.0				107.1			
Machine Factor, %				98.3				103.5				114.2			
<u>September, 1961</u>															
A-1	9-1-61	9-14-61	35	26.4	10.7	10.0	10.3	40.8	37.8	39.2	35.0	32.0	33.2	1-1/2	
A-2	9-2-61	9-14-61	36	26.3	10.4	10.0	10.1	39.6	36.0	38.5	35.4	32.2	33.6	1-1/2	
Current Machine Average				26.3				10.2				38.9			
Cumulative Machine Average				26.8				10.0				39.1			
Machine Factor, %				98.2				101.9				99.6			
Machine Index, %				96.4				99.3				105.7			

TABLE IV
SUMMARY OF TEST RESULTS FOR MACHINE B

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.		Runnability, Maximum Tension at 600 f.p.m., lb./in.			
					Max.	Min.	Max.	Min.	Max.	Min.		Av.		
<u>August, 1961</u>														
B-1	7-28-61	8-7-61	--	28.0	10.5	10.1	10.2	42.0	37.8	40.3	39.2	37.0	37.8	1-1/2
B-2	8-1-61	8-7-61	--	27.6	10.3	10.0	10.2	42.6	39.0	40.1	39.4	37.4	38.2	1-1/2
B-3	8-4-61	8-15-61	--	26.8	10.0	9.8	9.9	40.2	35.4	38.3	38.6	36.6	37.3	1-1/2
B-4	8-9-61	8-15-61	--	26.5	10.0	9.8	9.9	41.4	39.0	39.8	36.4	34.0	35.0	1-1/2
B-5	8-12-61	8-22-61	--	27.6	10.8	10.2	10.5	42.0	37.8	40.0	36.6	35.6	36.2	1-1/2
B-6	8-17-61	8-22-61	--	27.0	10.7	10.0	10.4	38.4	35.4	36.8	35.8	33.2	34.5	1-1/2
<u>September, 1961</u>														
				27.3			10.2			39.2			36.5	
				27.0			10.0			37.0			34.4	
				100.9			101.8			105.9			106.1	
				99.8			99.0			107.9			109.1	
B-1	8-22-61	9-13-61	--	27.1	10.7	10.1	10.3	41.4	38.4	39.8	36.0	34.2	35.1	1
B-2	8-25-61	9-13-61	--	26.6	10.9	10.0	10.5	37.8	30.0	34.8	34.2	31.6	32.6	1
B-3	8-30-61	9-13-61	--	26.5	11.2	10.0	10.5	37.8	30.6	34.1	33.6	31.0	32.0	1
B-4	9-2-61	9-13-61	--	27.0	10.7	10.0	10.3	37.2	34.2	35.3	33.2	30.6	31.6	1
				26.8			10.4			36.0			32.8	
				27.1			10.0			37.2			34.5	
				99.1			103.6			96.8			95.0	
				98.2			100.9			98.8			97.8	

TABLE V
SUMMARY OF TEST RESULTS FOR MACHINE C

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.		Runnability, Maximum Tension at 600 f.p.m., lb./in.			
					Max.	Min.	Max.	Min.	Max.	Min.		Max.	Min.	
<u>August, 1961</u>														
C-1	6- 9-61	8-14-61	8	27.6	10.4	9.6	9.8	37.2	33.0	35.3	35.6	34.6	35.2	Min.
C-2	6-26-61	8-14-61	9	27.9	10.0	9.2	9.7	35.4	33.0	34.4	36.4	34.0	35.2	Min.
C-3	6-29-61	8-14-61	10	27.7	10.7	9.7	10.2	36.6	34.2	35.3	34.2	32.6	33.4	Min.
C-4	7- 1-61	8-14-61	11	26.8	9.7	8.8	9.1	34.2	31.8	32.6	32.4	30.6	31.7	1/2
C-5	7- 3-61	8-14-61	12	26.5	9.7	8.8	9.3	35.4	33.0	34.2	34.2	32.0	33.4	1/2
C-6	7- 5-61	8-14-61	13	26.3	9.6	9.2	9.3	34.8	32.4	33.7	35.6	34.2	34.9	1
<u>September, 1961</u>														
C-1	8- 4-61	9-13-61	14	26.9	10.3	9.5	10.0	34.8	30.6	32.5	31.0	29.4	30.1	Note a
C-2	8- 7-61	9-13-61	15	27.4	10.2	9.4	9.9	34.8	33.0	33.8	30.0	27.4	28.8	Note a
C-3	8- 8-61	9-13-61	16	26.9	9.5	8.6	9.1	32.4	29.4	30.0	28.0	26.8	27.3	Note a
C-4	8- 9-61	9-13-61	17	27.0	10.0	9.0	9.5	34.2	32.4	33.0	30.0	29.0	29.4	Note b
C-5	8-10-61	9-13-61	18	27.1	10.0	9.2	9.6	36.0	31.8	33.5	31.2	28.0	29.3	Note a
C-6	8-11-61	9-13-61	19	27.4	10.2	9.2	9.8	34.2	31.8	32.9	29.0	26.4	28.1	Note a
<u>Current Machine Average</u>														
				27.1			9.6			34.3			34.0	
<u>Cumulative Machine Average</u>				27.5			9.6			34.2			33.0	
<u>Machine Factor, %</u>				98.5			100.0			100.1			102.9	
<u>Machine Index, %</u>				99.2			93.1			94.3			101.6	
<u>September, 1961</u>														
<u>Current Machine Average</u>				27.1			9.6			32.6			28.8	
<u>Cumulative Machine Average</u>				27.3			9.6			34.2			33.5	
<u>Machine Factor, %</u>				99.2			100.0			95.3			86.1	
<u>Machine Index, %</u>				99.3			93.8			89.5			85.9	

a Maximum speed at which this roll could be corrugated with minimum tension was 450 f.p.m.

b Maximum speed at which this roll could be corrugated with minimum tension was 400 f.p.m.

TABLE VI
SUMMARY OF TEST RESULTS FOR MACHINE D

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.		Runnability, Maximum Tension at 600 f.p.m., lb./in.			
					Max.	Min.	Max.	Min.	Max.	Min.		Av.		
<u>August, 1961</u>														
D-1	7-28-61	8-7-61	--	26.1	10.3	9.8	10.0	39.6	37.2	38.2	37.8	36.4	37.0	1
D-2	8-2-61	8-15-61	--	27.1	10.3	9.5	10.0	40.8	39.6	40.2	38.2	35.0	36.5	1
D-3	8-5-61	8-15-61	--	27.1	10.3	9.9	10.1	44.4	39.6	42.0	40.2	36.8	38.6	1/2
D-4	8-10-61	8-15-61	--	27.1	10.8	9.8	10.2	41.4	37.8	39.2	39.2	36.0	37.6	1
D-5	8-15-61	8-22-61	--	26.9	10.8	10.2	10.4	41.4	37.2	39.6	36.6	34.8	35.7	1/2
D-6	8-18-61	8-22-61	--	26.8	10.8	10.0	10.3	40.8	37.8	39.0	37.2	34.4	35.3	1-1/2
<u>September, 1961</u>														
				26.9	10.2			39.7			36.8			
Current Machine Average				26.8	10.1			37.2			34.4			
Cumulative Machine Average				100.3	100.5			106.7			106.9			
Machine Factor, %				98.3	99.1			109.2			110.0			
				26.2	10.2	9.8	10.0	38.4	32.4	36.1	33.4	31.6	32.8	1
D-1	8-23-61	9-13-61	--	26.7	10.6	9.9	10.2	40.8	33.0	37.6	35.8	32.4	34.1	1/2
D-2	8-27-61	9-13-61	--	25.9	10.4	9.8	10.0	38.4	36.0	37.6	34.2	32.0	33.5	1/2
D-3	8-31-61	9-13-61	--	27.0	11.4	10.5	10.9	40.8	37.8	38.9	36.2	34.0	35.1	1
D-4	9-6-61	9-13-61	--	26.4	10.3			37.5			33.8			
Current Machine Average				26.8	10.1			37.3			34.5			
Cumulative Machine Average				98.8	101.2			100.5			98.1			
Machine Factor, %				96.9	99.8			102.9			100.8			
Machine Index, %														

TABLE VII
 SUMMARY OF TEST RESULTS FOR MACHINE E

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.		Runnability, Maximum Tension at 600 f.p.m., lb./in.			
					Max.	Min.	Max.	Min.	Max.	Min.				
<u>August, 1961</u>														
E-1	8-1-61	8-8-61	565	27.1	10.2	9.9	10.0	40.2	37.8	38.5	36.6	32.8	34.7	1-1/2
E-2	8-1-61	8-8-61	566	27.6	10.2	9.3	10.0	40.2	35.4	37.8	37.2	33.8	36.2	1-1/2
E-3	8-17-61	8-22-61	573	26.9	10.8	10.0	10.4	37.8	31.2	35.9	32.6	29.4	31.0	1-1/2
E-4	8-17-61	8-22-61	574	27.1	10.5	10.0	10.3	42.0	34.8	38.0	33.4	30.6	32.2	1-1/2
<u>September, 1961</u>														
E-1	8-30-61	9-5-61	581	28.0	10.7	10.1	10.5	40.8	36.0	38.0	31.2	27.8	30.1	1-1/2
E-2	8-30-61	9-5-61	582	28.2	10.8	9.9	10.3	40.2	35.4	38.0	32.8	29.8	31.5	1-1/2
E-3	9-11-61	9-20-61	589	27.2	10.3	10.0	10.1	38.4	34.2	36.4	32.0	29.6	31.4	1-1/2
E-4	9-11-61	9-20-61	590	27.9	10.7	10.0	10.2	39.0	34.2	35.9	34.4	30.6	32.6	1-1/2
<u>Summary of Test Results for Machine E</u>														
				Current Machine Average	27.8			10.3			37.1			31.4
				Cumulative Machine Average	27.4			10.0			36.3			32.3
				Machine Factor, %	101.4			102.6			102.2			97.4
				Machine Index, %	101.9			99.8			101.7			93.6

TABLE VIII
SUMMARY OF TEST RESULTS FOR MACHINE F

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.			Runnability, Maximum Tension at 600 f.p.m., lb./in.
					Max.	Min.	Average	Max.	Min.	Average	Max.	Min.	Average	
<u>August, 1961</u>														
F-1	7-7-61	7-19-61	459	26.9	10.0	8.8	9.7	42.0	39.0	40.2	36.6	35.8	36.0	1
F-2	7-12-61	8-11-61	460	26.5	10.3	9.8	10.1	40.8	34.8	37.4	36.2	33.8	35.0	1/2
F-3	7-17-61	7-31-61	461	26.6	10.3	9.6	9.9	38.4	34.8	37.2	32.8	31.8	32.4	Min.
F-4	7-28-61	8-10-61	462	27.4	10.6	9.7	10.1	40.2	36.6	38.4	37.4	36.8	37.0	1-1/2
F-5	8-10-61	8-21-61	463	26.3	10.0	9.5	9.9	39.6	34.8	37.3	38.4	35.2	37.0	1-1/2
<u>September, 1961</u>														
Current Machine Average														
Cumulative Machine Average														
Machine Factor, %														
Machine Index, %														
F-1	8-15-61	8-27-61	464	28.1	11.0	10.3	10.7	42.0	39.6	40.6	37.4	35.4	36.5	Min.
F-2	8-19-61	8-30-61	465	26.8	11.0	10.1	10.6	43.2	34.8	38.0	35.2	33.6	34.1	Min.
F-3	8-21-61	9-15-61	466	27.5	10.2	9.2	9.9	42.0	37.8	39.4	39.4	37.8	38.4	1-1/2
F-4	8-24-61	9-15-61	467	26.9	11.0	10.2	10.7	36.6	34.8	36.0	33.8	31.0	32.7	1/2
F-5	8-28-61	9-15-61	468	26.9	10.4	9.8	10.1	39.0	35.4	36.6	35.0	31.8	33.3	1
F-6	9-7-61	9-20-61	469	27.8	11.2	10.8	11.0	38.4	34.8	36.7	37.6	34.0	35.9	1-1/2
Current Machine Average														
Cumulative Machine Average														
Machine Factor, %														
Machine Index, %														

TABLE IX
 SUMMARY OF TEST RESULTS FOR MACHINE G

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.		Runnability, Maximum Tension at 600 f.p.m., lb./in.			
					Max.	Min.	Max.	Min.	Max.	Min.		Av.		
<u>August, 1961</u>														
G-1	7-20-61	8- 8-61	324	29.0	10.9	10.2	10.6	50.4	40.2	45.8	42.2	40.4	41.4	1-1/2
G-2	7-26-61	8- 8-61	325	28.2	10.7	10.0	10.4	46.2	37.8	42.7	43.0	42.0	42.3	1-1/2
G-3	8- 2-61	8-23-61	326	28.7	10.8	10.3	10.6	45.6	43.8	44.9	42.4	40.6	41.3	1-1/2
G-4	8- 8-61	8-23-61	327	29.3	10.9	10.2	10.5	48.0	45.0	46.1	41.8	40.0	41.0	1-1/2
G-5	8-14-61	8-23-61	328	27.9	10.2	10.0	10.0	45.0	42.6	43.8	42.0	36.6	38.4	1-1/2
Current Machine Average														
Cumulative Machine Average														
Machine Factor, %														
Machine Index, %														
<u>September, 1961</u>														
G-1	8-23-61	9-11-61	329	28.7	11.0	10.2	10.5	49.8	43.8	46.7	42.4	39.6	41.0	1-1/2
G-2	9- 4-61	9-11-61	330	28.4	11.0	10.2	10.6	47.4	41.4	44.5	40.8	39.4	40.2	1-1/2
Current Machine Average														
Cumulative Machine Average														
Machine Factor, %														
Machine Index, %														

TABLE X
SUMMARY OF TEST RESULTS FOR MACHINE H

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Calliper, points		Concora Flat Crush, p.s.i.		Single-Face Flat Crush, p.s.i.		Runnability, Maximum Tension at 600 f.p.m., lb./in.												
					Max.	Min.	Max.	Min.	Max.	Min.		Av.											
H-1	8- 1-61	8- 7-61	563	27.6	12.9	11.0	11.9	41.4	36.0	38.4	36.8	35.4	36.3	1-1/2									
H-2	8- 1-61	8- 7-61	564	27.7	13.0	11.0	12.2	40.2	35.4	37.4	35.6	35.0	35.3	1-1/2									
<u>August, 1961</u>																							
				27.7			12.0			37.9			35.8										
Current Machine Average				26.9			11.2			36.6			33.9										
Cumulative Machine Average				102.8			107.6			103.5			105.7										
Machine Factor, %				101.3			117.0			104.3			107.1										
<u>September, 1961</u>																							
H-1	8-23-61	8-27-61	571	26.7	12.2	10.2	11.4	37.2	32.4	34.7	34.0	31.4	32.8	1-1/2									
H-2	8-23-61	8-27-61	572	26.5	12.2	11.2	11.8	35.4	30.0	33.1	33.8	30.8	32.4	1									
H-3	9- 5-61	9-13-61	587	27.4	11.8	11.0	11.4	36.6	34.8	35.5	32.8	29.8	31.1	1/2									
H-4	9- 5-61	9-13-61	588	27.4	12.5	10.4	11.0	36.6	35.4	36.2	32.6	29.4	30.5	Min.									
Current Machine Average													11.4			34.9			31.7				
Cumulative Machine Average													27.0			11.2			36.5			34.0	
Machine Factor, %													100.0			101.8			95.5			93.3	
Machine Index, %													98.8			111.0			95.7			94.4	

TABLE XI
 SUMMARY OF TEST RESULTS FOR MACHINE I

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.		Runnability, Maximum Tension at 600 f.p.m., lb./in.	
					Max.	Min.	Max.	Min.	Max.	Min.		Max.
<u>August, 1961</u>												
I-1	7-23-61	8-11-61	G-1	28.3	10.3	9.7	9.9	39.6	35.4	35.6	33.4	1-1/2
I-2	7-23-61	8-11-61	G-2	28.9	10.6	10.0	10.2	42.0	39.0	40.6	36.4	1-1/2
I-3	7-23-61	8-11-61	G-3	28.0	10.0	9.5	9.8	41.4	34.8	39.6	36.0	1-1/2
I-4	7-23-61	8-11-61	G-4	27.3	10.1	9.5	9.8	40.2	37.2	39.6	35.2	1-1/2
I-5	7-23-61	8-11-61	G-5	27.6	10.5	8.8	9.7	40.8	36.0	38.8	34.6	1-1/2
I-6	7-23-61	8-11-61	G-6	27.9	10.0	9.5	9.8	39.6	36.6	40.6	36.6	1-1/2
				Current Machine Average			9.9					
				Cumulative Machine Average			9.8					
				Machine Factor, %			100.6					
				Machine Index, %			95.9					
<u>September, 1961</u>												
No samples submitted.												

TABLE XII
SUMMARY OF TEST RESULTS FOR MACHINE J

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.			Runnability, Maximum Tension at 600 f.p.m., lb./in.
					Max.	Min.	Av.	Max.	Min.	Av.	Max.	Min.	Av.	
<u>August, 1961</u>														
J-1	7-13-61	8-21-61	165	26.0	10.7	10.2	10.4	36.6	34.8	35.8	33.4	31.6	32.4	Min.
J-2	7-15-61	8-21-61	166	26.1	10.4	10.0	10.2	40.8	32.4	36.5	35.4	33.4	34.4	1/2
J-3	7-19-61	8-21-61	167	26.3	10.4	9.7	10.2	37.8	33.0	36.0	35.6	32.8	33.6	1/2
Current Machine Average														
Cumulative Machine Average														
Machine Factor, %														
Machine Index, %														
<u>September, 1961</u>														
J-1	8-10-61	9-14-61	168	27.2	11.0	10.0	10.4	38.4	34.2	36.1	33.8	31.4	32.4	1/2
J-2	8-13-61	9-14-61	169	26.9	10.8	10.1	10.5	34.8	31.8	33.8	34.2	28.8	31.8	Min.
J-3	8-18-61	9-14-61	170	26.9	10.8	9.9	10.3	39.0	33.6	35.9	33.4	29.8	32.0	1/2
J-4	8-23-61	9-14-61	171	26.5	10.6	10.0	10.3	39.6	33.6	36.2	32.0	31.2	31.7	1
J-5	8-28-61	9-14-61	172	26.5	10.3	9.8	10.1	34.8	34.2	34.7	31.4	30.0	30.8	1-1/2
J-6	9-2-61	9-14-61	173	26.0	10.6	10.0	10.2	36.6	33.0	35.0	32.2	29.6	31.4	1
J-7	9-5-61	9-14-61	174	27.4	11.0	10.0	10.5	40.8	34.8	37.4	34.0	32.2	32.8	1-1/2
Current Machine Average														
Cumulative Machine Average														
Machine Factor, %														
Machine Index, %														

TABLE XIV
SUMMARY OF TEST RESULTS FOR MACHINE L

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.		Runnability, Maximum Tension at 600 f.p.m., lb./in.			
					Max.	Min.	Max.	Min.	Max.	Min.		Max.	Min.	
<u>August, 1961</u>														
L-1	7-23-61	7-31-61	454	26.1	9.2	8.9	9.0	35.4	32.4	34.1	33.0	30.8	32.2	1
L-2	7-23-61	8-8-61	455	26.7	10.0	9.5	9.8	37.8	34.8	36.5	37.2	35.4	36.2	1-1/2
L-3	7-23-61	8-8-61	456	27.8	9.8	9.2	9.6	40.2	36.6	38.0	39.4	36.0	37.4	1-1/2
L-4	8-1-61	8-9-61	457	27.0	9.6	9.0	9.3	37.8	33.6	35.4	35.4	32.0	34.0	1-1/2
L-5	8-6-61	8-14-61	458	26.5	10.0	9.5	9.8	37.2	34.8	35.9	36.2	33.2	34.4	1-1/2
L-6	8-12-61	8-25-61	459	26.9	9.2	8.8	9.1	39.0	34.8	37.0	34.6	32.6	33.7	1-1/2
L-7	8-13-61	8-25-61	460	27.3	10.0	9.3	9.6	40.8	33.6	37.6	36.6	34.0	35.0	1-1/2
Current Machine Average														
Cumulative Machine Average														
Machine Factor, %														
Machine Index, %														
<u>September, 1961</u>														
L-1	8-23-61	9-5-61	461	26.8	9.4	8.8	9.1	37.8	36.6	37.3	33.8	30.6	31.6	1
L-2	8-26-61	9-5-61	462	26.8	9.8	8.9	9.4	39.6	34.8	36.6	34.2	31.6	32.9	1-1/2
L-3	9-10-61	9-14-61	463	26.0	9.3	8.7	9.0	36.6	34.2	35.2	30.2	28.2	29.3	Min.
L-4	9-13-61	9-20-61	464	25.7	9.5	8.9	9.1	34.2	31.2	33.2	30.6	28.0	29.6	1-1/2
Current Machine Average														
Cumulative Machine Average														
Machine Factor, %														
Machine Index, %														

TABLE XVI

SUMMARY OF TEST RESULTS FOR MACHINE N

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.		Runnability, Maximum Tension at 600 f.p.m., lb./in.				
					Max.	Min.	Max.	Min.	Max.	Min.		Av.	Av.		
					<u>August, 1961</u>										
N-1	6-23-61	8-2-61	710	26.7	10.0	9.3	9.7	41.4	36.0	39.5	40.0	39.4	39.7	1	
N-2	6-23-61	8-2-61	711	26.9	10.1	9.4	9.8	39.0	36.0	37.8	40.2	37.2	38.4	1-1/2	
N-3	6-29-61	8-2-61	881	26.5	9.7	9.0	9.3	35.4	31.2	34.3	37.8	34.0	35.9	1-1/2	
N-4	6-29-61	8-2-61	882	26.8	9.8	8.7	9.5	35.4	31.8	33.6	36.0	33.4	34.6	1-1/2	
N-5	6-30-61	8-2-61	909	26.9	10.3	9.2	9.9	40.2	34.8	37.4	37.4	35.0	36.0	1	
N-6	6-30-61	8-2-61	910	26.9	9.9	9.0	9.6	41.4	34.8	37.6	36.6	33.4	34.8	1-1/2	
N-7	7-20-61	8-11-61	293	27.4	10.7	10.0	10.2	42.6	39.6	41.2	43.4	37.8	41.8	Min.	
N-8	7-20-61	8-11-61	294	27.6	10.5	10.0	10.2	42.6	39.0	40.7	41.0	39.2	40.0	1/2	
N-9	7-21-61	8-11-61	325	27.4	10.1	9.8	10.0	43.8	40.8	42.6	42.6	39.2	41.0	Min.	
N-10	7-21-61	8-11-61	326	26.9	10.3	9.5	10.0	43.2	42.0	42.6	40.6	37.6	39.3	Note a.	
				Current Machine Average	27.0		9.8						38.2		
				Cumulative Machine Average	26.6		10.0						35.2		
				Machine Factor, %	101.4		98.0						108.4		
				Machine Index, %	98.9		95.4						114.0		
					<u>September, 1961</u>										
N-1	8-2-61	9-6-61	32	27.4	10.2	9.8	10.0	40.8	37.8	39.4	39.2	36.2	37.6	1-1/2	
N-2	8-11-61	9-6-61	297	26.4	9.8	9.0	9.3	38.4	33.6	36.4	35.4	32.4	34.4	Min.	
N-3	8-15-61	9-6-61	418	27.4	9.9	9.0	9.6	40.2	36.6	37.4	38.6	35.4	36.6	1-1/2	
N-4	8-22-61	9-6-61	629	26.7	9.7	9.0	9.2	40.8	36.0	38.5	37.4	32.8	34.7	1-1/2	
				Current Machine Average	26.9		9.5							35.8	
				Cumulative Machine Average	26.7		10.0							35.5	
				Machine Factor, %	101.0		95.4							101.0	
				Machine Index, %	98.7		92.7							106.7	

a Maximum speed at which this roll could be corrugated with minimum tension was 575 f.p.m.

TABLE XVII
SUMMARY OF TEST RESULTS FOR MACHINE O

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.		Runnability, Maximum Tension at 600 f.p.m., lb./in.		
					Max.	Min.	Max.	Min.	Max.	Min.		Av.	
0-1	8-2-61	8-7-61	567	27.1	11.0	10.2	10.6	36.6	34.8	32.6	29.2	31.5	1-1/2
0-2	8-2-61	8-7-61	568	26.5	11.0	10.0	10.6	33.0	31.7	32.6	30.4	31.4	1-1/2
0-3	8-17-61	8-22-61	575	27.9	10.8	9.3	10.4	43.2	40.0	38.4	35.6	36.7	1-1/2
0-4	8-17-61	8-22-61	576	27.8	11.0	10.0	10.5	42.0	40.3	37.6	35.4	36.4	1-1/2
<u>August, 1961</u>													
				27.3			10.5		36.7			34.0	
Current Machine Average				27.7			10.8		35.7			32.6	
Cumulative Machine Average				98.7			97.3		102.6			104.3	
Machine Factor, %				100.1			102.3		100.9			101.6	
<u>September, 1961</u>													
0-1	9-12-61	9-22-61	591	28.1	11.9	11.0	11.2	39.6	36.4	32.6	31.0	32.0	1-1/2
0-2	9-12-61	9-22-61	592	27.4	11.1	10.5	10.9	36.6	35.3	32.2	30.2	31.2	1-1/2
Current Machine Average				27.8			11.0		35.8			31.6	
Cumulative Machine Average				27.6			10.8		35.8			32.6	
Machine Factor, %				100.4			102.5		100.0			96.8	
Machine Index, %				101.7			107.3		98.3			94.1	

TABLE XVIII
SUMMARY OF TEST RESULTS FOR MACHINE P

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.		Runnability, Maximum Tension at 600 f.p.m. lb./in.			
					Max.	Min.	Max.	Min.	Max.	Min.		Av.	Av.	
<u>August, 1961</u>														
P-1	7-29-61	8-7-61	--	27.0	10.5	9.3	10.0	40.2	34.8	38.0	38.2	36.4	37.2	1/2
P-2	8-8-61	8-15-61	--	27.6	10.5	10.0	10.2	41.4	38.4	40.1	38.2	36.2	37.1	1/2
P-3	8-11-61	8-15-61	--	27.5	10.3	9.7	10.0	39.6	36.0	37.9	37.8	34.6	36.0	1/2
P-4	8-16-61	8-22-61	--	27.1	10.7	10.0	10.1	39.6	36.0	37.9	38.4	34.0	36.0	1
P-5	8-18-61	8-22-61	--	28.0	10.8	10.4	10.6	45.6	37.8	41.6	36.8	33.2	35.5	1
P-6	8-19-61	8-22-61	--	27.9	10.7	10.0	10.1	44.4	38.4	40.3	35.8	34.4	35.0	1-1/2
<u>September, 1961</u>														
Current Machine Average				27.5			10.2			39.3				36.2
Cumulative Machine Average				27.5			10.3			37.0				34.5
Machine Factor, %				100.0			98.3			106.3				104.8
Machine Index, %				100.7			98.9			108.2				108.1
P-1	8-24-61	9-13-61	--	27.6	10.7	10.0	10.3	44.4	39.6	41.8	37.6	34.6	36.5	1/2
P-2	8-29-61	9-13-61	--	26.7	10.1	9.8	10.0	42.6	36.0	38.5	36.4	32.4	34.5	1/2
P-3	9-1-61	9-13-61	--	27.4	10.8	10.1	10.5	40.8	34.8	37.8	35.8	32.6	34.5	1
P-4	9-7-61	9-13-61	--	27.1	10.6	10.0	10.2	38.4	33.0	36.6	34.6	32.6	33.8	1/2
Current Machine Average				27.2			10.3			38.7				34.8
Cumulative Machine Average				27.5			10.4			37.1				34.5
Machine Factor, %				98.6			98.9			104.3				100.8
Machine Index, %				99.5			99.8			106.1				103.7

TABLE XIX
 SUMMARY OF TEST RESULTS FOR MACHINE Q

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.		Runnability, Maximum Tension at 600 f.p.m., lb./in.			
					Max.	Min.	Max.	Min.	Max.	Min.		Av.		
<u>August, 1961</u>														
Q-1	7-28-61	8-8-61	561	28.1	10.8	10.2	10.5	38.4	35.4	36.4	36.4	34.6	35.3	1-1/2
Q-2	7-28-61	8-8-61	562	28.2	10.9	10.5	10.7	39.0	36.6	38.0	38.0	34.0	35.8	1-1/2
Q-3	8-8-61	8-17-61	569	27.9	11.6	10.5	11.0	39.0	31.8	36.0	36.2	31.4	33.2	1
Q-4	8-8-61	8-17-61	570	28.4	11.5	11.0	11.1	42.6	36.6	38.9	35.2	32.8	34.1	1
<u>September, 1961</u>														
Current Machine Average														
Cumulative Machine Average														
Machine Factor, %														
Machine Index, %														
Q-1	8-24-61	9-6-61	577	27.6	11.3	10.7	11.1	39.0	33.6	36.4	36.8	33.2	34.3	1
Q-2	8-24-61	9-6-61	578	27.6	11.4	11.0	11.2	39.0	34.2	36.1	34.0	31.2	32.7	1
Q-3	9-7-61	9-20-61	585	28.2	10.9	10.1	10.5	39.0	34.8	37.7	34.6	32.4	33.0	1-1/2
Q-4	9-7-61	9-20-61	586	28.8	10.9	10.1	10.5	39.6	34.8	36.7	35.4	31.6	33.5	1-1/2
Current Machine Average														
Cumulative Machine Average														
Machine Factor, %														
Machine Index, %														

TABLE XI
SUMMARY OF TEST RESULTS FOR MACHINE R

Code	Date Made	Date Recd.	Mill Roll No.	Basis Weight, lb. per 1000 sq. ft.	Calliper, points		Concora Flat Crush, P.S.I.		Single-Face Flat Crush, P.S.I.		Runnability, Maximum Tension at 600 r.p.m. lb./in.			
					Max.	Min.	Max.	Min.	Max.	Min.		Max.	Min.	
	<u>August, 1961</u>													
R-1	7-18-61	8-7-61	33	27.7	10.0	9.3	9.7	29.4	27.6	28.3	30.6	27.0	28.9	1-1/2
R-2	7-18-61	8-7-61	34	27.7	10.0	9.2	9.6	31.8	28.8	29.5	29.4	27.6	28.6	1-1/2
R-3	7-18-61	8-7-61	35	27.6	10.1	9.4	9.8	31.8	27.0	29.4	30.6	26.2	28.4	1-1/2
R-4	7-18-61	8-7-61	36	27.4	10.2	9.0	9.7	31.2	28.8	30.0	27.0	25.4	26.0	1-1/2
R-5	8-9-61	8-21-61	37	28.0	10.7	9.2	9.9	31.8	28.8	31.0	29.2	27.4	27.9	1/2
R-6	8-9-61	8-21-61	38	28.1	10.2	9.2	9.8	32.4	30.0	31.2	30.0	27.6	28.8	1-1/2
				Current Machine Average	27.7		9.7				29.9		28.1	
				Cumulative Machine Average	27.9		9.2				35.9		31.9	
				Machine Factor, %	99.5		105.4				83.3		87.9	
				Machine Index, %	101.6		94.8				82.3		84.0	
<u>September, 1961</u>														
R-1	8-22-61	9-5-61	39	28.2	9.9	8.9	9.2	34.8	31.8	33.2	30.4	29.6	30.0	1-1/2
R-2	8-22-61	9-5-61	40	27.8	10.0	9.0	9.3	33.6	31.2	32.9	29.0	26.0	27.4	1-1/2
				Current Machine Average	28.0		9.3				33.1		28.7	
				Cumulative Machine Average	27.8		9.3				35.3		31.5	
				Machine Factor, %	100.6		100.0				93.7		91.1	
				Machine Index, %	102.4		90.1				90.7		85.5	

TABLE XXI
 SUMMARY OF TEST RESULTS FOR MACHINE S

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.		Runnability, Maximum Tension at 600 f.p.m. lb./in.			
					Max.	Min.	Max.	Min.	Max.	Min.		Max.	Min.	
S-1	7-20-61	8-11-61	33	26.0	10.7	9.0	9.8	36.0	28.8	33.1	30.0	28.4	29.1	Min.
S-2	7-27-61	8-11-61	34	25.3	10.7	9.7	10.2	33.6	28.8	30.7	28.8	27.6	28.2	Note a.
<u>August, 1961</u>														
				25.6			10.0			31.9			28.6	
				27.0			10.3			35.3			32.7	
				95.0			97.9			90.5			87.6	
				93.8			97.6			87.8			85.6	
<u>September, 1961</u>														

No samples submitted.

a Maximum speed at which this roll could be corrugated with minimum tension was 575 f.p.m.

TABLE XXII
 SUMMARY OF TEST RESULTS FOR MACHINE T

August, 1961

No samples submitted.

TABLE XXII (Continued)

SUMMARY OF TEST RESULTS FOR MACHINE T

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.		Runnability, Maximum Tension at 600 f.p.m. lb./in.			
					Max.	Min.	Max.	Min.	Max.	Min.		Av.	Av.	
<u>September, 1961</u>														
T-1	8-21-61	8-28-61	95	29.0	10.3	10.0	10.1	39.0	33.6	36.7	35.6	34.0	34.7	1-1/2
T-2	8-21-61	8-28-61	96	30.3	10.7	10.0	10.4	39.0	35.4	36.8	36.4	33.8	35.1	1-1/2
T-3	8-21-61	8-28-61	97	27.7	10.3	9.0	9.9	34.2	30.0	31.9	33.0	30.6	32.0	1-1/2
T-4	8-22-61	8-28-61	98	27.2	9.9	9.0	9.5	33.6	31.8	32.8	30.2	29.0	29.4	1-1/2
T-5	8-22-61	8-28-61	99	28.0	10.3	9.3	10.0	33.6	31.8	33.0	32.6	29.6	31.2	1-1/2
T-6	8-22-61	8-28-61	100	27.1	10.3	9.3	9.8	33.6	30.6	32.0	32.6	31.0	31.6	1-1/2
				Current Machine Average	28.2			9.9			33.9			32.3
				Cumulative Machine Average	27.9			9.9			36.2			34.0
				Machine Factor, %	101.2			100.0			93.6			95.0
				Machine Index, %	103.4			96.6			92.9			96.3

TABLE XXIII

SUMMARY OF TEST RESULTS FOR MACHINE U

August, 1961

No samples submitted.

TABLE XXIV (Continued)

SUMMARY OF TEST RESULTS FOR MACHINE V

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.		Runnability, Maximum Tension at 600 f.p.m. lb./in.		
					Max.	Min.	Max.	Min.	Max.	Min.		Av.	Av.
<u>September, 1961</u>													
V-1	8-21-61	8-28-61	92	29.5	10.3	9.1	9.8	37.2	31.8	29.8	28.0	28.7	1-1/2
V-2	8-21-61	8-28-61	93	29.5	10.0	7.4	9.3	37.8	33.0	33.6	30.4	31.8	1-1/2
V-3	8-21-61	8-28-61	94	25.5	10.8	9.3	10.1	36.6	28.8	30.8	28.8	29.5	1-1/2
V-4	8-22-61	8-28-61	95	28.1	11.8	10.8	11.3	33.6	32.4	27.6	25.2	26.4	1-1/2
V-5	8-22-61	8-28-61	96	27.4	11.9	10.0	10.8	37.2	28.2	34.0	30.4	31.8	1-1/2
V-6	8-22-61	8-28-61	97	26.0	11.3	9.8	10.4	34.8	28.8	30.4	26.2	28.3	1-1/2
Current Machine Average				27.6			10.3					29.4	
Cumulative Machine Average				28.7			10.0					29.7	
Machine Factor, %				96.5			102.7					99.2	
Machine Index, %				101.3			100.1					87.7	

DISCUSSION OF RESULTS

Shown below from Table II are the maximum and minimum current machine averages noted for each test during the months of August and September (the current machine average is the average of the results obtained on all rolls submitted from a given machine during a given month); also given for each test is the current F.K.I. average which is determined by averaging the current machine averages for a given month and is indicative of the test level being maintained by the industry as a whole to the extent that the industry is represented by the participating machines:

	August			September		
	Maximum Current Machine Average	Minimum Current Machine Average	Current F.K.I. Average	Maximum Current Machine Average	Minimum Current Machine Average	Current F.K.I. Average
Basis wt., lb.	28.6	25.6	27.2	28.6	26.3	27.3
Caliper, pt.	12.0	9.5	10.3	11.4	9.1	10.3
Comcora flat crush, p.s.i.	44.7	29.9	37.6	45.6	32.6	36.7
Single-face flat crush, p.s.i.	40.9	28.1	35.2	40.6	28.7	33.0

The runnability data for the 98 rolls evaluated during August and the 83 rolls evaluated during September are summarized as follows:

Runnability	August		September	
	Number of Rolls	Percentage of Total Rolls	Number of Rolls	Percentage of Total Rolls
Less than 600 f.p.m. with minimum tension	2	2.0	6	7.2
600 f.p.m.--minimum tension	9	9.2	6	7.2
600 f.p.m.--1/2 lb. per in. tension	12	12.2	10	12.0
600 f.p.m.--1 lb. per in. tension	21	21.4	14	16.9
600 f.p.m.--1-1/2 lb. per in. tension	54	55.1	47	56.6

In Table XXV a comparison of Institute and mill Concora flat crush test results obtained on conditioned specimens is given for the month of August. A similar comparison for the month of September is given in Table XXVI. These comparisons 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. Shown in Tables XXV and XXVI are the Institute and mill Concora averages for each roll included in these comparisons, the difference between the roll average based on Institute data and that based on mill data, the Institute and mill averages based on all rolls included in the comparison, and the difference between these over-all averages.

The Concora flat crush data shown in Table XXV for the month of August are summarized in Part I of Table XXVII and those shown in Table XXVI for the month of September are summarized in Part I of Table XXVIII where for each machine the following information is given: (1) Current machine average based on Institute data, (2) current machine average based on mill data, (3) the average difference--that is, the difference between the current machine average based on Institute data and that based on mill data and (4) the maximum difference encountered in comparing Institute and mill test averages for individual rolls. In Part II of Tables XXVII and XXVIII the average differences given in Part I have been converted to per cent. It may be seen in Table XXVII that, for the month of August, the highest average difference of 11.4% was associated with Machine G and the lowest of 0.0% with Machine O. An average

TABLE XXV
INSTITUTE AND MILL CONCORDIA FLAT CRUSH TEST RESULTS IN INDIVIDUAL ROLLS FOR AUGUST, 1961

Machine B				Machine D				Machine E			
Code	Mill Roll No.	Date Made	Concra Flat Crush, P.s.i.	Code	Mill Roll No.	Date Made	Concra Flat Crush, P.s.i.	Code	Mill Roll No.	Date Made	Concra Flat Crush, P.s.i.
			Insti- tute				Insti- tute				Insti- tute
			Diff- erence a				Diff- erence a				Diff- erence
B-1	--	7-22-61	40.3	D-1	--	7-22-61	38.2	E-1	565	8-1-61	38.5
B-2	--	8-1-61	38.9	D-2	--	8-2-61	40.2	E-2	566	8-1-61	37.8
B-3	--	8-4-61	38.3	D-3	--	8-5-61	42.0	E-3	573	8-17-61	35.9
B-4	--	8-9-61	39.8	D-4	--	8-10-61	39.2	E-4	574	8-17-61	38.0
B-5	--	8-12-61	40.0	D-5	--	8-15-61	39.6				
B-6	--	8-17-61	36.8	D-6	--	8-18-61	39.0				
Current Machine Av.			39.2	Current Machine Av.			39.7	Current Machine Av.			37.6
			+0.4				+0.2				+0.2
Machine F				Machine G				Machine H			
Code	Mill Roll No.	Date Made	Concra Flat Crush, P.s.i.	Code	Mill Roll No.	Date Made	Concra Flat Crush, P.s.i.	Code	Mill Roll No.	Date Made	Concra Flat Crush, P.s.i.
			Insti- tute				Insti- tute				Insti- tute
			Diff- erence a				Diff- erence a				Diff- erence
F-1	459	7-7-61	40.2	G-1	324	7-20-61	45.8	H-1	563	8-1-61	38.4
F-2	460	7-12-61	37.4	G-2	325	7-26-61	42.7	H-2	564	8-1-61	37.4
F-3	461	7-17-61	37.2	G-3	326	8-2-61	44.9				
F-4	462	7-28-61	38.4	G-4	327	8-8-61	46.1				
F-5	463	8-10-61	37.3	G-5	328	8-14-61	43.8				
Current Machine Av.			38.1	Current Machine Av.			44.7	Current Machine Av.			37.9
			+0.3				-5.1				+0.7
Machine J				Machine K							
Code	Mill Roll No.	Date Made	Concra Flat Crush, P.s.i.	Code	Mill Roll No.	Date Made	Concra Flat Crush, P.s.i.				
			Insti- tute				Insti- tute				
			Diff- erence a				Diff- erence				
J-1	165	7-13-61	35.8	K-2	2610	6-15-61	43.2				
J-2	166	7-15-61	36.5	K-3	3015	6-17-61	37.6				
J-3	167	7-19-61	36.0	K-4	4081	6-23-61	37.9				
				K-5	4356	6-24-61	37.6				
				K-6	3006	7-17-61	33.7				
				K-7	4801	7-25-61	37.9				
				K-8	634	8-4-61	37.2				
				K-9	1266	8-7-61	40.0				
Current Machine Av.			36.1	Current Machine Av.			36.1				
			-0.3				-1.9				

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

TABLE XXV --Continued
INSTITUTE AND MILL CONCORA FLAT CRUSH TEST RESULTS ON INDIVIDUAL ROLLS FOR AUGUST, 1961

Machine M				Machine N				Machine O			
Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Mill	Difference ^a	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Mill	Difference ^a	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Mill	Difference ^a
M-1	637 7-25-61	38.4	+1.1	N-1	710 6-23-61	39.5	+0.9	O-1	567 8-2-61	34.8	-0.4
M-2	638 7-28-61	41.3	-0.1	N-2	711 6-23-61	37.8	+2.8	O-2	568 8-2-61	31.7	+1.8
M-3	639 8-3-61	38.4	+2.6	N-3	881 6-29-61	34.3	+2.3	O-3	575 8-17-61	40.0	0.0
M-4	640 8-11-61	40.2	+0.2	N-4	882 6-29-61	33.6	+5.4	O-4	576 8-17-61	40.3	-1.5
				N-5	909 6-30-61	37.4	+2.2				
				N-6	910 6-30-61	37.6	+2.0				
				N-7	293 7-20-61	41.2	+2.4				
				N-8	294 7-20-61	40.7	+0.1				
				N-9	325 7-21-61	42.6	+0.1				
				N-10	326 7-21-61	42.6	-1.1				
Current Machine Av.	39.6	40.6	+1.0	Current Machine Av.	38.7	40.4	+1.7	Current Machine Av.	36.7	36.7	0.0
Machine P				Machine Q				Machine R			
Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Mill	Difference ^a	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Mill	Difference ^a	Mill Roll No.	Date Made	Concora Flat Crush, p.s.i. Mill	Difference ^a
P-1	7-29-61	38.0	-0.4	Q-1	561 7-28-61	36.4	-3.2	R-1	33 7-18-61	28.3	+1.0
P-2	8-8-61	40.1	-0.3	Q-2	562 7-28-61	38.0	-5.5	R-2	34 7-18-61	29.5	+0.4
P-3	8-11-61	37.9	-0.5	Q-3	569 8-8-61	36.0	+0.6	R-3	35 7-18-61	29.4	-0.1
P-4	8-16-61	37.9	-2.9	Q-4	570 8-8-61	38.9	-6.7	R-4	36 7-18-61	30.0	-1.0
P-5	8-18-61	41.6	+0.4					R-5	37 8-9-61	31.0	+1.0
P-6	8-19-61	40.3	+0.6					R-6	38 8-9-61	31.2	+1.7
Current Machine Av.	39.3	38.8	-0.5	Current Machine Av.	37.3	33.6	-3.7	Current Machine Av.	29.9	30.4	+0.5

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

TABLE XXVI
INSTITUTE AND MILL CONCORDIA FLAT CRUSH TEST RESULTS ON INDIVIDUAL ROLLS FOR SEPTEMBER, 1961

Machine B				Machine C				Machine D			
Code	Mill Roll No.	Date Made	Concordia Flat Crush, p.s.i. Institute	Code	Mill Roll No.	Date Made	Concordia Flat Crush, p.s.i. Institute	Code	Mill Roll No.	Date Made	Concordia Flat Crush, p.s.i. Institute
			Difference ^a				Difference ^a				Difference ^a
B-1	--	8-22-61	39.8	C-1	14	8-4-61	32.5	D-1	--	8-23-61	36.1
B-2	--	8-25-61	34.8	C-2	15	8-7-61	33.8	D-2	--	8-27-61	37.6
B-3	--	8-30-61	34.1	C-3	16	8-8-61	30.0	D-3	--	8-31-61	37.6
B-4	--	9-2-61	35.3	C-4	17	8-9-61	33.0	D-4	--	9-6-61	38.9
				C-5	18	8-10-61	33.0				
				C-6	19	8-11-61	32.9				
Current Machine Av.			36.0	Current Machine Av.			32.6	Current Machine Av.			37.5
			+1.1				0.0				37.4
											-0.1
Machine E				Machine F				Machine H			
Code	Mill Roll No.	Date Made	Concordia Flat Crush, p.s.i. Institute	Code	Mill Roll No.	Date Made	Concordia Flat Crush, p.s.i. Institute	Code	Mill Roll No.	Date Made	Concordia Flat Crush, p.s.i. Institute
			Difference ^a				Difference ^a				Difference ^a
E-1	581	8-30-61	35.0	F-1	464	8-15-61	40.6	H-1	571	8-23-61	34.7
E-2	582	8-30-61	32.0	F-2	465	8-19-61	33.0	F-2	572	8-23-61	32.1
E-3	589	9-11-61	36.4	F-3	466	8-21-61	39.4	H-3	587	9-5-61	35.5
E-4	590	9-11-61	35.9	F-4	467	8-24-61	36.0	H-4	588	9-5-61	36.2
				F-5	468	8-28-61	36.6				
				F-6	469	9-7-61	36.7				
Current Machine Av.			37.1	Current Machine Av.			37.9	Current Machine Av.			34.9
			+1.1				+1.3				+1.1
Machine J				Machine K							
Code	Mill Roll No.	Date Made	Concordia Flat Crush, p.s.i. Institute	Code	Mill Roll No.	Date Made	Concordia Flat Crush, p.s.i. Institute				
			Difference ^a				Difference ^a				
J-1	168	8-10-61	36.1	K-1	2698	8-14-61	36.4				
J-2	169	8-13-61	33.8	K-2	2941	8-15-61	35.0				
J-3	170	8-18-61	35.9	K-3	3394	8-17-61	33.7				
J-4	171	8-23-61	36.2	K-4	1088	9-6-61	35.6				
J-5	172	8-28-61	34.7								
Current Machine Av.			35.3	Current Machine Av.			35.2				
			+2.7				+0.3				

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

TABLE XXVII

PART I: A COMPARATIVE SUMMARY FOR EACH MACHINE OF THE CONCORDA FLAT CRUSH AVERAGES BASED ON INSTITUTE DATA AND THOSE BASED ON MILL DATA FOR AUGUST, 1961

Machine Code	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	
Number of Rolls Compared	0	6	0	6	4	5	5	2	0	3	5	7	4	10	4	6	4	6	6	C
Concorda Flat Crush, p.s.i.																				
Current Machine Av. (Institute) ^a	--	39.2	--	39.7	37.6	38.1	44.7	37.9	--	36.1	38.1	36.3	39.6	38.7	36.7	39.3	37.3	29.9	--	
Current Machine Av. (Mill) ^a	--	39.6	--	40.0	36.1	38.4	39.6	38.6	--	35.8	34.2	37.8	40.6	40.4	36.7	38.8	33.6	30.4	--	
Average Difference ^b	--	+0.4	--	+0.3	-1.5	+0.3	-5.1	+0.7	--	-0.3	-1.9	+1.5	+1.0	+1.7	0.0	-0.5	-3.7	+0.5	--	
Maximum Difference ^c	--	+2.1	--	+2.8	-2.8	+2.3	-7.3	+1.6	--	-1.9	-5.4	+2.8	+2.6	+5.4	+1.8	-2.9	-6.7	+1.7	--	

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

Average Difference, % ^d	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
Current Report (Aug.)	--	+1.0	--	+0.8	-4.0	+0.8	-11.4	+1.8	--	-0.8	-5.0	+4.1	+2.5	+4.4	0.0	-1.3	-9.9	+1.7	--
20th Report (July)	--	+4.4	-5.3	+3.4	+0.5	+1.6	-8.7	+6.2	--	-3.7	-5.4	+2.2	-1.2	--	-0.3	+4.5	-9.9	+0.5	--
29th Report (June)	--	+3.0	--	+0.2	+6.6	+3.0	-2.8	+1.4	--	+6.3	-0.8	+0.8	+0.8	+0.8	+0.6	+2.9	-3.8	+0.5	--

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

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

^c Maximum difference is the greatest difference encountered in comparing Institute and mill test averages for individual rolls. See Table XXV.

^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 Institute current machine average and multiplying the result by 100.

TABLE XXVIII
PART I: A COMPARATIVE SUMMARY FOR EACH MACHINE OF THE CONCORDA FLAT CRUSH AVERAGES BASED ON INSTITUTE DATA AND THOSE BASED ON MILL DATA FOR SEPTEMBER, 1961

Machine Code	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
Number of Rolls Compared	0	4	6	4	4	6	6	4	0	5	4	4	4	4	2	4	4	2	0	0	0	0
Concorda Flat Crush, p.s.i.																						
Current Machine Av. (Institute) ^a	--	36.0	32.6	37.5	37.1	37.9	--	34.9	--	35.3	35.2	35.6	40.0	37.9	35.6	36.7	36.7	33.1	--	--	--	--
Current Machine Av. (Mill) ^a	--	37.1	32.6	37.4	36.5	39.2	--	36.0	--	38.0	35.5	37.7	41.2	38.1	35.8	37.9	35.1	31.2	--	--	--	--
Average Difference ^b	--	+1.1	0.0	-0.1	-0.5	+1.3	--	+1.1	--	+2.7	+0.3	+2.1	+1.2	+0.2	0.0	-0.8	-1.6	-1.9	--	--	--	--
Maximum Difference ^c	--	+2.1	+1.1	-3.4	-1.3	+2.6	--	+4.5	--	+4.6	+1.3	+3.4	+3.7	-2.1	-0.2	-2.7	-3.5	-1.5	--	--	--	--

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

Average Difference, % ^d	Current Report (Sept.)	Current Report (Aug.)	90th Report (July)
--	+3.1	0.0	-0.3
--	+1.0	--	+0.8
--	+4.4	-5.3	+3.4
--	--	+3.4	+0.5
--	+3.2	-11.4	+6.2
--	+7.6	-0.8	-3.7
--	+5.9	+4.1	+2.2
--	+3.0	+2.5	-1.2
--	+0.5	+4.4	--
--	0.0	-0.3	-0.3
--	-2.1	-1.3	+4.5
--	-4.4	-9.9	-8.9
--	-5.7	+1.7	+0.6

^a Comparisons based on current machine average include only those rolls for which mill data were submitted.
^b Average difference is the difference between the current machine average based on Institute test results and that based on mill test results with the Institute test results used as the reference. See Table XXVI.
^c Maximum difference is the greatest difference encountered in comparing Institute and mill test averages for individual rolls. See Table XXVI.
^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 Institute current machine average and multiplying the result by 100.

difference in excess of five per cent was noted for Machines G and Q. Likewise, in Table XXVIII it may be seen that the highest average difference noted during the month of September was 7.6% for Machine J and the lowest average difference was 0.0% for Machines C and O. Average differences in excess of five per cent were associated with Machines J, L, and R.

In Table XXIX a comparison of the agreement between Institute and mill Concora flat crush data is given for the months of June, July, August, and September, 1961. An inspection of the percentages shown in Table XXIX indicates that agreement between Institute and mill Concora flat crush data for the months of August and September covered by this report is, in general, comparable to the agreement for the two earlier periods. In general, agreement between Institute and mill results was good for all four months for which comparative data are shown.

TABLE XXIX
 COMPARISON BY PERIODS OF AGREEMENT BETWEEN INSTITUTE
 AND MILL CONCORA FLAT CRUSH DATA

Average Percentage Difference Between Institute and Mill Concora Flat Crush Test Results ^a	Percentage of All Machines Included Within the Indicated Range			
	June	July	August	September
+ 1.0	40.0	20.0	33.3	33.3
+ 2.5	46.7	40.0	60.0	46.7
+ 5.0	80.0	66.7	86.7	80.0
+10.0	100.0 ^b	100.0 ^c	93.3	100.0 ^d
+11.4			100.0	

^a The average obtained at the Institute was used as the reference in the calculation of the percentage differences.

^b Maximum percentage difference was 6.6.

^c Maximum percentage difference was 9.9.

^d Maximum percentage difference was 7.6.

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