<table>
<thead>
<tr>
<th>Company - Mill</th>
<th>Machine No.</th>
<th>Code Letter</th>
</tr>
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<tbody>
<tr>
<td>The Chesapeake Corporation - Norfolk</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>Continental Can Company, Inc. - Reynold</td>
<td>1</td>
<td>F</td>
</tr>
<tr>
<td>Crown Zellerbach Corporation - Baltimore</td>
<td>1</td>
<td>I</td>
</tr>
<tr>
<td>- Baltimore</td>
<td>2</td>
<td>G</td>
</tr>
<tr>
<td>- Bayview</td>
<td>4</td>
<td>P</td>
</tr>
<tr>
<td>- Bedroom</td>
<td>1</td>
<td>E</td>
</tr>
<tr>
<td>- Manchester</td>
<td>2</td>
<td>V</td>
</tr>
<tr>
<td>International Paper Company - Barstow</td>
<td>1</td>
<td>O</td>
</tr>
<tr>
<td>- Barstow</td>
<td>2</td>
<td>--</td>
</tr>
<tr>
<td>- Eloy</td>
<td>1</td>
<td>D</td>
</tr>
<tr>
<td>- Eloy</td>
<td>2</td>
<td>--</td>
</tr>
<tr>
<td>The Wood Corporation - Harriman</td>
<td>1</td>
<td>B</td>
</tr>
<tr>
<td>- Knoxville</td>
<td>1</td>
<td>Q</td>
</tr>
<tr>
<td>- Limestone</td>
<td>2</td>
<td>G</td>
</tr>
<tr>
<td>- Sylva</td>
<td>1</td>
<td>N</td>
</tr>
<tr>
<td>St. Regis Container Corporation - Mill Division - Comstock</td>
<td>1</td>
<td>T</td>
</tr>
<tr>
<td>North Carolina Pulp Company - Plymouth</td>
<td>3</td>
<td>U</td>
</tr>
<tr>
<td>Olia Mathieson Chemical Corporation - Monroe</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>- Monroe</td>
<td>2</td>
<td>L</td>
</tr>
<tr>
<td>Crown-Illinois Glass Company - Tamoka</td>
<td>1</td>
<td>H</td>
</tr>
<tr>
<td>- Tamoka</td>
<td>2</td>
<td>A</td>
</tr>
<tr>
<td>- Tamoka</td>
<td>3</td>
<td>M</td>
</tr>
<tr>
<td>- Big Island</td>
<td>1</td>
<td>--</td>
</tr>
<tr>
<td>- Big Island</td>
<td>2</td>
<td>--</td>
</tr>
<tr>
<td>- Big Island</td>
<td>3</td>
<td>R</td>
</tr>
<tr>
<td>St. Joe Paper Company - Fort St. Joe</td>
<td>1</td>
<td>K</td>
</tr>
<tr>
<td>Union Bag-Camp Paper Corporation - Savannah</td>
<td>2</td>
<td>S</td>
</tr>
<tr>
<td>West Virginia Pulp and Paper Company - Covington</td>
<td>6</td>
<td>J</td>
</tr>
<tr>
<td>- Covington</td>
<td>7</td>
<td>--</td>
</tr>
<tr>
<td>- Charleston</td>
<td>--</td>
<td>--</td>
</tr>
</tbody>
</table>
SUPPLEMENTARY REPORT ON CALIPER OF SINGLE-FACED BOARD

Project 1108-17

Progress Report 70

to

FOURDRINIER KRAFT BOARD INSTITUTE, INC.

July 1, 1960
This report is supplementary to Progress Report 69 of the baseline study on corrugating medium entitled, "Continuous evaluation of corrugating medium" which provides a program whereby participating mills have the opportunity to submit rolls of medium on a regular weekly schedule for evaluation with regard to physical characteristics of the medium and of the single-faced board made from the medium. Specifically, each medium is evaluated for caliper, basis weight, and Concora flat crush. In addition each medium is fabricated into A-flute single-faced corrugated board on the Institute's corrugator to determine its runability in terms of speed and tension, and the single-faced board obtained at maximum speed with minimum tension is evaluated for its flat crush strength.

This report is an extension of the baseline study described above and is concerned specifically with the caliper and uniformity of caliper of the single-faced board fabricated from each roll of medium. Uniformity of caliper is generally considered to be another facet of the criteria used to evaluate the runability of corrugating medium, and the Technical Committee of the Fourdrinier Kraft Board Institute, Inc., has requested that a measurement of the uniformity of caliper be included as a part of the evaluation given each roll of corrugating medium.

The evaluation of the caliper and uniformity of caliper of the single-faced board made from each roll of corrugating medium was carried out using the five circular specimens that were subsequently tested for flat crush strength. Each specimen was five square inches in area. They were cut at intervals of approximately two feet along the central portion
of a strip of the single-faced board fabricated at maximum speed and minimum tension. On each of these five specimens, caliper measurements were made on five consecutive flutes and the caliper difference between consecutive flutes was calculated, there being four calculations of differences for each specimen. The twenty-five caliper measurements (five calipers on each of the five specimens) were averaged and are reported as the caliper for each sample of medium. Likewise, the twenty caliper differences between consecutive flutes (four caliper differences on each of the five specimens) were averaged, and the maximum, minimum, and average values are reported for each sample of corrugating medium.

The instrument for measuring the caliper of invididual flutes of single-faced board consists of a bench-type thickness gage with a pressure foot 3/8 inch in diameter and an anvil consisting of a plane circular surface 2 inches in diameter. The pressure foot is attached to a dial indicator which can be read to 0.0001 inch. The load on the pressure foot is 100 ± 10 grams. A caliper determination is made by inserting each five-square-inch circular specimen between the pressure foot and the anvil so that the foot rests on the second flute from one end of the specimen without touching either of the adjacent flutes. The 3/8-inch diameter of the pressure foot permits it to contact only one flute with ease. The specimen is pressed gently against the anvil, and the reading is then recorded. As mentioned previously, five consecutive flutes through the center of each specimen are calipered in this way. It should be emphasized that these calipers may not necessarily correspond to regular caliper measurements because of differences in load and other variables.
Caliper data have been obtained on the single-faced board fabricated from each of the one hundred and four rolls of corrugating medium which were submitted for evaluation during the month of June. Also included for purposes of convenient reference are the single-face flat crush and runability data. The current machine averages for each test are summarized in Table I for Machines A through V. A graphical presentation of the current machine caliper averages on single-faced board is shown in Figure 1, and a similar presentation of the current machine averages for the caliper difference between consecutive flutes is given in Figure 2.

The test results obtained on the individual rolls of medium submitted by each company are given in Tables II through XXIII for Machines A through V, respectively.

It may be seen in Figure 1 and Table I that the average caliper results for the single-faced boards varied from a low value of 192.3 points for Machine C to a high value of 196.8 points for Machine N. Likewise, from the results given in Table I and Figure 2, it may be noted that the average caliper difference between consecutive flutes ranged from a minimum of 1.2 points for Machines I and U to a maximum of 4.0 points for Machine V. The majority of the machines were associated with average caliper differences of two points or less. The differences in the area of three points may be excessive.
TABLE I

SUMMARY OF CURRENT MACHINE AVERAGES
June, 1960

<table>
<thead>
<tr>
<th>Machine</th>
<th>Number of Rolls</th>
<th>Caliper, points</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>8</td>
<td>195.3</td>
<td>2.0</td>
<td>36.1</td>
</tr>
<tr>
<td>B</td>
<td>6</td>
<td>195.9</td>
<td>1.6</td>
<td>30.6</td>
</tr>
<tr>
<td>C</td>
<td>4</td>
<td>192.3</td>
<td>2.1</td>
<td>31.0</td>
</tr>
<tr>
<td>D</td>
<td>4</td>
<td>195.8</td>
<td>1.8</td>
<td>35.0</td>
</tr>
<tr>
<td>E</td>
<td>6</td>
<td>194.2</td>
<td>3.0</td>
<td>33.2</td>
</tr>
<tr>
<td>F</td>
<td>4</td>
<td>195.9</td>
<td>2.0</td>
<td>36.8</td>
</tr>
<tr>
<td>G</td>
<td>4</td>
<td>196.7</td>
<td>1.4</td>
<td>32.6</td>
</tr>
<tr>
<td>H</td>
<td>8</td>
<td>195.8</td>
<td>2.1</td>
<td>36.2</td>
</tr>
<tr>
<td>I</td>
<td>4</td>
<td>193.6</td>
<td>1.2</td>
<td>32.1</td>
</tr>
<tr>
<td>J</td>
<td>5</td>
<td>195.7</td>
<td>1.4</td>
<td>32.4</td>
</tr>
<tr>
<td>K</td>
<td>4</td>
<td>195.5</td>
<td>2.3</td>
<td>30.4</td>
</tr>
<tr>
<td>L</td>
<td>1</td>
<td>Note a</td>
<td>Note a</td>
<td>Note a</td>
</tr>
<tr>
<td>M</td>
<td>8</td>
<td>195.6</td>
<td>1.9</td>
<td>36.1</td>
</tr>
<tr>
<td>N</td>
<td>4</td>
<td>196.8</td>
<td>1.9</td>
<td>34.0</td>
</tr>
<tr>
<td>O</td>
<td>4</td>
<td>196.0</td>
<td>2.0</td>
<td>35.5</td>
</tr>
<tr>
<td>P</td>
<td>5</td>
<td>195.0</td>
<td>2.2</td>
<td>30.7</td>
</tr>
<tr>
<td>Q</td>
<td>2</td>
<td>195.3</td>
<td>2.4</td>
<td>33.3</td>
</tr>
<tr>
<td>R</td>
<td>5</td>
<td>195.9</td>
<td>1.5</td>
<td>36.1</td>
</tr>
<tr>
<td>S</td>
<td>7</td>
<td>195.0</td>
<td>2.1</td>
<td>35.7</td>
</tr>
<tr>
<td>T</td>
<td>6</td>
<td>195.5</td>
<td>2.8</td>
<td>33.0</td>
</tr>
<tr>
<td>U</td>
<td>4</td>
<td>195.0</td>
<td>1.2</td>
<td>36.0</td>
</tr>
<tr>
<td>V</td>
<td>1</td>
<td>196.2</td>
<td>4.0</td>
<td>33.3</td>
</tr>
</tbody>
</table>

Total 104

*a Single-face flat crush and caliper could not be determined because the medium fractured at less than 100 f.p.m.*
Figure 1
Comparison of Caliper Results on Single-Faced Board
June, 1960

Figure 2
Comparison of the Caliper Differences Between Consecutive Flutes of Single-Faced Board
June, 1960
### TABLE II

**SUMMARY OF TEST RESULTS FOR MACHINE A**

June, 1960

<table>
<thead>
<tr>
<th>Code</th>
<th>Date Made</th>
<th>Roll No.</th>
<th>Caliper, pt.</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m.), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-1</td>
<td>5-17-60</td>
<td>--</td>
<td>196.1</td>
<td>4.8</td>
<td>0.1</td>
<td>1.9</td>
</tr>
<tr>
<td>A-2</td>
<td>5-21-60</td>
<td>--</td>
<td>194.7</td>
<td>6.1</td>
<td>0.2</td>
<td>2.7</td>
</tr>
<tr>
<td>A-3</td>
<td>5-24-60</td>
<td>--</td>
<td>195.7</td>
<td>5.2</td>
<td>0.5</td>
<td>2.9</td>
</tr>
<tr>
<td>A-4</td>
<td>5-27-60</td>
<td>--</td>
<td>195.4</td>
<td>6.0</td>
<td>0.1</td>
<td>1.4</td>
</tr>
<tr>
<td>A-5</td>
<td>6-1-60</td>
<td>--</td>
<td>195.5</td>
<td>4.3</td>
<td>0.3</td>
<td>2.1</td>
</tr>
<tr>
<td>A-6</td>
<td>6-7-60</td>
<td>--</td>
<td>195.6</td>
<td>4.0</td>
<td>0.0</td>
<td>1.5</td>
</tr>
<tr>
<td>A-7</td>
<td>6-9-60</td>
<td>--</td>
<td>194.5</td>
<td>3.2</td>
<td>0.0</td>
<td>1.4</td>
</tr>
<tr>
<td>A-8</td>
<td>6-14-60</td>
<td>--</td>
<td>194.7</td>
<td>4.6</td>
<td>0.2</td>
<td>1.9</td>
</tr>
</tbody>
</table>

**Current Machine Av.** 195.3

**Runability**

- 1.9
- 2.0
- 2.1

### TABLE III

**SUMMARY OF TEST RESULTS FOR MACHINE B**

June, 1960

<table>
<thead>
<tr>
<th>Code</th>
<th>Date Made</th>
<th>Roll No.</th>
<th>Caliper, pt.</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m.), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-1</td>
<td>5-18-60</td>
<td>313</td>
<td>195.8</td>
<td>3.9</td>
<td>0.0</td>
<td>1.9</td>
</tr>
<tr>
<td>B-2</td>
<td>5-18-60</td>
<td>314</td>
<td>195.9</td>
<td>2.4</td>
<td>0.1</td>
<td>1.5</td>
</tr>
<tr>
<td>B-3</td>
<td>6-1-60</td>
<td>321</td>
<td>195.5</td>
<td>3.7</td>
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<td>1.5</td>
</tr>
<tr>
<td>B-4</td>
<td>6-1-60</td>
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<td>195.8</td>
<td>2.7</td>
<td>0.0</td>
<td>1.5</td>
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<td>B-5</td>
<td>6-16-60</td>
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<td>5.3</td>
<td>0.1</td>
<td>1.7</td>
</tr>
<tr>
<td>B-6</td>
<td>6-16-60</td>
<td>330</td>
<td>196.5</td>
<td>3.2</td>
<td>0.2</td>
<td>1.2</td>
</tr>
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</table>

**Current Machine Av.** 195.9

**Runability**

- 1.6
- 1.2

### TABLE IV

**SUMMARY OF TEST RESULTS FOR MACHINE C**

June, 1960

<table>
<thead>
<tr>
<th>Code</th>
<th>Date Made</th>
<th>Roll No.</th>
<th>Caliper, pt.</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m.), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-1</td>
<td>5-27-60</td>
<td>23</td>
<td>193.6</td>
<td>4.3</td>
<td>0.0</td>
<td>2.0</td>
</tr>
<tr>
<td>C-2</td>
<td>5-28-60</td>
<td>24</td>
<td>194.0</td>
<td>6.4</td>
<td>0.2</td>
<td>2.4</td>
</tr>
<tr>
<td>C-3</td>
<td>5-31-60</td>
<td>25</td>
<td>191.0</td>
<td>6.8</td>
<td>0.4</td>
<td>2.7</td>
</tr>
<tr>
<td>C-4</td>
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<td>26</td>
<td>190.6</td>
<td>3.1</td>
<td>0.1</td>
<td>1.4</td>
</tr>
</tbody>
</table>

**Current machine Av.** 192.3

**Runability**

- 2.1
- 31.0
### TABLE V

**SUMMARY OF TEST RESULTS FOR MACHINE D**  
June, 1960

<table>
<thead>
<tr>
<th>Code</th>
<th>Date</th>
<th>Roll Code</th>
<th>Caliper, Mill</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m.), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>D-1</td>
<td>5-12-60</td>
<td>403</td>
<td>196.3</td>
<td>5.4 0.7 2.6</td>
<td>34.8</td>
<td>1-1/2</td>
</tr>
<tr>
<td>D-2</td>
<td>5-17-60</td>
<td>404</td>
<td>195.0</td>
<td>6.0 0.0 1.8</td>
<td>34.2</td>
<td>1-1/2</td>
</tr>
<tr>
<td>D-3</td>
<td>5-19-60</td>
<td>405</td>
<td>195.8</td>
<td>4.5 0.1 2.1</td>
<td>33.5</td>
<td>1-1/2</td>
</tr>
<tr>
<td>D-4</td>
<td>5-26-60</td>
<td>406</td>
<td>196.1</td>
<td>2.4 0.1 0.9</td>
<td>37.4</td>
<td>1-1/2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Current Machine Av. 195.8</strong></td>
<td>1.8</td>
<td>35.0</td>
</tr>
</tbody>
</table>

### TABLE VI

**SUMMARY OF TEST RESULTS FOR MACHINE E**  
June, 1960

<table>
<thead>
<tr>
<th>Code</th>
<th>Date</th>
<th>Roll Code</th>
<th>Caliper, Mill</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m.), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-1</td>
<td>5-17-60</td>
<td>41</td>
<td>194.0</td>
<td>9.3 0.0 3.9</td>
<td>33.6</td>
<td>1-1/2</td>
</tr>
<tr>
<td>E-2</td>
<td>5-25-60</td>
<td>42</td>
<td>193.1</td>
<td>8.0 0.0 2.6</td>
<td>32.7</td>
<td>1-1/2</td>
</tr>
<tr>
<td>E-3</td>
<td>6-1-60</td>
<td>43</td>
<td>193.9</td>
<td>8.0 0.3 3.1</td>
<td>31.6</td>
<td>1-1/2</td>
</tr>
<tr>
<td>E-4</td>
<td>6-2-60</td>
<td>44</td>
<td>194.1</td>
<td>5.1 0.3 3.2</td>
<td>33.6</td>
<td>1-1/2</td>
</tr>
<tr>
<td>E-5</td>
<td>6-7-60</td>
<td>45</td>
<td>195.1</td>
<td>5.5 0.4 3.1</td>
<td>33.8</td>
<td>1-1/2</td>
</tr>
<tr>
<td>E-6</td>
<td>6-16-60</td>
<td>46</td>
<td>194.9</td>
<td>6.1 0.0 2.0</td>
<td>33.9</td>
<td>1-1/2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Current Machine Av. 194.2</strong></td>
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<td>33.2</td>
</tr>
</tbody>
</table>

### TABLE VII

**SUMMARY OF TEST RESULTS FOR MACHINE F**  
June, 1960

<table>
<thead>
<tr>
<th>Code</th>
<th>Date</th>
<th>Roll Code</th>
<th>Caliper, Mill</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m.), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-1</td>
<td>6-1-60</td>
<td>269</td>
<td>195.1</td>
<td>3.5 0.0 1.4</td>
<td>34.3</td>
<td>1-1/2</td>
</tr>
<tr>
<td>F-2</td>
<td>6-9-60</td>
<td>270</td>
<td>195.7</td>
<td>2.8 0.3 1.6</td>
<td>37.7</td>
<td>1-1/2</td>
</tr>
<tr>
<td>F-3</td>
<td>6-10-60</td>
<td>271</td>
<td>196.8</td>
<td>4.3 0.0 2.0</td>
<td>37.6</td>
<td>1-1/2</td>
</tr>
<tr>
<td>F-4</td>
<td>6-14-60</td>
<td>272</td>
<td>196.0</td>
<td>6.6 0.2 2.8</td>
<td>37.6</td>
<td>1-1/2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Current Machine Av. 195.9</strong></td>
<td>2.0</td>
<td>36.8</td>
</tr>
</tbody>
</table>
### TABLE VIII

**SUMMARY OF TEST RESULTS FOR MACHINE G**  
**June, 1960**

<table>
<thead>
<tr>
<th>Code</th>
<th>Date Roll</th>
<th>Mill Code</th>
<th>Caliper, No.</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>G-1</td>
<td>5-25-60</td>
<td>G-1</td>
<td>317</td>
<td>4.3  0.2  1.5</td>
<td>33.0</td>
<td>1-1/2</td>
</tr>
<tr>
<td>G-2</td>
<td>5-25-60</td>
<td>G-2</td>
<td>318</td>
<td>5.0  0.0  1.8</td>
<td>32.3</td>
<td>1-1/2</td>
</tr>
<tr>
<td>G-3</td>
<td>6-8-60</td>
<td>G-3</td>
<td>325</td>
<td>5.2  0.1  1.2</td>
<td>33.6</td>
<td>1-1/2</td>
</tr>
<tr>
<td>G-4</td>
<td>6-8-60</td>
<td>G-4</td>
<td>326</td>
<td>2.5  0.1  1.2</td>
<td>31.4</td>
<td>1-1/2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Current Machine Avg.</td>
<td>196.7</td>
<td>1.4</td>
<td>32.6</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE IX

**SUMMARY OF TEST RESULTS FOR MACHINE H**  
**June, 1960**

<table>
<thead>
<tr>
<th>Code</th>
<th>Date Roll</th>
<th>Mill Code</th>
<th>Caliper, No.</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>H-1</td>
<td>5-19-60</td>
<td>H-1</td>
<td>196.1</td>
<td>4.5  0.2  2.0</td>
<td>37.2</td>
<td>1/2</td>
</tr>
<tr>
<td>H-2</td>
<td>5-20-60</td>
<td>H-2</td>
<td>196.3</td>
<td>4.7  0.7  2.8</td>
<td>37.3</td>
<td>1</td>
</tr>
<tr>
<td>H-3</td>
<td>5-26-60</td>
<td>H-3</td>
<td>196.6</td>
<td>4.0  0.0  1.8</td>
<td>35.2</td>
<td>1/2</td>
</tr>
<tr>
<td>H-4</td>
<td>6-3-60</td>
<td>H-4</td>
<td>195.0</td>
<td>3.0  0.0  1.2</td>
<td>34.0</td>
<td>1</td>
</tr>
<tr>
<td>H-5</td>
<td>6-4-60</td>
<td>H-5</td>
<td>195.5</td>
<td>5.3  0.3  1.9</td>
<td>36.0</td>
<td>Min.</td>
</tr>
<tr>
<td>H-6</td>
<td>6-8-60</td>
<td>H-6</td>
<td>195.5</td>
<td>4.8  0.0  2.5</td>
<td>36.7</td>
<td>1</td>
</tr>
<tr>
<td>H-7</td>
<td>6-11-60</td>
<td>H-7</td>
<td>196.3</td>
<td>6.2  0.0  2.3</td>
<td>35.8</td>
<td>1/2</td>
</tr>
<tr>
<td>H-8</td>
<td>6-15-60</td>
<td>H-8</td>
<td>195.4</td>
<td>5.2  0.0  2.4</td>
<td>37.2</td>
<td>Min.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Current Machine Avg.</td>
<td>195.8</td>
<td>2.1</td>
<td>36.2</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE X

**SUMMARY OF TEST RESULTS FOR MACHINE I**  
**June, 1960**

<table>
<thead>
<tr>
<th>Code</th>
<th>Date Roll</th>
<th>Mill Code</th>
<th>Caliper, No.</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-1</td>
<td>5-10-60</td>
<td>I-1</td>
<td>23</td>
<td>4.0  0.2  1.5</td>
<td>31.7</td>
<td>1-1/2</td>
</tr>
<tr>
<td>I-2</td>
<td>5-11-60</td>
<td>I-2</td>
<td>24</td>
<td>2.8  0.0  1.0</td>
<td>33.9</td>
<td>1-1/2</td>
</tr>
<tr>
<td>I-3</td>
<td>6-1-60</td>
<td>I-3</td>
<td>25</td>
<td>3.7  0.0  1.5</td>
<td>30.9</td>
<td>1-1/2</td>
</tr>
<tr>
<td>I-4</td>
<td>6-2-60</td>
<td>I-4</td>
<td>26</td>
<td>4.2  0.0  1.0</td>
<td>31.8</td>
<td>1-1/2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Current Machine Avg.</td>
<td>193.6</td>
<td>1.2</td>
<td>32.1</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE XI

**SUMMARY OF TEST RESULTS FOR MACHINE J**

<table>
<thead>
<tr>
<th>Code</th>
<th>Date Roll Made</th>
<th>Mill Caliper, Points</th>
<th>Caliper Difference Between Consecutive Flutes, Points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m.), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>J-1</td>
<td>5-18-60 91</td>
<td>196.0</td>
<td>1.8</td>
<td>0.8</td>
<td>31.6</td>
</tr>
<tr>
<td>J-2</td>
<td>5-23-60 92</td>
<td>195.5</td>
<td>3.9</td>
<td>0.5</td>
<td>1.9</td>
</tr>
<tr>
<td>J-3</td>
<td>5-31-60 93</td>
<td>196.2</td>
<td>2.8</td>
<td>0.0</td>
<td>1.0</td>
</tr>
<tr>
<td>J-4</td>
<td>6-6-60 93</td>
<td>195.6</td>
<td>5.3</td>
<td>0.1</td>
<td>1.9</td>
</tr>
<tr>
<td>J-5</td>
<td>6-10-60 94</td>
<td>195.3</td>
<td>3.0</td>
<td>0.0</td>
<td>1.2</td>
</tr>
<tr>
<td></td>
<td>Current Machine Av.</td>
<td>195.7</td>
<td>1.4</td>
<td>2.4</td>
<td></td>
</tr>
</tbody>
</table>

### TABLE XII

**SUMMARY OF TEST RESULTS FOR MACHINE K**

<table>
<thead>
<tr>
<th>Code</th>
<th>Date Roll Made</th>
<th>Mill Caliper, Points</th>
<th>Caliper Difference Between Consecutive Flutes, Points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m.), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>K-1</td>
<td>5-17-60 19</td>
<td>195.1</td>
<td>6.3</td>
<td>0.4</td>
<td>2.7</td>
</tr>
<tr>
<td>K-2</td>
<td>5-17-60 20</td>
<td>194.6</td>
<td>4.1</td>
<td>0.4</td>
<td>2.0</td>
</tr>
<tr>
<td>K-3</td>
<td>5-18-60 21</td>
<td>196.3</td>
<td>4.2</td>
<td>0.0</td>
<td>1.8</td>
</tr>
<tr>
<td>K-4</td>
<td>5-18-60 22</td>
<td>195.9</td>
<td>6.8</td>
<td>0.5</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td>Current Machine Av.</td>
<td>195.5</td>
<td>2.3</td>
<td>30.4</td>
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</tr>
</tbody>
</table>

### TABLE XIII

**SUMMARY OF TEST RESULTS FOR MACHINE L**

<table>
<thead>
<tr>
<th>Code</th>
<th>Date Roll Made</th>
<th>Mill Caliper, Points</th>
<th>Caliper Difference Between Consecutive Flutes, Points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m.), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-1</td>
<td>5-29-60 181</td>
<td>Note a</td>
<td>Note a</td>
<td>Note a</td>
<td>Note a</td>
</tr>
</tbody>
</table>

Current Machine Av. -- -- --

*a Single-face flat crush and caliper could not be determined because the medium fractured at less than 100 f.p.m.*
### TABLE XIV
**SUMMARY OF TEST RESULTS FOR MACHINE M**

**June, 1960**

<table>
<thead>
<tr>
<th>Code</th>
<th>Made</th>
<th>Date</th>
<th>Caliper, Mill Code</th>
<th>Roll No.</th>
<th>Caliper, Mill Code</th>
<th>Caliper Difference Between Consecutive Flutes, points Max.</th>
<th>Min.</th>
<th>Av.</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m.), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-1</td>
<td>5-16-60</td>
<td>--</td>
<td>196.3</td>
<td>3.2</td>
<td>0.0</td>
<td>1.5</td>
<td>37.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-2</td>
<td>5-18-60</td>
<td>--</td>
<td>196.5</td>
<td>6.3</td>
<td>0.4</td>
<td>2.3</td>
<td>35.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-3</td>
<td>5-23-60</td>
<td>--</td>
<td>195.2</td>
<td>7.0</td>
<td>0.0</td>
<td>2.1</td>
<td>35.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-4</td>
<td>5-26-60</td>
<td>--</td>
<td>195.3</td>
<td>4.4</td>
<td>0.1</td>
<td>1.8</td>
<td>35.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-5</td>
<td>5-28-60</td>
<td>--</td>
<td>195.8</td>
<td>4.7</td>
<td>0.0</td>
<td>1.8</td>
<td>36.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-6</td>
<td>5-31-60</td>
<td>--</td>
<td>195.9</td>
<td>4.6</td>
<td>0.1</td>
<td>2.0</td>
<td>36.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-7</td>
<td>6- 2-60</td>
<td>--</td>
<td>195.1</td>
<td>1.9</td>
<td>0.0</td>
<td>0.9</td>
<td>34.7</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>M-8</td>
<td>6- 6-60</td>
<td>--</td>
<td>194.8</td>
<td>4.4</td>
<td>0.4</td>
<td>2.5</td>
<td>37.7</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Current Machine Av. 195.6</td>
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</tr>
</tbody>
</table>

### TABLE XV
**SUMMARY OF TEST RESULTS FOR MACHINE N**

**June, 1960**

<table>
<thead>
<tr>
<th>Code</th>
<th>Made</th>
<th>Date</th>
<th>Caliper, Mill Code</th>
<th>Roll No.</th>
<th>Caliper, Mill Code</th>
<th>Caliper Difference Between Consecutive Flutes, points Max.</th>
<th>Min.</th>
<th>Av.</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m.), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>N-1</td>
<td>5-26-60</td>
<td>319</td>
<td>197.1</td>
<td>5.5</td>
<td>0.1</td>
<td>2.4</td>
<td>33.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-2</td>
<td>5-26-60</td>
<td>320</td>
<td>197.3</td>
<td>4.0</td>
<td>0.4</td>
<td>2.1</td>
<td>33.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-3</td>
<td>6-10-60</td>
<td>327</td>
<td>196.2</td>
<td>3.0</td>
<td>0.0</td>
<td>1.1</td>
<td>34.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-4</td>
<td>6-10-60</td>
<td>328</td>
<td>196.8</td>
<td>5.5</td>
<td>0.1</td>
<td>1.9</td>
<td>34.3</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Current Machine Av. 196.8</td>
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</tr>
</tbody>
</table>

### TABLE XVI
**SUMMARY OF TEST RESULTS FOR MACHINE O**

**June, 1960**

<table>
<thead>
<tr>
<th>Code</th>
<th>Made</th>
<th>Date</th>
<th>Caliper, Mill Code</th>
<th>Roll No.</th>
<th>Caliper, Mill Code</th>
<th>Caliper Difference Between Consecutive Flutes, points Max.</th>
<th>Min.</th>
<th>Av.</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m.), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>O-1</td>
<td>5-24-60</td>
<td>566</td>
<td>195.8</td>
<td>3.7</td>
<td>0.0</td>
<td>1.4</td>
<td>32.8</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>O-2</td>
<td>6- 7-60</td>
<td>567</td>
<td>195.5</td>
<td>4.6</td>
<td>0.0</td>
<td>2.0</td>
<td>37.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O-3</td>
<td>6-13-60</td>
<td>568</td>
<td>196.1</td>
<td>7.8</td>
<td>0.2</td>
<td>2.8</td>
<td>35.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>O-4</td>
<td>6-16-60</td>
<td>569</td>
<td>196.6</td>
<td>5.4</td>
<td>0.1</td>
<td>1.6</td>
<td>36.2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Current Machine Av. 196.0</td>
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</tr>
</tbody>
</table>

|       |       |       |       |       |       |       |       |       |       |       |
### TABLE XVII
SUMMARY OF TEST RESULTS FOR MACHINE P
June, 1960

<table>
<thead>
<tr>
<th>Code</th>
<th>Date</th>
<th>Roll No.</th>
<th>Caliper, pt.</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability Maximum Tension at 600 f.p.m., lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>5-25-60</td>
<td>52</td>
<td>192.4</td>
<td>Min. 0.1, Max. 1.8</td>
<td>30.1</td>
<td>Note a</td>
</tr>
<tr>
<td>P-2</td>
<td>5-26-60</td>
<td>53</td>
<td>195.7</td>
<td>Min. 0.0, Max. 1.7</td>
<td>28.8</td>
<td>1-1/2</td>
</tr>
<tr>
<td>P-3</td>
<td>6-1-60</td>
<td>54</td>
<td>195.8</td>
<td>Min. 0.3, Max. 2.1</td>
<td>30.4</td>
<td>1</td>
</tr>
<tr>
<td>P-4</td>
<td>6-2-60</td>
<td>55</td>
<td>195.1</td>
<td>Min. 0.4, Max. 2.8</td>
<td>33.2</td>
<td>1/2</td>
</tr>
<tr>
<td>P-5</td>
<td>6-6-60</td>
<td>56</td>
<td>196.0</td>
<td>Min. 0.2, Max. 2.4</td>
<td>31.0</td>
<td>1-1/2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Current Machine Av. 195.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TABLE XVIII
SUMMARY OF TEST RESULTS FOR MACHINE Q
June, 1960

<table>
<thead>
<tr>
<th>Code</th>
<th>Date</th>
<th>Roll No.</th>
<th>Caliper, pt.</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability Maximum Tension at 600 f.p.m., lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q-1</td>
<td>6-1-60</td>
<td>323</td>
<td>196.1</td>
<td>Min. 0.0, Max. 2.9</td>
<td>33.8</td>
<td>1-1/2</td>
</tr>
<tr>
<td>Q-2</td>
<td>6-1-60</td>
<td>324</td>
<td>194.5</td>
<td>Min. 0.0, Max. 1.9</td>
<td>32.9</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Current Machine Av. 195.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### TABLE XIX
SUMMARY OF TEST RESULTS FOR MACHINE R
June, 1960

<table>
<thead>
<tr>
<th>Code</th>
<th>Date</th>
<th>Roll No.</th>
<th>Caliper, pt.</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability Maximum Tension at 600 f.p.m., lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>R-1</td>
<td>5-10-60</td>
<td>1621</td>
<td>196.1</td>
<td>Min. 0.0, Max. 1.2</td>
<td>35.3</td>
<td>1/2</td>
</tr>
<tr>
<td>R-2</td>
<td>5-13-60</td>
<td>1999</td>
<td>195.3</td>
<td>Min. 0.0, Max. 1.4</td>
<td>36.0</td>
<td>1/2</td>
</tr>
<tr>
<td>R-3</td>
<td>5-18-60</td>
<td>2646</td>
<td>196.0</td>
<td>Min. 0.0, Max. 0.8</td>
<td>36.4</td>
<td>1</td>
</tr>
<tr>
<td>R-4</td>
<td>5-20-60</td>
<td>3077</td>
<td>195.9</td>
<td>Min. 0.5, Max. 2.2</td>
<td>38.9</td>
<td>1</td>
</tr>
<tr>
<td>R-5</td>
<td>5-24-60</td>
<td>3635</td>
<td>196.0</td>
<td>Min. 0.0, Max. 1.7</td>
<td>33.8</td>
<td>1-1/2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Current Machine Av. 195.9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Maximum speed at which this medium could be corrugated with minimum tension was 150 f.p.m.*
TABLE XX

SUMMARY OF TEST RESULTS FOR MACHINE S

<table>
<thead>
<tr>
<th>Code</th>
<th>Date Roll Made</th>
<th>Caliper, pt.</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m.), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>S-1</td>
<td>5-12-60 370</td>
<td>196.8</td>
<td>3.1 0.3 1.4</td>
<td>36.0</td>
<td>1-1/2</td>
</tr>
<tr>
<td>S-2</td>
<td>5-15-60 371</td>
<td>195.5</td>
<td>5.9 0.0 2.4</td>
<td>36.0</td>
<td>Min.</td>
</tr>
<tr>
<td>S-3</td>
<td>5-16-60 372</td>
<td>196.7</td>
<td>2.7 0.0 1.1</td>
<td>35.4</td>
<td>1/2</td>
</tr>
<tr>
<td>S-4</td>
<td>5-19-60 373</td>
<td>194.7</td>
<td>7.6 0.4 2.3</td>
<td>35.5</td>
<td>Note a</td>
</tr>
<tr>
<td>S-5</td>
<td>5-20-60 374</td>
<td>193.5</td>
<td>8.1 1.3 3.7</td>
<td>36.2</td>
<td>Note b</td>
</tr>
<tr>
<td>S-6</td>
<td>5-21-60 375</td>
<td>193.7</td>
<td>3.6 0.0 1.8</td>
<td>36.3</td>
<td>1-1/2</td>
</tr>
<tr>
<td>S-7</td>
<td>5-28-60 376</td>
<td>194.3</td>
<td>6.1 0.0 2.0</td>
<td>34.3</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Current Machine Av.</td>
<td>195.0</td>
<td>2.1</td>
<td>35.7</td>
<td></td>
</tr>
</tbody>
</table>

TABLE XXI

SUMMARY OF TEST RESULTS FOR MACHINE T

<table>
<thead>
<tr>
<th>Code</th>
<th>Date Roll Made</th>
<th>Caliper, pt.</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m.), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-1</td>
<td>5-21-60 336</td>
<td>195.0</td>
<td>7.2 0.5 2.9</td>
<td>36.2</td>
<td>1-1/2</td>
</tr>
<tr>
<td>T-2</td>
<td>5-26-60 337</td>
<td>196.1</td>
<td>9.1 0.0 3.2</td>
<td>30.0</td>
<td>1-1/2</td>
</tr>
<tr>
<td>T-3</td>
<td>5-27-60 338</td>
<td>195.6</td>
<td>3.7 0.3 1.8</td>
<td>30.9</td>
<td>1-1/2</td>
</tr>
<tr>
<td>T-4</td>
<td>6- 3-60 340</td>
<td>195.7</td>
<td>5.0 0.1 2.3</td>
<td>31.3</td>
<td>1-1/2</td>
</tr>
<tr>
<td>T-5</td>
<td>6- 8-60 341</td>
<td>195.4</td>
<td>10.0 0.0 2.9</td>
<td>33.5</td>
<td>1</td>
</tr>
<tr>
<td>T-6</td>
<td>6- 9-60 342</td>
<td>195.2</td>
<td>10.8 0.5 3.7</td>
<td>35.9</td>
<td>1-1/2</td>
</tr>
<tr>
<td></td>
<td>Current Machine Av.</td>
<td>195.5</td>
<td>2.8</td>
<td>33.0</td>
<td></td>
</tr>
</tbody>
</table>

TABLE XXII

SUMMARY OF TEST RESULTS FOR MACHINE U

<table>
<thead>
<tr>
<th>Code</th>
<th>Date Roll Made</th>
<th>Caliper, pt.</th>
<th>Caliper Difference Between Consecutive Flutes, points</th>
<th>Single-Face Flat Crush, p.s.i.</th>
<th>Runability (Maximum Tension at 600 f.p.m.), lb./in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>U-1</td>
<td>5-10-60 283</td>
<td>194.2</td>
<td>2.0 0.0 0.9</td>
<td>36.4</td>
<td>1</td>
</tr>
<tr>
<td>U-2</td>
<td>5-12-60 352</td>
<td>195.3</td>
<td>3.0 0.1 1.4</td>
<td>38.6</td>
<td>1</td>
</tr>
<tr>
<td>U-3</td>
<td>5-18-60 351</td>
<td>194.6</td>
<td>3.3 0.0 1.0</td>
<td>35.9</td>
<td>1/2</td>
</tr>
<tr>
<td>U-4</td>
<td>5-30-60 699</td>
<td>195.9</td>
<td>3.3 0.0 1.4</td>
<td>33.2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Current Machine Av.</td>
<td>195.0</td>
<td>1.2</td>
<td>36.0</td>
<td></td>
</tr>
</tbody>
</table>

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

b Maximum speed at which this medium could be corrugated with minimum tension was 500 f.p.m.
TABLE XXIII

SUMMARY OF TEST RESULTS FOR MACHINE V
June, 1960

<table>
<thead>
<tr>
<th>Mill</th>
<th>Caliper,</th>
<th>Caliper Difference Between Consecutive Flutes,</th>
<th>Single-Face Flat Crush,</th>
<th>Runability (Maximum Tension at 600 f.p.m.),</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>Date</td>
<td>Roll Code</td>
<td>Max.</td>
<td>Min.</td>
</tr>
<tr>
<td>V-1</td>
<td>5-20-60</td>
<td>E-1</td>
<td>196.2</td>
<td>8.0</td>
</tr>
<tr>
<td>Current Machine Av.</td>
<td>196.2</td>
<td></td>
<td>4.0</td>
<td></td>
</tr>
</tbody>
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THE INSTITUTE OF PAPER CHEMISTRY

W. N. Hubert, Research Aide
Container Section

R. C. McKee, Chief, Container Section