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Pet. William C. Wollman

Approved by:

Chief, Plastic Div. Branch

Approved by:

For Director

Part VII, Effect of Curing Time on Laminated Property

ASTIA

MAY 26 1958
Table II

<table>
<thead>
<tr>
<th>Sample</th>
<th>Test</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>70</td>
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<tr>
<td>B</td>
<td>70</td>
</tr>
<tr>
<td>C</td>
<td>70</td>
</tr>
<tr>
<td>D</td>
<td>70</td>
</tr>
<tr>
<td>E</td>
<td>80</td>
</tr>
<tr>
<td>F</td>
<td>80</td>
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<tr>
<td>G</td>
<td>80</td>
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<tr>
<td>H</td>
<td>100</td>
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<tr>
<td>I</td>
<td>100</td>
</tr>
<tr>
<td>J</td>
<td>100</td>
</tr>
<tr>
<td>K</td>
<td>100</td>
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</table>

*Sample B, G and H were discards due to defects.*
At high porosities, the laminate is so resilient that it collapses under a relatively light load. On the other hand, a laminate will become more susceptible to an earlier craze or crack when the effective porosity is low.

IV. CONCLUSIONS

1. The compressive stress at buckle of the laminate is not significantly affected by curing temperature or curing times over the range tested. Therefore, the effective porosity should be the controlling factor to be considered when choosing curing conditions with respect to compressive properties.

2. The bearing stress at 4% elongation, like compressive stress, does not appear to be significantly affected by curing conditions over the range tested. Again, the effective porosity appears to be the controlling factor.

3. The impact resistance like bearing and compressive strength is controlled by effective porosity rather than curing conditions over the range tested. As a result of these tests we take a general conclusion that the laminates may be completely cured at a temperature of 70°C or higher after a minimum pressure of 60 minutes. The best conditions for curing, taking into account effective porosity and physical properties, appear to be 70°C for 120 minutes. Longer or higher temperatures tend to cause dislocation of the laminates.

V. RECOMMENDATION

1. An addition to the Link Shop procedure (T.R. 0584C) for fabrication of porous laminated arms should be prepared. This addendum should contain a recommendation stating the use of a 70°C cure instead of the 80°C cure now in use.
<table>
<thead>
<tr>
<th>Cycle</th>
<th>Cure Temp. (°C)</th>
<th>Cure Time (min.)</th>
<th>Stress at Buckle (psi)</th>
<th>Strain (in/in)</th>
<th>During Strain Stress (psi)</th>
<th>Utl. Stress (psi)</th>
<th>Initial Crack (In. of)</th>
<th>Collapse (In. of)</th>
<th>Effective Hardness (°)</th>
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<td>15</td>
<td>15</td>
<td>30.4</td>
</tr>
</tbody>
</table>
Fig. 1

Effect of Cutting Conditions on Finish Rate

Stacked Above

G 70-100

A 70-100

C 70-100

B 100-150

G 80-150

LAMINATE PRESSURE - CM.

Flow Rate

L/min/ft²

L/min/ft²

L/min/ft²

L/min/ft²

L/min/ft²

L/min/ft²
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