TestrBot Test Results

**Title:** Acetone Treatment

**Objective:** Determine Effects of Acetone Treatment

**Test Method:** 4 Point Bend, loaded at constant displacement rate

**Procedure:** A total of 6 abs plastic specimens were tested. 3 of the specimens were treated with acetone vapor for 17 minutes and allowed to dry out for 24 hours prior to testing.

**Conclusions:** The vapor treatment resulted in a consistent overall weakening of the test specimens. Specimens that had not been treated with Acetone vapor had an average yield stress 24% higher than those treated with the vapor.

<table>
<thead>
<tr>
<th></th>
<th>Avg Yield Load (lb)</th>
<th>Avg Yield Stress (psi)</th>
<th>Avg Stiffness (lb/in)</th>
<th>Avg Ult Load (lb)</th>
<th>Avg Ult Stress (psi)</th>
<th>Ult Stress/Wei ght (psi/g)</th>
<th>Ult Stress/Prin t Time (psi/min)</th>
<th>Avg Stiffness per weight,(l b/in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>65.8</td>
<td>4083.4</td>
<td>319.8</td>
<td>73.6</td>
<td>4564.8</td>
<td>769.4</td>
<td>217.2</td>
<td>53.9</td>
</tr>
<tr>
<td>Treated</td>
<td>53.2</td>
<td>3272.7</td>
<td>308.1</td>
<td>65.0</td>
<td>4003.3</td>
<td>674.8</td>
<td>190.5</td>
<td>51.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Std Dev Yield (lb)</th>
<th>Std Dev Yield Stress (psi)</th>
<th>Std Dev Stiffness (lb/in)</th>
<th>Std Dev Ult Load (lb)</th>
<th>Std Dev Ult Stress (psi)</th>
<th>Std Dev Ult Stress/Wei ght (psi/g)</th>
<th>Std Dev Ult Stress/Prin t Time (psi/min)</th>
<th>Std Dev Stiffness per weight (lb/in)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Untreated</td>
<td>2.1</td>
<td>88.2</td>
<td>15.6</td>
<td>2.1</td>
<td>127.5</td>
<td>5.5</td>
<td>2.2</td>
<td>2.2</td>
</tr>
<tr>
<td>Treated</td>
<td>3.3</td>
<td>177.4</td>
<td>5.2</td>
<td>3.1</td>
<td>203.3</td>
<td>37.1</td>
<td>9.2</td>
<td>0.9</td>
</tr>
</tbody>
</table>
2% Yield: 65.63 lb
2% Yield Stress: 4094.8 psi
Stiffness: 304.9 lb/in
Ultimate Load: 75.40 lb
Displacement at Ultimate: 0.3408 in
Ultimate Bending Stress: 4704.1 psi

2% Yield: 67.97 lb
2% Yield Stress: 4165.5 psi
Stiffness: 336.0 lb/in
Ultimate Load: 74.03 lb
Displacement at Ultimate: 0.2777 in
Ultimate Bending Stress: 4536.5 psi
2% Yield: 63.87 lb
2% Yield Stress: 3990.1 psi
Stiffness: 318.5 lb/in
Ultimate Load: 71.29 lb
Displacement at Ultimate: 0.2910 in
Ultimate Bending Stress: 4453.8 psi

4 Point Bend Specimen ID: 1028
Acetone Treated ABS

2% Yield: 49.4180 lb
2% Yield Stress: 3094.2 psi
Stiffness: 302.4808 lb/in
Ultimate Load: 61.5283 lb
Displacement at Ultimate: 0.2729 in
Ultimate Bending Stress: 3852.4 psi
4 Point Bend Specimen ID: 1029
Acetone Treated ABS

- 2% Yield: 54.8871 lb
- 2% Yield Stress: 3448.9 psi
- Stiffness: 312.6822 lb/in
- Ultimate Load: 67.3881 lb
- Displacement at Ultimate: 0.3387 in
- Ultimate Bending Stress: 4234.5 psi

4 Point Bend Specimen ID: 1030
Acetone Treated ABS

- 2% Yield: 55.2778 lb
- 2% Yield Stress: 3275.0 psi
- Stiffness: 309.2835 lb/in
- Ultimate Load: 66.2161 lb
- Displacement at Ultimate: 0.2927 in
- Ultimate Bending Stress: 3923.1 psi