Smoke Density Test of Polycarbonate Material.

Date: March 22, 2016
REPORT NUMBER: HETI-16-F300
CLIENT: Palram Americas Inc.
Arcadia West Industrial Park, 9735 Commerce Circle, Kutztown, PA 19530
TEST LOCATION: HURRICANE ENGINEERING & TESTING INC.
6120 NW 97TH AVENUE, DORAL, FLORIDA, 33178
NOTIFICATION NUMBER: HETI16003 (MIAMI-DADE COUNTY, FLORIDA)
LAB. CERTIFICATION No.: 15-1216.04 (MIAMI-DADE COUNTY, FLORIDA)
IAS. CERTIFICATION No.: TL-296 (ISO 17025-05)
FBC ORGANIZATION No: TST1691
FBPE Certificate of Authorization Number: 6905

PRODUCT: 12mm Clear Palsun Basic Polycarbonate Material.
COLOR: Clear
PRODUCT DESCRIPTION: Density was 73.25 lb/ft³.

TEST STANDARDS:
ASTM D 2843-99 (Reapproved 2004)¹: Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastic

TEST WITNESSED BY
Dr. Syed Waqar Ali (HETI)
Dr. Nasreen K. Ali. (HETI)
Mr. Eugenio Rivera (HETI)
Mr. Rafael E. Droz-Seda, P.E. (HETI)

Summary of Results

<table>
<thead>
<tr>
<th>Description</th>
<th>Test Standards</th>
<th>Test Result</th>
<th>Miami-Dade County Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoke Density (Sₐ)</td>
<td>ASTM D 2843</td>
<td>10.80%</td>
<td>Acceptable if Sₐ &lt; 75%</td>
</tr>
</tbody>
</table>

TEST SPECIMEN QUANTITY & SIZE
Smoke Density Test: (3) 1” x 1” x 0.47” thick, tested as use thickness as per (ASTM D2843-99(2004))¹ Sec7.1, as referenced in IBC 2012.

CONDITIONING: The above listed specimens were conditioned at 23±2°C / 50±5%RH for 48 hours prior to testing.

TEST EQUIPMENT
Sample Conditioning: Sample Conditioning Chamber HOTPACK 435314, HETI-0937.
# TEST RESULTS

Observations and Results of Smoke Density Test

<table>
<thead>
<tr>
<th>Time (sec)</th>
<th>(%) Light Absorbed</th>
<th>Average Light Absorbed</th>
<th>Area Under the Curve</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Specimen 1</td>
<td>Specimen 2</td>
<td>Specimen 3</td>
</tr>
<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
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<td>0</td>
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<td>75</td>
<td>6</td>
<td>1</td>
<td>4</td>
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<td>90</td>
<td>9</td>
<td>2</td>
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</tr>
<tr>
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</tr>
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<td>6</td>
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</tr>
<tr>
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<td>6</td>
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<td>165</td>
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</tr>
<tr>
<td>240</td>
<td>24</td>
<td>21</td>
<td>20</td>
</tr>
</tbody>
</table>

Average Smoke Density 10.80 %
Standard Deviations Between Samples (σ) = 3.74%

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Average Time (s) 14.44
Time to Burst into Flame (s) 0:05
Flame Extinguishment Time (m:s) 3:13
Consumption Time (m:s) N/A
Exit Sign Obscured (YES/NO) No

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![Smoke Density Curve](image)
Conclusion

The samples were tested in accordance with ASTM Standard as listed in the report without deviation. The samples source material was randomly selected from product sample sheet provided by the client. The samples were tested within 5 minutes of removal from the conditioning chamber. See Table “Summary of Results” on page one for results.

Note: Samples were delivered by Client on 3/16/2016 to Hurricane Engineering & Testing Inc.

Caveats

ASTM D 2843-99 (Reapproved 2004)\(^1\).
This standard should be used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire-hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a Fire-hazard assessment or a fire risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard or fire-risk of a particular end. The degree of obscuration of vision by smoke generated by combustibles can be substantially affected by changes in quantity and form of material, humidity, draft, temperature, and oxygen supply.

NOTE: The above results were obtained using the designated test methods, which indicates compliance with the performance requirements of the referenced specifications. This report does not constitute certification of the specimens tested.

STATEMENT OF INDEPENDENCE

The Hurricane Engineering & Testing, Inc., does not have, nor does it intend to acquire or will acquire, a financial interest in any company manufacturing or distributing products tested or labeled by the Hurricane Engineering & Testing, Inc. Hurricane Engineering & Testing, Inc., is not owned, operated or controlled by any company manufacturing or distributing products it test or labels.

Dr. Nasreen K. Ali  
Vice President

Mr. Rafael E. Duran, P.E.  
Resident Engineer