PET Flake Oven Bake Evaluation

Introduction – Scope, Significance and Use

Contamination in washed PET flake may be revealed when the flake is baked in air at high temperature. This is a test that can be used in any laboratory evaluation directed to identifying contamination in PET flake. Contamination may be observed as melted particles, discolored material that is not PET, and a change in color of the PET flake. A change in color of the PET flake may occur from the use of additives in the PET, or as the result of adhesives or ink residues adhered on the flake surface.

The appearance of contamination in this test may signal that the PET flake is not suitable for use in certain recycling applications.

Disclaimer: This document has been prepared by the Association of Plastic Recyclers as a service to the plastic industry to promote the most efficient use of the nation’s plastic recycling infrastructure and to enhance the quality and quantity of recycled postconsumer plastic. The information in this document is offered without warranty of any kind, either expressed or implied, including WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, which are expressly disclaimed. APR and its members accept no responsibility for any harm or damages arising from the use of or reliance upon this information by any party. Participation in the Recognition Program is purely voluntary and does not guarantee compliance with any U.S. law or regulation or that a package or plastic article incorporating the innovation is recyclable or will be recycled.

Test Method Summary

Washed PET flake is exposed in an oven at 220°C to reveal any contaminants that melt or discolor with heat and air oxidation. PET flake will not melt at this temperature and will remain as free-flowing flakes. The individual flakes may discolor if there is contamination on the surface of the flakes. The color of flake can be evaluated before and after baking.

Equipment Required

- Weigh scale (0.001 ± grams)
- Conventional lab oven that can control temperature to 220°C

Materials Required

- Baking pans
- Aluminum foil
- PET flake samples, 100 grams minimum suggested.
Test Method Steps

**Safety Statement:** APR Test and Practice documents do NOT CLAIM TO ADDRESS ALL OF THE SAFETY ISSUES, IF ANY, ASSOCIATED WITH THEIR USE. These Tests and Practices may require the use of electrically powered equipment, heated equipment and molten polymers, rotating motors and drive assemblies, hydraulic powered equipment, high pressure air, and laboratory chemicals. IT IS THE RESPONSIBILITY OF THE USER TO ESTABLISH AND FOLLOW APPROPRIATE SAFETY AND HEALTH PROCEDURES WHEN UNDERTAKING THESE TESTS AND PRACTICES THAT COMPLY WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATORY REQUIREMENTS. APR and its members accept no responsibility for any harm or damages arising from the use of or reliance of these Tests and Practice documents by any party.

1. Pre-heat the oven to 220°C.
2. Weigh the flake sample and place it in a baking pan.
3. Place the sample in the oven for 60 minutes time.
4. Remove the baking pan from the oven and allow the sample to cool at room temperature.
5. Spread the flake out onto a clean white work surface.
6. Manually inspect the sample for any discoloration, burnt pieces of plastic, colored spots and sticking. A spatula and tweezers can be used to separate contaminated material.
7. Remove all contaminants and retain them. Common sources of contamination can be grouped if desired.
8. Weigh any separated components and record values.
9. PET flake color measurements may be conducted before and after the oven bake test. See PET-S-XX.

**Test assessment**

This test is done for general information only, there is no specific guidance associated with this test. The preferred result is that no contamination is revealed and there is negligible change in the color of the PET flake as a result of after baking.

The table below illustrates how contamination results might be collected and reported.
### Test Oven Bake Data

<table>
<thead>
<tr>
<th>Sample Fractions</th>
<th>Material Weight (g)</th>
<th>Sample Wt(%)</th>
<th>Content (ppm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baked Flake</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contaminant 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contaminant 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contaminant 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Weight</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DOCUMENT VERSION HISTORY

<table>
<thead>
<tr>
<th>Version</th>
<th>Publication Date</th>
<th>Revision notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>November 16, 2018</td>
<td></td>
</tr>
</tbody>
</table>