Test Report
No. : CE/2020/11870
Date : 2020/01/14

The following samples was/were submitted and identified by/on behalf of the applicant as:

Sample Submitted By : HITACHI CHEMICAL CO., LTD.
Sample Description : GENERAL COPPER FOIL
Style/Item No. : COPPER FOIL
Sample Receiving Date : 2020/01/07
Testing Period : 2020/01/07 to 2020/01/14

Test Result(s) : Please refer to following pages.
### Test Report

**No.**: CE/2020/11870  
**Date**: 2020/01/14

**HITACHI CHEMICAL CO., LTD.**  
1500 OGAWA, CHIKUSEI-SHI IBARAKI, 308-8521, JAPAN

### Test Result(s)

**PART NAME No.1**: ORANGE/COPPER COLORED FOIL

<table>
<thead>
<tr>
<th>Test Item(s)</th>
<th>Unit</th>
<th>Method</th>
<th>MDL</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antimony (Sb)</td>
<td>mg/kg</td>
<td>With reference to US EPA 3052 (1996). Analysis was performed by ICP-OES.</td>
<td>2</td>
<td>n.d.</td>
</tr>
<tr>
<td>Halogen</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Halogen-Fluorine (F)</td>
<td>mg/kg</td>
<td></td>
<td>50</td>
<td>n.d.</td>
</tr>
<tr>
<td>(CAS No.: 14762-94-8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Halogen-Chlorine (Cl)</td>
<td>mg/kg</td>
<td>With reference to BS EN 14582 (2016). Analysis was performed by IC.</td>
<td>50</td>
<td>n.d.</td>
</tr>
<tr>
<td>(CAS No.: 22537-15-1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Halogen-Bromine (Br)</td>
<td>mg/kg</td>
<td></td>
<td>50</td>
<td>n.d.</td>
</tr>
<tr>
<td>(CAS No.: 10097-32-2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Halogen-Iodine (I)</td>
<td>mg/kg</td>
<td></td>
<td>50</td>
<td>n.d.</td>
</tr>
<tr>
<td>(CAS No.: 14362-44-8)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:**
1. mg/kg = ppm; 0.1wt% = 1000ppm
2. MDL = Method Detection Limit
3. n.d. = Not Detected = less than MDL

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These samples were dissolved totally by pre-conditioning method according to below flow chart.

- Technician: Rita Chen
- Supervisor: Troy Chang

Flow Chart of digestion for the elements analysis performed by ICP-OES

1. Cutting / Preparation
2. Sample Measurement
3. Acid digestion by suitable acid depended on different sample material (as below table)
4. Filtration
5. Solution
6. Residue
   - 1) Alkali Fusion
   - 2) HCl to dissolve
7. ICP-OES

<table>
<thead>
<tr>
<th>Material</th>
<th>Reagents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel, copper, aluminum, solder</td>
<td>Aqua regia, HNO₃, HCl, HF, H₂O₂</td>
</tr>
<tr>
<td>Glass</td>
<td>HNO₃/FH</td>
</tr>
<tr>
<td>Gold, platinum, palladium, ceramic</td>
<td>Aqua regia</td>
</tr>
<tr>
<td>Silver</td>
<td>HNO₃</td>
</tr>
<tr>
<td>Plastic</td>
<td>H₂SO₄, H₂O₂, HNO₃, HCl</td>
</tr>
<tr>
<td>Others</td>
<td>Added appropriate reagent to total digestion</td>
</tr>
</tbody>
</table>
Analytical flow chart - Halogen

- Technician: Rita Chen
- Supervisor: Troy Chang

1. Sample pretreatment / Separation
2. Weighting and putting sample in cell
3. Oxygen Bomb Combustion / Absorption
4. Dilution to fixed volume
5. Analysis was performed by IC
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* The tested sample / part is marked by an arrow if it's shown on the photo. *

** End of Report **