Measure of superficial resistance on a plastic sample Ref180, following standard EN 13463-1.
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Levallois-Perret (92)

Customer: Extruflex

List of people having taken part in the study: Y. OLLIER
FOREWORD

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1. CONTEXT AND CONTRACTUAL ELEMENTS

EXTRUFLEX is specialized in manufacturing of flexible doors. EXTRUFLEX requested INERIS to perform the electrostatic evaluation of a plastic sample Ref 180.

The objective was to measure the superficial resistance of the sample following the standard EN 13463-1.

This report has been established in reference to the following contractual elements:
- A request from EXTRUFLEX, for an electrostatic evaluation on a plastic sample Ref 180;
- A quote referenced DRA-16-159522-00775A;
- An order referenced n°10786 dated 28/01/2016.

2. DESCRIPTION OF THE SAMPLE

The sample supplied by the company EXTRUFLEX is:

<table>
<thead>
<tr>
<th>Customer reference</th>
<th>INERIS reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plastic Ref 180 (20 cm*30 cm thickness 2 mm)</td>
<td>16AH520</td>
</tr>
</tbody>
</table>

Photo of the sample
3. OPERATING MODE

The objective of this service is to verify the electrostatic property of the sample, by a measurement of the superficial resistance following the standard EN 13463-1:2009.

The superficial resistance is measured by means of two silver electrodes painted on the sample (picture 1). A voltage is applied on one electrode and the second is connected to an electrometer. This equipment allows measuring the intensity between the electrodes. The value of the resistance is calculated by applying the Ohm rule.

\[ R = \frac{U}{I} \]

Picture 1: electrodes for measuring the superficial resistance

Measurements were done on both sides of the sample

4. EQUIPMENTS USED

<table>
<thead>
<tr>
<th>Type</th>
<th>Manufacturer</th>
<th>Reference INERIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generator</td>
<td>Keithley</td>
<td>M-AB-4160</td>
</tr>
<tr>
<td>Electrometer</td>
<td>Keithley</td>
<td>M-AB-4157</td>
</tr>
<tr>
<td>Thermohygromètre</td>
<td>Testo</td>
<td>M-AB-4199</td>
</tr>
</tbody>
</table>
5. RESULTS
The ambient atmosphere conditions of test and preliminary conditioning were:
22°C±2°C and 50%HR±5%:

<table>
<thead>
<tr>
<th>Ref sample</th>
<th>Voltage (V)</th>
<th>Resistance (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ref 180</td>
<td>500</td>
<td>8.27E+09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.18E+09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.16E+09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.94E+09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.94E+09</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6.95E+09</td>
</tr>
</tbody>
</table>

| Average Resistance | 7.24E+09 |

*Observation:* The tests were made using silver coating electrodes.

6. CONCLUSION

The objective of this service at the request of EXTRUFLEX was to measure the superficial electric resistance following the method described in standard EN 13463-1:2009.

The Measurement, done on a plastic sample referenced “Ref180” by EXTRUFLEX and “INERIS 16AH520” by INERIS, gave an average superficial resistance of 7.24.10^9 Ohm.

This average value has been established by calculating the average of resistance measured on the both sides of the sample test.