



## **Test Procedure for Volume Resistivity of Solid Insulation Materials**

### **1 Introduction**

**Note:** Nothing in this standard supercedes applicable laws and regulations.

**Note:** In the event of conflict between the English and domestic language, the English language shall take precedence.

**1.1 Purpose.** The current standard provides IEC 62631-3-1 based test methodology for the volumetric resistivity of plastic/composite materials at application temperatures for insulation purpose

**1.2 Applicability.** Solid insulation materials for GM approval.

**1.3 Remarks.** Not applicable

### **2 References**

**Note:** Only the latest approved standards are applicable unless otherwise specified.

#### **2.1 External Standards/Specifications.**

|            |               |           |           |
|------------|---------------|-----------|-----------|
| ASTM D257  | IEC 60216-4-1 | ISO 294-1 | ISO 17025 |
| ASTM D5423 | IEC 62631-3-1 | ISO 15512 |           |

#### **2.2 GM Standards/Specifications.**

GMW3221

#### **2.3 Additional References.** None.

### **3 Resources**

**3.1 Facilities.** The test facilities shall be ISO 17025 accredited to perform IEC 62631-3-1 resistivity tests.

**3.1.1 Calibration.** The test facilities and equipment shall be in good working order and shall have a valid calibration label.

**3.1.2 Alternatives.** Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

#### **3.2 Equipment.**

**3.2.1 Oven.** The oven used to measure resistance/resistivity shall comply with IEC 60216-4-1 and ASTM D5423 standards.

**3.2.2 Electrodes.** The electrode arrangements shall meet IEC 62631-3-1 requirements.

Conductive metals in parallel plate arrangements meeting the requirements of ASTM D257, Section 6.1.9, can be used as the mechanical supports with suitable load. Full intimate contacts between the electrodes and the specimen shall be established and verified at testing temperatures. Suitable conductive media, such as conductive paint or conductive rubber, should be used in conjunction with the metal base materials. Care shall be taken to ensure neither the paint nor the rubber shall exert adverse impacts on the specimen at test.

**3.2.3 Lead wires.** Wires and connections between electrodes and specimens shall be such to sustain measurements at the required temperatures.

**3.2.4 Ohm meter.** Suitable to meet IEC 62631-3-1 accuracy requirements.

**3.3 Test Vehicle/Test Piece.** Molded plate, 100 mm × 100 mm × (1 mm ± 0.2 mm). Other types of specimens, either molded or machined from other sources, shall be mutually agreed prior to testing. All molded specimens shall conform to ISO 294-1.

### 3.4 Test Time.

Calendar time: 1 d  
Test time: 0.5h  
Coordination time: 2 h

**3.5 Test Required Information.** Not applicable.

**3.6 Personnel/Skills.** Only trained personnel shall perform the tests.

## 4 Procedure

**4.1 Preparation.** Not applicable.

### 4.2 Conditions.

**4.2.1 Environmental Conditions.** The test facility shall meet GMW3221 Code A.

**4.2.1.1 Specimen Conditions.** Test samples shall have moisture content similar to Dry-As-Molded (DAM) condition determined by the resin supplier when tested to ISO 15512 unless otherwise specified in applicable General Motors Worldwide Engineering Standards (GMW) standards.

**4.2.2 Test Conditions.** Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

**4.2.2.1 As-specified in applicable GMW standards.** All specimens shall be maintained at the test temperature for (60 minutes +60/-0 minutes) before measurements to ensure thermal equilibrium.

**4.3 Instructions.** In accordance to IEC 62631-3-1.

The volume resistance shall be determined after a fixed time of electrification of 1 minute.

## 5 Data

**5.1 Calculations.** In accordance to IEC 62631-3-1.

**5.2 Interpretation of Results.** Not applicable.

**5.3 Test Documentation.** Document and report the test and results in accordance to IEC 62631-3-1.

## 6 Safety

This Engineering Standard may involve safety requirements for hazardous materials, the method of operations and equipment. This standard does not propose to address all the safety issues associated with its use. It is the responsibility of the user of this standard to ensure compliance with all appropriate safety and health practices. This would include any specific training that may be required. The safety and health standards include site specific rules and procedures, company rules and procedures, and Government Standards. Contact shall be made with the appropriate site Safety and Health personnel for further direction and guidance in these matters.

## 7 Notes

**7.1 Glossary.** Not applicable.

### 7.2 Acronyms, Abbreviations, and Symbols.

|              |                                                |
|--------------|------------------------------------------------|
| <b>DAM</b>   | Dry as Molded                                  |
| <b>GMW</b>   | General Motors Worldwide Engineering Standards |
| <b>GSSLT</b> | Global Subsystem Leadership Team               |
| <b>IEC</b>   | International Electrotechnical Commission      |
| <b>ISO</b>   | International Organization for Standardization |