

**WATER ABSORPTION - ELASTOMERS AND PLASTICS**

**Application**

This procedure is used to determine the water absorption properties of elastomers and plastics used in the construction of various automotive parts subjected to prolonged exposure to moisture.

**Apparatus Required**

**Drying Oven**

A mechanical convection oven that conforms to ASTM D573/E145 Type IIA and ISO 188 maintained at a temperature of 121 +/- 2 °C.

**Tank**

Size shall be sufficient to totally submerge the sample in water.

**Laboratory Balance**

Balance must be capable of weighing samples to the nearest 0.0001 gm.

**Desiccator**

**Materials Required**

**Distilled or Deionized Water**

10 ppm max total dissolved solids (ASTM D 1888).

**Towels or Blotters**

Must be lint free.

**Conditioning and Test Conditions**

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

| Date       | Action  | Revisions                                  |
|------------|---------|--------------------------------------------|
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**Procedure**

1. Prepare three sample test bars 50 x 25 mm x nominal part thickness.
2. Dry the samples in the oven for 16 hours at 121 +/- 2 °C unless otherwise specified in the material specification.
3. Remove the samples from the oven and immediately place in a desiccator for one hour, allowing the samples to cool to 23 +/- 2 °C.
4. Remove the samples from the desiccator and weigh immediately to the nearest 0.0001 gm.
5. After weighing, promptly immerse the samples in a water bath that has been conditioned to 23 +/- 2 °C.
6. After immersion for the time required by the material specification, remove the samples from the water. Blot away any excess water on the surfaces of the samples until no visually perceptible surface water remains and immediately reweigh.
7. Calculate the percent water absorption by weight as follows:

$$\text{Percent Water Absorption} = \frac{W_f - W_i}{W_i} \times 100$$

Where:  $W_i$  = initial dry weight

$W_f$  = final weight after water immersion

8. Report all three values and the time of immersion.

Chemicals, materials, parts, and equipment referenced in this document must be used and handled properly. Each party is responsible for determining proper use and handling in its facilities.