



Standard Test Methods of Measuring Dimensions of Rigid Rods and Tubes Used for Electrical Insulation¹

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1. Scope

1.1 These test methods cover the measurement of the dimensions of all rigid rods and tubes used as electrical insulation, the limitations imposed being those of the size range of the more common forms of measuring instruments used.

1.2 Where the number of tests to be made or the specifications covering the rod or tube justify its use, an accurately calibrated “go-and-no-go” ring gage of suitable size may be used.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

D 374 Test Methods for Thickness of Solid Electrical Insulation²

D 1711 Terminology Relating to Electrical Insulation²

3. Terminology

3.1 *Definitions*—For definitions of terms used in these test methods refer to Terminology D 1711.

4. Significance and Use

4.1 These test methods are used to measure the dimensions of the rod or tube to determine conformance with specifications on full lengths or cut lengths. The measurements can also be used for manufacturing control, determination of uniformity, dimensional stability, and physical and electrical properties of the rods and tubes.

5. Conditioning

5.1 Condition specimens prior to testing for at least 48 h at $23 \pm 1^\circ\text{C}$ and $50 \pm 2\%$ relative humidity. Perform tests in air controlled at that temperature and humidity.

6. Method of Measurement

6.1 Make all diameter and wall thickness measurements for specimens with dimensions 300 mm (12 in.) and under in accordance with the procedure described in Test Methods D 374 as applicable. Close the micrometer or vernier caliper slowly on the specimen until contact is made without appreciable distortion of the specimen. The criterion of contact is the initial development of frictional resistance to movement of the specimen between the micrometer or caliper surfaces. Use a steel tape or steel scale for measurement of length and diameter greater than 300 mm (12 in.).

7. Length of Rods or Tubes 300 mm (12 in.) and Under in Length

7.1 *Apparatus*—A machinist’s micrometer or vernier caliper of suitable size reading to 0.02 mm or 0.001 in.

7.2 *Test Specimens*—Specimens shall consist of rods or tubes 300 mm (12 in.) or shorter.

7.3 *Procedure*—Measure the length of the specimen to the nearest 0.02 mm or 0.001 in. Size permitting, make four measurements at points 90° apart around the circumference of the specimen.

7.4 *Report*—Report the average of the measurements taken as the length of the rod or tube.

8. Length of Rod or Tubes Over 300 mm (12 in.) in Length

8.1 *Apparatus*—Steel tape or steel scale of suitable length graduated in 0.5 mm or $\frac{1}{64}$ in.

8.2 *Test Specimens*—Specimens shall consist of rods or tubes over 300 mm (12 in.) in length, including full lengths.

8.3 *Procedure*—Measure the length of the specimen to the nearest 0.5 mm or $\frac{1}{64}$ in. Size permitting, make four measurements at points 90° apart around the circumference of the specimen.

¹ These test methods are under the jurisdiction of ASTM Committee D-9 on Electrical and Electronic Insulating Materials and are the direct responsibility of Subcommittee D09.07 on Flexible and Rigid Insulating Materials.

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² *Annual Book of ASTM Standards*, Vol 10.01.