



Standard Test Methods for Evaluating Connectability Characteristics of Electrical Conductor Materials¹

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1. Scope

1.1 These test methods define procedures for the relative characterization of conductor material connectability on the basis of measurements of parameters important to the design and performance of electrical contacts and connections to and with such conductors for both power and signal applications.

1.2 The parameters measured are contact resistance as a function of contact force, fretting sensitivity, and compressive relaxation.

1.3 Provision is made for measurement of the connectability parameters at elevated temperature, or corrosive ambient, or both, as may be required for evaluation for particular applications.

1.4 These test methods, using standardized specimen geometry and procedures, are applicable to conductor materials as employed in an electrical system and may be adapted for evaluation of connectability of materials in the form of actual connection system components.

1.5 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.6 *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 become familiar with all hazards including those identified in the appropriate Safety Data Sheet (SDS) for this product/material as provided by the manufacturer, to establish appropriate safety and health practices, and determine the applicability of regulatory limitations prior to use.*

¹ These test methods are under the jurisdiction of ASTM Committee B02 on Nonferrous Metals and Alloys and are the direct responsibility of Subcommittee B02.11 on Electrical Contact Test Methods.

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2. Referenced Documents

2.1 ASTM Standards:²

B539 Test Methods for Measuring Resistance of Electrical Connections (Static Contacts)

B542 Terminology Relating to Electrical Contacts and Their Use

3. Terminology

3.1 *Definitions*—Definitions of terms used in this test method are in accordance with Terminology B542.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *connectability, n*—a combination of properties determining the ability of a material to establish and maintain stable low resistance electrical contact under the influence of deteriorating environmental and operational factors.

3.2.2 *fretting, n*—accelerated surface damage occurring at the interface of contacting materials subjected to small oscillatory displacements.

4. Summary of Test Method

4.1 *Contact Resistance*—Contact resistance is measured as force is increased between conductors in a crossed-rod contact pair of the material(s) being tested. Held at the maximum specified force, test contacts may be exposed to temperature changes or corrosive environments such as high humidity to observe the effects of such conditions on electrical contact resistance.

4.2 *Fretting Sensitivity*—Contact resistance of a crossed-rod pair is measured at constant normal force while a microscopic oscillatory tangential motion is applied at the contact interface. The number of applied motion cycles required to induce contact resistance instability is determined. The test may be performed at elevated temperature or in corrosive environment.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.