



Designation: B678 – 23

Standard Test Method for Solderability of Metallic-Coated Products¹

This standard is issued under the fixed designation B678; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method provides a procedure for evaluating the solderability of metallic-coated products and test specimens to assure satisfactory performance in manufacturing processes requiring soldering with soft (tin-lead) solder and rosin flux. This test method is applicable only for testing coatings that are normally readily solderable such as: tin, tin-lead alloy, silver, and gold.

1.2 This test method is qualitative and broadly applicable. It is easy to perform and requires only simple equipment. There are other solderability tests not covered by this test method that are more applicable to specific situations, yield quantitative results, or both. Several are described in the literature.² This is a “go-no-go” test and does not grade solderability as excellent, good, fair, and so forth.

1.3 *This standard may involve hazardous materials, operations, and equipment. 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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This test method is under the jurisdiction of ASTM Committee B08 on Metallic and Inorganic Coatings and is the direct responsibility of Subcommittee B08.10 on Test Methods.

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² Long, J. B., “A Critical Review of Solderability Testing,” in *Properties of Electrodeposits, Their Measurement and Significance*, edited by Richard Sard, Henry Leidheiser, Jr., and Fielding Ogburn, The Electrochemical Society, 1975.

Harding, W. B., “Solderability Testing,” *Plating*, Vol 52, No. 10, October 1965, pp. 971–981.

2. Referenced Documents

2.1 *ASTM Standards*:³

D509 Test Methods of Sampling and Grading Rosin

D1193 Specification for Reagent Water

3. Summary of Test Method

3.1 The specimen to be tested is coated with rosin flux, dipped briefly into molten tin-lead solder, and examined for complete and uniform coverage by the solder. When specifically required, the specimens are artificially aged before testing by exposure to hot, humid air.

4. Significance and Use

4.1 In order that a sound solder joint be formed simply and quickly in a production operation, the molten solder must readily wet and spread over the surfaces of the products being joined. For this to happen, the surfaces must be clean or be soiled only with contaminants that are easily removed by an appropriate flux. It often is necessary that the flux be only strong enough to remove the normally occurring soils. A more aggressive flux may corrode the product and have other harmful effects. Nonactivated rosin in alcohol is the standard flux used in this test method; however, provision is made for the use of other fluxes. Since rosin is a mild flux, it provides better discrimination between acceptable and unacceptable solderability in marginal cases than do more active fluxes.

4.2 Metallic coatings are frequently used to provide solderable surfaces. But, an improperly produced coating may not yield the required solderability. There are many coating defects that cause poor solderability including porosity, codeposited impurities, incorrect thickness, and surface contamination. It may be difficult or impractical to test a coating directly for each of the undesirable conditions. In these instances solderability is tested. Products that pass the solderability test can be expected to solder satisfactorily in production. In the case of failure to

³ 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.