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IPC/EIA/JEDEC J-STD-002B

Solderability Tests for Component Leads, Terminations, Lugs, Terminals and Wires

A joint standard developed by the ECA Soldering Technology Committee (STC), the Component and Wire Solderability Specification Task Group of IPC, the JEDEC JC-13 TG9901 Solderability Test Method Task Group and JEDEC JC-14.1 Committee on Reliability Test Methods for Packaged Devices



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Users of this standard are encouraged to participate in the development of future revisions.

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Solderability Tests for Component Leads, Terminations, Lugs, Terminals and Wires

1 SCOPE

1.1 Scope This standard prescribes test methods, defect definitions, acceptance criteria, and illustrations for assessing the solderability of electronic component leads, terminations, solid wire, stranded wire, lugs, and tabs. This standard is intended for use by both vendor and user.

1.2 Purpose Solderability evaluations are made to verify that the solderability of component leads and terminations meets the requirements established in this standard and that subsequent storage has had no adverse effect on the ability to solder components to an interconnecting substrate. Determination of solderability can be made at the time of manufacture, at receipt of the components by the user, or just before assembly and soldering.

The resistance to dissolution of metallization determination is made to verify that metallized terminations will remain intact throughout the assembly soldering processes.

1.3 Method Classification This standard describes methods by which component leads or terminations may be evaluated for solderability. Test A, Test B, or Test C and Test D, unless otherwise agreed upon between vendor and user, are to be used for each application as a default.

1.3.1 Tests with Established Accept/Reject Criteria

Test A – Solder Bath/Dip and Look Test (Leaded Components and Stranded Wire)

Test B – Solder Bath/Dip and Look Test (Leadless Components)

Test C – Wrapped Wire Test (Lugs, Tabs, Hooked Leads, and Turrets)

Test D – Resistance to Dissolution/Dewetting of Metallization Test

Test S – Surface Mount Process Simulation Test

1.3.2 Test without Established Accept/Reject Criteria

Test E – Wetting Balance Test (Leaded Components)

Test F – Wetting Balance Test (Leadless Components)

These methods are included for evaluation purposes only. Data collected should be submitted to the IPC Wetting Balance Task Group for correlation and analysis.

1.4 Coating Durability The following are guidelines for determining the needed level of steam conditioning category assurance (see Table 1-1). The user and vendor need to agree on the coating durability requirements. If this is

not provided, Coating Durability Category 3 becomes the default condition for tin and tin/lead finishes.

Category 1 — Minimum Coating Durability Intended for surfaces that will be soldered within a short period of time (e.g., up to six months) from the time of testing and are likely to experience a minimum of thermal exposures before soldering (see 5.8).

Category 2 — Typical Coating Durability (for nontin and nontin-lead finishes) Intended for surfaces finished with other than Sn or Sn/Pb coatings that will be soldered after an extended time from the time of testing and which may see limited thermal exposures before soldering (see 5.8).

Category 3 — Typical Coating Durability (default for tin and tin-lead finishes) Intended for surfaces finished with Sn or Sn/Pb coatings that will be soldered after an extended storage (e.g., greater than four months) from the time of testing and/or which see multiple thermal exposures before soldering (see 5.8).

Table 1-1 Steam Conditioning Categories for Component Leads and Terminations

Category 1	Category 2	Category 3
No Steam Conditioning Requirements	1 Hour \pm 5 min. Steam Conditioning	8 hours \pm 15 min. Steam Conditioning

1.5 Referee Verification Solder Dip for Tests A, B, C

When the dipped portion of the termination exhibits anomalies such as surface roughness, or dross, or anomalies that may have been induced by improper solder dipping, a referee verification solder dip of the suspect anomaly may be necessary. Upon reinspection if the suspect anomaly has been removed, the anomaly will have been verified as a nonrejectable cosmetic surface defect. If the anomaly persists, regardless of area, it **shall** be classified a rejectable solderability defect. This procedure may only be used on one component per lot. Continuous need of procedure is an indication of either improper testing procedure, examination interpretation, or of poor component quality.

1.6 Limitation This standard **shall** not be construed as a production procedure for the pretinning of leads and terminations.

1.7 Contractual Agreement In cases where the stated test parameters are inappropriate or insufficient, alternative parameters may be agreed upon between vendor and user.