IPC/ECA J-STD-002C

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

A joint standard developed by IPC Component and Wire Solderability Specification Task Group (5-23b) of the Assembly and Joining Processes Committee (5-20) and the Electronic Components, Assemblies and Materials Association (ECA) Soldering Technology Committee (STC)

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

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Table of Contents

1 SCOPE ................................................................. 1
1.1 Scope ............................................................... 1
1.2 Purpose ............................................................. 1
1.2.1 Shall and Should ............................................... 1
1.2.2 Document Hierarchy .......................................... 1
1.3 Method Classification ......................................... 1
1.3.1 Visual Acceptance Criteria Tests ......................... 1
1.3.2 Force Measurement Tests ................................ 1
1.4 Coating Durability ............................................. 2
1.5 Referee Verification Solder Dip for Tests A, B, C, A1, B1, C1 .................................................. 2
1.6 Limitations .......................................................... 2
1.7 Contractual Agreement ......................................... 2

2 APPLICABLE DOCUMENTS ........................................ 2
2.1 Industry ............................................................. 2
2.1.1 IPC ............................................................... 2
2.1.2 International Electrotechnical Commission ........... 2
2.2 Government ........................................................ 2
2.2.1 Federal .......................................................... 2

3 REQUIREMENTS .................................................... 2
3.1 Terms and Definitions ......................................... 2
3.2 Materials ........................................................... 3
3.2.1 Solder ............................................................ 3
3.2.2 Flux .............................................................. 3
3.2.2.1 Flux Maintenance ............................................. 3
3.2.3 Flux Removal .................................................... 3
3.2.4 Standard Copper Wrapping Wires ....................... 3
3.2.5 Water ............................................................. 4
3.3 Equipment .......................................................... 4
3.3.1 Steam Conditioning Apparatus ......................... 4
3.3.2 Solder Vessel .................................................. 4
3.3.3 Optical Inspection Equipment ............................ 4
3.3.3.1 Referee Magnification .................................... 5
3.3.4 Dipping Equipment .......................................... 5
3.3.5 Timing Equipment ........................................... 5
3.4 Preparation for Testing ....................................... 5
3.4.1 Specimen Preparation and Surface Condition .... 5
3.4.1.1 Steam Conditioning Categories ....................... 5
3.4.2 Steam Conditioning .......................................... 5
3.4.2.1 Post Conditioning Drying ............................... 6
3.4.2.2 Equipment Maintenance ................................. 6
3.4.3 Surfaces to be Tested ....................................... 6
3.4.4 Solder Bath Requirements ................................. 6
3.4.5 Solder Temperatures ....................................... 6
3.4.6 Solder Contamination Control ......................... 6

4 TEST PROCEDURES ............................................... 6
4.1 Application of Flux ............................................. 6
4.2 Visual Acceptance Criteria Tests ........................... 8
4.2.1 Test A – Tin/Lead Solder – Solder Bath/Dip and Look Test (Leads, Wires, etc.) ............... 8
4.2.1.1 Apparatus .................................................... 8
4.2.1.1.1 Solder Pot/Bath .......................................... 8
4.2.1.1.2 Dipping Device ........................................... 8
4.2.1.2 Preparation .................................................. 8
4.2.1.3 Procedure .................................................... 8
4.2.1.4 Evaluation ................................................... 8
4.2.1.4.1 Magnification .............................................. 8
4.2.1.4.2 Accept/Reject Criteria ................................ 9
4.2.2 Test B – Tin/Lead Solder – Solder Bath/Dip and Look Test (Leadless Components) ........ 10
4.2.2.1 Apparatus .................................................... 10
4.2.2.1.1 Solder Pot/Bath .......................................... 10
4.2.2.1.2 Vertical Dipping Device .............................. 10
4.2.2.2 Preparation .................................................. 10
4.2.2.3 Procedure .................................................... 10
4.2.2.4 Evaluation ................................................... 10
4.2.2.4.1 Magnification .............................................. 10
4.2.2.4.2 Accept/Reject Criteria ................................ 10
4.2.3 Test C – Tin/Lead Solder – Wrapped Wires Test (Lugs, Tabs, Terminals, Large Stranded Wires) .................................................. 11
4.2.3.1 Apparatus .................................................... 11
4.2.3.1.1 Solder Pot/Bath .......................................... 11
4.2.3.1.2 Dipping Device .......................................... 11
4.2.3.2 Procedure .................................................... 11
4.2.3.3 Procedure .................................................... 11
4.2.3.4 Evaluation ................................................... 12
4.2.3.4.1 Magnification .............................................. 12
4.2.3.4.2 Accept/Reject Criteria ................................ 12
4.2.4 Test D – Tin/Lead or Lead-Free Solder – Resistance to Dissolution of Metallization Test .... 13
4.2.4.1 Apparatus .................................................... 13
4.2.4.1.1 Solder Pot/Bath .......................................... 13
4.2.4.1.2 Dipping Device .......................................... 13
4.2.4.1.3 Attitude (Angle of Immersion) ..................... 13
4.2.4.2 Preparation .................................................. 13
4.2.4.3 Procedure .................................................... 13
4.2.4.4 Evaluation ................................................... 13
4.2.4.4.1 Magnification .............................................. 13
4.2.4.4.2 Accept/Reject Criteria ................................ 13
4.2.5 Test S – Tin/Lead Solder – Surface Mount Process Simulation Test ........................... 14
4.2.5.1 Apparatus .................................................... 14
4.3.5.2 Preparation ..................................................... 27
4.3.5.3 Procedure ..................................................... 27
4.3.5.4 Evaluation ..................................................... 27
4.3.5.4.1 Magnification .............................................. 27
4.3.5.4.2 Accept/Reject Criteria ................................. 27
4.3.6 Test G1 – Lead-free Solder – Wetting Balance
   Globule Test ..................................................... 28
  4.3.6.1 Apparatus ................................................. 28
  4.3.6.1.1 Dipping Device ........................................ 28
  4.3.6.2 Materials .................................................. 28
  4.3.6.2.1 Flux ..................................................... 28
  4.3.6.2.2 Solder .................................................. 28
  4.3.6.2.3 Test Specimen ......................................... 28
  4.3.6.3 Procedure ................................................. 28
  4.3.6.3.1 Temperature of the Solder ................. 28
  4.3.6.3.2 Fluxing ................................................ 28
  4.3.6.3.3 Dipping Angle, Immersion Depth, and Immersion Rates 28
  4.3.6.3.4 Preheat ............................................... 28
  4.3.6.4 Evaluation ................................................. 28
  4.3.6.4.1 Magnification ..................................... 28
  4.3.6.4.2 Suggested Criteria ................................ 28

5 NOTES ................................................................. 29
  5.1 Use of Activated Flux ........................................ 29
  5.2 Massive Components .................................... 29
  5.3 Sampling Plans ............................................. 29
  5.4 Safety Notes ............................................... 29
  5.5 Correction for Buoyancy ................................. 29
  5.6 Accelerated Steam Conditioning Limitations ...... 29

Appendix A .......................................................... 30
Appendix B .......................................................... 39
Appendix C .......................................................... 44
Appendix D .......................................................... 46
Appendix E .......................................................... 47
Appendix F .......................................................... 48
Appendix G .......................................................... 50

Figures
Figure 3–1 Example Reticle ........................................ 4
Figure 4–1 Dipping Schematic .................................. 8
Figure 4–2 Solder Dipping Angle for Surface Mount
   Leaded Components ......................................... 9
Figure 4–3 Solder Dipping Depth for Through-
   Hole Components ........................................... 9
Figure 4–4 Leadless Component Immersion Depth ....... 10
Figure 4–5 Illustration of Acceptable Solderable
   Terminal......................................................... 11
Figure 4–6 Illustration of Unsolderable Terminal ....... 11
Figure 4–7 Illustration of Acceptable Solderable
   Stranded Wire ............................................... 11
Figure 4–8 Illustration of Partially Solderable Stranded
   Wire Showing Incomplete Fillet ......................... 12
Figure 4–9 Wetting Balance Apparatus ................... 19
Figure 4–10 Set A Wetting Curve ........................ 20
Figure 4–11 Set B Wetting Curve ........................ 21
Figure 4–12 Component and Dipping Angle (Directly
   from IEC 60068-2-69) ........................................ 25
Figure A-1 “I” Leaded Components ...................... 30
Figure A-2 Passive Components .......................... 31
Figure A-3 Gull Wing Components ...................... 32
Figure A-4 Leadless Chip Carrier ......................... 33
Figure A-5 “L” Leaded Components ..................... 34
Figure A-6 Through-Hole Components – Flat Pin ...... 35
Figure A-7 Through-Hole Components – Round Pin ... 36
Figure A-8 Exposed Pad Package ......................... 37
Figure A-9 Bottom-Only Termination Component .... 37
Figure A-10 Area Array Component Critical Surface .... 38
Figure B-1 Defect Size Aid ................................... 39
Figure B-2 Types of Solderability Defects .............. 40
Figure B-3 Aid in Evaluation of 5% Allowable Area
   of Pin Holes .................................................. 40
Figure B-4 Aid in Evaluation of 5% Allowable Area
   of Pin Holes .................................................. 40
Figure B-5 Solderability Coverage Guide .............. 43
Figure C-1 Lead Periphery and Volume for a 132
   I/O PQFP ....................................................... 45

Tables
Table 1–1 Steam Conditioning Categories for
   Component Leads and Terminations ................. 2
Table 3–1 Flux Compositions .............................. 3
Table 3–2 Steam Temperature Requirements ........... 4
Table 3–3 Solderability Test Selection Component Type .. 5
Table 3–4 Maximum Limits of Solder Bath Contaminant .. 6
Table 4–1 Stencil Thickness Requirements ............ 14
Table 4–2 Reflow Parameter Requirements ............ 14
Table 4–3 Stencil Thickness Requirements ............ 18
Table 4–4 Lead-free Reflow Parameter Requirements .... 18
Table 4–5 Wetting Balance Parameter and Suggested
   Evaluation Criteria ........................................ 20
Table 4–6 Dipping Angle and Immersion Depth
   for Components (Directly from
   IEC 60068-2-69) ............................................ 24
Table 4–7 Wetting Parameters and Suggested
   Evaluation Criteria ........................................ 25
Table 3–1 Flux Compositions .............................. 48
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 wires, stranded wires, lugs, and tabs. This standard also includes a test method for the Resistance to Dissolution/Dewetting of Metallization. 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 to determine that 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.

1.2.1 Shall and Should The word “shall” is used in the text of this document wherever there is a requirement for materials, preparation, process control or acceptance of a soldered connection or a test method. The word “should” reflects recommendations and is used to reflect general industry practices and procedures for guidance only.

1.2.2 Document Hierarchy In the event of conflict, the following decreasing order of precedence applies:

1. Procurement as agreed between user and supplier.
2. Master drawing or master assembly drawing reflecting the user’s detailed requirements.
3. When invoked by the customer or per contractual agreement, this document, J-STD-002.
4. Other documents to extent specified by the customer.

1.3 Method Classification This standard describes methods by which component leads or terminations may be evaluated for solderability. Test A, Test B, Test C, Test D and Test S for tin/lead solder processes and Test A1, Test B1, Test C1, Test D and Test S1 for lead-free solder processes, unless otherwise agreed upon between vendor and user, are to be used for each application as a default.

1.3.1 Visual Acceptance Criteria Tests

Test A – Solder Bath/Dip and Look Test (Leaded Components and Stranded Wires) Tin/Lead Solder (paragraph 4.2.1)
Test B – Solder Bath/Dip and Look Test (Leadless Components) Tin/Lead Solder (paragraph 4.2.2)
Test C – Wrapped Wires Test (Lugs, Tabs, Hooked Leads, and Turrets) Tin/Lead Solder (paragraph 4.2.3)
Test D – Resistance to Dissolution/Dewetting of Metallization Test Tin/Lead Solder and Lead-free Solder (paragraph 4.2.4)
Test S – Surface Mount Process Simulation Test Tin/Lead Solder (paragraph 4.2.5)
Test A1 – Solder Bath/Dip and Look Test (Leaded Components and Stranded Wires) Lead-free Solder (paragraph 4.2.6)
Test B1 – Solder Bath/Dip and Look Test (Leadless Components) Lead-free Solder (paragraph 4.2.7)
Test C1 – Wrapped Wires Test (Lugs, Tabs, Hooked Leads, and Turrets) Lead-free Solder (paragraph 4.2.8)
Test S1 – Surface Mount Process Simulation Test Lead-free Solder (paragraph 4.2.9)

1.3.2 Force Measurement Tests

Test E – Wetting Balance Solder Pot Test (Leaded Components) Tin/Lead Solder (paragraph 4.3.1)
Test F – Wetting Balance Solder Pot Test (Leadless Components) Tin/Lead Solder (paragraph 4.3.2)
Test G – Wetting Balance Globule Test Tin/Lead Solder (paragraph 4.3.3)
Test E1 – Wetting Balance Solder Pot Test (Leaded Components) Lead-free Solder (paragraph 4.3.4)
Test F1 – Wetting Balance Solder Pot Test (Leadless Components) Lead-free Solder (paragraph 4.3.5)
Test G1 – Wetting Balance Globule Test Lead-free Solder (paragraph 4.3.6)

These methods (1.3.2) are included for evaluation purposes only. Data collected should be submitted to the IPC Wetting Balance Task Group for correlation and analysis. Tests E, F, G, E1, F1 and G1 shall not be used for acceptance/rejection without user and vendor agreement.