

INCH-POUND

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(see 6.1)

**DEPARTMENT OF DEFENSE
TEST METHOD STANDARD
METHOD 208, SOLDERABILITY**



AMSC N/A

FSC 59GP



MIL-STD-202-208

FOREWORD

1. This standard is approved for use by all Departments and Agencies of the Department of Defense.
2. This entire standard has been revised. This revision has resulted in many changes to the format, but the most significant one is the splitting the document into test methods. See MIL-STD-202 for the change summary.
3. Comments, suggestions, or questions on this document should be emailed to std202@dla.mil or addressed to: Commander, Defense Logistics Agency, DLA Land and Maritime, ATTN: VAT, P.O. Box 3990, Columbus, OH 43218–3990. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.dla.mil>.

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METHOD 208
SOLDERABILITY

1. SCOPE

1.1 Purpose. The purpose of this test method is to determine the solderability of all terminations which are normally joined by a soldering operation. This determination is made on the basis of the ability of these terminations to be wetted by solder and the predictability of a suitable fillet resulting from solder application. These procedures will verify that the pre-assembly lead finish provides a solderable surface of sufficient quality to enable satisfactory soldering.

2. APPLICABLE DOCUMENTS

2.1 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

ASSOCIATION CONNECTING ELECTRONIC INDUSTRIES (IPC)

- J-STD-002 - Solderability Tests For Component Leads, Terminations, Lugs, Terminals and Wires
- J-STD-006 - Requirements For Electronic Grade Solder Alloys and Fluxed and Non-Fluxed Solid Solders For Electronic Soldering Applications

Copies of these documents are available online at www.IPC.org

3. DEFINITIONS

This section not applicable to this standard.

4. GENERAL REQUIREMENTS

4.1 J-STD exceptions. The solderability test shall be performed in accordance with J-STD-002 "Solderability Tests for Component Leads, Terminations, Lugs, Terminals and Wires" and herein. The following details and exceptions shall apply:

4.2 Contractual agreements. The contractual agreements statement in J-STD-002 shall not apply. Any exceptions to the requirements specified in J-STD-002 and this test method shall be documented in the individual military procurement document or approved by the procuring military activity.

4.3 Coating durability. The coating durability category (from J-STD-002) shall be as follows:

- a. Category 2 - for stranded wire (1 hour \pm 5 minutes steam aging with insulation removed).
- b. Category 3 - for all other components (8 hours \pm 15 minutes steam aging).

4.4 Test method. The test method used (from J-STD-002) shall be as follows:

- a. Test A - for through-hole mount and surface mount leaded components, solid wire less than .045 inch diameter and stranded wire 18 AWG or smaller. If not otherwise specified in the procurement document, angle of immersion for surface mount leaded components shall be 90°.
- b. Test B - for surface mount leadless components.
- c. Test C - for lugs, tabs, terminals, solid wire greater than .045 inch diameter and stranded wire larger than 18 AWG.

4.5. Soldering iron test method. When specified in the individual specification, the soldering iron test method shall be performed as specified herein.

4.5.1 Apparatus. The soldering iron used shall be temperature controlled and shall be capable of maintaining the measured idling tip temperature within $\pm 5.5^\circ\text{C}$. Three-wire cords and tip grounding shall be used. The solder iron shall be of such design as to provide zero voltage switching. Solder guns of the transformer type shall not be used.

4.5.2 Materials. The solder shall be composition Sn60Pb40A or Sn63Pb37A of J-STD-006 "Requirements for Electronic Grade Solder Alloys and Fluxed and Non-Fluxed Solid Solders for Electronic Soldering Applications". The solder shall be of form W, flux symbol A, flux percentage symbol 6 or 7 (see J-STD-006).

4.5.3 Procedure. Preparation of terminations and aging shall be as specified in J-STD-002 and 4.4 above. Flux shall be applied by a suitable method (e.g., brush) and allowed to drain for 5 to 20 seconds. Solder in accordance with 4.5.2 shall be applied to the terminal along with the clean solder coated tip of an iron (unless otherwise specified in the individual specification, iron temperature shall be 350°C) to a point $\frac{1}{4}$ inch from the nearest insulating material or $\frac{1}{2}$ the exposed length of the terminal, whichever is closer. The termination shall be positioned so that the iron can be applied to the test surface in a horizontal position as in figure 1. Unless otherwise specified in the individual specification, the iron shall be applied for a period of 5 ± 0.5 seconds and shall remain stationary during this period. Only enough solder shall be applied to flow a single thin layer of new solder.

Should mechanical support for the termination be required while performing this test, such support shall be of thermally insulating material. For solder cups, the cup shall be filled with solder in accordance with 4.5.2, and the excess solder wicked out with a compatible fluxed solder wick. Prior to examination, flux residue shall be removed from the terminations by cleaning in a suitable solvent. Terminations shall be examined as specified in ANSI/J-STD-002.

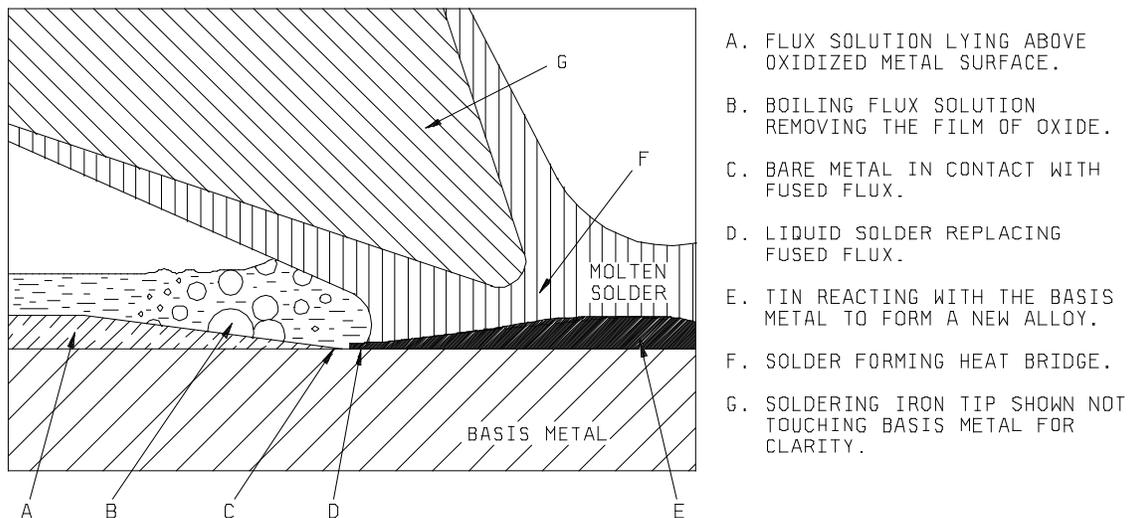


FIGURE 1. Soldering iron position and process diagram.

5. DETAILED REQUIREMENTS

5.1 Summary. The following details are to be specified in the individual specification:

- a. Depth of immersion if other than specified.
- b. Angle of immersion for surface mount leaded components, if other than 90°.
- c. Measurements after test, when applicable.
- d. Whether soldering iron method is to be used.
 - 1. Soldering iron temperature if other than 350°C.
 - 2. Duration of application of soldering iron if other than 5 ±0.5 seconds.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Supersession data. The main body and 38 parts of this revision of MIL-STD-202 replace superseded MIL-STD-202.

Custodians:

Army - CR
Navy - EC
Air Force - 85
DLA - CC

Preparing activity:
DLA – CC

(Project 59GP-2015-022)

Review activities:

Army - AR, AT, AV, CR4, MI, SM, TE
Navy - AS, OS, SH
Air Force - 19, 99
NSA - NS

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