



ASSOCIATION CONNECTING
ELECTRONICS INDUSTRIES®

IPC J-STD-004A

Requirements for Soldering Fluxes

A standard developed by the Flux Specifications Task Group (5-24a)
of the Assembly and Joining Processes Committee (5-20) of IPC



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

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Requirements for Soldering Fluxes

1 SCOPE AND DESIGNATION

1.1 Scope This standard prescribes general requirements for the classification and testing of fluxes for high quality solder interconnections. This standard is a flux characterization, quality control, and procurement document for flux and flux-containing material.

1.2 Purpose This standard defines the classification of soldering materials through specifications of test methods and inspection criteria. These materials include: liquid flux, paste flux, solder paste flux, solder preform flux, and flux cored solder. It is not the intent of this standard to exclude any acceptable flux or soldering aid material; however, these materials must produce the desired electrical and metallurgical interconnection.

The requirements for fluxes are defined in general terms for standardized classification. Appendix B has additional information that will help users understand some of the requirements of this standard. In practice, where more stringent requirements are necessary or other manufacturing processes are used, such as soldering with alloys other than tin/lead, the user **shall** define these as additional requirements.

There are unresolved issues related to fluxes that are evaluated and used with certain lead free alloys. While some criteria may be applicable to testing with lead free alloys, users need to recognize that other testing may be required. Future revisions to this standard will address those issues when sufficient data is available.

1.3 Designation For ordering purposes and designation by other specifications, the following flux identification system **shall** be used (see Table 1-1).

1.4 Interpretation “**Shall**,” the imperative form of the verb, is used throughout this standard whenever a requirement is intended to express a provision that is mandatory. Deviation from a “**shall**” requirement may be considered if sufficient information is supplied to justify the exception.

The words “should” and “may” are used whenever it is necessary to express nonmandatory provisions. “Will” is used to express a declaration of purpose.

To assist the reader, the word “**shall**” is presented in bold characters.

2 APPLICABLE DOCUMENTS

The following documents of the issue currently in effect form a part of this specification to the extent specified

herein. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1 IPC¹

IPC-T-50 Terms and Definitions for Interconnecting and Packaging Electronic Circuits

IPC-TM-650 Test Methods Manual²

- 2.3.13 Determination of Acid Value of Liquid Solder Flux - Potentiometric and Visual Titration Methods
- 2.3.28.1 Halide Content of Soldering Fluxes and Pastes
- 2.3.32 Flux Induced Corrosion (Copper Mirror Method)
- 2.3.33 Presence of Halides in Flux, Silver Chromate Method
- 2.3.34 Solids Content, Flux
- 2.3.35 Halide Content, Quantitative (Chloride and Bromide)
- 2.3.35.1 Fluorides by Spot Test, Fluxes - Qualitative
- 2.3.35.2 Fluoride Concentration, Fluxes - Quantitative
- 2.4.14.2 Liquid Flux Activity, Wetting Balance Method
- 2.4.34.4 Paste Flux Viscosity - T-Bar Spindle Method
- 2.4.46 Spread Test, Liquid or Extracted Solder Flux, Solder Paste and Extracted Cored Wires or Preforms
- 2.6.1 Fungus Resistance Printed Wiring Materials
- 2.6.3.3 Surface Insulation Resistance (SIR), Fluxes
- 2.6.14.1 Electrochemical Migration Resistance Test
- 2.6.15 Corrosion, Flux

2.2 Joint Industry Standards¹

J-STD-003 Solderability Tests for Printed Boards

2.3 American Society for Testing and Materials (ASTM)³

ASTM D-465 Standard Test Methods for Acid Number of Naval Stores Products Including Tall Oil and Other Related Products

1. www.ipc.org

2. Current and revised IPC Test Methods are available through IPC-TM-650 subscription and on the IPC Web site (www.ipc.org/html/testmethods.htm).

3. www.astm.org