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JOINT INDUSTRY STANDARD

Requirements for Solder Pastes

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IPC-J-STD-005B

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If a conflict occurs between the English language and translated versions of this document, the English version will take precedence.

Developed by the 5-24B Task Group of the Assembly and Joining General Committee 5-20 of IPC

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

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1 GENERAL

1.1 Scope This standard prescribes general requirements for the characterization and testing of solder pastes used to make high quality electronic interconnections. This specification is a material quality control document and is not intended to relate directly to the material's performance in the assembly process. Solder paste users are referred to paragraph 6.3 for a listing of requirements information and options that should be addressed when procuring solder paste.

1.2 Purpose This standard defines the characteristics of solder paste through the definitions of properties and specification of test methods and inspection criteria. The materials include solder powder and solder paste flux blended to produce solder paste. Solder powders are classified by the shape of the particles and size distribution of the particles. It is not the intent of this standard to exclude particle sizes or distributions not specifically listed. The flux properties of the solder paste, including classification and testing, shall be based on J-STD-004. The solder alloy properties of solder paste, which includes requirements, shall be based on J-STD-006. The requirements for solder paste are defined in general terms. Users can perform additional tests (beyond the scope of this specification) to determine the acceptability of the solder paste for specific processes.

1.3 Quality/Performance Classification Three general classes have been established to reflect progressive increases in inspection and testing frequency. It should also be recognized that there is typically an overlap between classes. In many cases the difference between classes is one of attribute assurance level not attribute difference. The user has the responsibility to determine the class into which his product belongs. Testing and inspection requirements in this specification have been separated so the metallic foils may be tested to any one of the three quality/performance classes.

The three classes are:

Class 1 Material in this class is suitable for applications where mechanical properties and cosmetic defects are not important, and the only requirement is functionality of the complete circuit. This material has no prescribed inspection and testing requirements.

Class 2 Material in this class is suitable for use where circuit design, process yield, and specification conformance requirements allow localized areas of nonconformance. This material has moderate levels of assurance, demonstrated via the use of testing and/or statistical process control (SPC)/statistical quality control (SQC) techniques.

Class 3 Material in this class is suitable for applications where high levels of assurance are required. These levels of assurance shall be demonstrated via the use of testing and/or SPC/SQC techniques.

1.4 Measurement Units This Standard uses International System of Units (SI) units per ASTM SI10, IEEE/ASTM SI 10, Section 3 [Imperial English equivalent units are in brackets for convenience]. The SI units used in this Standard are millimeters (mm) [in] for dimensions and dimensional tolerances, Celsius (°C) [°F] for temperature and temperature tolerances, grams (g) [oz] for weight, and lumens (lm) [footcandles] for illuminance.

Note: This Standard uses the SI prefixes (ASTM SI10, Section 3.2) to eliminate leading zeroes (for example, 0.0012 mm becomes 1.2 µm) or as an alternative to powers-of-ten (3.6×10^3 mm becomes 3.6 m).

1.5 Definition of Requirements The words shall or shall not are used in the text of this document wherever there is a requirement for materials, preparation, process control or acceptance. The word "should" reflects recommendations and is used to reflect general industry practices and procedures for guidance only. Line drawings and illustrations are depicted herein to assist in the interpretation of the written requirements of this Standard. The text takes precedence over the figures.

1.6 Process Control Requirements The use of "statistical process control" (SPC) is optional and should be based on factors such as design stability, lot size, production quantities, and the needs of the Manufacturer. See paragraph 4.6 for the quality assurance section regarding SPC.

1.7 Order of Precedence The contract shall take precedence over this Standard, referenced standards and drawings.