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Qualification and Performance Specification of Permanent Solder Mask and Flexible Cover Materials

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

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Qualification and Performance Specification of Permanent Solder Mask and Flexible Cover Materials

1 SCOPE AND DESIGNATION

1.1 Scope This specification **shall** define the criteria for and method of obtaining the maximum information about and confidence in cured permanent solder mask and cover material under evaluation with the minimum of test redundancy.

This specification **shall** establish the requirements for:

- The evaluation of solder mask and cover materials
- The conformance of solder mask and cover material properties
- The qualification of the solder mask and cover material via the appropriate test substrate
- The qualification assessment of the solder mask and cover material in conjunction with the production printed board process

1.2 Purpose This specification **shall** establish the requirements, based on applicable test methods and conditions, for the evaluation of a solder mask and cover material and for the determination of the acceptability of use on a printed board. These same requirements **shall** also be used to qualify a printed board production process based on conformance criteria defined by the reliability requirements of the end use environment. Acceptability and/or verification criteria of the production printed board **shall** be determined in accordance with the applicable performance requirements (e.g., IPC-6012, IPC-6013, IPC-6018, etc.).

The solder mask materials described herein, when applied to the printed board substrate are intended to prevent and/or minimize the formation and adherence of solder balls, solder bridging, solder build-up and physical damage to the printed board substrate. The solder mask material **shall** retard electromigration and other forms of detrimental or conductive growth.

The cover materials described herein, when applied to the printed board substrate, **shall** provide a flexible dielectric protective layer over the etched conductors and other conductive features. The cover materials are intended to prevent and/or minimize the formation and adherence of solder balls, solder bridging, solder build-up and physical damage to the printed board substrate. The cover materials **shall** retard electromigration and other forms of detrimental or conductive growth.

NOTE: The determination of compatibility between solder mask and cover materials and post soldering products and processes is beyond the scope of this specification. The use of Test Methods specified herein to determine the compatibility and the requirement to do so **shall** be as agreed between user and supplier (AABUS).

This specification **shall** list the base requirements for solder mask and cover materials and their production processes. The solder mask and cover material **shall** be cured per the manufacturer's recommended process in accordance with those conditions specified for that product. Additional requirements or deviations from these requirements **shall** be AABUS.

1.3 Classes This specification provides four classes of requirements, T, FT, H, and FH to reflect functional performance requirements and testing severity based on industry/end use requirements. Qualification to a particular class **shall not** be extended to cover any other class.

Note: The reference of a single class does not preclude invoking or allowing specific requirements defined in other classes.

T — Telecommunication This includes computers, telecommunication equipment, sophisticated business machines, instruments, and certain non-critical military applications. Solder mask and cover material on printed boards in this class is suitable for high performance commercial and industrial products in which extended performance life is required but for which interrupted service is not life threatening.

H — High Reliability/Military This includes that equipment where continued performance is critical, equipment down-time cannot be tolerated and/or the equipment is a life support item. Solder mask and cover material on printed boards of this class is suitable for applications where high levels of assurance are required and uninterrupted service is essential.

FT — Flexible Printed Board Applications (Telecommunications) This applies to cover materials for flexible printed board applications used in Telecommunications applications.