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Environmental testing – Part 2-88: Tests – Test XD: Resistance of components and assemblies to liquid cleaning media

Essais d'environnement – Partie 2-88: Essais – Essai XD: Résistance des composants et des assemblages aux produits de nettoyage liquides

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IEC 60068-2-88 has been prepared by IEC technical committee 91: Electronics assembly technology. It is an International Standard.

The text of this International Standard is based on the following documents:

Draft	Report on voting
91/2027/FDIS	91/2038/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60068 series, published under the general title *Environmental testing*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

INTRODUCTION

a) Background

Current manufacturing processes preferably do not use cleaning steps for the sake of cost saving, environmental impacts, and potentially detrimental effects to quality and reliability of the equipment. But there are situations, where cleaning of components or assemblies becomes unavoidable, for example when it is necessary to apply protective coatings, or cleaning is required by specific regulations concerning the end use of the equipment. It is the challenge for process engineers to select effective cleaning media and processes at one side, and on the other side to evaluate whether the components and circuit boards exposed to those processes can withstand it without being damaged or their performance being deteriorated.

b) Current industry standard test methods

Current standards, like IEC 60068-2-45 [1][1] and some other component standards describe resistance to solvents tests, but the test liquids used for testing (e.g. alcohols) are not commonly used in real industrial cleaning processes. In addition, the current resistance to solvent test methods are immersion tests without any mechanical load to the components or ultrasonic agitation. The current focus of these tests is mainly on the legibility of marking, etc.

Other standards, like MIL-STD-202 [12], Method 215K, describe very specific qualification processes and solvents, which again are not common in today's manufacturing processes of electronic equipment.

c) To close the gap

It is the intention of this document to close the above described gap between industrial practice and existing test methods. The approach used is a combination of basic qualification tests to perform on component and unpopulated circuit board level, and a validation test to perform on assembly level, using the real manufacturing processes conditions and media. By this two-step approach, a pre-selection of components suitable for the intended assembly and cleaning processes, the evaluation of its resistance against the selected processes, and detection of material incompatibilities are enabled.

The test liquids specified in this document are representative for solvent families used in cleaning processes of electronics industry.

1 Numbers in square brackets refer to the Bibliography.

ENVIRONMENTAL TESTING –

Part 2-88: Tests – Test XD: Resistance of components and assemblies to liquid cleaning media

1 Scope

This part of IEC 60068-2 establishes test methods for the resistance of electronic and electromechanical components, unpopulated circuit boards and assemblies to liquid cleaning media and cleaning processes, which are agreed between user and supplier for applications, where cleaning is required. These tests are not applicable to components, unpopulated circuit boards and assemblies, which are not intended to be subjected to cleaning processes.

Tests XD_1 and XD_2 primarily are intended for qualification testing of components and unpopulated circuit boards suitable for cleaning processes but can be adopted as well to testing of material compatibility and specific cleaning media used in manufacturing processes of components and unpopulated circuit boards.

Test XD_3 is intended to determine the resistance of electronic assemblies suitable for cleaning processes to the various cleaning processes to which they are exposed during manufacturing, including the effects of assembly and soldering processes.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60068-2-20, *Environmental testing – Part 2-20: Tests – Tests Ta and Tb: Test methods for solderability and resistance to soldering heat of devices with leads*

IEC 60068-2-58, *Environmental testing – Part 2-58: Tests – Test Td: Test methods for solderability, resistance to dissolution of metallization and to soldering heat of surface mounting devices (SMD)*

3 Terms and definitions

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ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- IEC Electropedia: available at https://www.electropedia.org/
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