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Environmental testing - Part 2: Test methods - Text XA and guidance: Immersion in cleaning solvents

环境试验 第 2 部分：试验方法 试验 XA 和导则：在清洗剂中浸渍

(IEC 60068-2-45:1980/Amd 1:1993, Basic environmental testing procedures - Part 2: Tests - Text XA and guidance: Immersion in cleaning solvents, MOD)

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Environmental testing - Part 2: Test methods - Text XA and guidance: Immersion in cleaning solvents

1 Scope

This part of GB/T 2423 is applicable to the test, in which the test sample is immersed in a cleaning solvent, at a specified temperature, within a specified time.

If required by the relevant specifications, the test sample shall be wiped by absorbent cotton or tissue paper, after immersion and drying.

See Appendix A for the guidelines for this test.

2 Purpose

Determine the degree to which the electronic components (including components, etc., the same below) or other parts, which are installed on the printed circuit board, are affected by the cleaning agent, when they are immersed in the cleaning agent as specified below.

Note: This test does not simulate the impact of other operations.

3 Types of test solvents and test conditions

3.1 Solvent

3.1.1 This test specifies the use of two common cleaning solvents.

Note: A good test result, which is obtained, according to this test method, does not mean that it can withstand other solvents.

3.1.2 Isopropanol for industrial use. This solvent shall be used whenever possible.

Note: This solvent has been sold as a finished chemical product.

3.1.3 Soft water or distilled water, which has a resistivity not less than 500 Ω·m (equivalent to conductivity of 2 mS/m).

Note: In the case of technical appraisal, when relevant specifications have provisions, it may use other solvents, which have similar activity to the specified solvent.

Note: It may use commercially available absorbent cotton, such as medical absorbent cotton.

In this Part, "thin roll paper" refers to thin, soft, relatively tough paper, which is usually used for packaging fragile items. Its unit mass is 12 g/m^2 ~ 25 g/m^2. It may also use soft tissues on the market.

5.3 Method 2 (without wiping)

The test sample shall be completely immersed in a solvent, which is specified in 3.1, at a certain temperature as specified in 3.2.1, for a duration as specified in 3.2.2.

6 Recovery

After the test sample is taken out of the solvent, if the final electrical performance and (or) mechanical performance test is required, the test sample shall be placed, under standard test atmospheric conditions, for 1 h ~ 2 h, before testing, OR after the time specified by the relevant specifications.

7 Final inspection

If the purpose of the test is to determine the impact on the surface of the marking, encapsulation, coating, etc., the test sample shall be visually inspected.

If the purpose of the test is to determine the impact on the working performance of the test sample, the relevant specifications may also require electrical and (or) mechanical performance testing.

8 Information to be provided by relevant specifications

When the test is included in the relevant specifications, the following information shall be provided as much as possible:

Appendix A

(Informative)

Guidelines for test XA

A.1 Overview

Many components or parts, which are installed on printed circuit boards, are subject to solvent cleaning processes.

In order to simulate the impact of this cleaning operation AND verify the solvent resistance of components or parts, it shall use the test XA.

Test XA includes two aspects:

a) Determine the impact on the surface of the marking, packaging, coating, etc.;

b) Determine the impact on the performance of the test sample.

After marking, after at least 48 h, to let the ink is in full contact air AND is dried, before the test samples can be tested.

A.2 Cleaning

A.2.1 Basic considerations (test methods and solvents)

The printed circuit board (that is, the printed circuit board plus the components), on which the components are soldered, can be cleaned in different ways.

In many cases, it is necessary to completely immerse the printed circuit board in the prescribed solvent. In this case, the components on the board shall be subjected to short-term immersion, in the relevant cleaning agent.

Usually, the cleaning agent used depends on the flux selected.

A.2.1.1 Printed circuit boards which use rosin-based flux

These circuit boards can be effectively cleaned, by the use of a mixture of fluorocarbon and alcohol.

In order to remove flux and flux residues, printed circuit boards are usually immersed in cold (room temperature) solvent, OR immersed in boiling solvent, OR successively immersed in cold and boiling solvent.

A.2.1.2 Printed circuit boards which use water-soluble flux

and skin diseases, like touching other organic solvents.

Generally speaking, the actual cleaning process is to immerse the printed circuit board in a solvent for 0.5 min ~ 2 min. In order to strengthen the treatment, the immersion time is 5 min.

It needs to measure the temperature of the solvent, during the process of immersion of components and parts in the solvent. The temperature must be kept within a given range.

A.2.3 Wipe

In fact, after the printed circuit board is immersed in the cleaning agent, it shall be wiped or brushed on the side where it is soldered, to remove insoluble residues or certain impurity contaminants.

For this reason, if required by the relevant specifications, dry surfaces shall be wiped, because wiping the wet surfaces may cause irreproducible effects. For the usual printed circuit boards, wiping after the cleaning procedure is only to judge whether the markings are legible.

In order to obtain good reproducibility and an operator-independent wiping method, it shall use a suitable wiping device. A recommended device is an analog "fingertip". It consists of a rubber disc, which has a diameter of 11.3 mm (approximately 1 cm^2), a thickness of 5 mm, a Shore hardness of 30 ~ 40, whose back is installed on a hard (metal or plastic) disk or rod. This rubber disc is covered with absorbent cotton or soft-thin paper gasket. When the gasket is pressed, under the specified pressure, its thickness is about 1 mm. This component is fixed to the pressure spring balance measuring instrument; the suitable pressure is 10 N (about 1 kg).

For small components, it may use a scaled-down modified wiping device; the top diameter is reduced to 5 mm (approximately 0.2 cm^2); the force is about 1 N.

For good reproducibility, absorbent cotton and thin roll paper shall be selected (see 5.2) with the best specifications. If deemed necessary and allowed by the size of the test sample, the recommended wiping length is about 10 mm.

A.3 Some considerations in practical applications

When using cleaning solvents, it shall observe the relevant safety precautions.

When testing the same type of components or parts, under different test conditions or methods, different test samples shall be used, for each test. Components with insulating sleeves (such as shrinkable plastic pipes) OR components with capillary cracks in their shells, may have long-term effects,

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