

ICS 19.040
CCS K 04



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 2423.28-2005

**Environmental testing for electric and electronic products - Part
2: Test methods - Test T: Soldering
(English Translation)**

Issued on: August 26, 2005

Implemented on: April 1, 2006

**Issued by: General Administration of Quality Supervision, Inspection and
Quarantine of PRC**

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Foreword

This part of GB/T 2423 is equivalent to the International Electrotechnical Commission's IEC 60068-2-20:1979 "Basic environmental testing procedures - Part 2: Test - Test T: Soldering" and its revision 2:1987.

This part is a revision of GB/T 2423.28-1982 "Environmental testing for electric and electronic products - Part 2: Tests methods - Test T: Soldering". GB/T 2423.28-1982 identically adopts IEC 60068-2-20:1979. Compared with GB/T 2423.28-1982, this Part mainly identically adopts the revision 2:1987 of the IEC 60068-2-20:1979, to revise the 4.7.3, 4.11, 5.6.3, 5.9, to make the standards more scientific and stricter.

Other national standards cited in this Part include:

- GB/T 2423.2-2001 Environmental testing for electric and electronic products - Part 2: Test methods - Tests B: Dry heat (idt IEC 60068-2-2:1974)
- GB/T 2423.3-1993 Basic environmental testing procedures for electric and electronic products - Test Ca: Damp heat, steady state (egv IEC 60068-2-3:1969 and revision 1:1984)

- GB/T 2421-1999 Environmental testing for electric and electronic products
- Part 1: General and guidance (idt IEC 60068-1:1988)

The editorial amendments to IEC 60068-2-20:1979 in this Part are as follows:

The "2-propanol (isopropanol)" in the original text is uniformly called "isopropanol". The Figures in the Appendix are consecutively numbered together with the Figures in the text in the original text, which are now numbered according to the Appendix where they are located. Figure D.3 and Figure E.1 originally used the third angle projection method, BUT now use the first angle projection method.

Appendix A, Appendix B, Appendix C, Appendix D, Appendix E of this Part are all normative annexes.

This part will replace GB/T 2423.28-1982, from the date of implementation.

This part was proposed by China Electrical Equipment Industry Association.

This part shall be under the jurisdiction of the National Technical Committee for Standardization of Environmental Technology for Electrical and Electronic Products.

Responsible drafting organization of this Part: The Fifth Institute of Electronics of the Ministry of Information Industry.

Environmental testing for electric and electronic products - Part 2: Tests methods - Test T: Soldering

1 Scope

This Part of GB/T 2423 applies to all electrical and electronic components, that may be subject to the following test conditions.

2 Purpose

Determine the ability of component terminations and printed circuits to be easily wetted; check the ability of components themselves not to be damaged during assembly and soldering.

3 Terms

3.1

Colophony

Natural rosin is the residue, after turpentine is extracted from the oil-containing pine tree. It is mainly composed of rosin acid and similar resin acids. It also includes a small amount of resin acid esters.

3.2

Contact angle

Usually refers to the angle, between the tangent plane of the liquid surface and the two planes of the liquid-solid interface, at the intersection of the liquid and the solid (see Figure 1). This specifically refers to the contact angle, when the liquid solder is in contact with a solid metal surface.

When inactive flux is not suitable for use, according to the requirements of relevant standards, ammonium chloride (analytical pure) can be added to the above flux, to increase the chloride ion content to 0.5% by mass (referring to the amount, which is expressed by free chloride ions, based on the benchmark of rosin content).

4.8.3 Procedure

The test wire shall be basically straight. If necessary or convenient, they can be removed from a sample to be tested.

Before the solderability test, the wire shall not be cleaned. If required by the relevant standards, the wire can be immersed in a neutral organic solvent, at room temperature, to remove oil stains.

Before the new solder ball, which is selected in accordance with 4.8.2.1, is placed on the heating head in the soldering device, the solder, which is left on the heating head from the previous test, shall be wiped clean.

The flux is used, by dipping the wire in the flux OR brushing the flux on the wire, that has been placed in a suitable position in the test device. A small amount of

flux can also be applied to the molten solder ball, to ensure that it is clean AND not oxidized; meanwhile it can completely wet the heating head.

Then put the wire to be tested into the ball, so that the wire touches the surface of the heating head.

4.8.4 Requirements

Measure the elapsed time, FROM when the wire cuts the solder and touches the heating head TO when the solder flows around the wire and covers the wire.

This is the soldering time. The maximum soldering time shall be specified, in the relevant standards.

4.9 De-wetting

Note: The relevant standards shall specify whether this test is required.

4.9.1 Description of solder bath

The depth of the solder bath shall not be less than 40 mm; its volume shall not be less than 300 mL. The solder bath shall contain solder as specified in Appendix B. The temperature of solder, in the bath, shall be $260\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$, before the test.

4.9.2 Procedure

At the temperature of the test room, before each test, the surface of the molten solder shall be scratched clean and bright, by the use of a suitable material.

The test shall be carried out immediately after the scratch.

First, immerse the tested termination into the flux, which is specified in 4.6.2.

Excess flux can be drip-drying, by hanging for a suitable time OR removed by any other method, that can produce the same effect. In case of disputes, the drip-drying time shall be $60\text{ s} \pm 5\text{ s}$.

Then immediately immerse the termination into the solder bath, in the direction of the longitudinal axis. The distance, between the dipping point of the termination and the tank wall, shall not be less than 10 mm.