SLOVENSKI STANDARD
SIST EN ISO 9455-17:2006

01-oktober-2006

Talila za mehko spajkanje ï Preskusne metode ï 17. del: Preskus odpornosti povrġine izolacije z glavnikom in preskus elektrokemiļ nega prenosa talila (ISO 9455-17:2002)

Soft soldering fluxes - Test methods - Part 17: Surface insulation resistance comb test and electrochemical migration test of flux residues (ISO 9455-17:2002)

Flussmittel zum Weichlöten - Prüfverfahren - Teil 17: Bestimmung des Widerstandes der Oberflächenisolierung, Kammprüfung und elektrochemische Migrationsprüfung von Flussmittelrückständen (ISO 9455-17:2002)

Flux de brasage tendre - Méthodes d'essai - Partie 17: Essai au peigne et essai de migration électrochimique de résistance d'isolement de surface des résidus de flux (ISO 9455-17:2002)

Ta slovenski standard je istoveten z: **EN ISO 9455-17:2006**

ICS:

25.160.50	Trdo in mehko lotanje	Brazing and soldering

SIST EN ISO 9455-17:2006 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 9455-17

June 2006

ICS 25.160.50

English Version

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This European Standard was approved by CEN on 2 June 2006.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

Foreword

The text of ISO 9455-17:2002 has been prepared by Technical Committee ISO/TC 44 "Welding and allied processes" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 9455-17:2006 by Technical Committee CEN/TC 121 "Welding", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2006, and conflicting national standards shall be withdrawn at the latest by December 2006.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of ISO 9455-17:2002 has been approved by CEN as EN ISO 9455-17:2006 without any modifications.

INTERNATIONAL STANDARD

ISO 9455-17

First edition
2002-12-15

Soft soldering fluxes — Test methods —

Part 17: Surface insulation resistance comb test and electrochemical migration test of flux residues

Flux de brasage tendre — Méthodes d'essai —

Partie 17: Essai au peigne et essai de migration électrochimique de résistance d'isolement de surface des résidus de flux

Reference number
ISO 9455-17:2002(E)

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Published in Switzerland

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 9455-17 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 12, *Soldering and brazing materials*.

ISO 9455 consists of the following parts, under the general title *Soft soldering fluxes — Test methods*:

— *Part 1: Determination of non-volatile matter, gravimetric method*

— *Part 2: Determination of non-volatile matter, ebulliometric method*

— *Part 3: Determination of acid value, potentiometric and visual titration methods*

— *Part 5: Copper mirror test*

— *Part 6: Determination and detection of halide (excluding fluoride) content*

— *Part 8: Determination of zinc content*

— *Part 9: Determination of ammonia content*

— *Part 10: Flux efficacy tests, solder spread method*

— *Part 11: Solubility of flux residues*

— *Part 12: Steel tube corrosion test*

— *Part 13: Determination of flux spattering*

— *Part 14: Assessment of tackiness of flux residues*

— *Part 15: Copper corrosion test*

— *Part 16: Flux efficacy tests, wetting balance method*

— *Part 17: Surface insulation resistance comb test and electrochemical migration test of flux residues*

Soft soldering fluxes — Test methods —

Part 17: Surface insulation resistance comb test and electrochemical migration test of flux residues

1 Scope

This part of ISO 9455 specifies a method of testing for deleterious effects that may arise from flux residues after soldering or tinning test coupons. The test is applicable to type 1 and type 2 fluxes, as specified in ISO 9454-1, in solid or liquid form, or in the form of flux-cored solder wire, solder preforms or solder paste constituted with eutectic or near-eutectic tin/lead (Sn/Pb) solders (ISO 9453:1990, Class E).

NOTE This test method is also applicable to fluxes for use with lead-free solders. However, the soldering temperatures may be adjusted with agreement between tester and customer.

2 Normative references

The following referenced documents are indispensable for the application 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.

ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*

ISO 9453:1990, *Soft solder alloys — Chemical compositions and forms*

ISO 12224-1:1997, *Solder wire, solid and flux cored — Specification and test methods — Part 1: Classification and performance requirements*

IEC 61249-2-7:2002, *Materials for printed boards and other interconnecting structures — Part 2-7: Reinforced base materials clad and unclad — Epoxide woven E-glass laminated sheet of defined flammability (vertical burning test), copper-clad*

IEC 60068-2-20, *Environmental testing — Part 2: Tests — Test T: Soldering*

IPC-TM-650[1)], *Test Methods Manual (TM 2.6.3.3 Surface Insulation Resistance, Fluxes) (Test pattern IPC-B-24)*

3 Principle

The objective of this test method is to characterize fluxes by determining the degradation of electrical resistance and the electrochemical migration of rigid printed wiring coupon specimens after exposure to the specified flux. This test is carried out at high humidity and heat conditions under bias voltage. For fluxes which may leave undesirable residues and hence require cleaning, the results obtained from the test will depend on the characteristics of the flux residue, substrate, metallization, and also on the effectiveness of the cleaning operation.

1) Obtainable from: IPC, 2215 Sanders Road, Northbrook, IL, 60062-6135.

The measurement of surface insulation resistance (SIR) makes use of a printed wiring coupon substrate having one or more conductive interleaved test patterns. Prior to being subjected to conditioning, the interleaved test patterns are fluxed, soldered or tinned, and cleaned (when required). The patterns are then exposed to a controlled environment for a specified time, with an applied voltage. The surface insulation resistance is measured using insulation test apparatus, at a suitable test voltage while the test coupons are in the controlled environment.

4 Reagents

In the test use only reagents of recognized analytical grade or higher and only distilled, or deionized water, with a conductivity of less than 0,5 µS/cm (resistivity $\geqslant$ 2 MA·cm).

4.1 Propan-2-ol, $(CH_3)_2CHOH$ or other suitable solvent.

4.2 Cleaning solvent (where required), recommended by the flux manufacturer as suitable for the removal of post soldering flux residues, or propan-2-ol.

5 Apparatus

Equipment shall be capable of demonstrating repeatability in accordance with the gauge r and R methodology specified in ISO 5725-2.

5.1 Low profile container, e.g. a Petri dish or a watch glass.

5.2 Drying oven, suitable for use at up to 120 °C ± 3 °C.

5.3 Insulated wire or cable, tin coated single copper conductor, 1 000 V general purpose wire, temperature rated to 150 °C; primary insulation of radiation-crosslinked, extruded polyalkene; primary jacket of radiation-crosslinked, extruded polyvinylidene fluoride; configuration suitable for equipment in use.

5.4 Connector, 64-position, glass filled polyester body with the following properties:

— 1,27 mm × 10,67 mm (0,05 in × 0,42 in) on 2,54 mm (0,10 in) centres;

— 32 tabs, gold plated over nickel plate over copper;

— 0,762 µm (0,000 03 in) gold plated post/pin mating end;

— bifurcated beam contacts;

— for coupon thickness of 1,40 mm to 1,78 mm (0,055 in to 0,070 in);

— capable of withstanding temperatures up to 105 °C.

5.5 Test coupon, conforming to IPC B-24, specified in IPC-TM-650 (see Figure 1). It shall be single sided copper clad epoxide woven glass fabric laminate conforming to IEC 61249-2-7 with nominal thickness of 1,5 mm, clad copper foil with a nominal thickness of 18 µm. The final finish of the circuit conductors shall be bare copper (without preservative). This test substrate is referred to as the “test coupon” comprising four (4) “test patterns”. The dimensions of the test coupon shall be 101,6 mm × 114,4 mm (4,0 in × 4,5 in). The connections of the test coupon (connectors with gold-to-gold mechanical contacts) shall be:

— 32 tabs, gold plated over nickel plate over copper;

— 1,27 mm × 10,67 mm (0,05 in × 0,42 in) on 2,54 mm (0,10 in) centres

The test pattern shall be:

— 0,4 mm (0,016 in) width

— 0,5 mm (0,020 in) spacing

— 15,25 mm (0,6 in) overlap

— 34 overlapping spaces

— 1 040 squares (nominal)

NOTE Spaces are determined by counting the number of overlapping areas per pattern. Squares are determined by the following formula:

$$\frac{\text{length of overlap} \times \text{number of spaces}}{\text{spacing width}} \approx 1\,040 \text{ squares}$$

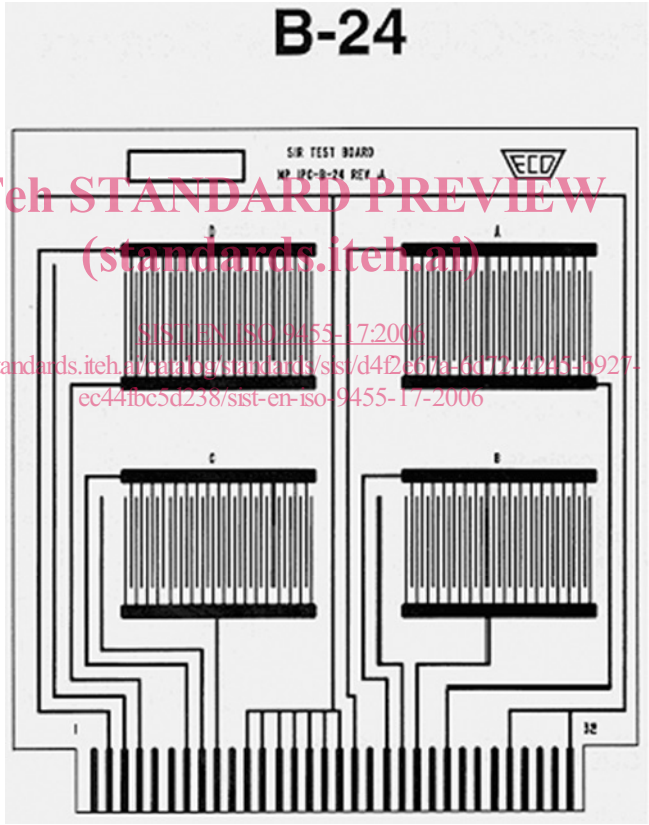

Figure 1 — Resistor verification coupon
(Reproduced with permission)

5.6 Soldering equipment.

5.6.1 Flux-cored solder wire, conforming to S-Sn60Pb40E/1.1.1 or S-Sn63Pb37E/1.1.1 of ISO 12224-1:1997.

NOTE This wire consists of 60/40 or 63/37 tin/lead solder wire with a core of non-activated rosin (colophony) flux (classification 1.1.1, non-activated of ISO 9454-1:1990).