SLOVENSKI STANDARD
oSIST prEN ISO 9455-17:2022

01-oktober-2022

Talila za mehko spajkanje - Preskusne metode - 17. del: Preskus odpornosti površine izolacije z glavnikom in preskus elektrokemičnega prenosa talila (ISO/DIS 9455-17:2022)

Soft soldering fluxes - Test methods - Part 17: Surface insulation resistance comb test and electrochemical migration test of flux residues (ISO/DIS 9455-17:2022)

Flussmittel zum Weichlöten - Prüfverfahren - Teil 17: Bestimmung des Widerstandes der Oberflächenisolierung, Kammprüfung und elektrochemische Migrationsprüfung von Flussmittelrückständen (ISO/DIS 9455-17:2022)

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/DIS 9455-17:2022)

Ta slovenski standard je istoveten z: prEN ISO 9455-17

ICS:

25.160.50 Trdo in mehko lotanje Brazing and soldering

oSIST prEN ISO 9455-17:2022 en,fr,de

DRAFT INTERNATIONAL STANDARD
ISO/DIS 9455-17

ISO/TC **44**/SC **12** Secretariat: **DIN**

Voting begins on:
2022-08-01

Voting terminates on:
2022-10-24

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

ICS: 25.160.50

This document is circulated as received from the committee secretariat.

ISO/CEN PARALLEL PROCESSING

Reference number
ISO/DIS 9455-17:2022(E)

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document 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 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*

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Soft soldering fluxes — Test methods —

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

1 Scope

This document 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) or Sn95,5Ag3Cu0,5 or other lead free solders as agreed between user and supplier (ISO 9453).

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

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.

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 9454-1, *Soft soldering fluxes — Classification and requirements — Part 1: Classification, labelling and packaging*

IEC 61189-5-501, *Test methods for electrical materials, printed boards and other interconnection structures and assemblies — Part 5-501: General test methods for materials and assemblies — Surface insulation resistance (SIR) testing of solder fluxes*

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

3 Terms and definitions

No terms and definitions are listed in this document.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

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

4 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.

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

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.

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.

5 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 05 µS/cm (resistivity ≥ 20 MΩ).

5.1 Propan-2-ol, (CH3)2CHOH or other suitable solvent.

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

6 Apparatus

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

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

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

6.3 Insulated wire or cable, 1 000 V general purpose wire, temperature rated to 150 °C; primary insulation of radiation-crosslinked; configuration suitable for equipment in use.

Electromagnetic shielding: For consistent and repeatable results, it is important that all cabling carrying test signals be encased in an electromagnetic shield. Most often, this is a metallic foil or braid material. Since SIR measurement often deals with picoamperes of current or less, electromagnetic coupling (EMC) and other stray electrical fields can unduly affect the test signals. Encasing the signal lines with a grounded metal dramatically reduces currents due to EMC and other electrical noise. It is not necessary to individually shield each line, such as in coaxial cabling, but separating voltage supply lines and current-return lines is recommended. A single EMC shield can be used to encase all current-return lines.

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

The IR (Insulation Resistance) of pin to pin at the connector must have a resistance under climate and temperature conditions with a minimum of 1012 Ω under test condition. The connector must be able for use under different test conditions.

— 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 resisting temperatures up to 105 °C.

6.5 Test coupon, The test pattern, IPC B53 according to IEC 61189-5-501 ED1 and IPC-TM-650 shown in Figure 1, shall be used for the test specimen. The 6 comb patterns comprise A and F Patterns = 0,4 mm line width and 0,2 mm spacing, comprising 5 207 squares (IEC 61189-5-501 ED1); B and E Patterns have 0,4 mm line width and 0,5 mm spacing, comprising 1 038 squares (IPC B24 according to IPC-TM-650); C and D Patterns have 0,318 mm line width and 0,318 mm spacing, comprising 1 981 squares (Bellcore).

The specimen is approximately 150 mm × 95 mm in size. The conductive patterns shall be either unpreserved bare copper or finished with electroless nickel gold (ENIG).

— 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 Table 1 and the test coupon shall be Fig 1:

Table 1 — Test pattern

Type of SIR Test Patterns	A and F	B and E	C and D
Width of conductor	0,4 mm	0,4 mm	0,318 mm
Spacing of conductor	0,2 mm	0,5 mm	0,318 mm
Overlap length	25,4 mm	15,25 mm	15,75 mm
Overlapping spaces	41	34	40
Squares(nominal)	5 207	1 038	1 981

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

$$\frac{\text{length of overlap} \times \text{number of spaces}}{\text{spacing width}} = \text{squares}$$

B-24

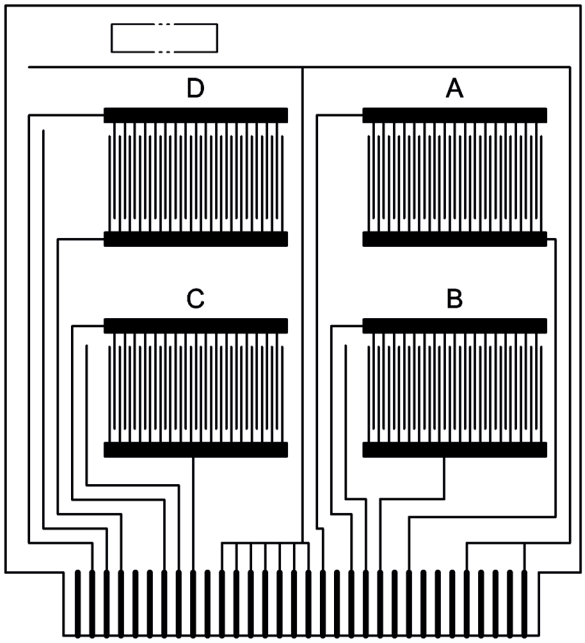

Figure 1 — Resistor verification coupon (Reproduced with permission)