INTERNATIONAL STANDARD

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Second edition
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Soft soldering fluxes — Test methods —

Part 11:
Solubility of flux residues

Flux de brasage tendre — Méthodes d'essai —

Partie 11: Solubilité des résidus de flux

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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.

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).

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For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*, Subcommittee SC 12, *Soldering materials*.

This second edition cancels and replaces the first edition (ISO 9455-11:1991), which has been technically revised.

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The main changes to the previous version are:

- thickness in 5.6.2 b) has been clarified;
- alloy of the brass sheets has been clarified;
- the test procedure regarding immersion has been clarified;
- the test report has been updated;
- editorial revisions have been made.

A list of all parts in the ISO 9455 series can be found on the ISO website.

Requests for official interpretations of any aspect of this document should be directed to the Secretariat of ISO/TC 44/SC 12 via your national standards body. A complete listing of these bodies can be found at www.iso.org.

Soft soldering fluxes — Test methods —

Part 11:
Solubility of flux residues

1 Scope

This document specifies a qualitative method for assessing the solubility of flux residues in a selected solvent. The method is applicable to all fluxes of Type 1, as defined in ISO 9454-1.

NOTE This test gives no assurance that post-cleaning residues, which may be present in sufficiently small amounts to pass the test, will not be detrimental to the soldered assembly in the long term.

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

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3 Terms and definitions

No terms and definitions are listed in this document.

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

ISO 9455-11:2017
https://standards.iteh.ai/catalog/standards/iso/7cce0e1a-9adb-4e95-9c61-e78bd5ba5069/iso-9455-11-2017

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

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

4 Principle

A brass test plate is fluxed, heated to soldering temperature and, after conditioning, is immersed in the selected solvent to dissolve the flux residue. The effectiveness of the flux residue removal is indicated by the presence of a current flowing across the junction between the cleaned area and an electrical probe tip.

5 Reagents and materials

5.1 General.

In the test, only reagents of recognized analytical quality and only distilled or deionized water shall be used.

5.2 Acid cleaning solution.

Add cautiously, with stirring, 75 ml of sulfuric acid (ρ = 1,84 g/ml) to 210 ml of water and mix. Cool, add 15 ml of nitric acid (ρ = 1,42 g/ml) and mix the solution thoroughly.

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5.3 Solvent.

This is the solvent selected for the flux residue removal as recommended by the flux manufacturer or supplier.

NOTE The solvent to be used can vary with the flux composition.

5.4 Industrial methylated spirits.

5.5 Oil crayon.

5.6 Brass test plates.

5.6.1 Mechanical properties

Each test plate shall have the dimensions of 60 mm × 60 mm, cut from 0,5 mm thick brass sheet (alloy CuZn 37) with mechanical properties according to Table 1.

Table 1 — Mechanical properties for brass test plates

Temper	Thickness	Mechanical properties[a]					Hardness			
	mm	Tensile strength R_m N/mm^2	0,2 Proof stress $R_{p\,0,2}$ N/mm^2	Elongation			Vickers HV	Rockwell[b]		
				A_5 % min.	A_{10} % min.	A_{50} % min.		F scale	B scale	Superficial 30 T
HA	0,15 to 5	350 to 420	(min. 200)	31	28	23	95 to 125	—	45 to 70	45 to 63

[a] For the relation between gauge length and thickness, see 5.6.2.

[b] The Rockwell hardness values listed are valid.

- For thickness from 0,3 mm up to and including 0,7 mm: superficial 30 T;
- For thickness over 0,5 mm: B scale.

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A 3 mm deep depression shall be formed in the centre of each test plate by means of a 20 mm diameter steel ball.

5.6.2 Relation between gauge length and thickness

The elongation values given in Table 1 are valid

a) for thickness over 2,5 mm based on gauge length $5{,}65\sqrt{S_0} \triangleq A_5$;

b) for thickness from 0,10 mm up to and including 2,5 mm based on:

  1) either a gauge length of $11{,}3\sqrt{S_0} \triangleq A_{10}$, or

  2) a fixed gauge length of 50 mm $\triangleq A_{50}$.

The A_{50} values depend upon thickness. The given values are valid for a thickness range of 0,10 mm to 0,4 mm. The values increase slightly with increasing thickness. With a thickness equal to 2,5 mm, they are identical with those of A_{10}. For thicknesses over 2,5 mm, the A_{50} values are somewhat higher than the A_{10} values.

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