

# INTERNATIONAL STANDARD

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## **Soft soldering fluxes — Classification and requirements —**

### **Part 1:** Classification, labelling and packaging

*Flux de brasage tendre — Classification et caractéristiques —  
Partie 1: Classification, marquage et emballage*



Reference number  
ISO 9454-1:1990(E)

## 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.

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.

International Standard ISO 9454-1 was prepared by Technical Committee ISO/TC 44, *Welding and allied processes*.

ISO 9454 consists of the following parts, under the general title *Soft soldering fluxes — Classification and requirements*:

- *Part 1: Classification, labelling and packaging*

Annexes A and B of this part of ISO 9454 are for information only.

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## Introduction

Fluxes assist molten solder to wet metal surfaces to be joined by removing oxides and related contaminants from the solder and surfaces of the parts during soldering. Fluxes also protect surfaces from oxidation and assist wetting of the basis metals by molten solder.

Care is necessary when selecting a flux for a particular application, in order to ensure an adequate service life of the assembly. Factors such as the ease of residue removal, corrosiveness, possible health and safety hazards and the efficacy of the flux, should all be considered when making the selection.

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# Soft soldering fluxes — Classification and requirements —

## Part 1:

### Classification, labelling and packaging

#### 1 Scope

This part of ISO 9454 specifies a coding system for the classification of fluxes intended for use with soft solders, according to their active fluxing ingredients, together with requirements for labelling and packaging.

**WARNING** — This part of ISO 9454 deals with products which may be hazardous to health, or which may cause other hazards such as corrosion, fire etc., if adequate precautions are not taken. It refers only to the technical suitability of substances and in no way absolves the testing laboratory, the supplier or the user from legal obligations relating to health and safety at any stage of flux manufacture or use.

#### 2 Classification of fluxes

Fluxes specified in this part of ISO 9454 have been classified in terms of their main ingredients and shall be encoded in accordance with table 1.

For example, a phosphoric acid activated inorganic paste flux shall be encoded 3.2.1.C; a non-halide activated liquid rosin flux shall be encoded 1.1.3.A.

#### 3 Labelling and packaging

Fluxes supplied according to this part of ISO 9454 shall be packed in suitable containers, resistant to the flux they contain, and shall carry a label bearing the following information:

- a) the supplier's name and address;
- b) the name of the product;
- c) the number of this part of ISO 9454 and the flux classification code;
- d) the batch number;
- e) the date of manufacture;
- f) details of any legal requirements concerning aspects of safety.

Labels shall be made of material resistant to the flux in the container.

NOTE 1 Additional labelling requirements may be agreed upon between the supplier and the purchaser in accordance with the rules and regulations of the country or countries in question.

Table 1 — Classification of soft soldering fluxes according to their main ingredients

Flux type	Flux basis	Flux activation	Flux form
<b>1</b> Resin	<b>1</b> Colophony (rosin)	<b>1</b> No activator added <b>2</b> Halide activated <sup>1)</sup>	<b>A</b> Liquid
	<b>2</b> Non-colophony (resin)		
<b>2</b> Organic	<b>1</b> Water-soluble	<b>3</b> Non-halide activated	<b>B</b> Solid
	<b>2</b> Non-water-soluble		
<b>3</b> Inorganic	<b>1</b> Salts	<b>1</b> With ammonium chloride <b>2</b> Without ammonium chloride	<b>C</b> Paste
	<b>2</b> Acids	<b>1</b> Phosphoric acid <b>2</b> Other acids	
	<b>3</b> Alkalis	<b>1</b> Amines and/or ammonia	
1) Other activators may be present.			

## Annex A (informative)

### Testing of fluxes

Test methods for the determination of the properties and characteristics of soft soldering fluxes are given in ISO 9455 (see annex B ).

Table A.1 indicates, for guidance, those test methods which are relevant to various fluxes according to

their classifications. The test methods to be carried out on a consignment of flux should be the subject of agreement between the supplier and the purchaser.

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Table A.1 — Guidance for the use of test method

Flux classification			Relevant test methods (with ISO 9455 part number shown in parantheses)																
			Non-volatile matter (1)	Acid value (3)	Copper mirror (5)	Ionic residues	Potentiometric method	Halide content (6)			Zinc content (8)	Ammonia content (9)	Flux efficacy		Ease of residue removal (11)	Steel tube corrosion test (12)	Printed circuitry — Surface resistance	Flux spattering test (13)	Dryness test (tackiness) (14)
Flux type	Flux basis	Flux activation					Total halide of water-based flux	Halide of fluxes containing phosphate	Free halides — Silver chromate paper test			Solder spread method (10)	Wetting balance method (16)						
1 Resin	1 Colophony (rosin)	1 No activator added	*	*	*	*	*		*			*	*	*	*	*	*	*	*
	2 Non-colophony (resin)		*	*	*	*			*			*	*	*	*	*	*	*	*
2 Organic	1 Water-soluble	2 Halide activated		*	*	*	*	*	*			*	*	*	*	*	*	*	*
	2 Non-water-soluble	3 Non-halide activated				*	*		*			*	*	*	*	*	*	*	*
3 Inorganic	1 Salts	1 With ammonium chloride		*		*	*	*	*	*	*	*	*	*	*	*	*	*	*
		2 Without ammonium chloride														*		*	
	2 Acids	1 Phosphoric acid		*		*	*	*	*	*	*	*	*	*	*	*	*	*	*
		2 Other acids														*		*	
3 Alkalis	1 Amines and/or ammonia				*	*	*				*	*	*				*		

NOTE — The symbol \* indicates that the test is relevant to the flux of that classification.

## Annex B (informative)

### Bibliography

- [1] ISO 9455-1:1990, *Soft soldering fluxes — Test methods — Part 1: Determination of non-volatile matter, gravimetric method.*
- [2] ISO 9455-2:—<sup>1)</sup>, *Soft soldering fluxes — Test methods — Part 2: Determination of non-volatile matter — Ebulliometric method .*
- [3] ISO 9455-3:—<sup>1)</sup>, *Soft soldering fluxes — Test methods — Part 3: Determination of acid value — Potentiometric and titration method.*
- [4] ISO 9455-5:—<sup>1)</sup>, *Soft soldering fluxes — Test methods — Part 5: Copper mirror test.*
- [5] ISO 9455-6:—<sup>1)</sup>, *Soft soldering fluxes — Test methods — Part 6: Determination of halide content.*
- [6] ISO 9455-8:—<sup>1)</sup>, *Soft soldering fluxes — Test methods — Part 8: Determination of zinc content.*
- [7] ISO 9455-9:—<sup>1)</sup>, *Soft soldering fluxes — Test methods — Part 9: Determination of ammonia content.*
- [8] ISO 9455-10:—<sup>1)</sup>, *Soft soldering fluxes — Methods of test — Part 10: Flux efficacy tests — Solder spread method .*
- [9] ISO 9455-11:—<sup>1)</sup>, *Soft soldering fluxes — Test methods — Part 11: Ease and efficiency of flux residue removal.*
- [10] ISO 9455-12:—<sup>1)</sup>, *Soft soldering fluxes — Test methods — Part 12: Steel tube corrosion test.*
- [11] ISO 9455-13:—<sup>1)</sup>, *Soft soldering fluxes — Test methods — Part 13: Determination of flux spattering.*
- [12] ISO 9455-14:—<sup>1)</sup>, *Soft soldering fluxes — Test methods — Part 14: Determination of tackiness — Chalk powder method.*
- [13] ISO 9455-16:—<sup>1)</sup>, *Soft soldering fluxes — Test methods — Part 16: Flux efficacy tests — Wetting balance method .*

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1) To be published.