# IEC 63522-35

Edition 1.0 2025-02

# INTERNATIONAL STANDARD

# NORME INTERNATIONALE

**Electrical relays – Tests and measurements –**
**Part 35: Resistance to cleaning solvents**

**Relais électriques – Essais et mesurages –**
**Partie 35: Résistance aux solvants de nettoyage**



IEC 63522-35:2025-02(en-fr)

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## Electrical relays – Tests and measurements – Part 35: Resistance to cleaning solvents

## Relais électriques – Essais et mesurages – Partie 35: Résistance aux solvants de nettoyage



INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

COMMISSION
ELECTROTECHNIQUE
INTERNATIONALE

ICS 29.120.70

ISBN 978-2-8327-0232-1

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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# ELECTRICAL RELAYS – TESTS AND MEASUREMENTS –

## Part 35: Resistance to cleaning solvents

## FOREWORD

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IEC 63522-35 has been prepared by IEC technical committee 94: Electrical relays. It is an International Standard.

The text of this International Standard is based on the following documents:

| Draft | Report on voting |
|---|---|
| 94/1087/FDIS | 94/1135/RVD |

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts of IEC 63522 series, published under the general title *Electrical relays* can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

# ELECTRICAL RELAYS – TESTS AND MEASUREMENTS –

# Part 35: Resistance to cleaning solvents

## 1 Scope

This document is used for testing all kind of relays within the scope of technical committee 94 and evaluates their ability to perform under expected conditions of transportation, storage and all aspects of operational use.

This document defines a standard test method for resistance to cleaning solvents.

## 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.

IEC 60068-2-45:1980, *Basic environmental testing procedures – Part 2-45: Tests – Test XA and guidance: Immersion in cleaning solvents*
IEC 60068-2-45:1980/AMD1:1993

IEC 63522-0, *Electrical relays – Tests and measurements – Part 0: General and guidance*[1]

IEC 63522-1, *Electrical relays – Tests and measurements – Part 1: Visual inspection and check of dimensions*[2]

IEC 63522-4, *Electrical relays – Tests and measurements – Part 4: Dielectric strength test*[3]

IEC 63522-7, *Electrical relays – Tests and measurements – Part 7: Functional tests*[4]



## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in IEC 63522-0 and the following apply.

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

- IEC Electropedia: available at https://www.electropedia.org/
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1 Under preparation. Stage at the time of publication: IEC CDV 63522-0:2024.

2 Under preparation. Stage at the time of publication: IEC FDIS 63522-1:2024.

3 Under preparation. Stage at the time of publication: IEC FDIS 63522-4:2024.

4 Under preparation. Stage at the time of publication: IEC FDIS 63522-7:2024.

**3.1**
**marking**
identification of a relay which, when completely given to the manufacturer of this relay, allows the unambiguous indication of its electrical, mechanical, dimensional and functional parameters

EXAMPLE Through the indication of the trademark and the type designation on the relay, all relay-specific data can be derived from the type code.

**3.2**
**ink marking**
marking created by using ink, paint, or other pigment

**3.3**
**laser marking**
marking created by using a laser to ablate or melt the relay surface, to bond a contrasting labelling material, or to activate a pigmented coating

**3.4**
**moulded marking**
marking created by using the process of moulding

**3.5**
**legibility**
ability of a character or symbol to be read or deciphered



## 4 Test procedure

### 4.1 General

The resistance to cleaning solvents test is to ensure that the marking legibility of relay can be guaranteed after immersion in either cleaning solvents or subjection to manual handling, or both, and that no damage, as visually inspected, has occurred.



When using solvents other than water (e.g. petroleum, mixture of organic hydrocarbons and alcohols) for the test, at least the following safety precautions shall be observed because these solvents exhibit some potential for health and safety hazards:

- Avoid contact with eyes and prolonged contact with skin;
- Provide adequate ventilation and avoid inhalation of vapours;
- Avoid exposure to open flame or hot surface;
- Solutions are to be kept in covered vessels when not in direct use.

### 4.2 Procedure

This test procedure applies only for ink marking.

NOTE This test has no influence on laser or moulding marked DUTs.

DUTs shall be representative of production in an as-shipped condition and shall not be subjected to any cleaning or surface treatment process prior to test.

Before testing, the DUTs shall be subjected to the atmospheric conditions defined in 4.3.1 for sufficient time to allow them to reach thermal equilibrium.

Before testing the DUTs shall be visually inspected according to IEC 63522-1, the relevant specification can also require either the electrical or mechanical measurements, or both.

The DUTs shall then be subjected to the test procedure with the method selected from 4.3.4.

If either final electrical or mechanical measurements, or both, are required for evaluation, after removal from the solvent the DUTs shall remain under the atmospheric conditions defined in 4.3.1 for not less than 1 h and not more than 2 h, or for a period as prescribed in the relevant specification.

### 4.3 Conditions

#### 4.3.1 General

The test shall be carried out under the conditions defined in 4.3.2 to 4.3.5. Deviations from these conditions may be specified and are subject to the agreement of manufacturer and customer, details of the deviation shall be documented in the test report.

#### 4.3.2 Ambient environment conditions

The test shall be carried out under the following atmospheric conditions:

- Temperature: 23 °C ± 5 °C
- Relative humidity: 25 % to 75 %
- Air pressure: 86 kPa to 106 kPa

#### 4.3.3 Solvents to be used



Demineralized or distilled water shall be used for test method A and B.

Demineralized or distilled water and petroleum shall be used for test method C.

The demineralized or distilled water shall have a resistivity of not less than 500 Ωm corresponding to a conductivity of 2 mS/m.



NOTE The petroleum spirit used is defined as an aliphatic solvent hexane with a content of aromatics of maximum 0,1 volume %, a kauributanol-value of 29, initial boiling point approximately 65 °C, dry point approximately 69 °C and specific gravity of 0,68 g/cm$^3$.

#### 4.3.4 Solvent temperature

For test method A and B, the temperature of solvent is 55 °C ± 5 °C.

For test method C, the temperature of solvent(s) is same as the ambient environment.

When solvents other than those defined in 4.3.2 are used for test, the temperature of solvents shall be prescribed by the manufacturer considering the recommended temperature for cleaning specified by the solvent supplier.

#### 4.3.5 Test method

##### 4.3.5.1 Method A

The test shall be conducted in accordance with IEC 60068-2-45:1980, 5.1, the rubbing material shall be specified by manufacturer. The solvent shall not be agitated during the test.

##### 4.3.5.2 Method B

The test shall be conducted in accordance with IEC 60068-2-45:1980, 5.2. The solvent shall not be agitated during the test.

#### 4.3.5.3 Method C

The test indicated below is applicable to ink marking only and shall be done by rubbing the marking by hand as follows:

a) 15 back-and-forth movements in about 15 s with a piece of cloth soaked with distilled water, followed by

b) 15 back-and-forth movements in about 15 s with a piece of cloth soaked with petroleum spirit.

During the tests, the soaked piece of cloth shall be pressed on the marking area with a force from 2 N to 5 N.

## 5 Evaluation

### 5.1 General

A final evaluation of the test shall be done as specified in 5.1.1 and 5.1.2.

#### 5.1.1 Visual inspection

The visual inspection after test shall be carried out according to IEC 63522-1, any of the following marking defects which render the marking illegible or unreadable shall be cause for rejection (some of these defects cannot apply to all marking types).

- Bridging: e.g. a portion of the character is bridged by excess ink, yielding an unintended character;
- Distorted marking: e.g. a character or symbol appears wavy, or undulating;
- Faded marking: e.g. fading of an ink marking, or insufficient etch of an ablative laser marking;
- Scratches: e.g. scratches that alter the form and intended legibility of the marking;
- Smearing or blurring: e.g. a character or symbol appears out of focus.



#### 5.1.2 Final measurements

In addition to the marking legibility, if the effects on the characteristics of specimen after test is also concerned, the following tests can be carried out with the consent of the customer and manufacturer, and the initial specification shall still be met.

- Functional tests in accordance with IEC 63522-7.
- Dielectric strength test in accordance with IEC 63522-4.