



**SLOVENSKI STANDARD**  
**SIST EN 2591-501:2004**

**01-maj-2004**

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**Aerospace series - Elements of electrical and optical connection - Test methods - Part 501: Soft solderability**

Aerospace series - Elements of electrical and optical connection - Test methods - Part 501: Soft solderability

Luft- und Raumfahrt - Elektrische und optische Verbindungselemente - Prüfverfahren - Teil 501: Weichlöten

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Série aérospatiale - Organes de connexion électrique et optique - Méthodes d'essais - Partie 501: Brasage tendre

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**Ta slovenski standard je istoveten z: EN 2591-501:2002**

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**ICS:**

49.060

Številni oznaki za električno in optično opremo in sisteme v letalstvu

Aerospace electric  
equipment and systems

**SIST EN 2591-501:2004**

**en**

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 2591-501**

June 2002

ICS 49.060

English version

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- Test methods - Part 501: Soft solderability**

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This European Standard was approved by CEN on 8 February 2002.

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 Management Centre 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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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

This document (EN 2591-501:2002) has been prepared by the European Association of Aerospace Manufacturers (AECMA).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of AECMA, prior to its presentation to CEN.

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 2002, and conflicting national standards shall be withdrawn at the latest by December 2002.

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

## 1 Scope

This standard specifies methods of verifying the solderability of electrical male and female contacts to be soldered in elements of connection and of contacts with self-contained solder and flux not accessible to a solder iron.

It shall be used together with EN 2591-100.

## 2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 2591-100	Aerospace series – Elements of electrical and optical connection – Test methods – Part 100: General <sup>1)</sup>
EN 2591-101	Aerospace series – Elements of electrical and optical connection – Test methods – Part 101: Visual examination

## 3 Preparation of specimens

**3.1** The barrels of contacts to be soldered shall be tested in their delivery condition and shall not suffer from contamination such as finger marks, traces of grease, etc.

If the technical specification requires, the barrels of contacts to be soldered may be degreased by immersion at room temperature in a pH neutral organic solvent.

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**3.2** Unless specified in the technical specification, the following details shall be stated:

- cleaning method (if applicable);
- application time of bit if different from that provided in this test;
- contact area where the test shall be carried out;
- initial measurement (if applicable);
- final measurement and requirement;
- different size of iron and solder wire according to the size of termination.

## 4 Apparatus

### 4.1 Solder iron

Temperature of bit:  $(350 \pm 10)$  °C (start of test)

Diameter of bit: 3 mm

Length exposed: 12 mm reducing to an edge over a length of approximately 5 mm

In accordance with normal practice, the bit shall be made of copper, preferably with a steel plating, or a copper alloy resistant to erosion, and shall be tin-plated over the whole area used to carry out the test.

1) Published as AECMA Prestandard at the date of publication of this standard

## 4.2 Alloy and flux

The alloy shall be in the form of a wire 0,8 mm in diameter and shall have one or more channels containing 2,5 % to 3,5 % of flux in relation to the total weight.

### 4.2.1 The alloy shall meet the following conditions:

- chemical composition;
  - a) tin: 59 % to 61 %;
  - b) antimony: 0,5 % max.;
  - c) copper: 0,1 % max.;
  - d) arsenic: 0,05 % max.;
  - e) iron: 0,02 % max.;
  - f) lead: remainder to 100 %.
- melting properties;
  - a) solidus: 183 °C;
  - b) liquidus: 188 °C.

The alloy shall not contain any impurities such as aluminium, zinc or cadmium in quantities which would significantly affect the properties of the solder.

### 4.2.2 The flux shall meet the following conditions:

- rosin (colophony);
  - a) colour: colour WW or paler;
  - b) acidity (mg KOH/g of rosin): 155 min.;
  - c) softening point (ring and ball): 70 °C min.;
  - d) melting point: 76 °C min.;
  - e) ash content: 0,05 % max.;
  - f) solubility: a solution of equal parts of rosin and propanol-2 shall be clear and have no deposits after 7 d at normal temperature;
- propanol-2;
  - a) purity: propanol-2 by weight: 95 % min.;
  - b) acidity as acetic acid (other than carbon monoxide): 0,002 % max. in mass;
  - c) non-volatile residues: 20 mg/dm<sup>3</sup> max..

## 5 Methods

### 5.1 Method A: solderability of contacts with a solder iron

#### 5.1.1 Initial measurement (if applicable)

If this test is carried out separately from a series of tests, the specimens shall be subjected to preconditioning of 4 h in steam.

### 5.1.2 Number of contacts to be tested (for non-removable contacts)

See table 1.

Table 1

Number of contacts of the same size in an element of connection: N	Minimum number to be tested %
$N \leq 5$	100
$5 < N \leq 20$	25 <sup>a</sup>
$20 < N \leq 60$	10 <sup>a</sup>
$60 < N \leq 130$	5 <sup>a</sup>
$N > 130$	

<sup>a</sup> The result shall be rounded up to the next full number.

### 5.1.3 Procedure

a) Preconditioning (if required, see 5.1.1)

The contacts shall be suspended vertically so that the area to be tested is located between 25 mm and 30 mm above the surface of boiling distilled water. This shall be contained in a glass or steel vessel of suitable size, third-quarters closed by a plate. The specimen holder shall not be metal.

b) Soldering test

The barrels of the contacts to be soldered are positioned so that the solder iron bit can be applied horizontally, as shown in figure 1 or 2.

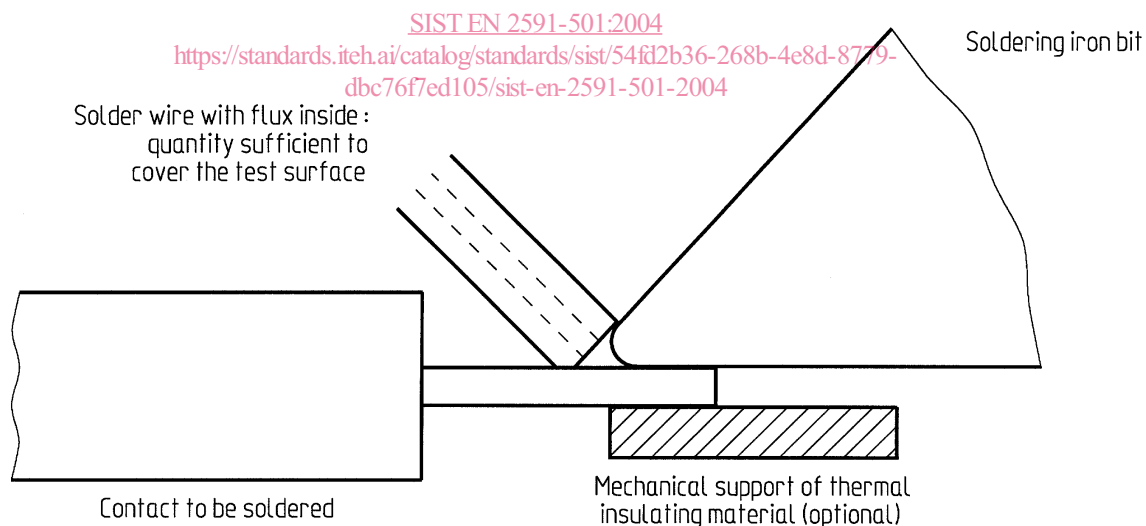


Figure 1 – Contact without solder bucket

If mechanical supports are necessary to carry out the test, they shall be made from materials which are non-conductors of heat.

Unless otherwise specified, the solder iron bit and the flux wire inside shall be applied on the barrel for 2 s to 3 s, at the point indicated in the technical specification. During that time the bit shall remain still.

After the test, the flux residues shall be removed with a solvent.

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#### 5.1.4 Final measurement and requirement

EN 2591-101 under adequate lighting, with the naked eye or with a maximum magnification  $\times 4$ . The alloy shall wet the test surface and there shall be no droplets present.

## 5.2 Method B

### 5.2.1 Procedure

Apply heat as recommended in the installation procedure, except no solder wire is introduced in the contact.

### 5.2.2 Final measurement and requirement

EN 2591-101 with the naked eye or with a maximum magnification  $\times 4$ . The solder shall wet the contact area and form a relatively uniform film adherent to the base material.

It may be necessary to carefully cut open the contact to check the solder area.

Test surface:

- inside of solder bucket;
- outside for other terminations.

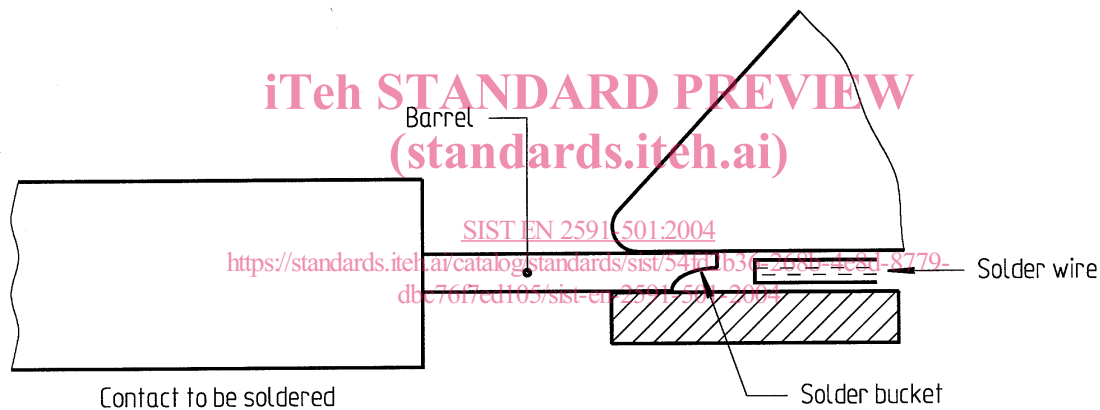


Figure 2 – Contact with solder bucket