SLOVENSKI STANDARD
SIST EN 3475-509:2004

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Aerospace series - Cables, electrical, aircraft use - Test methods - Part 509: Solderability

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Luft- und Raumfahrt - Elektrische Leitungen für Luftfahrtverwendung - Prüfverfahren - Teil 509: Lötbarkeit

Série aérospatiale - Câbles électriques à usage aéronautique - Méthodes d'essais - Partie 509: Soudabilité

Ta slovenski standard je istoveten z: EN 3475-509:2002

ICS:

49.060	Letalska in vesoljska elektriļna oprema in sistemi	Aerospace electric equipment and systems

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EUROPEAN STANDARD

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This European Standard was approved by CEN on 20 January 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.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

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Foreword

This document (EN 3475-509:2002) 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 a method of assessing the solderability of conductors and screens or strands taken from them.

It shall be used together with EN 3475-100.

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 2083	Aerospace series – Copper or copper alloy conductors in electrical cables – Product standard
EN 3475-100	Aerospace series – Cables, electrical, aircraft use – Test methods – Part 100: General

3 Principle of the test

A prepared specimen is vertically suspended from a sensitive balance in such a manner that it is immersed to a set depth in a bath of molten solder at a controlled temperature. The resulting vertical forces of buoyancy and surface tension acting upon the specimen are detected by a transducer and converted into a signal that is continuously recorded as a function of time on a high-speed chart recorder.

The test is not applicable to size 020 (gauge 14) and larger.

4 Preparation of specimens

Prepare the specimens as follows.

4.1 Cable conductors

Remove at least 150 mm from the end of the cable and discard. Cut five specimens of approximately 30 mm length from the remaining cable. Strip the specimens of insulation to expose a length of 14,5 mm to 15 mm of conductor, taking care to ensure that no part of the surface or the exposed conductor becomes contaminated, especially by contact with the fingers. Minimize and correct any disturbance of the strands.

4.2 Screens

Take five specimen strands from the completed cable. Ensure that no parts of the strand becomes contaminated, especially by contact with the fingers.

5 Apparatus

The apparatus comprising a balance, transducer, chart recorder and solder bath shall comply with the following characteristics:

– the response time of the chart recorder shall be such that its return to centre zero on removal of a maximum load shall be accomplished within 0,3 s with an overshoot corresponding to not more than 1 % of the maximum load;

– the recording system shall have a number of sensitivity settings, the most sensitive corresponding at least to a maximum deflection from centre being produced when a 200 mg mass is suspended from the specimen holder;

– the chart speed shall not be less than 10 mm/s;

– electrical and mechanical noise recorded in the trace shall not exceed the equivalent of 4, 10^{-5} N peak to peak;

– the deflection of the writing device shall be directly proportional to the force being measured over the full scale to an accuracy of better than 95 %;

– the stiffness of the spring system of the balance shall be such that a load of 10^{-2} N causes a vertical displacement of the specimen suspension not exceeding 0,1 mm;

– the dimensions of the solder bath shall be such that no portion of the specimen is less than 15 mm from the wall and the depth of the bath shall be not less than 15 mm;

– the immersion depth of the lowest point on the specimen shall be adjustable to any specified position between 2 mm and 5 mm with a maximum error of ± 0,2 mm;

– the speed of immersion and withdrawal shall be (20 ± 5) mm/s;

– the dwell time at the maximum immersion depth shall be adjustable.

6 Method

Mount the specimen in a suitable holder. Immerse the whole of the surface of the specimen to be tested in a flux at room temperature as specified below for the appropriate conductor type. Immediately drain off excess flux by standing the specimen vertically on clean filter paper for 1 s to 5 s. Fill the solder bath with the alloy specified below for the conductor type under test and raise it to the temperature shown.

For EN 2083 conductor types B (tin plated) and C (silver plated) use Sn63 solder (63 % tin, 37 % lead) at (235 ± 3) °C with non-activated pure collophony resin flux.

For conductor type D (nickel plated) use Sn96 solder (96,5 % tin, 3,5 silver) at (271 ± 5) °C with collophony resin flux activated to 0,5 % chloride level.

Suspend the specimen vertically with its cut end (20 ± 5) mm above the surface of the molten solder for (30 ± 15) s to allow most of the flux solvent to evaporate. During this drying period, scrape the surface of the molten solder with a blade of suitable material to remove oxides and adjust the suspension and chart recorder trace to the desired zero position.

Immerse the specimen in the molten solder at a speed of (20 ± 5) mm/s to a depth of (4 ± 1) mm and hold in this position for not less than 10 s and then withdraw. Obtain a trace of force versus time from the start of the lowering until the specimen returns to the start position.

NOTE A typical trace is shown in figure 1. The wetting time is taken to be the time difference between t_2 and t_1.

7 Requirement

The maximum wetting time shall be stated in the product standard.

NOTE Solderability will decrease with age depending upon the time, temperature and humidity of the storage conditions.

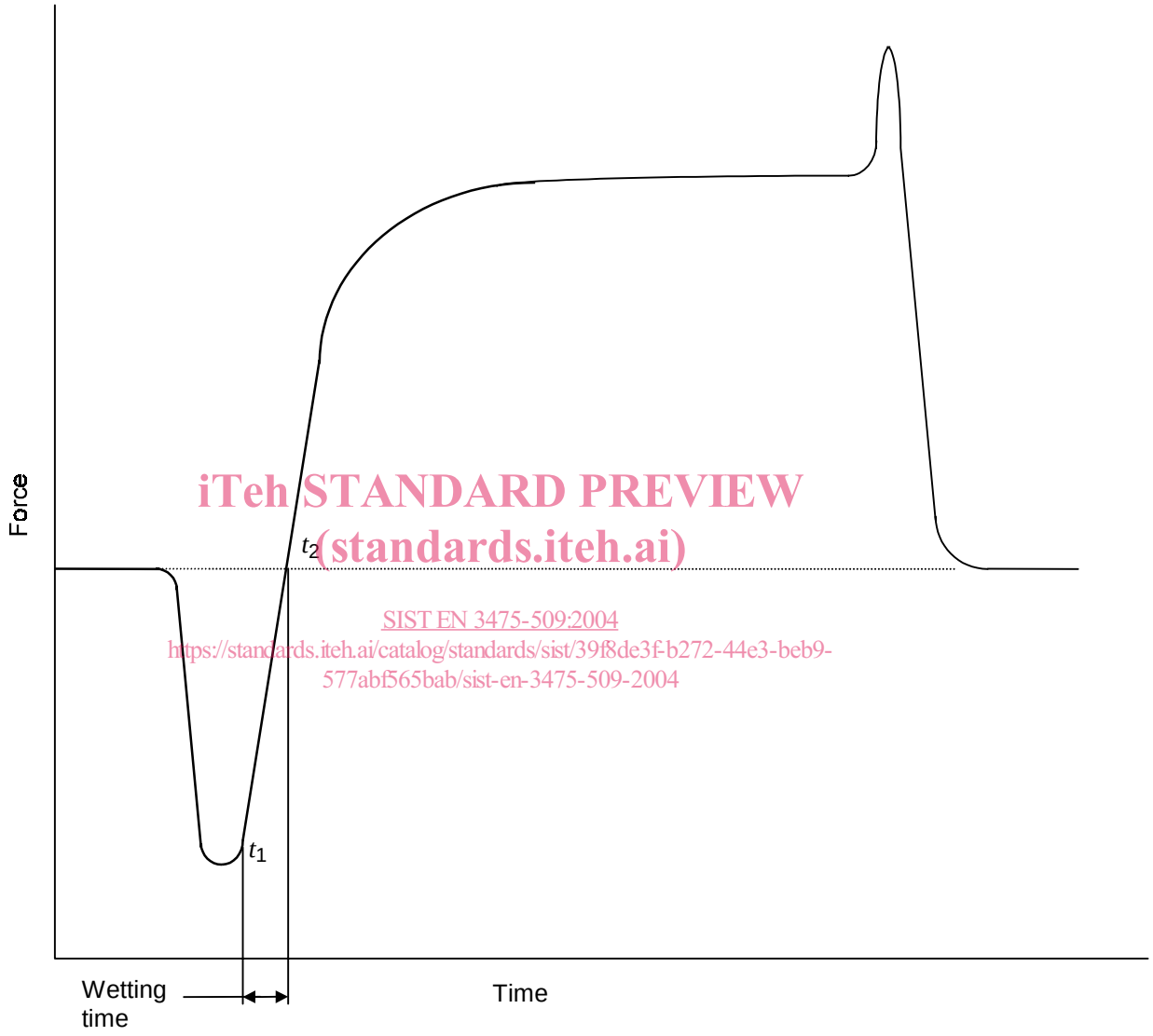

Figure 1 – Typical force/time trace for solderability test