SLOVENSKI STANDARD
SIST EN 3475-302:2009

01-marec-2009

Nadomeġļa:
SIST EN 3475-302:2004

Aeronavtika - Elektriļ ni kabli za uporabo v zraļ nih plovilih - Preskusne metode - 302. del: Preskuġanje napetosti

Aerospace series - Cable, electrical, aircraft use - Test methods - Part 302: Voltage proof test

Luft- und Raumfahrt - Elektrische Leitungen für Luftfahrtverwendung - Prüfverfahren - Teil 302: Spannungsfestigkeit

Série aérospatiale - Câbles électriques à usage aéronautique - Méthodes d'essais - Partie 302 : Tenue en tension

Ta slovenski standard je istoveten z: **EN 3475-302:2006**

ICS:

49.060	Letalska in vesoljska elektriļ na oprema in sistemi	Aerospace electric equipment and systems

SIST EN 3475-302:2009 **en,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 3475-302

May 2006

ICS 49.060

Supersedes EN 3475-302:2002

English Version

Aerospace series - Cable, electrical, aircraft use - Test methods - Part 302: Voltage proof test

Série aérospatiale - Câbles électriques à usage aéronautique - Méthodes d'essais - Partie 302 : Tenue en tension

Luft- und Raumfahrt - Elektrische Leitungen für Luftfahrtverwendung - Prüfverfahren - Teil 302: Spannungsfestigkeit

This European Standard was approved by CEN on 13 January 2006.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, 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

Ref. No. EN 3475-302:2006: E

Contents

Page

Foreword

This European Standard (EN 3475-302:2006) has been prepared by the European Association of Aerospace Manufacturers - Standardization (AECMA-STAN).

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 November 2006, and conflicting national standards shall be withdrawn at the latest by November 2006.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This European Standard supersedes EN 3475-302:2002.

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

1 Scope

This standard specifies a method of performing voltage proof tests on finished cables and cables in course of production.

It shall be used together with EN 3475-100.

2 Normative references

The following referenced documents are indispensable for the application 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.

EN 3475-100, *Aerospace series — Cables, electrical, aircraft use — Test methods — Part 100: General.*

3 Immersion test

The specimens, each 15 m long, shall be immersed in the solution so that their ends are at least 150 mm from the surface of the solution. The composition of the solution, at a temperature of between 15 °C and 25 °C, shall be as follows:

— sodium chloride 30 g

— distilled water 1 000 g

— wetting agent 2 g

After immersion for 1 h, the voltage specified by the technical specification with a frequency of 40 Hz to 60 Hz, shall be applied between the conductor of the cable and the screen, if present, or an electrode in contact with the liquid for 5 min.

Single and multicore (jacketed) without shield:

— between the conductor(s) and an electrode in contact with the liquid

Shielded and jacketed cables

— between the shield and an electrode in contact with the liquid

The voltage rise time shall be between 300 V per second and 500 V per second.

There shall be no perforation of the insulation or jacket.

4 Dry spark test (in production)

All the finished cables shall pass, without flash-over, through the electrode of a suitable dry tester, at the voltage stated in the technical specification at a frequency of 40 Hz to 60 Hz.

The electrode consists of an assembly of small chains or other metallic feelers suitable for making close contact with practically the whole surface of the cable.

The length of the electrode and speed of the cable shall be such that each portion of the insulation or jacket is subjected to the test voltage for at least 0,20 s.

The voltage shall be applied:

Single and multicore (jacketed) without shield:

— between the conductor(s) and the electrode

Shielded and jacketed cables

— between the shield and the electrode

There shall be no perforation of the insulation or jacket.

NOTE If a defect is found, a minimum length of 30 mm shall be cut away from each side of the defective point.

5 Dry impulse test (test in production as an alternative to 4)

Apparatus

The electrode through which the cable passes when subjected to the voltage test shall be formed of beaded chains so that effectively the whole surface of the cable insulator is in contact with the beads. The characteristics and ancillary apparatus of the impulse test shall be as follows.

Impulse test

The form of the signal shall be negative pulse with a peak value of the cable test voltage followed by a damped oscillation. The peak voltage is stated in the technical specification.

The rise time of the negative pulse of the signal between 0 % and 90 % of the peak voltage specified shall not be greater than 75 µs. The peak value of the first positive overshoot of the signal and each of the damped oscillations which flow from it shall be less than the initial negative pulse. The time during which each pulse and its damped oscillation (positive and negative) remain at a voltage equal to 80 % or higher than the specified peak voltage shall be between 20 µs and 100 µs. The pulse rate shall be between 200 pulses and 500 pulses per second inclusive. Apart from regulation of the peak voltage, conformity with the impulse test parameters shall be defined without capacitance load applied to the electrode.

Capacity tolerance

As far as the capacitive load is concerned, the suitable tolerance for the apparatus shall be such that where there is an increase in the capacitive load between electrode and earth, the peak voltage shall not be reduced by more than 12 % from an initial load of 12,5 pF/25 mm to 25 pF/25 mm electrode length.

Voltmeter

A voltmeter allowing continuous reading of the voltage at the electrode terminals is connected. The voltmeter shall be capable of showing a total deviation for a voltage not exceeding 15 kV and shall be accurate to within a minimum of 4 % of the test voltage.

Error detection circuit

The test apparatus shall consist of an error detection circuit with visual or audible indication of an insulation fault automatically cutting off the supply to the electrode and stopping the passage of the cable.

The detection circuit shall be sensitive enough to show the fault at 75 % of the specified test voltage when an arc occurs between the electrode and earth through a resistance of 20 kΩ; it shall also be capable of detecting a fault with a duration corresponding to that of a pulse.

Calibration of apparatus

The voltmeter shall be calibrated by comparison with another voltmeter capable of detecting the peak voltage of the electrode with or without auxiliary circuit. During calibration, the calibrated voltmeter shall be directly connected to one of the electrodes or through a calibrated attenuator circuit. The pulse generator shall be switched on and the control voltage of the generator regulated until the voltage reading on the calibrated voltmeter corresponds to the specified voltage; at this moment the voltage reading on the voltmeter to be calibrated shall be noted. The calibration shall be repeated for each peak voltage at which it is intended to operate the equipment. A calibrated oscilloscope can also be used connected to the electrode through an attenuator. Thus the value of the negative pulse peak can be read directly on the wave form indicator. An oscilloscope connected to the electrode at appropriate different points can also be used to check the conformity of the other waveform parameters specified for the impulse test.

Method

The finished cable shall be passed through the electrode and the conductor(s) earthed at one or both ends.

The voltage shall be applied:

Single and multicore (jacketed) without shield:

— between the conductor(s) and the electrode

Shielded and jacketed cables

— between the shield and the electrode

The electrode shall be supplied with the specified voltage and after a final voltage adjustment the cable shall be passed from the pay-off reel to the take-up reel through the electrode. The line speed shall be such that the cable is subjected to no fewer than three pulses and no more than 100 pulses at any given point. During the test, which includes the insertion of new lengths of cable, the cable shall be tested over its total length, including the ends, complying with the procedure. Any ends or other parts of the cable not tested in accordance with this method shall be withdrawn.

There shall be no perforation of the insulation or jacket.

NOTE If a defect is found, a minimum length of 50 mm shall be cut away from each side of the defective point.

6 Voltage test of components (screened cables)

The cables shall be subjected to a voltage test at ambient temperature.

The r.m.s. value of the voltage shall be specified in the technical specification at a frequency between 40 Hz and 60 Hz.

The voltage shall be applied for at least 1 min between one component and the other components and the screen connected together.

There shall be no perforation of the insulation.