



SLOVENSKI STANDARD
SIST EN 3745-410:2007
01-november-2007

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Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 410:
 Thermal life

Luft- und Raumfahrt - Faseroptische Leitungen für Luftfahrzeuge - Prüfverfahren - Teil
 410: Lebensdauer unter Temperatureinwirkung

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Série aérospatiale - Fibres et câbles optiques à usage aéronautique - Méthodes d'essais
 - Partie 410 : Durée de vie en température

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Ta slovenski standard je istoveten z: EN 3745-410:2007

ICS:

49.060 Š^cp\ æš Ā^•[|b\ æ Aerospace electric
 ^|\ dā} æ] |^ { æš Ā ã c { ã equipment and systems

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ICS 49.060

English Version

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methods - Part 410: Thermal life

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Luft- und Raumfahrt - Faseroptische Leitungen für
Luftfahrzeuge - Prüfverfahren - Teil 410: Lebensdauer unter
Temperatureinwirkung

This European Standard was approved by CEN on 23 June 2007.

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

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, 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.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This document (EN 3745-410:2007) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-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 ASD, 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 February 2008, and conflicting national standards shall be withdrawn at the latest by February 2008.

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.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, 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.

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1 Scope

This standard specifies method for determining life versus temperature curves of an optical cable.

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 2591-100, *Aerospace series — Elements of electrical and optical connection — Test methods — Part 100: General.*

EN 3745-100, *Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 100: General.*¹⁾

EN 3745-301, *Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 301: Attenuation.*

ASTM-D3032, *Standard test methods for hookup wire insulation.*²⁾

3 Preparation of specimens

3.1 The fibre ends shall be prepared in accordance with EN 2591-100.

If not yet at standard test conditions, the specimens shall be subjected to standard test conditions and stabilized at these conditions for 24 hours as defined in EN 3745-100.

Specimens have to be fixed on an apparatus representative of aircraft installation. Ten specimens are fixed on apparatus and constitute a set for life testing at each temperature. A minimum of four sets of specimens is necessary.

3.2 The following details shall be specified if not already included in the product standard:

- Type of fibre/cable from which the specimens were taken,
- Type/number/pitch of clamps
- Minimum authorized long term bend radius
- Length of specimens if not 10 m
- Maximum permissible variation in attenuation if not – 3 dB
- Temperature values ($\theta_1 > \theta_2 > \theta_3 > \theta_4$)

1) In preparation at the date of publication of this standard.

2) Published by: ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, USA.

4 Apparatus

The apparatus shall comprise:

- A Light Launch System (LLS) as defined in EN 2591-100,
- A split coupler 1×10 ,
- A Light Detector System (LDS) as defined in EN 2591-100, with 10 channel recorder,
- A fixture to secure the specimens,
- A climatic chamber capable of temperature control of ± 2 °C.

5 Method

5.1 Initial measurements

If the value of the highest temperature value is not specified in the product standard make a quick estimation of the highest test temperature with one specimen during 24 h at 80 °C above the nominal rating temperature. The variation in attenuation shall not exceed the specified value.

5.2 Procedure

The attenuation shall be monitored throughout the test in accordance with EN 3745-301, method C.

- Connect the specimen ends to the coupler, the coupler to LLS and the other specimen ends to LDS.
- Place the fixture in the test chamber. The coupler and connectors shall not be into climatic chamber.
- Begin the test sequence with the highest test temperature (θ_1) since exposure times will be relatively short.
- Record the exposure time to failure for each specimen. A failure is defined when the variation in attenuation is higher than the specified value.
- Stop the test sequence when all specimens in group have failed.
- Calculate the log average life as defined in ASTM-D3032. If the log average life at this temperature (highest) is found to be less than 100 h, too high a test temperature has been selected and these data should be discarded. Tests should be repeated at lower temperature.
- Repeat this procedure with the group N° 2 of specimens for θ_2 temperature value.
- Calculate the log average life as defined in ASTM-D3032.
- Repeat this procedure with the group N° 3 of specimens for θ_3 temperature value.
- Calculate the log average life as defined in ASTM-D3032.
- Repeat this procedure with the last group of specimens for θ_4 temperature value (lowest).
- Calculate the log average life as defined in ASTM-D3032. If the average life found at this test temperature is less than 5 000 h, this test will be made at lower temperature.

5.3 Final measurements and requirement

The calculation of average life and extrapolation have defined in the ASTM-D3032 - Standard test methods for hookup wire insulation.

5.4 Special precautions

- Extrapolation to a temperature index expected at the selected end of life (10 000 h, 20 000 h or 40 000 h) should not exceed 25 °C below the lowest aging test temperature.
- The log average life at the highest test temperature (θ_1) shall not be less than 100 h.
- The log average life at the lowest test temperature (θ_4) shall not be less than 5 000 h.

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