SLOVENSKI STANDARD
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Aerospace series - Fibres and cables, optical, aircraft use - Test methods - Part 504: Micro bending test

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Luft- und Raumfahrt - Faseroptische Leitungen für Luftfahrzeuge - Prüfverfahren - Teil 504: Mikrobiegungsstest

Série aérospatiale - Fibres et câbles optiques à usage aéronautique - Méthodes d'essais - Partie 504: Essai de microcourbure

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This European Standard was approved by CEN on 1 March 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

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Foreword

This document (EN 3745-504:2002) 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of an identical text or by endorsement, at the latest by December 2002, and conflicting national standards shall be withdrawn at the latest by December 2002.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 for determining the ability of an optical fibre or fibre optic cable to withstand microbending.

It shall be used together with EN 3745-100.

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 [1)]

EN 3745-100 Aerospace series – Fibres and cables, optical, aircraft use – Test methods – Part 100: General [2)]

EN 3745-201 Aerospace Series - Fibres and cables, optical, aircraft use - Test methods – Part 201: Visual examination

EN 3745-301 Aerospace Series - Fibres and cables, optical, aircraft use - Test methods - Part 301: Attenuation

EN 3745-402 Aerospace Series - Fibres and cables, optical, aircraft use - Test methods - Part 402: Temperature cycling [1)]

3 Preparation of specimens

3.1 The length of the specimens shall be (2 ± 0,2) m unless otherwise specified in the product standard. The fibre ends shall be prepared in accordance with EN 2591-100.

If the specimens are not at standard test conditions, they shall be subjected to standard test conditions and stabilized at these conditions for 24 h as defined in EN 2591-100.

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

- number of specimens;
- load to be applied (F);
- rate at which the load is applied;
- maximum permissible variation in attenuation;
- permissible residual attenuation 15 min after removing the load.

3.3 If combined temperature cycling is requested, the following additional details shall be specified if not already included in the product standard:

- high and low temperatures;
- duration of exposure to extreme temperatures and rates of change;
- number of cycles.

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

4 Apparatus

The apparatus shall comprise:

- a light launch system (LLS) as defined in EN 2591-100;
- a light detector system (LDS) as defined in EN 2591-100;
- a test fixture capable of applying the specified load (F).

The test fixture shall have four cylinders on the top jaw and three on the bottom jaw. The dimensions of the cylinders in the test fixture shall depend on the diameter of the fibre or cable under test as specified in table 1.

If combined temperature cycling is required the following apparatus shall be used:

- climatic chamber capable of temperature control of ± 3 °C.

A typical arrangement is shown in figure 1.

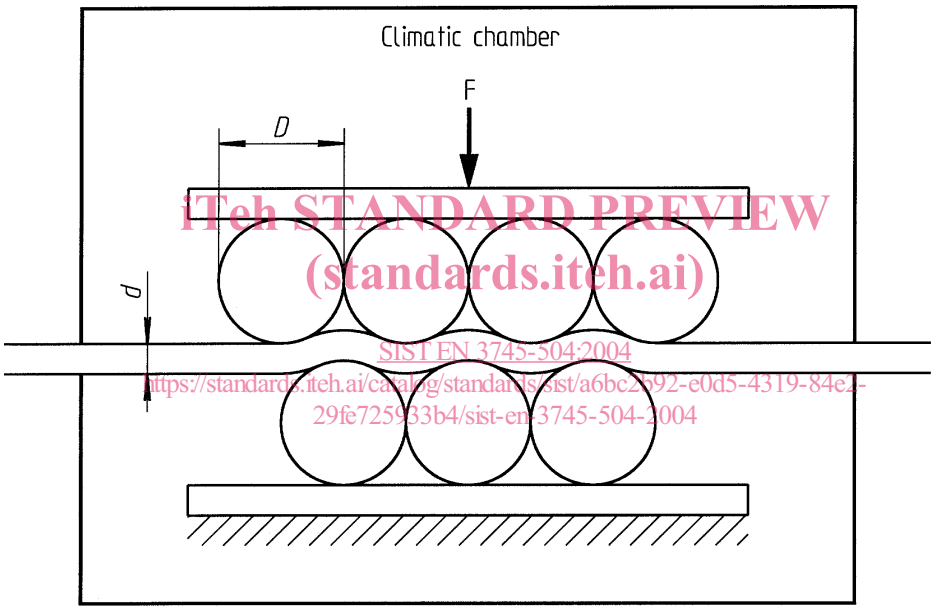

Figure 1

NOTE The length of the optical fibre or cable subjected to microbending is determined by the size of the cylinders in the test fixture as shown in figure 1.

Table 1

Fibre/cable diameter (*d*) mm	Cylinder diameter (*D*) mm
$d < 1,5$	3
$1,5 \leq d < 2,5$	5
$2,5 \leq d < 5$	10
$d \geq 5$	20

5 Method

5.1 Procedure

The variation of attenuation (EN 3745-301 method C) shall be monitored continuously throughout the test.

– Connect the specimen to the LLS and LDS.

– Place the specimen between the jaws of the test fixture.

– With no load applied, obtain a reference power measurement on the LDS.

– Apply the load at the specified rate until the specified load is reached.

– Maintain this load for 15 min.

– If temperature cycling is required, perform the specified cycles in accordance with EN 3745-402 Temperature cycling.

– Remove the load at the same speed as it was applied.

– When the load has been fully removed, leave the specimen for 15 min.

– Measure the final residual attenuation.

5.2 Final measurements and requirements

The maximum variation in attenuation and the final residual attenuation afterwards shall not exceed the specified values.

Inspect the specimen for damage in accordance with EN 3745-201 Visual examination.