BS EN 3745-405:2012

BSI Standards Publication

Aerospace series — Fibres and cables, optical, aircraft use — Test methods

Part 405: Low/High temperature bend test

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National foreword

This British Standard is the UK implementation of EN 3745-405:2012.

The UK participation in its preparation was entrusted to Technical Committee ACE/6, Aerospace avionic electrical and fibre optic technology.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Foreword

This document (EN 3745-405:2012) 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of an identical text or by endorsement, at the latest by January 2013, and conflicting national standards shall be withdrawn at the latest by January 2013.

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1 Scope

This European Standard specifies a method of determining the attenuation variation of an optical cable during mechanical bending under load at the maximum and minimum operating temperatures.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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, A*erospace series — Fibres and cables, optical, aircraft use — Test methods — Part 100: General*

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*

3 Preparation of specimens

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

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

— The number and length of specimens;

— The upper and lower temperatures at which test is carried out;

— The mandrel diameter and number of wraps;

— The maximum permissible variation in attenuation;

— The required loads to be applied during the test;

— The wavelengths to be measured.

4 Apparatus

4.1 The apparatus shall comprise:

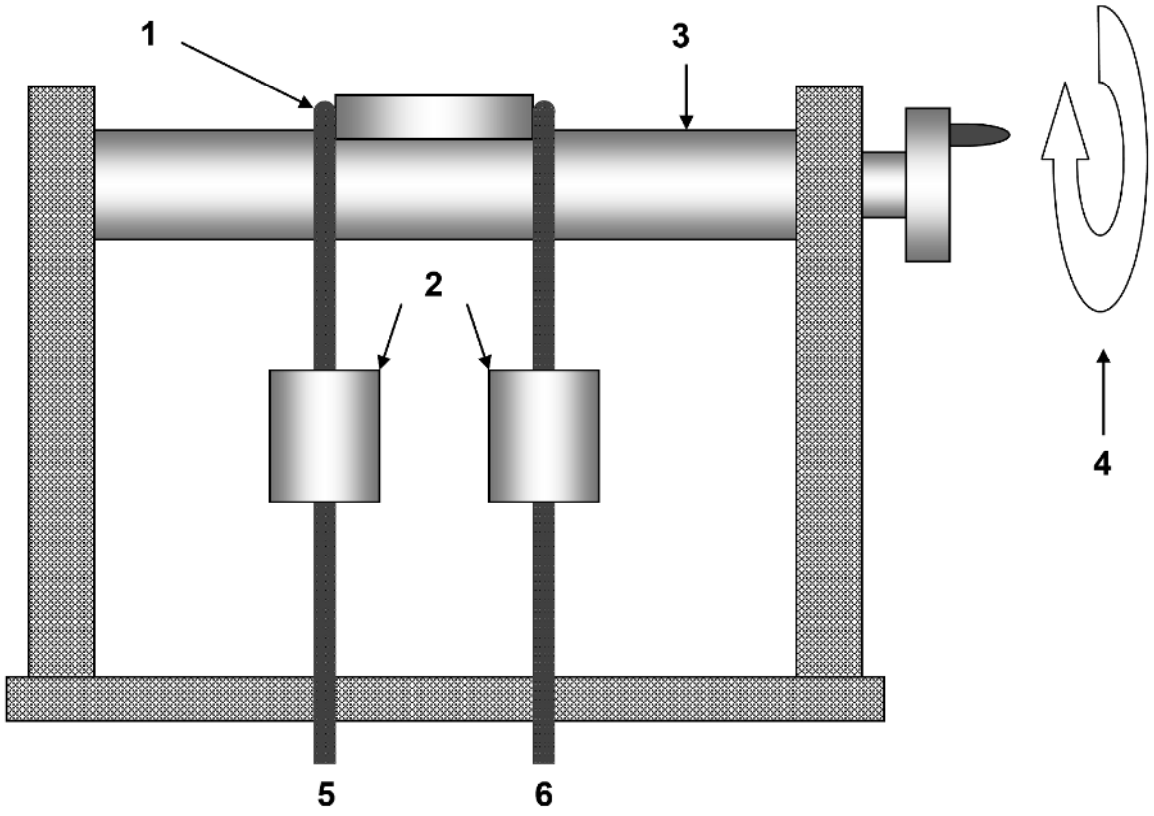
— A Light Launch System (LLS) as defined in EN 2591-100;

— A Light Detection System (LDS) as defined in EN 2591-100;

— A test fixture suitable for attaching the specimen with weights to a rotating mandrel;

— A suitable environmental chamber capable of meeting the specified temperatures ± 2 °C.

A typical arrangement is shown in Figure 1.



Key

1 Fibre optic cable
2 Loads
3 Mandrel
4 Winding direction
5 LLS
6 LDS

Figure 1

5 Method

5.1 Procedure

1) Connect the specimen to the LLS and LDS.

2) Place specimen in the environmental chamber and attach the specimen to the mandrel, in preparation for winding.

3) Attach loads to source and detection end of cable.

4) Measure the initial optical transmittance measurements at wavelengths according to the applicable product standard to establish a reference.

5) Condition the specimen for four (4) hours at the low temperature test condition specified in the applicable product standard.

6) Measure the optical transmittance values at the end of the four (4) hours conditioning at the low temperature test condition prior to winding on the mandrel.

7) After the four (4) hours conditioning period and while the cable is still at the test temperature, wind cable two turns on to the mandrel using a steady rate of two turns per minute. While specimen is still wrapped on the mandrel measure the optical transmittance.

8) Unwind the specimen and measure the optical transmittance.

9) Allow the specimen to come to room temperature.

10) Repeat steps 5) through to 9) at the high temperature test condition specified in the applicable product standard.

5.2 Final measurements and requirements

The difference in attenuation of the conditioned specimen before and after mandrel winding at both temperatures shall be less than the specified value in the applicable product standard.

Perform a visual examination according to EN 3745-201.

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