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Aerospace series - Lamps, incandescent - Part 001: Technical specification

Luft- und Raumfahrt - Glühlampen - Teil 001: Technische Lieferbedingungen

Série aérospatiale - Lampes à incandescence - Partie 001: Spécification technique

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Foreword

This document (EN 2240-001:2009) 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of an identical text or by endorsement, at the latest by April 2010, and conflicting national standards shall be withdrawn at the latest by April 2010.

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1 Scope

This European Standard specifies the characteristics of incandescent lamps for aerospace applications.

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 2240-002, *Aerospace series — Lamps, incandescent — Part 002: Main characteristics*

EN 2282, *Aerospace series — Characteristics of aircraft electrical supplies*

EN 2756, *Aerospace series — Lamps, incandescent — Tests methods*

EN 9133, *Aerospace series — Quality management systems — Qualification procedure for aerospace standard parts*

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection*

ISO 3951, *Sampling procedures and charts for inspection by variables for percent nonconforming*

IEC 60061-1, *Lamp caps and holders together with gauges for the control of interchangeability and safety — Part 1: Lamp caps*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply:

3.1
code (of a lamp)
group of figures and/or characters attributed in a specific manner to each type of standardized lamp and used by the whole profession to designate the lamps of the different types concerned

3.2
nominal voltage
voltage (alternating current RMS or direct current) to which the lamp is designed and to which the other nominal values refer

3.3
nominal current
current consumption of lamp at nominal voltage

3.4
nominal power
product of nominal voltage by nominal current

3.5
nominal luminous flux
luminous flux emitted by the lamp powered at nominal voltage

3.6
luminous efficacy
luminous flux emitted relative to the electrical power consumed

3.7
colour temperature
temperature of the black body which is of the same colour as that of the light source submitted to test

3.8
life
number of operating hours of a lamp powered at nominal voltage until failure (rupture of the filament, irregular luminous flux, etc.) under the test conditions of 3.4.6 of EN 2756

3.9
appearance
appearance of the lamp upon a visual examination, in particular: condition of the surface of the bulb glass (clear, frosted, etc.), finish and condition of cap, etc.

4 Required characteristics

4.1 Utilisation categories

These lamps shall be designed to be powered from the aircraft electrical power supplies (see EN 2282).

4.1.1 Lamps for normal operation

These lamps when powered at nominal voltage shall emit a luminous flux equal to the nominal luminous flux of the lamps within ± 25 %.

For certain models of lamp, the value of this tolerance may be different and shall be defined in the product standard (see EN 2240-002).

4.1.2 Aged and selected lamps

These lamps shall be aged at nominal voltage for 10 h (unless otherwise specified in the product standards); then, they are selected in such a way that their luminous flux at nominal voltage is equal to the nominal luminous flux with the following tolerances:

— 10 % (suffix AS 10): code A in the identity block;

— 15 % (suffix AS 15): code B in the identity block.

4.1.3 Lamps for use at reduced voltage

In addition to their use at nominal conditions, these lamps may be used at reduced voltage.

The test conditions, together with the tolerances for the luminous flux at reduced voltage are defined in 3.4.3 of EN 2756.

4.2 Type

Each type of lamp shall be defined in a product standard by the following characteristics, if applicable:

— code;

— nominal voltage;

— nominal current;

— nominal power;

— nominal luminous flux;

— environmental conditions;

— life (static with direct current and alternative current, and dynamic with direct current);

— utilisation category (normal operation, aged and selected, for use at reduced voltage);

— appearance (shape, bulb, cap, etc.);

— mass and dimensions;

— type of connection (cap in accordance with IEC 60061-1, wire, etc.);

— form and position of the filament;

— light centre length (LCL);

— perating position (specified or not specified);

— colour temperature;

— designation and marking (see Clause 6).

4.3 Main characteristics

See EN 2240-002.

4.4 Form and position of filament

See EN 2240-002.

5 Quality assurance

See EN 9133.

5.1 Qualification tests

See EN 2756.

5.1.1 Conditions of qualification

Qualification is obtained after a certain number of tests have been passed, indicated in Table 1, on a specified number of lamps. The realisation of the tests and monitoring thereof shall be the responsibility of the mandated body.

5.1.2 Sampling

The tests shall be carried out on lamps taken from a representative production batch from the current series production. The batch presented shall contain 124 items.

5.1.3 Quantity

61 lamps shall be taken for the realisation of the qualification tests defined in Table 1.

Having been subjected to tests of group 0, these lamps shall be divided into four groups as specified in Table 1. For each of these groups, the tests planned shall be carried out in the indicated sequence.

5.1.4 Breakdown of tests

The tests shall be carried out as indicated in Table 1.

Table 1

Group No.	Number of lamps	Tests to be carried out	EN 2756 subclause	Acceptable number of defective units [a]
0	61	Visual examination	3.2	1
		Mass and dimensions	3.3	
		Electrical and photometric tests	3.4.1 to 3.4.4	
1	1	Voltage strength and insulation resistance	3.4.5	0
2	20	Mechanical tests	3.5	1
3	8	Climatic tests	3.6	1
4	16	Static life	3.4.6.1	3
		Dynamic life	3.4.6.2	

[a] In the event of a defect, a replacement lamp shall be taken from the remainder of the batch defined in 5.1.2.

5.1.5 Qualification

If the number of defective units is above the acceptable number, a single check-test is possible with the remaining lamps of the batch defined in 5.1.2, according to Table 1. Following all these tests, qualification or non-qualification shall be pronounced.

5.2 Acceptance tests

5.2.1 General

See EN 2756.