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Locator lights for airborne applications —

Part 1: Specification for lifejacket lights

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Aerospace Standards Policy Committee (ACE/-) to Technical Committee ACE/6, upon which the following bodies were represented:

- British Airways
- British Cable Makers' Confederation
- British Rubber Manufacturers' Association
- Civil Aviation Authority (Airworthiness Division)
- Electronic Components Industries Federation
- Ministry of Defence
- Society of British Aerospace Companies Ltd.
- Coopted member

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Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Definitions	1
3 Individual specification sheet	1
4 Design	1
5 Performance	1
6 Type approval	2
7 Identification and marking	6
8 Quality assurance	6
Appendix A Individual specification sheet	7
Appendix B Performance tests	8
Appendix C Storage tests	9
Appendix D Safety tests (lithium batteries only)	9
Appendix E Type approval programme	11
Figure 1 — Horizontal polar diagram showing minimum requirement shaded	3
Figure 2 — Horizontal beam width and position	4
Figure 3 — Vertical beam width and position	5
Publication(s) referred to	Inside back cover

Foreword

This Part of this British Standard has been prepared under the direction of the Aerospace Standards Policy Committee and specifies the requirements for survivor location lights for fitment to lifejackets used in airborne applications.

Lifejacket lights enable survivors to be located quickly during the hours of darkness and failure to operate could prejudice survival. It is essential, therefore, that good design and manufacturing practices are applied to the production of this equipment.

It has been assumed in the drafting of this British Standard that the execution of its provisions is entrusted to appropriately qualified and experienced people.

The approving authority referred to in this standard is the body responsible for authorizing the manufacturer or supplier to issue certification, when to certify means to attest as meeting a standard.

WARNING. This British Standard calls for the use of substances and procedures that may be injurious to health if adequate precautions are not taken. It refers only to technical suitability and does not absolve the user from legal obligations relating to health and safety at any stage.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 12, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of British Standard G247 specifies the design, performance, testing and quality requirements for survivor locator lights for fitment to lifejackets used in airborne applications.

2 Definitions

For the purposes of this Part of BS G247, the following definitions apply.

2.1

storage life

the period during which the unit may be stored, under specified conditions, and still meet all performance requirements in use

2.2

light unit

a complete assembly comprising light source, cabling, battery and associated components

2.3

primary battery

a source of electrical energy obtained by the direct conversion of chemical energy

NOTE When ready for delivery, a primary battery includes terminals and may include a case. The word "battery" can refer to one single complete cell.

2.4

active battery

a battery which is completely self-contained and requires no initiating action before delivering current

2.5

reserve battery

a battery which requires initiating action, usually that of introducing electrolyte, before delivering current

2.6

discharge

a procedure by which a cell or battery delivers current to an external circuit

2.7

end-point voltage (V_e)

the on-load voltage of a light unit battery at the end of discharge

3 Individual specification sheet

The manufacturer shall prepare an individual specification sheet which complies with Appendix A of this standard for each type of light unit produced. The individual specification sheet shall define the values for parameters given in Appendix A.

4 Design

4.1 Construction

Light units shall be constructed to comply with clause 4 to clause 7 of this British Standard.

4.2 Materials

Materials used in the manufacture of light units shall be:

- a) compatible with the materials used in the manufacture of life jackets; and
- b) rot and corrosion resistant and unaffected by sea water, oil or fungal attack.

4.3 Attachment

The method of attachment of the light unit shall comply with 5.1.4. The light unit shall be capable of removal and replacement without causing damage to a lifejacket, and shall not have any adverse effect on the performance of a lifejacket to which it is attached.

4.4 Reflectors and lenses

Lenses or curved reflectors, if fitted, shall meet the requirements of 5.2.3 and 5.2.4.

4.5 Electronic components

Components of electronic circuits shall comply with quality control requirements of BS 9000-1 or of an equivalent standard. Components which cannot be obtained to this standard shall be covered by a Certificate of Conformity from the manufacturer of the components.

4.6 Battery

If a lithium battery is selected as the power source, it shall comply with the design requirements given in clause 5 of BS G239:1987 when within the lifejacket light unit.

WARNING. Certain lithium batteries under certain conditions can be hazardous.

4.7 Switching

Lifejacket light illumination shall switch on automatically upon deployment.

4.8 Servicing

The light unit shall include the means to show that it has not been operated during its specified life.

5 Performance

5.1 Environmental

5.1.1 Operational temperature range

When tested in accordance with B.1 and B.2, the light unit shall operate as specified in 5.2 throughout the temperature ranges:

- a) for active batteries unless immersed in water, $-30\text{ }^{\circ}\text{C}$ to $+30\text{ }^{\circ}\text{C}$;

- b) for water activated applications or active batteries mounted on the lifejacket such that they are immersed, $-1\text{ }^{\circ}\text{C}$ to $+30\text{ }^{\circ}\text{C}$.

5.1.2 Temperature

Following storage within the temperature range $-40\text{ }^{\circ}\text{C}$ to $+70\text{ }^{\circ}\text{C}$, the light unit shall exhibit no sign of physical distress and shall comply with 5.2.

5.1.3 Drop

When tested in accordance with B.3, the light unit shall not be damaged and shall remain fully functional.

5.1.4 Jump

When tested in accordance with B.4, the light unit when attached to a lifejacket shall not be dislodged or damaged and shall remain fully functional.

5.1.5 Acceleration

When tested in accordance with B.5, the light unit shall show no signs of damage or leaks and shall remain fully functional.

5.1.6 Vibration

When tested in accordance with B.6, the light unit shall show no signs of physical damage or leaks and shall remain fully functional.

5.1.7 Altitude

When tested in accordance with either BS 3G100-2.3.2 or BS 2G229 (Eurocae ED-14B/RTCA D0-160B¹⁾ section 4.6), the light unit shall not be adversely affected over the altitude pressure range 106.94 kPa at -457 m ($-1\,500\text{ ft}$) to 9.12 kPa at $+16\,760\text{ m}$ ($+55\,000\text{ ft}$).

5.2 Illumination

5.2.1 Endurance

The light shall provide the output specified in 5.2.3 and 5.2.4 throughout the temperature ranges specified in 5.1.1 for a continuous period of not less than 8 h.

5.2.2 Start-up times

The output specified in 5.2.3 and 5.2.4 shall be obtained after the following immersion times.

a) Reserve batteries

- 1) 5 min in sea water at $-1\text{ }^{\circ}\text{C}$;
- 2) 5 min in sea water at $+30\text{ }^{\circ}\text{C}$;
- 3) 10 min in fresh water at $+20\text{ }^{\circ}\text{C}$.

b) *Active batteries.* Active batteries shall achieve the output specified in 5.2.3 within 5 min of deployment under all conditions.

5.2.3 Horizontal light output

The horizontal light output with lens, when fitted, shall be a steady light providing a mean luminous intensity of 0.75 cd in the following planes:

- a) through 2 arcs in the horizontal plane each subtending 150° minimum and with a maximum separation of 30° (see Figure 1); and
- b) over a 10° uninterrupted arc in the horizontal plane at the point of peak intensity and 180° opposite, and which shall lie between 0° and 30° elevation (see Figure 2).

5.2.4 Vertical light output

The light with lens, when fitted, shall have a vertical luminous intensity of not less than 0.5 cd over a 15° cone which shall lie within a 30° cone symmetrically disposed about the vertical axis (see Figure 3).

5.3 Storage life

When tested in accordance with Appendix C, the storage life of the light unit in the unpacked state shall be as specified on the individual specification sheet (see Appendix A) from the date of manufacture.

6 Type approval

6.1 General requirements

6.1.1 Type approval of a light unit shall be in accordance with the tests given in Appendix B, Appendix C and Appendix D. The manufacturer shall demonstrate to the satisfaction of the approving authority²⁾ that the unit complies with the requirements of this British Standard and with any other relevant specification or requirement issued by the approving authority.

¹⁾ Available for examination at the BSI Library, Linford Wood, Milton Keynes, MK14 6LE, or available from EUROCAE, 11 rue Hamelin, 75783 Paris Cedex 16, France and from RTCA, Suite 1020, 1140 Connecticut Avenue N.W., Washington, D.C. 20036 – 4001.

²⁾ For UK civil aviation products, the approving authority is the Civil Aviation Authority; for UK military products, information is available from the Procurement Executive, Ministry of Defence, Directorate General of Defence Quality Assurance, Directorate of Standardization, Kentigern House, 65 Brown Street, Glasgow G2 8EX.