



Standard Specification for Searchlights on Motor Lifeboats¹

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1. Scope

1.1 This specification covers searchlights for motor lifeboats.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 The following precautionary caveat pertains only to the test method portion, Section 7, of this specification: *This standard does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

B 117 Practice for Operating Salt Spray (Fog) Apparatus²

2.2 *Military Standard:*

MIL-STD-105D Sampling Procedures and Tables for Inspection by Attributes³

3. Descriptions of Terms Specific to This Standard

3.1 *lot*—a manufacturer's production run for a specific type of searchlight.

3.2 *order batch*—size of a specific contract or purchase order taken from the lot.

3.3 *production testing*—testing performed during a lot run of specific searchlights.

4. Materials and Manufacture

4.1 *Material:*

4.1.1 All materials used in the construction of these searchlights shall be of a quality suitable for the purpose intended and shall conform to the requirements of this specification.

4.1.2 The searchlight shall be constructed of brass, copper-alloy, an equivalent corrosion-resistant material, or a material that when tested in accordance with Practice B 117 for 200 h, does not show signs of pitting, cracking, or deterioration.

4.1.3 Plastic, when used, shall be of a suitable thermoplastic or thermosetting material so molded as to produce a dense solid structure, uniform in texture, finish, and mechanical properties.

5. Requirements

5.1 The height of the searchlight from the base to the top of the light shall not exceed 19 in. (483 mm).

5.2 The housing of the searchlight shall be capable of free movement of at least 60° above and 45° below the horizontal, and be able to rotate 360° in the horizontal plane. There shall be a means provided to lock the searchlight in any desired position without the use of tools (vertically and horizontally).

5.3 The searchlight shall be capable of illuminating a light colored object at night at 55 ft (180 m). The searchlight shall project a beam of light of not less than 5.5 ft (18 m) in diameter at a distance of 55 ft from the light source. The edge of the beam shall be a point where the intensity of the light is 10 % of the maximum intensity. The light source shall have a candlepower rating of no less than 350 000 cd.

5.4 The searchlight shall be capable of being operated for not less than 3 h of continuous use and 6 h of intermittent use.

5.5 The lamp used in the searchlight shall be of the incandescent, quartz, or other type which would allow for instant start. The lamps shall be rated for 12 V.

5.6 Each searchlight shall be watertight. The searchlight shall show no leakage of water following the test method prescribed in 7.1.

5.7 Each searchlight shall be wired with a 6-ft (2-m) length of rubber jacketed hard service flexible cord, unless otherwise specified in 8.3. The conductor size shall be no less than 16 AWG. The cable entry into the searchlight shall be sealed with a watertight bushing and packing gland. A suitable clamping device shall be installed in the area where the cables enter the gland to prevent any force being exerted on the gland or connections. The free end of this cord shall be dead-ended unless otherwise specified in 8.3.

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² *Annual Book of ASTM Standards*, Vol 03.02.

³ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5098, Attn: NPODS.

5.8 Each searchlight shall be provided with a handle or handgrip to allow for ease of maneuvering the light into various positions.

6. Workmanship, Finish, and Appearance

6.1 Searchlights shall be of sturdy construction, and free from mechanical, electrical, or other imperfections or defects which materially affect appearance or which may affect quality, reliability, or serviceability.

6.2 The finished searchlight shall not contain rough edges, burrs, or other disfigurements and shall be clean, free from rust, tool marks, and other injurious defects.

7. Test Methods

7.1 *Watertightness*—The searchlight shall be submerged in a saltwater solution (1.04 sp gr) to a depth of 3 ft (0.9 m) of 60°F (16°C) for 2 h. The light will then be subjected to the tests of 7.2.1 and be in perfect working order.

7.2 *Environmental:*

7.2.1 *Operational Test*—The searchlight shall be operated continuously for 3 h at rated voltage in an ambient temperature of 77°F (25°C) and be operational after being subjected to the watertightness test of 7.1. The searchlight shall then be operated intermittently. The intermittent time periods shall be 15 min “ON” and 5 min “OFF” for a total 6-h period. These tests shall be repeated three times.

7.2.2 *Impact:*

7.2.2.1 *Test Conditions*—The searchlight shall be placed in a cold chamber at $-40 \pm 5^\circ\text{F}$ ($-40 \pm 3^\circ\text{C}$) for 2 h. With the searchlight stabilized at this temperature, it shall be immediately subjected to the low- and high-impact tests specified in 7.2.2.2 and 7.2.2.3. The point of impact shall be applied to the outside of the case at a point midway between the ends of the case at 4 points 90° apart and the back plate.

7.2.2.2 *Low Impact*—The searchlight shall be subjected to a 12 in·lbf (1.3 J) impact using a 1-lb (0.5-kg) steel ball at each of the points of impact specified in 7.2.2.1. The searchlight shall then be subjected to the watertightness test (see 7.1). There shall be no evidence of breakage from impact and no evidence of moisture shall be found in the case.

7.2.2.3 *High Impact*—The searchlight, after passing the low-impact test, shall be again placed in the cold chamber at $-40 \pm 5^\circ\text{F}$ ($-40 \pm 3^\circ\text{C}$) for 2 h and then immediately subjected to a 20 in·lbf (2.3 J) impact using a 1-lb (0.5-kg) steel ball at each of the points of impact specified in 7.2.2.1. There shall be no evidence of damage to the case or the lens.

7.3 *Test for Light Projection*—The beam spread of the searchlight shall be shown to meet the calculations contained in the IES Lighting Handbook.⁴ This test shall be conducted at rated voltage.

7.4 *Switch Endurance*—The contact switch mechanism of the searchlight shall be tested by operating the switch for 25 000 continuous cycles. A cycle shall consist of movements from “OFF” position through the full “ON” and “FLASHING” positions and back to “OFF” position. The switch shall be operated under normal electrical load conditions, and the lamp and batteries shall be replaced as often as required to ensure that the switch mechanism is operating under normal load throughout the 25 000 cycles. Burning out of bulbs and batteries during the test shall not constitute failure of this test. Failure of the switch to complete 25 000 cycles shall constitute failure of this test.

7.5 The searchlight, when mounted to a lifeboat, shall be able to withstand a vertical drop test of the lifeboat with forces of 10 g and a side impact test of the lifeboat with forces of 20 g.

8. Packaging and Package Marking

8.1 *Product Marking*—Each searchlight conforming to all the requirements in this specification shall be marked with the name, brand or trademark of the manufacturer, this ASTM specification number, and any other information as may be specified in the contract or purchase order.

8.2 *Packaging*—Unless otherwise specified by the customer in the contract or purchase order, the searchlight shall be packaged, packed, and marked in accordance with the manufacturer’s commercial practice to ensure acceptance and safe delivery by the carrier for the mode of shipping and handling.

8.3 Details pertaining to the cable, cable terminations, and voltage should be provided by the procuring agency in the contract or purchase order.

9. Quality Assurance

9.1 *Responsibility for Inspection*—Unless otherwise specified in the contract or purchase order, the producer is responsible for the performance of all inspection and requirements as specified herein. Except as otherwise specified in the contract or purchase order, the producer may use his own or any other facilities suitable for the performance of the inspection requirements specified herein. The purchaser reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure the searchlights conform to the prescribed requirements.

9.2 The producer shall perform the necessary inspection and tests to assure that an S-4 inspection level, in accordance with MIL-STD-105D, is provided. An Acceptable Quality Level (AQL) of 1 % defective for the operational test and the switch leakage test, and an AQL of 4 % for any of the other requirement or test specified shall be provided. Sample testing shall be in accordance with Table 1.

⁴ IES Lighting Handbook (Vol 1, Section 20), is available from Illuminating Engineering Society of North America, 120 Wall St., New York, NY 10005.

TABLE 1 Sample Testing

Production	Para-graph	Order Batch	Para-graph
Watertightness	7.1	Light projection	7.3
Operation	7.2.1	Operation	7.2.1
Impact	7.2.2		
Light projection	7.3		
Switch endurance	7.4		

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