STANDARD
FOR
PERSONAL LOCATOR LIGHTS (P.L.L)

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PERSONAL LOCATOR LIGHTS
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1 SCOPE

1.1 This standard prescribes the construction and performance requirements, and production tests and procedures for approving Personal Locator Lights, where required by Regulations to be fitted to a personal buoyant water safety device.

1.2 Personal locator lights conforming to this standard are in accordance with the provisions of the Canada Shipping Act, of the International Convention for the Safety of Life at Sea (SOLAS) 1974, as amended 1983 and Resolution A.689 (17), Testing of Life-Saving Appliances.

1.3 The tests required by this standard shall be conducted by

(a) a testing establishment recognized by the Board; or,

(b) a manufacturer at his premises in the presence of an inspector.

2 DEFINITIONS

2.1 Approval Authority means the Department of Transport, Board of Steamship Inspection (the Board)

2.2 Board means the Board of Steamship Inspection.

2.3 Independent laboratory means a laboratory that has the equipment, personnel , and procedures necessary to conduct the approval tests required by this standard, that is free of the influence and control of the applicant, other manufacturers, suppliers and vendors of lights.

2.4 Inspection Authority means the Ship Safety Branch, Canadian Coast Guard.

2.5 Inspector means a steamship inspector appointed pursuant to section 366 of the Canada Shipping Act.

2.6 Personal Buoyant Water Safety Device means any Life Saving device approved by the Department of Transport, that is designed to be worn by and provide flotation for a person in the water.

2.7 Storage Life, means with respect to a power source, the length of time after the date of manufacture, that the power source can be stored under expected conditions in a marine environment and retain sufficient power for the light to meet the performance requirements of this standard.

3 DETAIL REQUIREMENTS

3.1 CONSTRUCTION

3.1.1 Each personal locator light shall

(a) be designed to be attached to a personal buoyant water safety device without damaging such device or interfering with its performance, except where a light is designed to operate free-floating from the device, it shall be self-contained and attached to a personal buoyant water safety device with a lanyard not greater than 750mm in length and of adequate strength;

(b) with its power source, be designed to be removed and replaced without causing damage to the device to which it is attached;

(c) prior to activation, have means to prevent leakage from its container of any chemicals it contains or produces;

(d) after activation, not release any chemicals or gases into the water or atmosphere that may be hazardous to the wearer;

(e) not be operated by means of a water pressure switch;

(f) be designed so that the light is visible over as great a segment of the upper hemisphere as is practicable, when attached to a personal water safety device ;

(g) including its power source, be designed to fit into a cylindrical space that is 150mm by 75mm diameter;

(h) including its power source, not have a mass of more than 225 grams;

(i) be activated either

(i) automatically upon entry into the water;

(ii) manually upon completion of a single simple operation; or,

(iii) both,

except a flashing light in addition shall be provided with a manual switch.

(j) when designed to operate while detached from a device be capable of floating in water with its light source at or above the surface of the water;

3.2 PERFORMANCE

3.2.1 Each light shall be designed to operate both in sea water and in fresh water.

3.2.2 Each water activated light shall upon activation in salt water;

(a) begin to shine within 2 min. of activation; and

(b) within 5 min. of activation shall have reached a luminous intensity of not less than 0.75 cd.

3.2.3 Each water activated light shall upon activation in fresh water

(a) begin to shine within 2 min. of activation; and,

(b) within 10 min. of activation shall have reached a luminous intensity of not less than 0.75 cd.

3.2.4 Each light shall be designed to operate continuously, while floating in water, for at least 8 hours in water temperatures of between minus 1 to plus 30 deg C.

3.2.5 If a light is a flashing light, its flash rate when first activated, or within 5 minutes thereafter, shall be not less than 50 flashes per minute with an effective luminous intensity of at least 0.75 cd;

3.2.6 A light that concentrates its light beam by means of a curved reflector shall not be permitted; and,

3.2.7 Each light shall be designed to operate in accordance with this section after completion of the temperature cycling test.

4 INSTRUCTIONS FOR USE

4.1 Instructions shall be provided in both English and French on how to attach the light to a personal buoyant water safety device in a manner that complies with 3.1.1(a) except in the case where the light is to be attached by a manufacturer of personal water safety devices, only one set of instructions need be provided;

4.2 Operating instructions shall be clearly marked on each light in both English and French, and illustrations may be used.

4.3 Attachment and operating instructions shall be supplied in a format suitable for

(i) mounting on a bulkhead;

(ii) attachment on the lifejacket donning diagram required to be carried on board ship, (Appendix A) ; and,

(iii) for insertion into the ship's training manual.

4.4 If a light is designed to be attached to a finished device, any attachment materials that are not supplied with the light shall be clearly identified in the instructions. If a light is to be attached to a finished device by the purchaser, any attachment materials not supplied with the light shall be readily available for purchase from the manufacturer of the light or the personal water safety device.

5 APPROVAL TESTING

5.1 OPERATION TEST

5.1.1 The approval test described in this section shall be conducted for each light submitted for Department of Transport approval.

5.1.2 A sample of twelve lights shall be subjected to the temperature cycling test as per Annex I and as a result of this test the light shall show no signs of damage such as swelling, cracking, dissolution or change in mechanical properties.

5.1.3 Upon completion of the temperature conditioning in Annex I, four lights shall be subjected to an ambient temperature of -30°C., four lights shall be subjected to an ambient temperature of +65°C., and the remaining four shall be subjected to an ambient temperature of +20°C. After a period of at least 48 hours respectively, the lights shall be operated in the following condition:

(a) lights stored at -30°C; immersed in seawater at a temperature of -1°C;

(b) lights stored at +65°C; immersed in seawater at a temperature of +30°C; and

(c) lights stored at +20°C; immersed in fresh water at a temperature of +20°C.

5.1.4 Water activated lights shall commence functioning within 2 min. and have reached a luminous intensity of 0.75 cd. within 5 min. in seawater, and within 10 min. in fresh water.

5.1.5 At least eleven out of the twelve lights shall continue to provide a luminous intensity of 0.75 cd. for a period of not less than 8 hours.

5.2 JUMP TEST

(note* This test may be conducted by either the light manufacturer or the manufacturer of the device to which the light is to be attached.)

5. 2.1 One light shall be attached to the Personal Buoyant Water Safety Device for which it is to be approved, and subjected to a drop test.

5.2.2 The device to which the light is attached shall be donned by a test subject, in the normal manner, and the test subject shall jump from a height of at least 4.5m vertically, feet first into the water.

5.2.3 The light shall not

(a) suffer damage;

(b) be dislodged from the device; or,

(c) injure the test subject.

5.2.4 Upon completion of the jump test the light shall function as prescribed in 3.2.

5.3 **DROP TEST**

5.3.1 Two samples of the light shall be used for this test.

5.3.2 Lights shall be cooled to a temperature of -18 deg.C and then dropped twice from a height of 1m onto a rigidly mounted surface such as a steel plate of concrete surface.

5.3.3 The lights shall be dropped lens first then base first.

5.3.4 The lights shall show no damage as a result of this test and shall function as prescribed in 3.2.

5.4 **FLAME TEST**

5.4.1 Two samples of the light shall be used for this test.

5.4.2 A test pan 30 cm x 35 cm x 6 cm shall be placed in a draft-free location, with water to a depth of 1 cm and gasoline to a depth of 3 cm placed in the pan.

5.4.3 The gasoline shall be ignited and allowed to burn freely for a period of 30s.

5.4.4 The lights shall be passed through the flames at a height of 25cm above the top edge of the pan so that the duration of exposure to the flame is 2s.

5.4.5 The lights shall sustain no damage as a result of this test, and shall function as prescribed in 3.2.

5.5 **LEAK TEST**

5.5.1 Upon completion of the Drop Test (5.3), and the Flame Test (5.4), all samples used shall be immersed under a 100cm head of water for a period of 15 minutes.

5.5.2 The lights shall, when removed from the water, be opened or dismantled and shall show no evidence of water ingress that would affect the function of the light as prescribed in 3.2.

6 **POWER SOURCE**

6.1 The shelf life of the power source shall be established by the manufacturer based on an acceptable statistical method and the power source shall be clearly marked with its date of manufacture and expiration.

6.2 In the case of dry-cell batteries the shelf life shall be deemed to be not more than one year.

7 MARKING

7.1 Each light shall be permanently and legibly marked in English and French with

(a) The manufacturer's name or trade mark that clearly identifies the model designation and lot number.

(b) The Department of Transport approval number assigned to the light;

(c) Instructions on how to activate the light; and,

(d) in the case of a light using dry-cell batteries as the power source, the words **"CHANGE BATTERIES ANNUALLY".**

7.2 The power source of each light shall be permanently and legibly marked with the month and year of manufacture and expiration.

8 APPROVAL PROCEDURE

8.1 The application for approval shall be sent to the Superintendent, Equipment and Operational Safety, Ship Safety Branch, Canadian Coast Guard, Ottawa, K1A ON7.

8.2 The tests required under sections 5 shall be conducted by or under the supervision of an independent laboratory.

8.3 The Approval Authority shall consider approval of a Personal Locator Light when the manufacturer has submitted

(a) all relevant plans, drawings, and specifications for the light;

(b) production quality control manuals;

(c) details of all components to be used in the construction, and repair if applicable, of the light;

(d) the name of the proposed independent laboratory, a description of the laboratory's qualifications to conduct or supervise the approval tests, and, a proposed test plan describing in detail the proposed test procedures, apparatus and facilities; and,

(e) a standard production sample of the light.

8.4 The Board shall approve a personal locator light when it is satisfied with the submissions required under 8.3, that all applicable tests have been successfully completed, and that provisions have been made for inspection and testing of production line lights is to its satisfaction.

8.5 Following testing two copies of the test reports shall be forwarded to the Superintendent, Equipment and Operational Safety at the address shown in 8.1

8.6 The test reports shall be reviewed and if the contents indicate compliance with the requirements of this standard, approval will be granted.

8.7 The Approval certificate granted is valid only for the light identified thereon, and, only when such light is manufactured in accordance with the relevant requirements of this standard and the Approval Certificate.

8.8 Any modification to an existing approved light shall be submitted to the Approval Authority for its consideration, and shall be tested in accordance with the requirements of this standard as applicable.

9 PRODUCTION INSPECTION AND TESTING

9.1 Every production line personal locator light shall be manufactured to the same standard as the approved prototype light.

9.2 The manufacturer of approved lights shall randomly select a sample of twelve lights from each lot of lights produced, or from each batch of 1000 lights if a lot exceeds 1000, which shall be subjected to the tests prescribed in paragraphs 5.1.3, 5.1.4, and 5.1.5

9.4 If less than twelve lights meet the test criteria, another random sample of twelve lights shall be taken and tested, and if less than twelve of these lights meet the test criteria, none of those lights in the lot may be sold as Department of Transport approved equipment.

9.5 The results of these tests are to be sent to the Superintendent, Equipment and Operational Safety, Ship Safety Branch, Canadian Coast Guard, Ottawa, KlA ON7.

9.6 The Approval Authority does not inspect lights approved under this standard on a regular basis, however, the Board may select samples and conduct tests and examinations whenever necessary to determine whether the lights are being manufactured in compliance with the requirements of this standard.

10 RECORDS

10.1 Manufacturers are required to maintain records relating to the quality control and production tests carried out in accordance with this standard.

10.2 Records shall include

(a) details of material purchases and usage;

(b) date when production commenced and terminated, if production was not continuous;

(c) test records of all components used in the production process;

(d) records of all prototype tests; and,

(e) detailed descriptions of any failures.

10.3 Manufacturers shall retain the records for a period of at least 60 months, unless otherwise required by the Board.

10.4 The records shall be available for inspection by, or submission to the Approval Authority upon request.

Annex I

1 Temperature Cycling Test

1.1 Each object shall be alternately subjected to surrounding temperatures of -30°C and +65°C.

1.2 These alternating cycles need not follow immediately after one another and the following procedure, repeated for a total of 10 cycles, is acceptable.

(a) an 8 hour cycle at +65°C to be completed in one day; and

(b) the specimens then removed from the warm chamber and left exposed under ordinary room temperature until the next day;

(c) an 8 hour cycle at -30°C to be completed the next day; and

(d) the specimens then removed from the cold chamber and left exposed under ordinary room conditions until the next day.

1.3 Room temperatures is taken to be between +20°C (± 2°).

INSTRUCTIONS

1. Place life jacket over head
2. Tie neck tie-tapes.
3. Grasp waist tapes.

1. Rabattre le gilet par-dessus la tete.
2. Attacher les lanieres du cou.
3. Saisir les lanieres a la base.

4. Pull tie tapes to back, cross, bring to front.
5. Tie securely at waist, under life jacket

4. Amener les lanieres vers l'arriere, croiser, puis ramener vers l'avant.
5. Attacher fermement a la taille en-dessus du gilet.

Manufactured by Style

Manufacture par Style

Reserved for:
Personal Locator,Light
Operating Instructions

Réservé à:
Instructions relatives au fonctionnement des appareil lumineux

7" x 2 3/4"

18cm x 7cm