For Comments only

DRAFT *INDIAN STANDARD*

LIFE-BUOYS — SPECIFICATION

(*Second Revision* of IS 5326)

(ICS No. 47.080)

Last date for receipt of comments is 10 08 2024

Marine Engineering and Safety Aids Sectional Committee TED 19

FOREWORD

This draft Indian Standard (Second Revision) will be adopted by the Bureau of Indian Standards, after the draft finalized by the Marine Engineering and Safety Aids Sectional Committee is approved by the Transport Engineering Division Council.

This standard was first published in 1966. The first revision in 2007 incorporated changes in International Maritime Resolution Requirements and International Convention for Safety of Life at Sea 'SOLAS 2000. This second revision is being undertaken to update the standard and to incorporate latest technological advancement/ development that has taken place in various fields. The salient features of this first revision are:

a) Latest changes in International Maritime Resolution Requirements and International Convention for Safety of Life at Sea 'SOLAS 2000' with amendments have been incorporated.

b) Temperature cycling test, Test for resistance to oil, Strength test and Fire test have been added.

c) Tests for life-buoy with self-igniting lights and life-buoys with self-activating smoke signals have been added.

d) Requirement for drop test has been modified.

e) Reference to Indian Standards has been updated.

f) Clauses related to marking, BIS Certification and sampling plan have been added.

Life-buoys are part of the life-saving appliances to be provided on all sea-going vessels, harbour crafts and other floating crafts. The number and the location of the life-buoys on board vessels are covered by statutory rules in respect of life saving appliances. The aim of this standard is primarily to guide manufacturers, ship owners and the inspecting authorities. The important consideration that is safety of life has been kept in view whileprescribing the requirements for testing of life-buoys.

Not with standing what is stated in the standard, life-saving appliances life buoy appliances carriedor fitted on board merchant navy ship shall conform to the statutory rules in this behalf issued under the *Merchant Shipping Act* 1958 with amendments and shall be subject to the approval of Government of India.

The composition of the committee responsible for formulation of this standard is given at Annex G (To be added later).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2:2022 ‘Rules for rounding off numerical values (*second revision*)*’.* The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

DRAFT *INDIAN STANDARD*

LIFE-BUOYS — SPECIFICATION

(*Second Revision* of IS 5326)

1 SCOPE

1.1 This standard specifies the requirements of life-buoys for use on board ships and other floating crafts.

1.2 It also covers the requirements of life-buoys with self-igniting lights, life-buoys with self-activating smoke signals and requirements of buoyant lifelines.

2 REFERENCE

The following standards contain provisions, which through reference in this text, constitutes provisions of this standard. At the time of publication the editions indicated were valid. This standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No. / Other publication	*Title*
IS 2500 (Part 1):2000	sampling inspection procedures: Part 1: Attribute sampling plans indexed by acceptable quality limit (AQL) for lot-by-lot inspection (*third revision*)
IS 3751: 1993	Textiles — Heavy cee jute cloth — Specification (first revision)

IMO Resolution A.658 (16)

3 GENERAL REQUIREMENTS FOR LIFEBUOY

3.1 Life-buoy shall be constructed with proper workmanship and materials.

3.2 It shall not get damaged in stowage throughout the air temperature range –30°C to +65°C when tested as per test method given at Annex A.

3.3 It shall operate throughout the seawater temperature range –1°C to + 30°C if it is likely to be immersed in seawater during its use.

3.4 It shall be rot-proof, corrosion-resistant and not be unduly affected by sea water, oil or fungal attack, where applicable. (*see* Annex B)

3.5 It shall be resistant to deterioration where exposed to sunlight.

3.6 It shall be of vivid reddish orange or highly visible colour on all parts where this will assist detection at sea.

3.7 It shall be fitted with retro-reflective material, in accordance with recommendation of IMO Resolution A.658 (16), where it will assist in detection.

3.8 It shall be capable of satisfactory operation in that environment if these are to be used in a seaway.

3.9 It shall be clearly marked with approval information, including the Administration which approved it and any operational restrictions.

3.10 It shall be provided with electrical short-circuit protection to prevent damage or injury, where applicable.

4 CONSTRUCITON, MATERIAL AND DIMENSIONS

4.1 Life-buoys shall have an outer diameter of not more than 800 mm and an inner diameter of not less than 400 mm;

4.2 Life-buoys shall be constructed of inherently buoyant material. It shall not depend upon rushes, cork shavings or granulated cork, any other loose granulated material or any air compartment which depends on inflation for buoyancy.

4.3 Floatation Test

The two lifebuoys subjected to the above test shall be floated in fresh water with not less than 14.5 kg of iron suspended from each of them and shall remain floating for a period of 24 h.

4.4 Life-buoys shall have a mass of not less than 2.5 kg. If it is intended to operate the quick release arrangement provided for the self-activated smoke signals and self-igniting lights, life-buoys shall have a mass not more than 4 kg.

4.5 Life-buoys shall not sustain burning or continue melting after being totally enveloped in a fire for a period of 2 s when tested as per Annex C.

4.6 Drop Test

Life-buoys shall be constructed to withstand a drop into the water from the height at which it is stowed above the waterline in the lightest seagoing condition or 30 m, whichever is greater, without impairing either its operating capability or that of its attached components. In addition one lifebuoy should be dropped three times from a height of 2 m on to a concrete floor.

4.7 Life-buoys shall be fitted with a grab line not less than 9.5 mm in diameter and not less than four times the outside diameter of the body of the buoy in length. The grab line shall be secured at four equidistant points around the circumference of the buoy to form four equal loops.

4.8 The life-buoy shall pass in strength test given at Annex D.

5 LIFE-BUOY SELF IGNITING LIGHTS

Self-igniting lights for life-buoy, where provided by rules,

a) Shall be such that these cannot be extinguished by water;

b) Shall be of white colour and capable of either burning continuously with a luminous intensity of not less than 2 cd in all directions of the upper hemisphere or flashing (dischargeflashing) at a rate of not less than 50 flashes and not more than 70 flashes per minute with atleast the corresponding effective luminous intensity;

c) Shall be provided with a source of energy capable of meeting the requirement of 5(b) for a period of at least 2 h; and

d) Shall be capable of withstanding the drop test specified in **4.6**.

6 LIFE-BUOY SELF ACTIVATING SMOKE SIGNALS

Self-activating smoke signals (*see* Annex E), where provided by rules,

a) Shall emit smoke of a highly visible colour at a uniform rate for a period of at least 15 min when floating in calm water;

b) Shall not ignite explosively or emit any flame during the entire smoke emission time of the signal;

c) Shall not be swamped in a seaway;

d) Shall continue to emit smoke when filly submerged in water for a period of at least 10 s;

e) Shall be capable of withstanding the drop test as specified in **4.6**; and

f) Shall be provided with a quick release arrangement that will automatically release and activate the signal and associated self-igniting light (*see* Annex F) connected to a lifebuoy having a mass not more than 4 kg.

7 BUOYANT LIFELINES

Buoyant lifelines,

a) Shall be non-kinking;

b) shall have a diameter of not less than 8 mm; and

c) Shall have a breaking strength of not less than 5 kN.

8 SAMPLING

Unless otherwise agreed upon between a supplier and purchaser, the inspection sampling shall be as per IS 2500 (Part 1).

9 DELIVERY AND PACKING

The life-buoy shall be delivered in a new, clean and dry condition. The life-buoys shall be delivered in bales of a convenient number with two layers of new jute
heavy cee cloth confining to IS 3751. The contents and the date of packing shall be marked on the outside of each bale.

10 MARKING

10.1 The type, date of test, manufacturer's batch number shall be marked on all life-buoys by indelible colour.

10.2 BIS Certification Marking

Life-buoys may also be marked with the Standard Mark.

10.2.1 The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the BIS Act, 2016 and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

ANNEX A

(*Clause* 3.2)

TEMPERATURE CYCLING TEST

A-1 The following test should be carried out on two lifebuoys.

A-1.1 The lifebuoys shall be alternately subjected to surrounding temperatures of −30° C and +65° C. These alternating cycles need not follow immediately after each other and the following procedure, repeated for a total of 10 cycles, is acceptable:

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

b) the specimens removed from the warm chamber that same day and left exposed under ordinary room conditions until the next day;

c) an 8 h cycle at −30° C to be completed the next day; and

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

A-2 The lifebuoys shall show no sign of loss of rigidity under high temperatures and, after the tests, shall show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.

ANNEX B

(*Clause* 3.4)

RESISTANCE TO OIL

B-1 One of the life buoy shall be immersed horizontally for a period of 24 h under a 100 mm head of diesel oil at normal room temperature. After this test the lifebuoy should show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.

ANNEX C
(*Clause* 4.5)

FIRE TEST

C-1 The lifebuoy shall be subjected to a fire test. A test pan 30 cm × 35 cm × 6 cm should be placed in an essentially draught-free area. Water should be put in the bottom of the test pan to a depth of 1 cm followed by enough petrol to make a minimum total depth of 4 cm. The petrol should then be ignited and allowed to burn freely for 30 s. The lifebuoy be moved through flames in an upright, forward, free-hanging position, with the bottom of the lifebuoy 25 cm above the top edge of the test pan so that the duration of exposure to the flames is 2 s.

ANNEX D
(*Clause* 4.8)

STRENGTH TEST

D-1 A lifebuoy shall be suspended by a 50 mm wide strap. A similar strap shall be passed around the opposite side of the body with a 90 kg mass suspended from it. After 30 min, the lifebuoy shall be examined. There shall be no breaks, cracks or permanent deformation.

ANNEX E
(*Clause* 6)

LIFEBUOY SELF-ACTIVATING SMOKE SIGNAL TESTS

E-1 Nine self-activating smoke signals shall be subjected to temperature cycling as prescribed in Annex A and, after the tests, shall show no sign of damage such as shrinking, cracking, swelling, dissolution or change of mechanical qualities.

E-2 After at least 10 complete temperature cycles, the first three smoke signals shall be subjected to a temperature of -30°C for at least 48 h and then activated and operated in seawater at a temperature of -1°C.

E-2.1 The next three smoke signals shall be subjected to a temperature +65°C for at least 48 h and then activated and operated in seawater at a temperature +30°C. After the smoke signals have been emitting smoke for 7 min, the smoke-emitting ends of the smoke signals shall be immersed to a depth of 25 mm for 10 s. On being released the smoke signals shall continue to operate to a total period of smoke emission of not less than 15 min. The signals shall not ignite explosively or in a manner dangerous to persons close by.

E-2.2 The last three smoke signals taken from ordinary room conditions and attached by a line to a lifebuoy having a mass of not more than 4 kg should undergo the drop test into water given at **4.6**. The lifebuoy shall have both a smoke signal and a lifebuoy light attached in the manner recommended by the manufacturer and be dropped from a quick-release fitting. The smoke signals shall not be damaged and shall function for a period of at least 15 min.

E-3 Smoke signals shall conform to IS 14270 (Part 8).

E-4 A force of 225 N shall be applied to the fitting that attaches the self-activating smoke signal to the lifebuoy. Neither the fitting nor the signal shall be damaged as a result of the test.

ANNEX F

[*Clause* 6 f)]

TEST FOR OPERATION WITH A LIGHT AND SMOKE SIGNAL

F-1 A lifebuoy intended for quick release with a light and smoke signal shall be given this test. The lifebuoy shall be arranged in a manner simulating its installation on a ship for release from the navigating bridge. A lifebuoy light and smoke signal shall be attached to the lifebuoy in the manner recommended by the manufacturer. The lifebuoy shall be released and should activate both the light and the smoke signal.