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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION
R 338

LIFEBOATS FOR LESS THAN ONE HUNDRED PEOPLE

1st EDITION

October 1963

For each individual country the only valid standard is the national standard of that country.

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BRIEF HISTORY

The ISO Recommendation R 338, *Lifeboats for Less Than One Hundred People*, was drawn up by Technical Committee ISO/TC 8, *Shipbuilding Details*, the Secretariat of which is held by the Stichting Nederlands Normalisatie-Instituut (NNI).

Work on this question by the Technical Committee began in 1949, taking into account the studies which had been made by the former International Federation of the National Standardizing Associations (ISA), and led, in 1959, to the adoption of a Draft ISO Recommendation.

In November 1959, this Draft ISO Recommendation (No. 323) was circulated to all the ISO Member Bodies for enquiry. The Draft was approved by the following Member Bodies, subject to having various objections taken into consideration, one of which stressed the necessity of having the text in agreement with the latest edition of the International Convention for the Safety of Life at Sea (1960):

Australia	Finland	New Zealand
Belgium	Germany	Poland
Burma	Greece	Romania
Chile	Italy	Spain
Czechoslovakia	Japan	Turkey
Denmark	Netherlands	U.S.S.R.

One Member Body opposed the approval of the Draft: U.S.A.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in October 1963, to accept it as an ISO RECOMMENDATION.

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SHIPBUILDING DETAILS

LIFEBOATS FOR LESS THAN ONE HUNDRED PEOPLE

1. GENERAL

1.1 General conditions

Lifeboats on all passenger ships and on cargo ships of 500 tons gross tonnage and over should have rigid sides and internal buoyancy only.

Lifeboats having folding wash strakes or external buoyancy are not permitted by the International Convention for the Safety of Life at Sea (1960).

Lifeboats should be properly constructed and of sufficient strength to allow them to be launched safely with their full complement of persons and equipment.

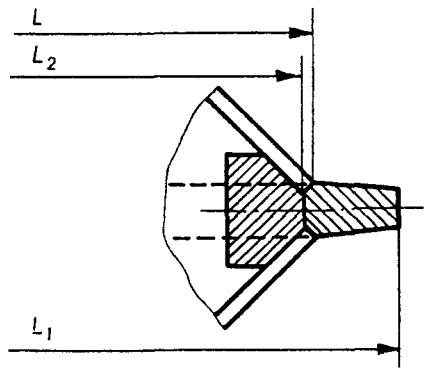
1.2 Definitions

1.2.1 *Lengths*

1.2.1.1 REGULATION LENGTH L, measured from the intersection of the outside of planking or plating with the stem to the corresponding point at the stern post or, in the case of a square-sterned boat, to the afterside of the transom.

1.2.1.2 OVERALL LENGTH L_1, measured from the forward edge of the stem post to the after edge of the stern post. The dimensions for this length are the maximum dimensions.

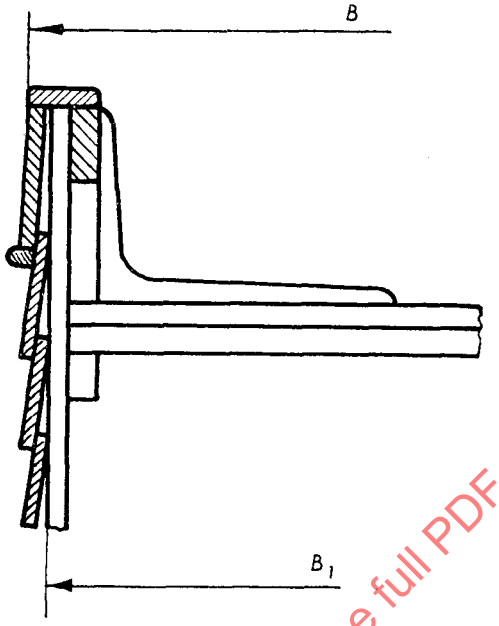
1.2.1.3 INTERNAL LENGTH L_2, measured from the inside of the planking or plating at the stem to the corresponding point at the stern post. In the case of a lifeboat with a square stern, the length is measured to the inside of the transom.



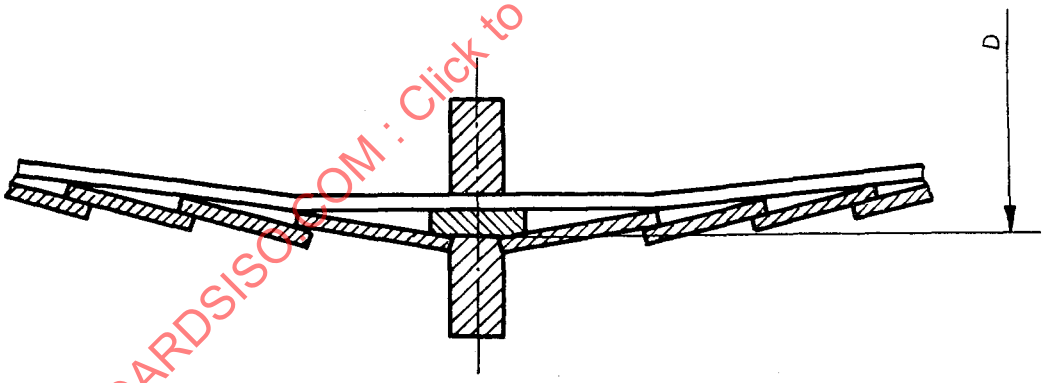
1.2.2 *Breadths*

1.2.2.1 OUTER BREADTH B, measured from the outside of the planking at the point where the breadth of the lifeboat is greatest.

1.2.2.2 INTERNAL BREADTH B_1, measured from the inside of the planking at the point where the breadth of the lifeboat is greatest.



1.2.3 *Depth D*, measured amidships inside the planking, from the keel to the limit of the watertight portion of the planking, i.e. to the top or the bottom of the gunwale strake, according as to whether the gunwale strake is watertight or not.*



1.2.4 *Symmetrical or pointed stern type* (type S) — This designation is given to a double-ended lifeboat (with a pointed stern).

1.2.5 *Square stern type* (type O) — This name designates a lifeboat having a transom stern.

2. DESIGN CALCULATIONS FOR LIFEBOATS

2.1 Cubic capacity

2.1.1 The ratio between the cubic capacity and the product $L \times B \times D$ should be not less than 0.64, except for wooden lifeboats made of planks, for which this ratio may be replaced by 0.60.

The cubic capacity should be determined by Stirling's (Simpson's) Rule or by any other method giving the same degree of accuracy.

* The inside face of the garboard strake that meets the upper sawcut of the keel rabbet, is accepted as datum line.

The capacity of a square sterned lifeboat (type O) should be calculated as if the lifeboat had a pointed stern (type S).

For the application of the Stirling's (Simpson's) Rule, the length L_2 and breadth B_1 (inside the planking) should be used.

2.1.2 If the depth D of the lifeboat amidships exceeds 45 per cent of the breadth,

(a) the depth employed in calculating the area of the amidships cross section should be deemed to be equal to 45 per cent of the breadth

(b) the depths employed in calculating the areas of the quarter length sections (from the bow or stern) are obtained by increasing the depth employed under *(a)* by an amount equal to 1 per cent of the length of the lifeboat, provided that in no case should the depths employed in the calculation exceed the actual depths at these points.

2.1.3 If the depth D of the lifeboat is greater than 1.22 m (or 4 ft), the number of persons admitted on board by the application of this Rule should be reduced in proportion to the ratio of 1.22 m (or 4 ft) to the actual depth, until the lifeboat has been satisfactorily tested afloat with that number of persons on board, all wearing life-jackets.

2.1.4 For lifeboats of different draughts (fore and aft), the rules of the competent national organization should be taken into account.

2.1.5 The cubic capacity of a motor lifeboat or a lifeboat fitted with other propelling gear should be obtained from the gross capacity by deducting a volume equal to that occupied by the motor and its accessories or the gear box of the other propelling gear and, when carried, the radiotelegraph installation and searchlight with their accessories.

2.2 Sheer

All lifeboats should have a mean sheer equal to at least 4 per cent of their length. At the quarter distance from bow and stern the sheer should be at least one per cent. It should be approximately parabolic in form.

2.3 Buoyancy

2.3.1 *Pulling-boats and mechanically propelled boats*

2.3.1.1 All lifeboats should have sufficient inherent buoyancy, or should be fitted with watertight air cases or other equivalent non-corrodible buoyant material which should not be adversely affected by oil or oil products, sufficient to float the boat and its equipment when the boat is flooded and open to the sea.

2.3.1.2 An additional volume of watertight air cases or other equivalent non-corrodible buoyant material, which should not be adversely affected by oil or oil products, equal to at least 10 per cent of the cubic capacity of the boat should also be provided. The watertight air cases may be filled with a non-corrodible buoyant material which should not be adversely affected by oil or oil products.

2.3.1.3 Generally speaking, the mass of metal materials in a lifeboat should be subject to compensation (e.g. devices for mechanical propulsion, metal hull, accessories other than those normally found in wooden boats). For this purpose, in order to comply with clause 2.3.1.1, the internal buoyancy required by clause 2.3.1.2 should be increased by an additional volume.

As an indication, the value of this additional volume is equal to the weight multiplied by a factor given by the following table:

Material	Metric units dm^3/kg	United Kingdom units ft^3/cwt
Iron and steel	1	1.80
Aluminium and its alloys	0.76	1.37
Glass-reinforced plastics *	0.50	0.90

If the volume of the air cases or buoyant material provided complying with the clause 2.3.1.2 exceeds the volume resulting from the actual number of persons permitted on board, the excess volume may be used as compensation for the metal parts of the hull, the devices for mechanical propulsion etc., with the agreement of the competent national organization.

2.3.2 *Motor-boats*

On motor lifeboats the volume of the air cases or internal buoyancy compartments should be at least equal to that which would be present if the lifeboat did not have a motor. It should also be increased, if necessary, and to the extent needed to compensate for the difference between

(a) the weight of the motor, its accessories and, where applicable, the searchlight, radio-communication installation and their accessories

and

(b) the weight of the additional people which the lifeboat could take if the motor, its accessories and, where applicable, the searchlight and the radio-communication installation were removed.

This compensation is effected by increasing the volume of the internal buoyancy by 1 dm^3 per kilogramme (or 1.8 ft^3 per cwt) of the metallic material in the propelling gear (including shaft lines and propeller and, where applicable, the searchlight and radio-communication installation) and by subtracting from the volume of the internal buoyancy 28.3 dm^3 (or 1 ft^3) per extra person which the lifeboat could take if the propelling apparatus and its related installations (including the searchlight and radio-communication installation) were removed.

2.4 Freeboard when loaded

The minimum freeboard when loaded should be not less than 6 per cent of the regulation length of the boat and not less than 0.44 D (where D is the depth).

2.5 Stability

All lifeboats should be properly constructed and should be of such form and proportions that they have ample stability in a sea-way, and sufficient freeboard when loaded with their full complement of persons and equipment.

The minimum modulus of stability of the upright boat, fully loaded, without shipped water, is deduced from the formula: **

$$GM = 0.05\,B^2 - 0.05\,B + 0.20 \qquad \text{(in metres)}$$

$$\text{or } GM = \frac{B^2}{65} - \frac{B}{20} + 0.65 \qquad \text{(in feet)}$$

B being the outer breadth as defined in 1. 2. 2. 1.

* The figures 0.50 and 0.90 are applicable in the case of plastics the mass density of which is less than 1.6 kg/dm^3.
** This formula will in general give GM-values exceeding those derived from the stability formula included in Recommendation No. 18 of Annex D to the International Convention for the Safety of Life at Sea (1960).

All lifeboats should be capable of maintaining positive stability when open to the sea and loaded with their full complement of persons and equipment.

The stability after swamping (e.g., 10 per cent of the cubic capacity) should be taken into consideration and for this purpose, the lines of the boat and the arrangement of the air cases or internal buoyancy compartments should be taken into account.

As a general rule, the air cases or internal buoyancy compartments should be arranged close to the sides in order to obtain, to the fullest possible extent, maximum stability in the event of swamping.

Air cases or internal buoyancy compartments may, however, be permitted at the ends, but none should be installed in the bottom.

The distance between the watertight air cases or internal buoyancy compartments as well as the gap between the cases and the planking should be kept to a minimum.

2.6 Number of persons permitted on board

Calculations are made on the assumption that the weight of one person is 75 kg (or 165 lb).

The number of persons to be allowed into the lifeboat is determined by the conditions below, occurring simultaneously:

(*a*) The number should not exceed the greatest whole number obtained by dividing the cubic capacity:

by 0.283, where the capacity is measured in cubic metres (or by 10, where the capacity is measured in cubic feet),	in the case of a lifeboat of 7.3 m (or 24 ft) in length or over;
by 0.396, where the capacity is measured in cubic metres (or by 14, where the capacity is measured in cubic feet),	in the case of lifeboats of 4.9 m (or 16 ft) in length;
by a number to be obtained by interpolation, between 0.396 and 0.283, where the capacity is measured in cubic metres (or between 14 and 10, where the capacity is measured in cubic feet).	in the case of lifeboats of over 4.9m (or 16 ft) in length but under 7.3 m (or 24 ft).

(*b*) That number should enable the persons to take their seats wearing their life-jackets.

The number for which seating is provided may be obtained by allowing a minimum of 0.46 m (or 18 in) for each person, measured on the edge of his seat, adequate space being allowed for the legs of each person.

(*c*) It should give a satisfactory result in the stability test.

(*d*) It should not interfere with the use of the oars, which includes the handling of the steering oar and the tiller, or with the operation of other propulsion equipment.

The maximum number of persons authorized should be inscribed on the boat (see clause 3.8).

3. CONSTRUCTION AND EQUIPMENT

3.1 Rules of construction

The construction should comply with the instructions approved by the competent national organization, which may approve lifeboats with a rigid shelter, provided that it may be readily opened from both inside and outside and does not impede rapid embarkation and disembarkation or the launching and handling of the lifeboat.

Standard boats have the dimensions shown in section 5.

3.2 Seats

All thwarts and the side-seats should be fitted as low as is practicable in the lifeboat.

3.3 Suspension and release devices

The hooks and the release devices should have a safety factor of 6 against breaking load, unless otherwise decided by the competent national organization.

Arrangements should be made for speedily, but not necessarily simultaneously, detaching the lifeboats from the two falls.

The point of attachment of the lifeboats to the falls should be at such height above the gunwale as to ensure stability when lowering the lifeboats (e.g., 12.5 cm or 5 in).

3.4 Protection against corrosion

All steel parts used in the construction should be hot galvanized or receive equivalent protection against corrosion.

3.5 Mechanically propelled lifeboats

According to the Convention for the Safety of Life at Sea, it is compulsory for lifeboats carrying more than 60 persons (types P3, P4 and P5 according to table of section 5) to have man-powered (or motor, see clause 3.6) mechanical propulsion of an approved type.

The propelling gear should be of an approved type and should have sufficient power to enable the lifeboat to be readily cleared from the ship's side when launched and to be able to hold course under adverse weather conditions. The lifeboat with full load should be capable of covering 150 m (or 500 ft) in two minutes, from a standing start, in calm water.

3.5.1 The propelling gear (manually operated) should be capable of being worked by persons untrained in its use, and it should also be capable of being operated when the lifeboat is flooded.

3.5.2 A device should be fitted by means of which the helmsman can cause the lifeboat to go astern at any time when the propelling gear is in operation.

3.5.3 The compensation of the mass of the propelling gear is the subject of provisions of clause 2.3.1.3.

3.6 Motor lifeboats

3.6.1 A motor lifeboat should comply with the following conditions:

3.6.1.1 It should be fitted with a compression ignition engine and kept so as to be at all times ready for use; it should be capable of being readily started in all conditions; sufficient fuel for 24 hours continuous operation at the speed specified in 3.6.1.3 should be provided.

3.6.1.2 The engine and its accessories should be suitably enclosed to ensure operation under adverse weather conditions, and the engine casing should be fire-resisting. Provision should be made for going astern.

Pipes for the intake and the overboard discharge from the engine should be suitably connected and protected between the engine casing and the hull to avoid accidental flooding.

3.6.1.3 The speed ahead in smooth water when loaded with its full complement of persons and equipment should be:

(*a*) At least six knots, in the case of motor lifeboats required by Chapter III of the International Convention for the Safety of Life at Sea (1960), to be carried in passenger ships, tankers, ships employed as whale factory ships, ships employed as fish-processing or canning factory ships and ships engaged in the carriage of persons employed in the whaling, fish-processing or canning industries.

(*b*) At least four knots, in the case of any other motor lifeboat.

3.6.2 The volume of the airtight compartments is the subject of the last paragraph of clause 2.3.2.

3.6.3 Motor lifeboats may be fitted with means for preventing the entry of water and spray at the fore end.

3.7 Equipment

3.7.1 Arrangements should be made by the builder to allow for fitting the regulation equipment specified in Regulation 11 of Chapter III of the International Convention for the Safety of Life at Sea (1960).

Special agreements made when ordering should state the extent to which the equipment forms part of the order.

3.7.2 Motor lifeboats or other approved mechanically propelled lifeboats need not carry a mast or sails or more than half the complement of oars (at least 4), but they should carry two boat hooks.

3.7.3 All lifeboats should be fitted with suitable means to enable persons in the water to climb into the lifeboats.

3.7.4 Every motor lifeboat should carry portable fire-extinguishing equipment of an approved type capable of discharging foam or other suitable substance for extinguishing oil fires.

3.8 Inscriptions

The dimensions *L*, *B* and *D* of a lifeboat and the number of persons which it is permitted to carry should be marked on it in clear permanent characters. The name and port of registry of the ship to which the lifeboat belongs should be painted on each side of the bow.

4. PROTOTYPE TESTS

The prototype boats approved by the competent national organizations should pass the following tests:

4.1 Strength test

The lifeboat is suspended by its hooks, in the fully loaded state, with an overload equal to 25 per cent of the total weight of the lifeboat, passengers and gear, distributed over the whole boat. After removal of the load the lifeboat should not suffer residual deflection.

In the case of glass-reinforced plastics, time interval for recovery is permissible. Special tests may be required for glass-reinforced plastics lifeboats particularly with regard to overload and the use of a drop test.

4.2 Test afloat with full load

(*a*) This test is to verify that the arrangement of the persons does not in any way hinder the operation of the oars or of the man-powered mechanical propulsion unit or of the motor or of the fixed radio installation if fitted.

(*b*) The persons taking part in this test should be adults, wearing life-jackets.

(*c*) This test is at the same time a buoyancy test which is used to verify the free board and the draughts.

4.3 Stability test with and without partial swamping

This test is to verify the stability, in accordance with clause 2.5.

4.4 Test for the efficient operation of the mechanical propulsion devices or of the motor. Propulsion test of the lifeboat

This test is to verify the operating of the propulsion gear defined in clauses 3.5 and 3.6, the lifeboat being at its normal draft, at full load, and with a crew not exceeding the normal launching crew in the launching condition.