

ANNEX 11

OPEN REVERSIBLE LIFERAFTS

These requirements are closely similar but slightly different to those given in MSN 1676 (M), schedule 4, part 4.

1 General

1.1 All open reversible liferafts shall :

Refer to the Life Saving Appliances Code Chapter IV and MSC/Circ.81(70), as appropriate.

- .1 be constructed with proper workmanship and materials;
- .2 not be damaged in stowage throughout the air temperature range of -18°C to $+65^{\circ}\text{C}$;
- .3 be capable of operating throughout an air temperature range of -18°C to $+65^{\circ}\text{C}$ and a seawater temperature range of -1°C to $+30^{\circ}\text{C}$;
- .4 be rot-proof, corrosion-resistant and not be unduly affected by seawater, oil or fungal attack;
- .5 be stable and maintain their shape when inflated and fully laden; and
- .6 be fitted with retro-reflective material, where it will assist in detection, and in accordance with the recommendations adopted by the Organization*.

* Refer to the Recommendation on the use and fitting of retroreflective materials on life-saving appliances, adopted by the Organization by resolution A.658(16).

2 Construction

2.1 The open reversible liferaft shall be so constructed that when it is dropped into the water in its container from a height of 10 m, the liferaft and its equipment will operate satisfactorily. If the open reversible liferaft is to be stowed at a height of more than 10 m above the waterline in the lightest seagoing condition, it shall be of a type which has been satisfactorily drop-tested from at least that height.

2.2 The open reversible floating liferaft shall be capable of withstanding repeated jumps on to it from a height of at least 4.5 m.

2.3 The open reversible liferaft and its fittings shall be so constructed as to enable it to be towed at a speed of 3 knots in calm water when loaded with its full complement of persons and equipment, with the sea-anchor deployed.

2.4 The open reversible liferaft when fully inflated shall be capable of being boarded from the water whichever way up it inflates.

2.5 The main buoyancy chamber shall be divided into:

- .1 not less than two separate compartments, each inflated through a non-return inflation valve on each compartment; and
- .2 the buoyancy chambers shall be so arranged that in the event of one of the compartments being damaged or failing to inflate, the intact compartment shall be able to support, with positive freeboard over the open reversible liferaft's entire periphery, the number of persons which the liferaft is permitted to accommodate, each having a mass of 75 kg and seated in their normal positions.

2.6 The floor of the open reversible liferaft shall be waterproof.

2.7 The open reversible liferaft shall be inflated with a non-toxic gas by an inflation system complying with the requirements of paragraph 4.2.2 of the LSA Code. Inflation shall be completed within the period of 1 min at an ambient temperature of between 18°C and 20°C and within a period of 3 min at an ambient temperature of -18°C. After inflation the open reversible liferaft shall maintain its form when loaded with its full complement of persons and equipment.

2.8 Each inflatable compartment shall be capable of withstanding a pressure equal to at least three times the working pressure and shall be prevented from reaching a pressure exceeding twice the working pressure either by means of relief valves or by a limited gas supply. Means shall be provided for fitting the topping-up pump or bellows.

2.9 The surface of the buoyancy tubes shall be of non-slip material. At least 25% of these tubes shall be of a highly visible colour.

In this respect it will be acceptable if the water pockets required by 3.5 of this annex are manufactured in a highly visible colour. (MSN 1673 (M))

2.10 The number of persons which an open reversible liferaft shall be permitted to accommodate shall be equal to the lesser of:

- .1 the greatest whole number obtained by dividing by 0.096 the volume, measured in cubic metres, of the main buoyancy tubes (which for this purpose shall not include the thwarts, if fitted) when inflated; or
- .2 the greatest whole number obtained by dividing by 0.372 the inner horizontal cross-sectional area of the open reversible liferaft measured in square metres (which for this purpose may include the thwart or thwarts, if fitted) measured to the innermost edge of the buoyancy tubes; or
- .3 the number of persons having an average mass of 75 kg, all wearing lifejackets, that can be seated inboard of the buoyancy tubes without interfering with the operation of any of the liferaft's equipment.

3 Open reversible liferaft fittings

3.1 Lifelines shall be securely becketed around the inside and outside of the open reversible liferaft.

3.2 The open reversible liferaft shall be fitted with an efficient painter of a length suitable for automatic inflation on reaching the water. For open reversible liferafts accommodating more than 30 persons an additional bowsing-in line shall be fitted.

3.3 The breaking strength of the painter system, including its means of attachment to the open reversible liferaft, except the weak link required by paragraph 4.1.6.2 of the LSA Code, shall be:

- .1 7.5 kN for open reversible liferafts accommodating up to 8 persons;
- .2 10 kN for open reversible liferafts accommodating 9 to 30 persons; and
- .3 15 kN for open reversible liferafts accommodating more than 30 persons.

3.4 The open reversible liferaft shall be fitted with at least the following number of inflated ramps to assist boarding from the sea whichever way up the raft inflates:

- .1 one boarding ramp for open reversible liferafts accommodating up to 30 persons; or
- .2 two boarding ramps for open reversible liferafts accommodating more than 30 persons; such boarding ramps shall be 180° apart.

3.5 The open reversible liferaft shall be fitted with water pockets complying with the following requirements:

- .1 the cross-sectional area of the pockets shall be in the shape of an isosceles triangle with the base of the triangle attached to the buoyancy tubes of the open reversible liferaft;
- .2 the design shall be such that the pockets fill to approximately 60% of capacity within 15 s to 25 s of deployment;
- .3 the pockets attached to each buoyancy tube shall normally have aggregate capacity of between 125 l and 150 l for inflatable open reversible liferafts up to and including the 10-person size;
- .4 the pockets to be fitted to each buoyancy tube on liferafts certified to carry more than 10 persons shall have, as far as practicable, an aggregate capacity of 12 *N* litres, where *N* is the number of persons carried;
- .5 each pocket on a buoyancy tube shall be attached so that when the pocket is in the deployed position it is attached along the full length of its upper edges to, or close to, the lowest part of the lower buoyancy tube; and
- .6 the pockets shall be distributed symmetrically round the circumference of the liferaft with sufficient separation between each pocket to enable air to escape readily.

3.6 At least one manually controlled lamp complying with the requirements shall be fitted on the upper and lower surfaces of the buoyancy tubes.

3.7 Suitable automatic drain arrangements shall be provided on each side of the floor of the liferaft in the following manner:

- .1 one for open reversible liferafts accommodating up to 30 persons; or
- .2 two for open reversible liferafts accommodating more than 30 persons.

3.8 The equipment of every open reversible liferaft shall consist of:

- .1 one buoyant rescue quoit, attached to not less than 30 m of buoyant line with a breaking strength of at least 1 kN;
- .2 two safety knives of the non-folding type, having a buoyant handle, shall be fitted attached to open reversible liferaft by light lines. They shall be stowed in pockets so that, irrespective of the way in which the open reversible liferaft inflates, one will be readily available on the top surface of the upper buoyancy tube in a suitable position to enable the painter to be readily cut;
- .3 one buoyant bailer;
- .4 two sponges;
- .5 one sea-anchor permanently attached to the open reversible liferaft in such a way as to be readily deployable when the open reversible liferaft inflates. The position of the sea-anchor shall be clearly marked on both buoyancy tubes;

The sea anchor should comply with the requirements of Part 4 of the schedule 13 of MSN 1676 (M).

- .6 two buoyant paddles;
- .7 one first-aid outfit in a waterproof case capable of being closed tightly after use;

The first aid outfit should comply with the requirements of Part 1 of the schedule 13 of MSN 1676 (M).

- .8 one whistle or equivalent sound signal;
- .9 two hand flares;
- .10 one waterproof electric torch suitable for Morse signalling together with one spare set of batteries and one spare bulb in a waterproof container;
- .11 one repair outfit for repairing punctures in buoyancy compartments; and
- .12 one topping-up pump or bellows.

3.9 The equipment specified in 3.8 is designated an HSC Pack.

An HSC Pack corresponds to an "E PACK" complying with MSN 1676 (M), schedule 4, part 4, section 3.9.

3.10 Where appropriate, the equipment shall be stowed in a container which, if it is not an integral part of, or permanently attached to, the open reversible liferaft, shall be stowed and secured to the open reversible liferaft and be capable of floating in water for at least 30 min without damage to its contents. Irrespective of whether the equipment container is an integral part of, or is permanently attached to, the open reversible liferaft, the equipment shall be readily accessible irrespective of which way up the open reversible liferaft inflates. The line which secures the equipment container to the open reversible liferaft shall have a breaking strength of 2 kN or a breaking strength of 3:1 based on the mass of the complete equipment pack, whichever is the greater.

4 Containers for open reversible inflatable liferafts

4.1 The open reversible liferafts shall be packed in a container that is:

- .1 so constructed as to withstand conditions encountered at sea;
- .2 of sufficient inherent buoyancy, when packed with the liferaft and its equipment, to pull the painter from within and to operate the inflation mechanism should the craft sink; and
- .3 as far as practicable, watertight, except for drain holes in the container bottom.

4.2 The container shall be marked with:

- .1 maker's name or trademark;
- .2 serial number;
- .3 the number of persons it is permitted to carry;
- .4 non-SOLAS reversible;
- .5 type of emergency pack enclosed;
- .6 date when last serviced;
- .7 length of painter;
- .8 maximum permitted height of stowage above waterline (depending on drop-test height); and
- .9 launching instructions.

5 Markings on open reversible inflatable liferafts

The open reversible liferafts shall be marked with:

- .1 maker's name or trademark;
- .2 serial number;
- .3 date of manufacture (month and year);
- .4 name and place of service station where it was last serviced; and
- .5 number of persons it is permitted to accommodate on the top of each buoyancy tube, in characters not less than 100 mm in height and of a colour contrasting with that of the tube.

The markings should also include the statement "DfT (UK) approved".

6 Instructions and information

Instructions and information required for inclusion in the craft's training manual and in the instructions for on-board maintenance shall be in a form suitable for inclusion in such training manual and instructions for on-board maintenance. Instructions and information shall be in a clear and concise form and shall include, as appropriate, the following:

Refer to schedule 14 of MSN 1676 (M).

- .1 general description of the open reversible liferaft and its equipment;
- .2 installation arrangements;
- .3 operational instructions, including use of associated survival equipment; and

These should include launching, deployment and boarding instructions.

- .4 servicing requirements.

7 Testing of open reversible inflatable liferafts

When testing open reversible liferafts in accordance with the recommendations of resolution MSC.81(70), part 1:

- .1 tests No. 5.5, 5.12, 5.16, 5.17.2, 5.17.10, 5.17.11, 5.17.12, 5.18 and 5.20 may be omitted;
- .2 the part of test No. 5.8 regarding closing arrangement may be omitted;
- .3 the temperature -30°C in tests No. 5.17.3 and 5.17.5 may be substituted with -18°C ; and
- .4 the drop height of 18 m in test No. 5.1.2 may be substituted with 10 m.

Omittances and substitution, as described above, shall be reflected in the type approval certificate.