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Child's Flotation Cot

1 Applicability

This specification details the A.R.B. standards for the assessment of a manufacturer's specification for a flotation cot for a small child, if and when such a cot is required by Air Navigation Regulation No. 24, paragraphs 3 and 5.

2 General

2.1 The weight of the child shall be assumed to be 22 lb. The cot shall have a minimum inside width of 10 inches at the approximate shoulder position and a minimum inside length of 28 inches.

2.2 The method of loading the child in the cot shall either be obvious or shall be explained with brief simple instructions. Provision shall be made for restraining the child in the intended position in the cot; if a safety belt or harness is used for this purpose its method of fastening shall either be obvious or shall be explained with brief simple instructions.

2.3 Thermal insulation shall be provided to reduce heat loss from the child.

2.4 The cot shall be capable of being passed through an opening measuring 19 inches wide by 26 inches high when:

a) inflated and occupied. The child being in a horizontal position;

b) deflated.

2.5 A light which shall be visible to a person in the water shall be provided. This light shall automatically light up when the cot is placed in the water.

2.6 It is visualized that when the cot is in use, an adult, wearing a conventional aircraft type life jacket will always be in attendance in the water. To facilitate maintenance of contact between the attendant and the cot, a line having a loop or toggle or similar device at the end shall be attached to the cot. The line shall be buoyant or in a buoyant container.

2.7 The cot shall be provided with means for lowering it into the water. In this connection it shall be assumed that the water level is 10 feet below the launching point. During launching there shall be no danger of the cot taking up an attitude differing in a marked degree from the normal flotation attitude.

It shall be possible for an adult to launch the cot unaided. Whilst it is acceptable for this duty to be normally allocated to a male member of the crew, it shall, nevertheless, be possible for a stewardess to launch the cot in an emergency.

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Simple and obvious means shall be provided for facilitating the withdrawal of the occupied cot from the water either by hand or boat-hook from a boat without there being any necessity for a person to enter the water.

2.8 The cot shall not deteriorate or lose buoyancy to a marked extent whilst being used in rough seas for a period of at least 24 hours.

2.9 The cot and its equipment shall remain serviceable for the period between scheduled inspections. The choice of materials used in the construction, and the design of the associated equipment shall be such that when stowed in accordance with the relevant instructions, neither the cot nor the associated equipment shall be liable to become unserviceable through chafing, wear at folds, or any other cause. Due consideration shall be taken of possible temperature variation during stowage which may reach -40°C. and +70°C. for limited periods.

2.10 Suitable provision shall be made for ventilation.

2.11 As large an area of the cover over the child as is practicable shall consist of transparent material to allow visual contact between an attendant and the child.

2.12 The means for securing the cover over the child shall be such that it can be fastened and unfastened by an adult whose hands may be numbed by cold. The method of operating the fastening shall be simple and obvious.

3 Flotation Qualities

3.1 It shall not require a high degree of skill or care to ensure that even when launched in a rough sea, the cot will float the correct way up.

3.2 The cot shall have a high degree of stability in roll and pitch. It shall be possible in calm water, to rotate it through at least 80 about the rolling and pitching axes separately without it turning over.

3.3 With the cot floating in the water and containing a child as described in 2.1, it shall be assumed that a wind of 40 m.p.h. is blowing horizontally. In the absence of better information it may be assumed that this wind gives rise to a pressure of 4 lb./sq.ft. and its centre of pressure is located at the centre of the area of the cot as projected in a vertical plane normal to the direction of the wind. The maximum possible self-righting moment of the cot shall be at least twice the upsetting moment due to the wind forces specified. This may be established by simple tests or by calculation.

3.4 Survival of the child is very largely dependent upon its being kept warm and dry. The method of fastening the cover and the design of any openings for ventilating air shall therefore be such as to reduce the ingress of water to very small quantities even when the cot is floating in a rough sea with a high wind. blowing.

3.5 It shall be possible for the occupied cot to be placed upside down in calm water for at least 20 seconds and the quantity of water finding its way into the inside must not be such as would drown the child.

3.6 With the cot containing a child, it shall, when floating, be capable of supporting an adult, not wearing a life jacket, to an extent necessary to permit care of the child.

4 Inflation

4.1 If the cot is of a type which needs to be inflated before use, it shall have two means of inflation - (1) a semi-automatic (e.g. gas bottle) and (2) a standby method capable of repeated use (e.g. bellows or by mouth) capable of operation by an adult attendant in the water. Full inflation shall be possible by either method.

4.2 The method of operating the standby method of inflation shall be simple and obvious and it shall be impossible for any valve which might be used to be inadvertently left in a position which would allow the cot to deflate.

4.3 It shall be possible to "top up" the cot whilst in use without loss of initial pressure.

4.4 It shall be possible to deflate the cot without the use of tools and without rendering it unserviceable for subsequent use.

5 Practical Tests

5.1 The cot with a weighted dummy simulating the child described in paragraph 2.1 shall be dropped from a height of 10 feet above the water. For the purposes of this test, the cot, prior to being dropped, shall be held (a) in the normal floating attitude, and (b) upside down. There shall be no sign of failure of any part of the cot as a result of this test.

5.2 In calm water and with a dummy occupant in position, the cot shall be rotated through 80° about the rolling axis and it shall not turn over. It shall also be rotated through 80° about the pitching axis without turning over.

5.3 The cot shall be floated or held for 20 seconds with a dummy occupant, in calm water in an inverted position. The amount of water entering the cot in this time shall not be sufficient to endanger the life of the child by drowning, either when the cot is upside down or the right way up. In making an assessment as to whether the amount of water which has entered does not exceed this requirement, it must be borne in mind that the cot will be rolling and. pitching and the water within the cot will be surging.

5.4 With the cot floating upside down, it shall be possible for an adult of average dexterity and strength and wearing a life jacket, to right it.

5.5 Tests shall be carried, out to ascertain the extent to which 3.4is complied with. This may be done either by sea trials if the conditions of sea and wind are suitable or alternatively tests may be carried out in calm water using diffused water jets to simulate the effect of the wind. In the latter case, if it can be shown that the flotation cot has definite "Weathercock" stability in a wind, the jets of water may be generally directed in the direction of the wind, otherwise either the cot must be moved so that each side is sprayed in turn or jets must be positioned around all sides of the cot. The amount of water entering the cot in a period of 3 hours must not be in excess of that implied by 3.4.

5.6 If the cot is of the inflatable type it shall have proof and ultimate factors of not less than 3.0 and 5.0 respectively on the pressure at which it is designed to be inflated by the automatic means, at a temperature of 45°C., and in no case shall the proof pressure be less than 2 lb./sq.in. Tests shall be carried out on a cot which is representative of the type to establish compliance with this requirement.

5.7 The manufacturer's specification for the cot shall contain a list of tests which are required to be carried out on series cots to prove consistency with the prototype.

6 Materials and Processes

6.1 Applicable only in respect of parts affecting the correct functioning and satisfactory endurance of the cot.

6.1.1 All materials used shall be to a specification which is recognized as satisfactory by the Board, or shall be obtained from a source approved by the Board.

6.1.2 Leather shall not be used.

6.1.3 The choice of materials and the protective treatment shall be such that during the period between inspections as laid down by the manufacturer, no corrosion or deterioration shall render the cot unserviceable.

6.1.4 The cot, packed ready for stowage shall not support combustion nor shall it be likely to be rendered unserviceable by inadvertent contact with a match or lighted cigarette.

6.1.5 The magnetic effect of the cot shall not exceed 1° deflection of an ordinary aircraft compass placed at a distance of 1 foot.

7 Marking

7.1 The methods of inflation shall be clearly indicated and shall be readable by an attendant before the cot is inflated. The method of "topping up" shall be readable when the cot is inflated and floating and the attendant is also in the water wearing a conventional aircraft type life jacket.

7.2 Each detachable portion of the cot shall be marked with the following:

7.1.1 The manufacturer's approved inspection mark.

7.1.2 The part number.

7.1.3 Date of manufacture.

7.2 The markings prescribed in 2.2, 7.1 and. 7.2 shall be such that they will remain legible.