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**Small craft — Inflatable liferafts —**

**Part 1:  
Type I**

*Petits navires — Radeaux de survie gonflables —*

*Partie 1: Type I*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 9650-1 was prepared by Technical Committee ISO/TC 188, *Small craft*.

ISO 9650 consists of the following parts, under the general title *Small craft – Inflatable liferafts*:

- *Part 1: Type I*
- *Part 2: Type II*
- *Part 3: Material*

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## Introduction

This part of ISO 9650 is intended for inflatable liferafts for small craft used for leisure activities. It does not apply to liferafts required for ships under the International Maritime Organisation (IMO) *Safety Of Life At Sea* (SOLAS) Convention.

A liferaft manufactured and maintained in accordance with this part of ISO 9650 should provide:

- a reasonably safe refuge for a shipwrecked person awaiting rescue;
- a reasonable service lifetime, provided a user meets a manufacturer's clearly specified recommendations on stowage and maintenance.

Compliance with this part of ISO 9650 does not imply that a liferaft will be suitable in all circumstances.

A liferaft which complies with this part of ISO 9650 must be constructed in such a manner that maintenance is as easy and straightforward as possible.

A user must be responsible for selecting a liferaft appropriate to the intended circumstances of use. Manufacturers and vendors must inform potential purchasers of the properties of the product, including possible choices (e.g. different equipment packs), limits on normal usage, and recommendations on stowage and maintenance.

The tests in this part of ISO 9650 have been designed to simulate reality as closely as possible. Compliance with a test does not guarantee similar performance in service. For example, compliance with the re-righting tests does not guarantee that a liferaft can be righted at sea by an exhausted person in any circumstances.

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# Small craft — Inflatable liferafts —

## Part 1: Type I

### 1 Scope

This part of ISO 9650 specifies the design, performance and marking characteristics, and gives the test methods for inflatable liferafts of Type I:

- having a carrying capacity of 4 to 12 persons;
- applicable on small craft of hull length up to 24 m;
- suitable for launching overboard from a height not exceeding 6 m;
- divided into two groups (group A and group B);
- designed for extended voyages, where high wind and significant wave heights may be experienced, but excluding abnormal conditions such as hurricanes;
- completely self-sufficient;
- prepared to meet serious emergencies without expectation of outside assistance;
- and not voyaging in extreme zones (e.g. Southern Oceans).

Type II liferafts are specified in ISO 9650-2.

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 1402, *Rubber and plastics hoses and hose assemblies — Hydrostatic testing*

ISO 6718, *Bursting discs and bursting disc devices*

ISO 17339:2002, *Ships and marine technology — Sea anchors for survival craft and rescue boats*

IMO SOLAS 83, Chapter III, Resolution A.658 (16), Annex 2

SOLAS International Life-Saving Appliance Code (LSA Code)

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

**3.1 operating pressure**  
pressure determined by the designed reseal pressure of the relief valves, except that, if the actual reseal pressure of the relief valves, determined by testing, exceeds the designed reseal pressure by more than 15 %, the higher figure is used

**3.2 full load**  
load of the number of people corresponding to the maximum capacity (see 5.2.3.2) of the liferaft, each weighing 75 kg, seated at their normal place, or, unless otherwise specified, load of the number of uniformly distributed equivalent masses weighing 75 kg (e.g. bags of sand)

**3.3 buoyancy chamber**  
**buoyancy compartment**  
chamber contributing to the buoyancy of the liferaft

### 4 General provisions

#### 4.1 Introduction

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4.1.1 An inflatable liferaft comprises: (standards.iteh.ai)

- a structure;
- an inflation system; <https://standards.iteh.ai/catalog/standards/sist/cba9b4bc-7aa0-4f66-8df6-9d8bb0242789/iso-9650-1-2005>
- fittings;
- equipment;
- instructions;
- packaging.

4.1.2 The structure of a liferaft comprises:

- at least two independent buoyancy chambers;
- a floor;
- a canopy and a canopy support;
- stabilisation means.

4.1.3 The inflation system comprises:

- an initial inflation system;
- a manual back-up inflation system.

4.1.4 The fittings shall include:

- external lights;
- painter line/mooring line;



- towing point;
- external and internal lifelines;
- righting system;
- boarding facilities;
- sea anchor;
- rescue quoit and line;
- safety knife.

Further fittings may be included, provided the tests of Clause 6 are completed.

#### 4.2 Groups of Type I liferafts

This part of ISO 9650 defines two groups of Type I liferafts according to the expected air-temperature conditions:

- group A liferafts shall be designed to inflate correctly in a air temperature between  $-15\text{ }^{\circ}\text{C}$  and  $+65\text{ }^{\circ}\text{C}$ ;
- group B liferafts shall be designed to inflate correctly in a air temperature between  $0\text{ }^{\circ}\text{C}$  and  $+65\text{ }^{\circ}\text{C}$ .

This part of ISO 9650 also gives the general and specific requirements that these liferaft groups, their equipment, etc. shall fulfil.

Compliance of the liferaft with this part of ISO 9650 does not guarantee that the liferaft will not overturn.

## 5 Requirements

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### 5.1 General requirements

Inflatable liferafts of groups A and B, serviced in accordance with the manufacturer's instructions, shall provide adequate protection against the risks incurred and shall satisfy the requirements described in the this part of ISO 9650.

Table 1 summarizes the subclause(s) to consider for each main characteristic.

Table 1

Characteristics	Requirements in	Tests methods in
Launching	5.2.1.1	6.2
Inflation	5.2.2	6.3
Buoyancy	5.2.3	
Stability and performance at sea	5.2.4	6.4, 6.5, 6.6, 6.7
Solidity, watertightness, materials	5.2.5	6.8, 6.9
Habitability	5.2.6	
Visibility to rescuers	5.2.7	
Fittings and equipment	5.2.8	
Instructions and marking	5.2.9	
Packaging	5.2.10	

## 5.2 Detailed requirements

### 5.2.1 Deployment

#### 5.2.1.1 Launching

The liferaft shall be capable of being dropped into the water from a height of 6 m above the water level without damage, in accordance with 6.2.

#### 5.2.1.2 Properties of the painter line

The painter line shall be positioned at the entrance to the liferaft.

The length of the painter line shall be at least 9 m.

A coloured indication shall be visible at less than 1 m from the firing point.

The painter line shall be efficient and shall be easy to handle and to pull.

The breaking load of the painter line, and of its attachment system to the liferaft, shall not be less than 7,5 kN. The painter-line attachment system shall be constructed so as to not damage the liferaft on failure of the attachment system.

The painter line shall withstand weathering.

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### 5.2.2 Inflation

The liferaft shall inflate within the temperature ranges according to 4.2, during the course of the launching and temperature inflation tests conducted in accordance with 6.2 and 6.3.

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#### 5.2.2.1 Initial inflation system - General

The initial inflation system shall be actuated by a pull on the painter line, thereby allowing the release of a pressurised gas. All subsequent force exerted on the painter line shall act directly on the towing point, or any other point offering strength characteristics equivalent to the values required for the painter line (see 5.2.1.2).

This inflation system may be supplemented by an automatic inflation system, i.e. inflation without pulling on the painter line (e.g. hydrostatic pressure-sensitive automatic actuation).

#### 5.2.2.2 Actuation device

The inflation-system mechanism shall attain the fully open position by exerting a pulling force on the painter line, not exceeding 150 N and with a travel not exceeding 200 mm.

The operating device shall be made of corrosion-resistant material capable of withstanding, without damage, a painter load of 450 N. The operating cable assembly shall not cause any wear of the fabric of the buoyancy chambers by abrasion.

#### 5.2.2.3 Inflation gas

##### 5.2.2.3.1 Type of gas

The gas, or mixture of gases, used for inflating the liferafts shall be non-toxic, for example carbon dioxide. The type and quantity shall provide a sufficient rate of inflation to allow the complete system to meet the specified inflation performance requirements for the equipment in which it is installed.

If the gas used is carbon dioxide, its moisture content shall be no more than 150 parts of water per million parts of gas by mass.

### 5.2.2.3.2 Quantity of gas

The quantity of gas shall be sufficient for the liferaft to inflate and achieve working pressure under low temperatures, as required by 6.3.4.

The quantity of gas in the cylinder shall be such that the internal pressure of the cylinder, at the temperature of + 65 °C, does not exceed the hydraulic test pressure of the cylinder.

### 5.2.2.4 Gas cylinder

The gas cylinder shall conform to national or international regulations.

It shall be corrosion-proof in accordance with the specifications of ISO 9650-3.

For an inflation system, where a liquefied gas is used, the cylinder shall be fitted with a corrosion-proof bursting disc in accordance with ISO 6718, or with an equivalent safety device to prevent bursting of the cylinder. The bursting disc or the safety device shall operate prior to the internal cylinder pressure reaching the hydraulic test pressure.

### 5.2.2.5 High-pressure hose assembly (if fitted)

Where a high-pressure hose assembly is used to convey the gas from the cylinder to the buoyancy chamber, it shall meet the following conditions:

- a) there shall be no leaks or any sign of deterioration after having been subjected, during at least 1 min, to a hydraulic test in accordance with ISO 1402, under a pressure of 12,5 MPa for liquefied gases and of 20 MPa for non-liquefied gases;
- b) it shall operate within a temperature range:
  - 1) between – 45 °C and + 65 °C inclusive for liquefied gases and carbon dioxide (CO<sub>2</sub>);
  - 2) between – 20 °C and + 65 °C inclusive for non-liquefied gases;
- c) at the lowest temperature of each of the ranges defined in b) above, the hose shall be bent through 180° over a mandrel of radius 5 cm and shall meet the requirements of a);
- d) the hose assembly shall not be in contact with any sharp edges and shall not show any sign of corrosion when tested in accordance with the test specified in ISO 9650-3;
- e) the bursting pressure of the hose assembly shall not be less than 168 % of the hydraulic test pressure.

NOTE A new hose may be used for each operating test.

### 5.2.2.6 Valves

#### 5.2.2.6.1 Topping-up inflation valves

All inflatable compartments, including canopy supports, but excluding, where fitted, boarding ramps, shall be provided with a topping-up non-return valve allowing the compartments to be inflated by a bellows or a pump.

#### 5.2.2.6.2 Non-return valve

Sufficient non-return shall be provided at gas inlets to comply with 5.2.3.1.

#### 5.2.2.6.3 Relief valve

The number and location of relief valves shall be such that the pressure is limited in all the inflatable compartments.