

This is a preview of "ISO 25649-1:2017". [Click here to purchase the full version from the ANSI store.](#)

First edition
2017-08

Floating leisure articles for use on and in the water —

Part 1: Classification, materials, general requirements and test methods

Articles de loisirs flottants à utiliser sur ou dans l'eau —

*Partie 1: Classification, matériaux, exigences et méthodes d'essai
générales*



Reference number
ISO 25649-1:2017(E)

© ISO 2017

This is a preview of "ISO 25649-1:2017". Click [here](#) to purchase the full version from the ANSI store.



COPYRIGHT PROTECTED DOCUMENT

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

This is a preview of "ISO 25649-1:2017". Click here to purchase the full version from the ANSI store.

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Classification and criteria to distinguish floating leisure articles from aquatic toys	4
5 General safety requirements and test methods related to all classes	6
5.1 General.....	6
5.2 Body entrapment.....	6
5.2.1 General.....	6
5.2.2 Requirements on body entrapment.....	8
5.2.3 Test procedure.....	8
5.2.4 Depths of gaps and openings.....	8
5.2.5 Method of measuring.....	9
5.3 Torso entrapment on safety line with regard to children.....	9
5.3.1 Requirements.....	9
5.3.2 Test method.....	9
5.4 Accessible protruding parts causing entanglement.....	9
5.4.1 Requirements.....	9
5.4.2 Test method.....	9
5.5 Human subject testing.....	10
5.5.1 General.....	10
5.5.2 Test panel.....	10
5.5.3 Assessment panel.....	11
5.5.4 Positioning and posture of test subjects for testing floating stability (if applicable).....	11
5.5.5 Basic test postures.....	11
5.6 Design working pressure.....	12
5.6.1 Requirements.....	12
5.6.2 Test method.....	12
5.7 Load bearing components.....	12
5.7.1 Requirements.....	12
5.7.2 Test method.....	12
5.8 Towing device.....	12
5.8.1 Requirements.....	12
5.8.2 Test method.....	12
5.9 Valves and valve adapters.....	12
5.9.1 Requirements.....	12
5.9.2 Test method.....	13
5.9.3 Numbering of air chambers.....	13
5.10 Edges, corners and points.....	13
5.10.1 Requirements.....	13
5.10.2 Test method.....	13
5.11 Shearing and crushing points.....	13
5.11.1 Requirements.....	13
5.11.2 Test method.....	14
5.12 Strength of the hull and test conditions.....	14
5.12.1 Requirements.....	14
5.12.2 Pressure test.....	14
5.12.3 Heat test (not applicable to Class D devices).....	15
5.12.4 Air tightness test for inflatables made from unsupported material.....	15

This is a preview of "ISO 25649-1:2017". Click here to purchase the full version from the ANSI store.

5.12.5	Air tightness test for inflatables made from reinforced or fabric covered material	16
5.13	Buckles and other fixings	16
5.13.1	Requirements	16
5.13.2	Test methods	16
6	Material requirements and test methods	16
6.1	General	16
6.1.1	Requirements	16
6.1.2	Test method	16
6.2	Chemical requirements for materials making up the hull, unsupported or reinforced	17
6.2.1	General	17
6.2.2	Resistance to mineral oil	17
6.2.3	Resistance to chlorinated salt water	17
6.3	Physical requirements	17
6.3.1	Resistance to cold	17
6.3.2	Resistance to heat	17
6.4	Mechanical requirements of unsupported hull materials	18
6.4.1	General	18
6.4.2	Resistance to puncturing	18
6.5	Mechanical requirements for reinforced hull materials	18
6.5.1	General	18
6.5.2	Adhesion of coatings (if applicable)	18
6.6	Other materials	19
6.6.1	Wood	19
6.6.2	Metal and synthetic material parts	19
6.7	Threads	19
6.7.1	Requirements	19
6.7.2	Test method	19
7	Durability of warnings and markings	19
7.1	Resistance to perspiration	19
7.1.1	Requirements	19
7.1.2	Test method	20
7.2	Resistance to chlorinated salt water	20
7.2.1	Colour fastness	20
7.2.2	Test liquid	20
7.2.3	Apparatus	20
7.2.4	Test method	20
7.3	Adhesion of markings	20
7.3.1	Requirements	20
7.3.2	Test method	20
7.4	Provision of repair means	20
	Annex A (normative) Templates	21
	Annex B (informative) Examples of openings	23
	Bibliography	29

This is a preview of "ISO 25649-1:2017". [Click here to purchase the full version from the ANSI store.](#)

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

ISO 25649-1 was prepared by the European Committee Standardization (CEN) Technical Committee CEN/TC 136, *Sports, playground and other recreational facilities and equipment*, in collaboration with ISO Technical Committee TC 83, *Sports and other recreational facilities and equipment*, in accordance with the agreement on technical cooperation between ISO and CEN (Vienna Agreement).

A list of all the parts in the ISO 25649- series can be found on the ISO website.

Introduction

0.1 Motives, problems, risk assessment, methods

Investigations in statistical data related to drowning accidents and near-drownings create a new awareness about the enormous relevance of drownings in many countries. In particular, during childhood drowning is the second most common cause of death. Due to a lack of exactness of the available statistical data, they do not reveal details concerning the relation between drowning accidents and the involvement of certain products. Such links can be shown only for segments of the wide range of water activities related products. Consumer protection needs to rely on conclusions by risk analysis, experience and analogy to known cases. Considerations based on probability and the precautionary principle is the second access to the problem. That applies in particular for the product group “Floating leisure articles for use on and in the water” as this group is constituted here and now as a market segment to be addressed by standardization for safety reasons. Beyond the statistical deficiencies, relations between certain products and an increased risk of drowning are plausible. A risk analysis undertaken by WG 13 shows what the partial and final risks are.

Until now, standardization has addressed the risks through a wide series of standards aiming at the protection against drowning and covering a number of products used in leisure activities on and in the water. There are standards covering the relevant products for activities like playing in the water, water sports, boating, diving, learning to swim and even the emergency devices as buoyancy aids and life jackets. Beyond these typical and traditional activities and products, there is a new tendency for the creation and marketing of more and more new products. They are all aiming to increase pleasure and entertainment on the water but also more speed, action and thrill as far as the new adventurous activities as “tubing”, “white water rafting” etc. is concerned. The new products are partly modified traditional core products or they are derived from them and further developed to something new. Additionally, there is a clear trend to bring more and more formerly land based playground equipment on the water. The term “amphibiation” is justified as in many cases the original function of the product is maintained, i.e. they can be used both ways. Typical examples for the first mentioned kind of new products are modifications of inflatable boats into a bathing raft in fantasy shape or the further development of the earlier swim-ring into a flotation seat. Examples for “amphibians” exist in inflatable trampolines, climbing installations being put on the water for action and fun. Inflatable floating armchairs and sun loungers including the mini bar and sun shade rather serve for more comfort and relaxation when bathing. This trend is clear and very likely to continue.

It can be shown that the nature of these new products provide an equal or even higher risk potential than the original core products. In parallel, the number of these products override the number of the core products. In cases of collective use, the frequency of use is considerably increased which in turn increases the likelihood of accidents — drownings. Drowning is the final risk of the mentioned product related activities, there are other somewhat lesser evils — partial risks — which are likely to happen too independently or in combination with the final risk.

Having in mind the existing safety related standardization, an evident discrepancy emerges. Standardization in the past was focused on the core products and has neglected the huge amount of products forming the so called “grey zone”. We always were aware of this fact, but the “grey zone” was so disturbingly complicated and never really considered and investigated. The triggering incident to change this was the swim seat case, its interaction with aquatic toys and all the many related products mentioned above. The fact of negligence highlights the reason. It was due to this inconsistency, variety and complexity that these products were usually excluded from the scopes of related standards. Experts involved in this standardization work therefore invented the term “grey zone products”. A systematic risk analysis or an investigation in drowning accidents was never made. What matters today is not so much the fact of a disturbing gap in the series of existing standards but the knowledge that there are a number of coincidences:

- all in all the main user groups of these products are children and adolescents who in turn are the main victims of drowning;
- the main areas where drowning happens are identical with the areas of use for such products (rivers, lakes, pools, bathing beaches);

This is a preview of "ISO 25649-1:2017". [Click here to purchase the full version from the ANSI store.](#)

- the risks can be easily identified partly proven, the increase in numbers and frequencies were already mentioned.

0.2 Equal risk, equal requirement

- Equality of risks shall lead to an equality of technical rules (risk-/rule-alignment);
- closing the standardization gap, completeness;
- setting of clear boundaries between the product areas in order to avoid incorrect certification (e.g. unjustified CE-Mark), “standard jumping” including escape from tougher standards into weaker ones, contributing to overcome the problems of an extremely wide and vague definition of aquatic toys according to European Directive 2009/48/EC and the distinction of shallow and deep water as dividing criterion;
- avoidance of individually established testing procedures by the various test houses in the absence of a unified technical rule.

0.3 Risks and need for prevention

- Relevance of drowning is proven (age groups, places, partly product involvement);
- new products increase frequency of use and amount of products likely to contribute to accidents;
- theoretical risk analysis shows additional risks below the final risk of drowning;
- plausibility and likelihood of harm to users is evident, so is the probability of adequate safety standards to avoid or minimize this;
- to contribute positively to the basic problem of parental supervision which is needed and claimed with regard to child activities but in many cases weak, not existing or neglected;
- safety by utmost inherent safety by design from the product in addition to this technical safety shall be supplemented through supervision it is recommended for younger children;
- we should recognize that there are new trends to bring more and more former land based products on the water, as well as trends to adventure activities increasing the thrill of water related leisure activities and entertainment;
- need for prevention.

0.4 Body dimensions by the USA-population

Body entrapment, human tests subjects and USA anthropometric data: ISO 25649-1 includes test procedures based on human test subjects. The anthropometric data for the worst case human test subject – the heaviest and biggest person representing the 95th percentile of a population – have been derived from European body measurement data. With the current internationalization of this European standard to an ISO 25649 series it is necessary to adapt these European data to international circumstances. The international worst case regarding body dimensions is constituted by the USA-population. The 95.% body weight for the USA population has to be increased from 90 kg to 110 kg and the Body Mass Index (BMI) should be specified between 35 and 40. This corresponds to a body height of 170 cm to 175 cm. Accordingly the rigid test probe has to be modified too. An amendment concerning this subject is in process and will be launched immediately after the formal vote procedure.