

Australian/New Zealand Standard™

Flotation aids for water familiarization and swimming tuition



AS/NZS 1900:2014

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee CS-021, Swimming Aids. It was approved on behalf of the Council of Standards Australia on 29 July 2014 and on behalf of the Council of Standards New Zealand on 13 June 2014.

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The following are represented on Committee CS-021:

Australian Competition and Consumer Commission
Australian Toy Association
Austswim
Choice
Consumers Federation Australia
National Retail Association
NSW Fair Trading
Royal Life Saving Society, Australia
Safekids New Zealand
Swimming Pool and Spa Alliance
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Australian/New Zealand Standard™

Flotation aids for water familiarization and swimming tuition

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CS-021, Swimming Aids, to supersede AS 1900—2002, *Flotation aids for water familiarization and swimming tuition*.

This Standard incorporates Amendment No. 1 (June 2015). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.

The principal difference from the previous edition is a revision of the ‘strength of sewed seams’ and the ‘fastener security’ clauses. These clauses had been causing some concern amongst manufacturers and this prompted the review and subsequent revision of the Standard.

During the review, Committee CS-021 revisited the category of devices covered by the Standard and agreed that flotation toys would remain under the AS/NZS ISO 8124 series, *Safety of toys*, and that unattached flotation devices would still not form part of AS/NZS 1900. In addition, a review of the current European Standards was conducted. The EN 13138 series, *Buoyant aids for swimming instruction*, was considered to be more complex and comprehensive than necessary. It was agreed that AS 1900—2002 be revised rather than to adopt the European Standard.

Other changes of note in this revision include:

- (a) An update of the referenced documents.
- (b) Additional clause on strength of fabric.
- (c) An update to the requirement for threads in load bearing parts so that the use of natural fibres is not allowed.
- (d) A reduction of the leaking/bursting pressure for inflatable flotation aids from 15 kPa to 10 kPa.
- (e) Clarification on strength of sewed seams.
- (f) Additional force requirement for side release fasteners.
- (g) Inclusion of a small parts test.
- (h) A new requirement to ensure that markings are resistant to chlorinated water and ultraviolet light.
- (i) An amendment of the warnings to be consistent with the text specified in EN 13138, however the lettering size remains at a minimum of 6 mm (compared with 5 mm in the European Standard).
- (j) The deletion of cadmium plating as an acceptable coating for metal parts.
- (k) An update to the body mass to age equivalence shown in tables throughout this Standard to more closely align with current averages for body mass based on the age of the intended user.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

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FOREWORD

The main purpose of this revision of AS 1900 was to address concerns in relation to the ‘strength of sewed seams’ and the ‘fastener security’. These clauses have for a number of years been causing some difficulty amongst manufacturers, and Committee CS-021 decided, that while reviewing these clauses, it would also be appropriate to review the whole Standard.

As part of the process the Committee conducted a review of the European Standard EN 13138, *Buoyant aids for swimming instruction*. This 3-part Standard is quite comprehensive and is structured differently to this Standard. The Committee agreed that AS 1900—2002 was working well, apart from one or two clauses, and as there had been no major identified instances of compliant product failures they would revise the current Australian Standard rather than adopt the European Standard.

The Committee agreed that AS/NZS 1900 should continue to focus on the in-water safety of non-swimmers and that the scope of the Standard should remain restricted. The Standard continues to cater only for those flotation aids worn on or attached to the body, or in which the user sits, and are specifically designed to either enable individuals to gain confidence through water familiarization, or to assist them in acquiring unaided buoyancy through swimming tuition.

The reason for the exclusion of flotation toys from this edition of AS/NZS 1900 is that, although such items are unarguably used most of the time to provide flotation assistance, they are first and foremost toys, and should therefore be encompassed within the AS/NZS ISO 8124 series, which was written specifically for toys. Similarly, kickboards and other unattached flotation devices are also excluded from this Standard as such items are generally used either in conjunction with a flotation aid for swimming tuition or as a training aid by people who are able to swim.

This Standard is still aimed primarily at specifying design and performance requirements for manufacturers of flotation aids. The marking requirements are seen by the consumer organizations represented on Committee CS-021 as providing a strong message to the purchasers of these products.

STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Flotation aids for water familiarization and swimming tuition**

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies requirements for the design, performance and marking of flotation aids worn on or attached to the body or in which the user sits for the purpose of either enabling persons to gain confidence through water familiarization, or to assist them in acquiring unaided buoyancy through swimming tuition.

The Standard does not apply to—

- (a) flotation toys;
- (b) unattached flotation devices;
- (c) articles designed only for therapeutic use;
- (d) articles designed for use by disabled persons; and
- (e) personal flotation devices (PFDs) for use in boating and other recreational water activities.

NOTES:

- 1 PFDs have different application and are covered by other Standards. In general, the requirements specified in the AS 4758 series are more stringent than those specified herein.
- 2 Appendix F contains a list of typical products covered by this Standard and those that are not.

1.2 OBJECTIVE

The objective of this Standard is to provide safety requirements for the manufacture of flotation aids for non-swimmers which assist them in—

- (a) becoming familiarized with water; and
- (b) learning to swim.

1.3 NORMATIVE REFERENCES

The following are the normative documents to in this Standard.

NOTE: Documents referenced for informative purposes are listed in Appendix H.

AS

1192	Electroplated coatings—Nickel and chromium
1789	Electroplated zinc (electrogalvanized) coatings on ferrous articles (batch process)
2001	Methods of test for textiles
2001.2.20	Method 2.20: Physical tests—Determination of seam breaking force
2001.4.3	Method 4.3: Colourfastness tests—Determination of colourfastness to rubbing
2001.4.21	Method 4.21: Colourfastness tests—Determination of colourfastness to light using an artificial light source (mercury vapour, tungsten filament, internally phosphor-coated lamp)

AS

2193 Calibration and classification of force-measuring systems

2860 Textiles—Stitch types—Classification and terminology

AS/NZS ISO

8124 Safety of toys

8124.1 Part 1: Safety aspects related to mechanical and physical properties

8124.3 Part 3: Migration of certain elements (ISO 8124-3:2010, MOD)

1.4 DEFINITIONS

For the purpose of this Standard, the definitions below apply.

1.4.1 Flotation aid

An article which is worn on or attached to the body or in which the user sits and which, when fitted correctly in accordance with the manufacturer's instructions, provides flotation assistance for the purpose of enabling a person to gain confidence through water familiarization, or to assist them in acquiring unaided buoyancy through swimming tuition.

NOTES:

- 1 The aid need neither support the wearer in a position with the nose, mouth and chin clear of the water, nor assist the wearer to achieve such a position.
- 2 Typical means of wearing or attaching a flotation aid include a singlet, shoulder straps, crotch straps, a harness, tapes or other arrangements.

1.4.2 Flotation aid seat for babies and toddlers

A flotation aid in which the user sits.

1.4.3 Flotation toy

An article which is not worn or attached to the body and which, when ready for use, is intended as a buoyant toy.

1.4.4 Inflatable chamber

A compartment capable of being inflated with air for the purpose of providing buoyancy.

1.4.5 Normal room temperature

A temperature of $20 \pm 2^\circ\text{C}$.

1.4.6 Swimming aid vest

A flotation aid that fits over the shoulders and around the chest and/or waist of the wearer.

SECTION 2 DESIGN AND CONSTRUCTION

2.1 GENERAL DESIGN

2.1.1 Security of fit

Flotation aids, except for those defined by Clause 1.4.2, shall be designed in such a way that they can be securely fitted to the appropriate size wearer and, when correctly fitted, shall be incapable of dislocation in normal use.

NOTE: Care should be taken when selecting a flotation aid that it is the correct size for the intended wearer.

Press-studs, hook-and-loop fastening fabric, or other press-close fastening methods requiring a tear-away or peel-away action to release, or knots, or 'D' rings, shall not be used as the sole means of maintaining the security of fit.

NOTE: See also Clause 2.6.

2.1.2 Finish

A flotation aid shall—

- (a) be free from defects liable to impair its performance;
- (b) have no hazardous sharp edges and hazardous sharp points which could injure the wearer or others, or which could damage any inflatable chamber in the aid; and
- (c) have all flashing removed when flotation aids are manufactured from moulded plastics.

NOTE: Tests for hazardous sharp edges and hazardous sharp points can be found in AS/NZS ISO 8124.1.

2.2 SOURCE OF BUOYANCY

Where the buoyancy of a flotation aid is achieved by cellular material, inflatable chambers or hollow moulded chambers, or a combination of these, it shall meet the following requirements:

- (a) Cellular material shall be of the closed-cell type.
- (b) Inflatable chambers shall incorporate valves complying with the requirements of Clause 2.3.
- (c) Hollow moulded chambers shall be designed to prevent the ingress of water into those chambers.

NOTE: Closed-cell material may be natural (e.g. cork) or made from plastics.

2.3 VALVES

2.3.1 General

Each valve shall be a non-return valve and fitted with a permanently attached stopper.

2.3.2 Protrusion

When the flotation aid is inflated, the stopper and any protruding portion of the valve shall be capable of being pushed into the flotation aid so that it does not stand more than 5 mm from the surface of the flotation aid.

2.3.3 Mouthpiece

Valves shall be designed for oral inflation. The mouthpiece shall be non-metallic and shall have a smooth finish. Tyre valves shall not be used.

2.4 METAL PARTS

All metal parts shall be resistant to corrosion by fresh water, salt water and chlorinated pool water, or shall be adequately protected against corrosion by electroplating, complying with the following requirements:

- (a) *Nickel plus chromium plating* Not inferior to a coating complying with AS 1192 in respect of service condition number '4'.
- (b) *Nickel plating* Not inferior to a coating complying with AS 1192 in respect of service condition number '3'.
- (c) *Zinc plating* Not inferior to Class Fe/Zn 25c, with passivation, of AS 1789.

NOTE: Attention is drawn to the necessity to prevent corrosion by galvanic action and by substances used for the coating of fabrics.

2.5 MIGRATION OF CERTAIN ELEMENTS

Flotation aids shall conform to the requirements set out in AS/NZS ISO 8124.3.

NOTE: Any reference in AS/NZS ISO 8124.3 to 'toys', for the purpose of this Clause, will include flotation aids.

2.6 WEBBING OR TAPES

2.6.1 Attachment with webbing or tapes

If intended to bear directly on the body of the wearer, webbing or tapes shall not be less than 20 mm wide when wet and shall be designed to maintain a flat profile.

2.6.2 Finish

The ends of webbing or tapes shall be finished by such means that prevent them from fraying.

2.6.3 Fasteners

Fasteners shall not be removable from the webbing or tapes without causing damage to the flotation aid or the use of a tool.

2.7 SEWED FABRICS

2.7.1 Fabric

Fabric used in a flotation aid that is fundamental to the operation of the flotation aid with respect to maintaining the flotation of the user shall not rupture when tested in accordance with Clause 2.7.4.

2.7.2 Stitching

All stitching that relates to or affects the fundamental operation of the flotation aid with respect to maintaining the flotation of the user, shall be lockstitch conforming to Stitch Type 301 in accordance with AS 2860, or a locking-type stitch suitable for the fabric being sewn.

NOTE: An illustration of lockstitch conforming to Stitch Type 301 in AS 2860 is contained in Appendix G.

Where monofilament fibre is used, backstitching shall also be employed. Where a breakage occurs, the area shall be oversewn by restarting the stitching not less than 25 mm back from the break.

2.7.3 Thread

Thread used for sewing shall be compatible with the fabrics being sewn.

Threads used to sew load bearing components shall be manufactured from synthetic materials whose properties correspond to polyester or polyamide fibres.

Natural fibres shall not be used.

2.7.4 Strength of sewed seam

When tested in accordance with AS 2001.2.20, the breaking strength of a sewed seam that is fundamental to the operation of the flotation aid with respect to maintaining the flotation of the user shall not be less than that specified in Table 2.1.

TABLE 2.1
STRENGTH OF SEWED SEAMS

Mass	Age equivalent to mass (see Note)	Breaking strength
kg	years	N
Under 15	Under 2	70
15 to under 30	2 to under 6	120
30 to under 60	6 to under 12	250
60 and over	12 and over	450

NOTE: Age groups are for guidance only. The correlation between the age and the body mass can vary considerably.

If a flotation aid does not have the 'mass' and 'age equivalent to mass' (see Table 2.1) in the same category of wearer, or they overlap categories, then the aid shall meet the requirements of the highest applicable category.

2.8 INFLATABLE FLOTATION AIDS

Inflatable flotation aids shall incorporate a minimum of two separate chambers. Sizing of the chambers shall be such that failure or deflation of any single chamber shall result in a loss of no more than 2/3 of the original buoyancy. Failure or deflation of any chamber shall not affect the security of fit of the aid, as required by Clause 2.1.1.

2.9 SMALL PARTS

The flotation aid shall meet the small parts requirements of AS/NZS ISO 8124.1.

NOTE: Any reference in AS/NZS ISO 8124.1 to 'toys', for the purposes of this Clause, will include flotation aids.

2.10 FLOTATION AID SEATS

Flotation aid seats shall be designed so that when used with the correct age/mass, as outlined in Table 3.1, the possibility of overturning in normal use is minimized.

SECTION 3 PERFORMANCE

3.1 BUOYANCY OF FLOTATION AIDS

When determined in accordance with Appendix A, the buoyancy of a flotation aid shall not be less than that specified in Table 3.1.

TABLE 3.1
BUOYANCY OF FLOTATION AIDS

Category of wearer		Buoyancy, N					
Mass kg	Age equivalent to mass (see Note)	Type of flotation aid					
		Swimming aid vests	Attached flotation rings	Inflatable armbands (per pair)	Flotation belts	Back- bubble	Flotation seats
Under 15	Under 2	N/A	N/A	20	N/A	N/A	100
15 to under 30	2 to under 6	20	40	25	15	20	N/A
30 to under 60	6 to under 12	25	49	30	20	25	N/A
60 and over	12 and over	30	78	40	25	30	N/A

NOTE: Age groups are for guidance only. The correlation between the age and the body mass can vary considerably.

Flotation aids that have intentionally adjustable buoyancy (e.g. in the form of removable foam layers), shall be tested at their maximum buoyancy.

If a flotation aid does not have the 'mass' and 'age equivalent to mass' (see Table 3.1) in the same buoyancy category, or they overlap categories, then the aid shall be tested to the highest mass category.

3.2 STRENGTH OF ATTACHMENT ASSEMBLY

When tested in accordance with Appendix B, the attachment assembly shall not—

- (a) show evidence of detachment from the flotation aid;
- (b) show evidence of webbing or tapes slipping more than 25 mm past or through a fastening device (e.g. buckle, snap-lock fitting and similar); or
- (c) fail or unfasten so that the test weight is released.

3.3 RESISTANCE TO HEAT

The ability of the flotation aid to withstand exposure to heat shall be such that when tested in accordance with Appendix A, it shall not suffer a loss of buoyancy greater than 10% of its initial buoyancy after being subjected to a temperature of $60 \pm 2^\circ\text{C}$ for 4 h. For the purpose of this requirement, flotation aids which employ inflatable chambers as a source of buoyancy shall have those chambers inflated to a pressure of $6.9 + 0.5, -0$ kPa at normal room temperature prior to exposure to heat.