



Child use and care articles—Child seats for cycles—Safety requirements and test methods (EN 14344:2004, MOD)

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-

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Australian Standard[®]

**Child use and care articles—Child seats
for cycles—Safety requirements and
test methods (EN 14344:2004, MOD)**

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee CS-110, Bicycles and Bicycle Accessories, to supersede AS/NZS 4287:1995, *Child carrier seats for pedal bicycles—Safety requirements*.

The objective of this Standard is to specify the safety requirements and test methods for child seats that are intended to be mounted on pedal cycles, and electrically power-assisted pedal cycles, in order to transport a child passenger who is capable of sitting unaided and who weighs not more than 22 kg.

The specified safety requirements and test methods aim to ensure that—

- (a) a child is well-restrained and not exposed to hazards while being transported in a child carrier seat on a pedal cycle, excluding hazards arising in a crash (i.e. fall or collision); and
- (b) the child with carrier seat represents as minimal a hazard as possible for the operator of the pedal cycle to which they are attached (e.g. change in centre of mass notwithstanding).

In particular, the performance specifications relate to retaining the child in the seat during normal operation, retaining the seat mounted on the bicycle during normal operation, protecting the child from hazards on the bicycle (e.g. moving parts), and minimising lateral sway of the bicycle (by preventing the child's CM falling too far laterally).

The performance specifications do not relate to the protection offered by a seat in a crash, and this function has not been evaluated.

In 2014 the CS-110 committee reviewed available anthropometric data for children and identified that a small proportion of children reached the maximum dimensions before the approximate age specified in Clause 1 and Clause C.1.4. This highlights the importance of considering size and weight in preference to age.

This Standard is an adoption with national modifications and has been reproduced from EN 14344:2004, *Child use and care articles—Child seats for cycles—Safety requirements and test methods* and has been varied as indicated to take account of Australian conditions. The modifications are specified in Appendix ZZ.

As this Standard is reproduced from an International Standard, the following applies:

- (i) In the source text 'this European Standard' should read 'this Australian Standard'.
- (ii) A full point substitutes for a comma when referring to a decimal marker.

None of the normative references in the source document have been adopted as Australian or Australian/New Zealand Standards.

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

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AUSTRALIAN STANDARD

Child use and care articles—Child seats for cycles—Safety requirements and test methods (EN 14344:2004, MOD)**1 Scope**

This document specifies requirements for child seats for cycles, which are intended to be mounted on pedal cycles and electrically power assisted bicycles, in order to transport children with a weight from 9 kg up to 22 kg (approximately 9 months up to 5 years) and who are capable of sitting unaided.

NOTE Some European countries have special legislation for child seats for cycles. Compliance with this document may not meet this legislation.

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.

EN 71-1:1998, *Safety of toys – Part 1: Mechanical and physical properties*.

EN 71-3, *Safety of toys – Part 3: Migration of certain elements*.

EN 1811, *Reference test method for release of nickel from products intended to come into direct and prolonged contact with the skin*.

EN ISO 1043-1, *Plastics – Symbols and abbreviated terms – Part 1: Basic polymers and their special characteristics (ISO 1043-1:2001)*.

EN ISO 1043-2, *Plastics – Symbols and abbreviated terms – Part 2: Fillers and reinforcing materials (ISO 1043-2:2000)*.

ISO 4628-3, *Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 3: Assessment of degree of rusting*.

ISO 9227, *Corrosion tests in artificial atmospheres – Salt spray tests*.

ISO 11243, *Cycles – Luggage carriers for bicycles – Concepts, classification and testing*.

3 Terms and definitions

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

3.1**seat**

child seat intended to be mounted on a cycle

3.2**front seat**

child seat intended to be mounted on a cycle in front of the rider (between handlebar and rider)

3.3**rear seat**

child seat intended to be mounted on a cycle behind the rider

3.4**reclining seat**

front or rear seat that can transport a child either in an upright or in a reclined sitting position

3.5**integral guard**

guard that is part of, or pre-assembled with, another essential and major part of the seat (for example a footrest) and cannot be removed or can be removed by the use of tools only

3.6**additional guard**

guards that are always provided with the seat, but do not satisfy the definition of an integral guard

3.7**central plane**

vertical plane on which lies the centre line of the cycle, seat and the measuring instrument

3.8**reference plane**

horizontal plane defined on the seat measuring instrument, above the lowest points of the main sitting area of the seat

3.9**attachment system**

structure to attach the child seat to the cycle

3.10**footrest**

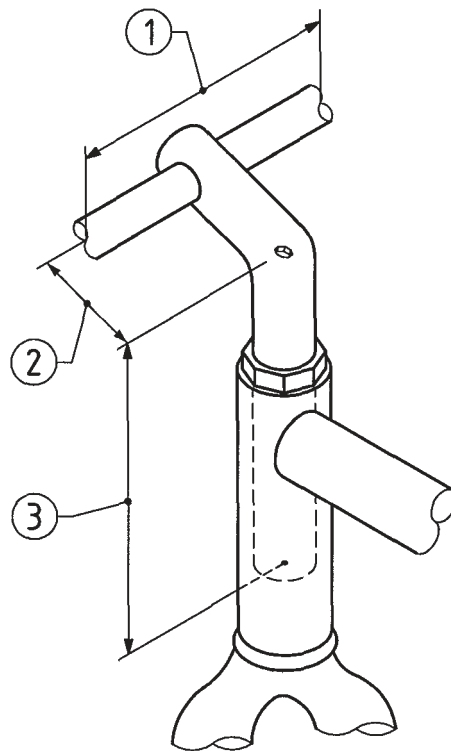
structure to support the child's foot

3.11**accessibility zone**

zones that are likely to be reached by the hands or toes of the child in the seat

3.12**handlebar and handlebar stem assembly (see Figure 1)**

- 1 handlebar – that is held by rider
- 2 extension – part of the handlebar stem that positions the handlebar in front of the steering axis
- 3 quill – part of some designs of the handlebar stem, that is co-axial with the steering axis and that fits partly into the fork steering tube



Key

- 1 handlebar
- 2 extension
- 3 quill

Figure 1 — Handlebar and handlebar stem assembly

3.13

restraint system

device designed to keep the child sitting in a safe position in the seat

3.14

crotch restraint

device designed to pass between the child's legs to prevent the child from sliding forward

4 Classification

Seats are classified according to the weight of the child carried and their mounting position on the cycle (see Table 1).

Table 1 — Classification of seats

Type of seat	Weight/capacity range	
	kg	
	9 – 15	9 – 22
Rear seat	A15	A22
Front seat between handlebar and rider	C15	Not permitted
Front seat in front of handlebar	Not permitted	Not permitted

EXAMPLE Designation of a seat to be mounted behind the rider (A), maximum load 15 kg (15) : Child seat A15.

5 General requirements and test conditions

5.1 Principle of the most onerous condition

Where a test calls for a seat to be mounted on a cycle, the tester shall refer to the purchase information (see 13) and instructions for use (see 14). It is allowed to use any cycle that is suitable according to this information. Each test shall be conducted with the seat in the most onerous condition for that test.

5.2 Tolerances and test conditions

Unless otherwise stated the following tolerances shall be used :

All forces shall have an accuracy of $\pm 5\%$.

All masses shall have an accuracy of $\pm 1\%$.

All dimensions shall have an accuracy of $\pm 1,0$ mm.

All time measurements shall have an accuracy of ± 1 s.

All angles shall have an accuracy of $\pm 1^\circ$.

All frequencies, amplitudes shall have an accuracy of $\pm 5\%$.

The seat shall be conditioned at a temperature of $(23 \pm 5)^\circ\text{C}$ for at least 2 h prior to test. All tests shall be carried out at a temperature of $(23 \pm 5)^\circ\text{C}$ unless otherwise specified.

5.3 Order of tests

The test shall be carried out in the order that they appear in this document. All tests shall be performed on one seat.

6 Construction

6.1 Dimensions

6.1.1 Seating area and footrests

6.1.1.1 Requirements for seating area and footrests

The dimensions of the main child supporting areas of the seat shall comply with items a, b, c, d, e and f in Table 2, when measured in accordance with 6.1.1.3.

NOTE 1 The reference plane of this measuring instrument lies approximately 55 mm above the sitting area, and measurements are made at or relative to this plane. Dimensions c and d in Table 2 are therefore some 55 mm less than the full dimensions of these features, whereas the dimensions in f are greater by a similar amount.

NOTE 2 The items h, i and j are not requirements but necessary points for the measuring instrument.

NOTE 3 For item f : the length of the lower leg is adjustable.

Table 2 — Dimensions

Dimensions in millimetres

Items		Class of seat		
		A15	C15	A22
a	Seat width (inside)	230 ± 30	230 ± 30	250 ± 40
b	Seat length (front to back)	190 ± 30	190 ± 30	200 ± 30
c	Minimum height of backrest	385	160	400
d	Minimum height of seat side	65	45	85
e	Minimum footrest overall width × length	75 × 100	75 × 100	75 × 115
f	Minimum range of footrest adjustment (height)	180 – 250	180 – 220	180 – 290
g	Minimum length of seat side	105	105	105
h	Corresponding knee point settings	154 – 244	154 – 244	154 – 294
i	Maximum lower leg length	270	270	340
j	Half maximum foot length	80	80	100

6.1.1.2 Mounting method for measuring instrument

The dimensions of the seat shall be checked using the measuring instrument described in Annex A. Mount the seat on a cycle or similar fixture, with any padding supplied with the seat fitted in accordance with the manufacturer's instructions. Place the measuring instrument in the seat with the point A touching the centre of the lower backrest area. Load the measuring instrument with a mass of 5 kg centred above point C and adjust the orientation of the seat until the reference plane of the instrument becomes horizontal.

NOTE When measuring the padded areas it is permitted that the measuring instrument is loaded to compress any padding in a similar way to a child sitting in the seat.

6.1.1.3 Test method for seating area and footrest

Take measurements relative to the points on the reference plane of the measuring instrument as follows (see Figure A.2) :

- a) measure the inside width of the seat, through point B ; check that this complies with the requirements given in Table 2, line a ;
- b) slide the 60 mm by 15 mm diameter pillar along the thigh scale until it touches the edge of the seat. The seat length is the distance between the edge of this pillar and point A ; check that this complies with the requirements given in Table 2, line b ;
- c) measure to the top centre of the backrest from point A. Take the linear distance between these two points using a calliper, or, if using the measuring instrument as shown, calculate from the vertical and horizontal displacement relative to point A ; check that this distance complies with the requirements given in Table 2, line c. If the child seat is fitted with an adjustable headrest measure to the top centre of the headrest, the headrest being in the lowest position ;
- d) measure vertically above point B to a horizontal straightedge laid across the seat sides ; check that this distance complies with the requirement given in Table 2, line d ;
- e) measure the maximum overall width and length of the area intended to support the child's foot, and check that the dimensions comply with the requirements, given in Table 2, line e ;
- f) set the end of the thigh scale – the knee point E – to the shorter of the two distances h from point D, as specified in Table 2, line h. Adjust the footrest to its highest position. Using the leg and foot component of the measuring instrument with the heel against the back of the footrest, check that the distance from E to F is not more than the smaller value of f (given in Table 2, line f). Re-set the knee point to the longer of the two distances h, adjust the footrest to its lowest position and check that the distance E to F is not less than the larger value of f (given in Table 2, line f) ;
- g) place a vertical straightedge on the reference plane touching the front edges of the seat sides. Check whether point C is between the straightedge and backrest of the seat.

6.1.1.4 Requirement for footrest adjustment

The height of the footrests shall be adjustable, either continuously or in steps of 40 mm or less, throughout a range of positions equal to or exceeding the range defined by 6.1.1.3 f).

6.1.1.5 Test method for footrest adjustment

Take the difference between the maximum and the minimum distances E to F found by the method stated in 6.1.1.3 f), and divide by the number of possible footrest positions minus one to find the average adjustment step. Check that this does not exceed the maximum specified in 6.1.1.4.

6.1.2 Centre of gravity mark for rear seats

6.1.2.1 Requirements for the centre of gravity mark for rear seats

Rear seats shall have a centre of gravity mark(s). This centre of gravity mark(s) shall be located on the same vertical and transverse plane as the centre of gravity for the seat with a child of maximum weight sat in it. When tested in accordance with 6.1.2.2 this centre of gravity mark shall be behind or no more than 10 mm in front of the theoretical centre of gravity.

6.1.2.2 Test method for the centre of gravity mark for rear seats

Find the position of the centre of gravity of the seat (e.g. by suspending it from a plumbline, twice from different points) and its mass, complete with mounting hardware.

If the seat is a reclining seat it shall be adjusted so that the centre of gravity of the seat and the child is as far to the rear of the bicycle as possible.

Assume that a child of weight equal to the load class of the seat, see Table 1, is seated so that the centre of this added mass is located on the central plane, 150 mm above the reference plane and 130 mm in front of the backrest (measured horizontally at this height) for seats of class A15, or at the same height and 150 mm in front of the backrest for class A22.

Calculate the theoretical position of the centre of gravity of the combined mass of the seat and this child, and check that the centre of gravity marked by the manufacturer on the seat complies with the requirements of 12.2.1

6.2 Edges, corners and projections

Edges, corners and projections shall conform to either the minimum radii given in Figure 2 a), 2 b) or 2 c) or, if arising from a wall thickness smaller than 4 mm, to at least one of the following requirements :

- they shall be rounded; or
- they shall be folded, rolled or spiralled as given in Figure 2 d), 2 e) or 2 f); or
- they shall be protected with a plastic coating or other adequate means as given in Figure 2 g).

These requirements do not apply to small components such as hinges, brackets and catches.

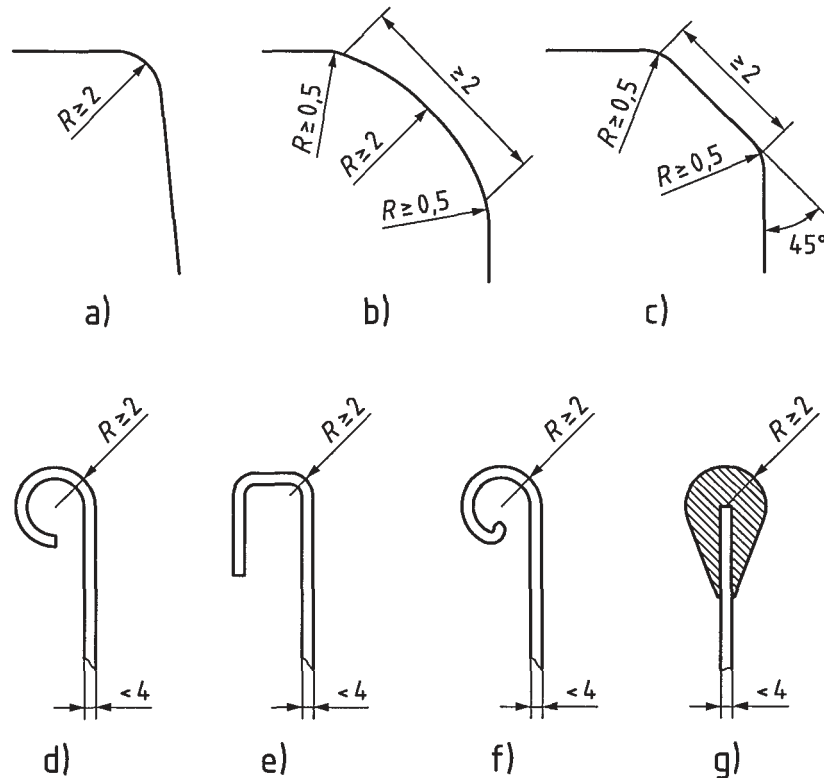


Figure 2 — Examples for minimum radii of edges and corners

6.3 Entrapment

There shall be no gaps in the accessibility zone of the assembled seat between 5 mm and 12 mm. The accessibility zone includes any part that is visible when looking at the product from the outside. Excluded from this requirement is an area of 200 mm width from the front of the seat going to the back of the seat to the height of the reference plane. Padding, restraint system and buckles are excluded.

6.4 Small parts

6.4.1 Requirements for detachable and non-detachable components

In order to avoid ingestion or inhalation of small parts, components shall conform to the following requirements :

- a) detachable components shall not, whatever orientation and without compressing, fit entirely within the cylinder according to Figure 3 ;
- b) non-detachable components, i.e. those parts which are not intended to be removed, shall conform to one of the following requirements :
 - 1) the components shall be so embedded that the child cannot grip them with its teeth or fingers ; or
 - 2) the components shall be so fixed to the product that they cannot become detached when a tensile test is carried out in accordance with EN 71-1:1998, 8.4.2.1, with the apparatus described in EN 71-1:1998, 8.4.1 and a torque test is carried out in accordance with Clause 6.4.3; or
 - 3) any components that become detached when the tensile test is carried out shall comply with the requirement for detachable components.