

AS 3973:2024



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Australia



Shower/toilet chairs (mobile and static)



AS 3973:2024

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Preface

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee ME-067, Assistive Technology to supersede AS/NZS 3973:2009.

After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this document as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this document is to provide manufacturers, suppliers, purchasers, specifiers and users with minimum safety requirements for chairs and stools for use by people with limited mobility in showers and toilets.

The major changes in this edition are as follows:

- (a) New requirements for electrical safety of shower chairs.
- (b) Where appropriate, alignment with relevant sections of ISO 17966.

[Appendix A](#) of this document is a list of information to be requested by the manufacturer/retailer from the purchaser ordering a chair or stool. This information will assist in the purchase of a product that is most suited to the needs of the intended user or users.

The terms “normative” and “informative” are used in Standards to define the application of the appendices to which they apply. A “normative” appendix is an integral part of a Standard, whereas an “informative” appendix is only for information and guidance.

Contents

Preface	ii
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Risk analysis	4
5 Materials	4
5.1 Cleaning and disinfection	4
5.2 Corrosion resistance	4
5.3 Surfaces, corners, edges and protruding parts	4
5.4 Upholstery	5
5.5 Cushioning materials	5
6 Design and construction	5
6.1 General	5
6.2 Clearance	5
6.3 Arm supports	6
6.4 Back support	6
6.5 Foot supports	6
6.6 Immobilization	6
6.7 Castors	7
6.7.1 Overview	7
6.7.2 Test method for movement over a threshold	7
6.8 User-propelled wheels	7
6.9 Tilting chairs	8
6.10 Safety of moving and folding parts	8
6.11 Locking mechanism	9
6.12 Ergonomic principles	9
7 Performance	10
7.1 Brake System	10
7.2 Weight-bearing foot supports—Strength and chair stability	10
7.3 Stability	10
7.4 Dynamic durability	10
7.5 Static durability	11
7.6 Hidden structural surfaces	11
7.7 Electrical Safety	11
7.7.1 General	11
7.7.2 Electrical systems	11
7.7.3 Safe positioning	11
7.7.4 Single fault safety	11
7.7.5 Hold to run activation	12
7.7.6 Emergency stopping functions	12
7.7.7 Continuity of power supply	12
7.7.8 Battery powered assistive products for personal hygiene	13
7.7.9 Circuit protection	14
8 Testing	14
9 Informative labelling	14
9.1 General	14
9.2 Labelling	14
9.3 Pre-sale information	15
9.4 User information	15
9.5 Service information	16
10 Report	

Appendix A (informative) **Provision of consumer guidance**..... **17**

Appendix B (informative) **Example frame measurement for mobile chairs**..... **19**

Appendix C (informative) **Important dimensions for seat with aperture for use by persons of adult stature**..... **20**

Appendix D (normative) **Test for weight-bearing foot support strength and chair stability**..... **21**

Appendix E (normative) **Test for dynamic durability**..... **22**

Appendix F (normative) **Static durability testing for mobile chairs**..... **24**

Appendix G (normative) **Points of application and directions of test forces for static durability testing of mobile chairs**..... **29**

Appendix H (normative) **Operations intended to be carried out by the operator**..... **31**

Australian Standard®

Shower/toilet chairs (mobile and static)

1 Scope

This document specifies materials, construction, performance and labelling requirements for chairs that are intended for use in showers and toilets. It specifies requirements and test methods for products within the divisions of AS/ISO 9999:2023 listed below:

- (a) 09 12 03 *Commode chairs* (chairs, with or without castors, with a collection receptable used for toileting away from the bathroom).
- (b) 09 33 07 *Shower chairs with and without wheels* (devices for supporting sitting during showering, including shower stools).

In addition, this document specifies requirements for products intended to be used in the following environments:

- (i) *Type A*: Multiple users — more than one person using an assistive product e.g. residential care facility.
- (ii) *Type B*: One user — e.g. domestic setting with one user.

It does not cover:

- (A) Use in pools or other similarly corrosive environments.
- (B) Stability and friction issues in relation to slippery surfaces due to soap.

For adaptable shower chairs, as defined in the Therapeutic Goods (Medical Devices) Regulations 2002 (Cth), a representative sample should be tested. For patient matched and custom-made shower chairs, as defined in the Therapeutic Goods (Medical Devices) Regulations 2002 (Cth), the manufacturer may apply parts of this document where practical to do so.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document.

NOTE Documents referenced for informative purposes are listed in the Bibliography.

AS 1192, *Electroplated coatings—Nickel and chromium*

AS 1428.1, *Design for access and mobility, Part 1: General requirements for access—New building work*

AS 1580.408.4, *Paints and related materials—Methods of test, Method 408.4: Adhesion (crosscut)*

AS 1683.15.1, *Methods of test for elastomers, Method 15.1: International rubber hardness*

AS 2281, *Flexible cellular polyurethane for seat cushioning and bedding*

AS 2282.3, *Methods for testing flexible cellular polyurethane, Part 3: Determination of apparent density*

AS 2282.8, *Methods for testing flexible cellular polyurethane, Part 8: Determination of force deflection*

AS 2331.3.1, *Methods of test for metallic and related coatings, Method 3.1: Corrosion and related property tests—Neutral salt spray (NSS) test*

AS 2088, *Prams and strollers—Safety requirements*

AS 2706, *Numerical values—Rounding and interpretation of limiting values*

AS ISO 14971, *Medical devices - Application of risk management to medical devices*

AS/NZS ISO 7176.1, *Wheelchairs, Part 1: Determination of static stability*

AS/NZS ISO 7176.3, *Wheelchairs, Part 3: Determination of effectiveness of brakes*

AS/NZS ISO 7176.6, *Wheelchairs, Part 6: Vocabulary*

AS/NZS ISO 7176.8, *Wheelchairs, Part 8: Requirements and test methods for static, impact and fatigue strengths*

AS/NZS ISO 7176.11, *Wheelchairs, Part 11: Test dummies*

AS/NZS ISO 7176.26, *Wheelchairs — Vocabulary*

AS/NZS ISO 9999, *Assistive products, — Classification and terminology*

ISO 12100, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

BS 4322, *Recommendations for buffering on hospital vehicles such as trolleys*

EN 12373-1, *Aluminium and aluminium alloys—Anodizing, Part 1: Method for specifying decorative and protective anodic oxidation coatings on aluminium*

3 Terms and definitions

For the purpose of this document, the definitions given in AS/NZS ISO 7176.26 and those below apply.

3.1 assistive product (AP)

assistive products for showering and toileting

3.2 buffering device

attachment made from a soft material that is attached to a chair to protect other objects from damage

3.3 castors

3.3.1

fixed castor

castor that cannot swivel about its vertical axis

Note 1 to entry: Fixed castors are also known as “fixed wheel brackets”, “rigid castors”, “stationary castors”, and “non-swivel castors”.

3.3.2 swivel castor

castor that is free to swivel without restriction about its vertical axis

3.4 combined wheel and swivel lock

device that immobilizes both the wheel rotation and swivel action and is applied when stationary

3.5 commode chairs

chairs, with or without castors, with a collection receptacle used for toileting away from the bathroom

[SOURCE: AS/ISO 9999:2023]

3.6 foot support

3.6.1

non-weight-bearing foot support

foot support that is intended to provide support for the user's feet when seated, but not to act as a load-bearing component when the user mounts or alights from the chair

3.6.2

weight-bearing foot support

foot support that is intended for the user and an attendant to stand on while mounting or alighting from the chair and to provide support for the user's feet

3.7

may

indicates the existence of an option

3.8

parking brake

device that immobilizes the wheel and is applied when the chair is stationary, also known as a wheel lock

3.9

positive locking device

device that prevents unintended movement

3.10

safe working load

manufacturer specified load equivalent to the maximum user mass for which the chair or stool is designed

3.11

shall

indicates that a statement is mandatory

3.12

should

indicates a recommendation

3.13

shower chairs with and without wheels

device for supporting sitting during showering including shower stools

[SOURCE: AS ISO 9999:2023]

3.14

swivel lock

device that immobilizes the swivel action of a swivel castor

3.15

thread guard

non-revolving circular component assembled on the side of a wheel to protect the hub from threads and other foreign objects that may prevent free revolving of the wheel

3.16

upholstery

fabric used to cover furniture

4 Risk analysis

The safety of an AP shall be assessed by identifying hazards and estimating the risks associated with them using the procedures specified in AS ISO 14971 and, if relevant, ISO 12100.

When an assistive product is intended by the manufacturer to be used in combination with a device that is not a medical device, the resulting combination of the assistive product and device shall behave in a safe way as a system. Risk management shall include all involved persons in normal use, and third persons (e.g. a child) in the surrounding coming into contact with the assistive product.

NOTE In the case of certain disabilities there may be a need for higher levels of safety for equipment used to offset the effects of that disability.

[SOURCE: ISO 17966:2016, Clause 4.1, modified.]

5 Materials

5.1 Cleaning and disinfection

The method and suitable cleaning or disinfection materials for the shower chair shall be described in the information supplied by the manufacturer. Where a shower chair is to be cleaned by automatic washing systems or hand-held jetstream/steam washing, the details of the procedure, such as temperature, pressure, flow and pH value of cleaning/rinsing solution shall be described in the instructions for use.

5.2 Corrosion resistance

Metal parts are exposed to a salt spray test in accordance with AS 2331.3.1 or ISO 9227 for not less than:

- (a) 1000 h for *Type A* chairs and stools; or
- (b) 168 h for *Type B* chairs and stools.

Their external and internal surfaces shall show no corrosion on the base metal that is more 3 mm from an edge or from a line scribed through a coating. There shall also be no discontinuity or non-uniformity of the material, or of blistering of the coating.

For the purposes of the test, any coating shall be stripped from the metal and any removable covers/seals shall be removed. A representative part of the product may be submitted for test under this Clause providing it contains elements of all differing metals (including joins) contained in the chair or stool.

NOTE 1 For provision of consumer guidance, see [Clause A.2](#).

NOTE 2 Grade 304 stainless steel, grade 6000 series aluminium will generally meet the requirement for Type A.

NOTE 3 Exposed parts include surfaces of those parts that are exposed to the atmosphere, irrespective of whether water falling or flowing down would contact them (e.g. inside vertical tubes).

5.3 Surfaces, corners, edges and protruding parts

The finish of all surfaces shall be smooth and non-absorbent. The following specifications apply:

- (a) *Enamel or plastics coating* — Finishes of enamel or plastics coating shall be tested in accordance with AS 1580.408.4 and shall not exceed Classification 2.
- (b) *Chromium plate* — Finishes of chromium plate shall conform with the requirements for any of those coatings specified in AS 1192 as being not less than service condition No. 3 (severe).

- (c) *Anodized finish* — Anodized finishes shall conform to the requirements for Grade AA15 of EN 12373-1.

Unless required for the intended function of a shower chair, all accessible edges corners and surfaces shall be smooth and be free from burrs and sharp edges. Unless required for the intended function, a shower chair shall not have any protruding parts. Where possible, necessary protruding parts shall have protection to prevent injury and/or damage.

NOTE 1 The requirements set in EN 1888:2003, subclause 6.1.3 should be applied.

NOTE 2 For guidance on test methods for protruding parts see EN 716-2:2008, subclause 5.9.

5.4 Upholstery

Upholstery materials shall be non-porous and non-absorbent. Any joins or seams shall be non-porous.

5.5 Cushioning materials

Cushioning materials shall:

- (a) Be flexible. Flexible cellular polyurethane, where used, shall conform to AS 2281.
- (b) Be non-absorbent or covered with a non-porous material.

NOTE To determine absorption of water, weigh cushion sample before immersing in a water bath with a water temperature of $40 \pm 5^\circ\text{C}$ for not less than 20 minutes. Wipe surface of sample with a cloth and reweigh.

6 Design and construction

6.1 General

There shall be no unsealed formations in which liquid may accumulate.

NOTE 1 Sharp edges should be tested to the hazardous sharp edges test specified in AS 2088.

NOTE 2 For purposes of infection control and hygiene, the chair and its component parts should be constructed to facilitate cleaning.

NOTE 3 Ensure that prevention of ingress and accumulation of water into such areas as wheel bearings, castor swivels, and the inside of tubular constructions is considered.

NOTE 4 Designers and purchasers should be aware of potential hazards to attendants caused by steering a chair with a long wheelbase and four swivel castors, especially where there is a weight-bearing foot support.

6.2 Clearance

The following specifications apply to chairs with a seat aperture. Documentation in accordance with [Clause 8\(b\)\(iii\)](#) shall be provided as to the water closet that they are designed to clear, stating:

- (a) When the chair is placed over a WC pan of the dimensions shown in [Figure 1](#), the chair shall clear the WC pan.
- (b) When the chair is placed over a WC pan as shown in [Figure 1](#), the chair shall be clear of the walls and any wall-mounted fixture at the rear of the pan.

NOTE 1 Provision should be made to clear a raised WC seat lid.

NOTE 2 For provision of consumer guidance, see [Clause A.3](#).

NOTE 3 These clearance requirements are considered crucial to the access, safety, and comfort of the user.

NOTE 4 For chairs to be used where there may be loss of muscle tone resulting in buttock skin sag, refer to [Clause 6.4](#).

NOTE 5 The dimensions in [Figure 1](#) are for WC pan installations in AS 1428.1. Chairs designed to clear these dimensions will also clear WC pan installations in accordance with NZS 4121 where the minimum height of the WC pan and lid is 460 mm and the height from the floor of a back wall-mounted cistern is 700 mm.

NOTE 6 See [Appendix B](#) for guidance on measurement of chair frame dimensions for mobile chairs.

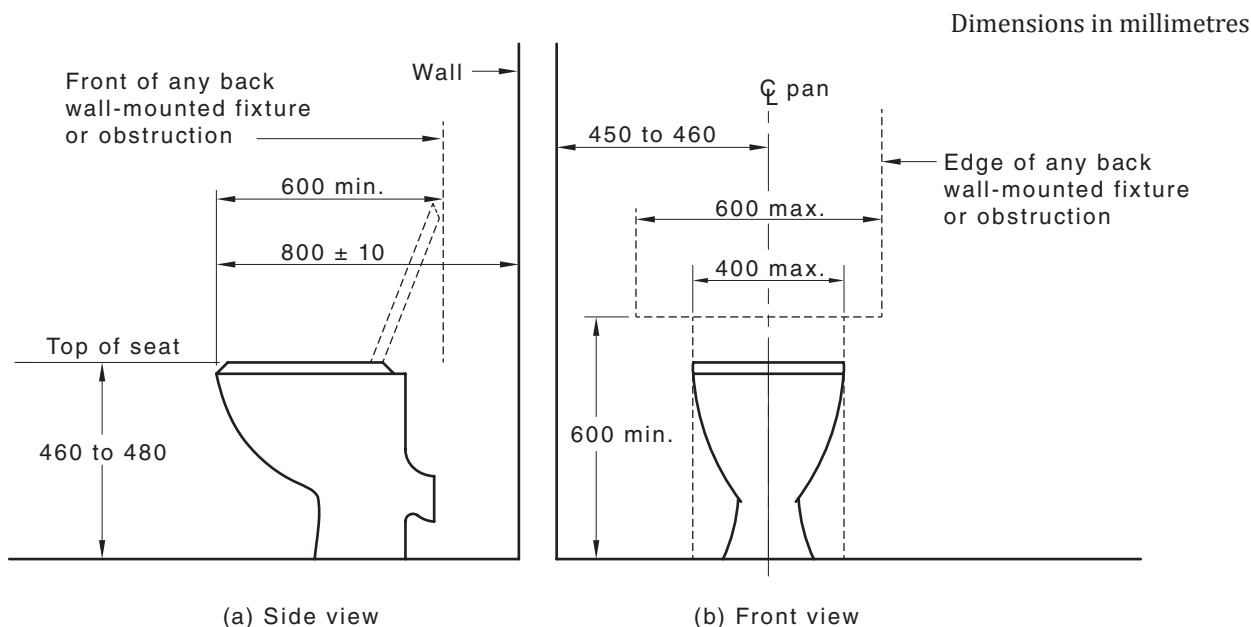


Figure 1 — Water closet pan and wall fixture clearances (from AS 1428.1)

6.3 Arm supports

The following specifications apply:

- (a) The force required to swing away arm supports designed to swing away shall be not more than 30 N) and the arm supports shall maintain their position when placed in the swing-away position.
- (b) The force required to lift out detachable arm supports shall be not more than 30 N.

NOTE For provision of consumer guidance, see [Clause A.7](#).

6.4 Back support

Chairs shall be provided with a back support. Where a back support is detachable, a positive locking device shall be provided. Extensions above the back support do not require a locking device.

6.5 Foot supports

A foot support if provided, shall be designed to minimize the risk of the user's feet being injured from rotation of the wheels.

6.6 Immobilization

A mobile shower chair or any of its parts that could constitute a risk for the user or a nearby person shall be fitted with immobilising means to prevent any undesired movement. Where a parking brake system is fitted it shall meet the requirements specified in [Clause 6.1](#).

6.7 Castors

6.7.1 Overview

Castors are to be designed and constructed as follows:

- (a) The corrosion resistance of the bearing system of castors shall be in accordance with [Clause 5.1\(b\)](#).
- (b) The method of attachment of castors shall be secure, with the swivel axis being at $90 \pm 3^\circ$ to the plane of the floor.
- (c) Where four swivel castors are fitted, combined wheel and swivel locks shall operate on a minimum of two.

NOTE 1 For provision of consumer guidance, see [Clause A.11](#).

- (d) Each castor shall have all exposed details well radiused and smooth, and the fit of all components to each other shall be such as to obviate rattle.

NOTE 2 The design should also allow for ease of cleaning.

- (e) The castor shall be capable of being dismantled for maintenance and adjustment.
- (f) The hardness of the solid tyre material shall be comparable to that of rubber of 80 to 90 IRHD when determined in accordance with AS 1683.15.1.

NOTE 3 This degree of hardness provides a good balance between ease of pushing and quietness of operation.

- (i) Thread guards shall be fitted to castors.

6.7.2 Test method for movement over a threshold

All accessories intended for normal use during transport shall be attached to the AP and with the height in the worst-case position and with the maximum load in place. Set up an obstruction which is fixed flat on the floor, with a rectangular cross-section, 10 mm high and at least 80 mm wide with a radius of 2 mm at the top edges.

The AP shall be moved at a speed of $0,8 \text{ m/s} \pm 0,1 \text{ m/s}$, or for motor driven mobile APs for transportation, the maximum speed shall be used, while all castors shall impact and pass over the obstruction. Manual mobile APs are propelled by a force acting at its handle(s). The mobile AP, with all castors, shall then be pulled back over the obstruction and back to the starting position of the test.

This is repeated 10 times.

Alternative method of testing: A double drum set-up may be used (see ISO 7176-8) on the condition that it cycles back and forth, and it is adapted to the attachments and speeds as per above.

This is repeated 10 000 times.

6.8 User-propelled wheels

The corrosion resistance of the bearing systems of wheels designed to be propelled by the user of the chair shall conform to [Clause 5.1](#).

NOTE For provision of consumer guidance, see [Clause A.11](#).