

Australian/New Zealand Standard[®]

**Water supply—Domestic type
water treatment appliances—
Performance requirements**

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Australian Chamber of Manufactures
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Performance requirements**

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee WS/27 on Domestic Water Treatment Appliances. This Standard specifies objectives and suitable tests for microbiological treatment, chemical reduction, mechanical filtration and chlorine reduction on filter cartridges and similar filter systems.

For construction, installation and structural integrity of these appliances see AS 3497, *Authorization requirements for plumbing products—Domestic type water treatment appliances*.

The objective of this Standard is to provide performance requirements and suitable type tests for testing laboratories.

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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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Water supply—Domestic type water treatment appliances—
Performance requirements**

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard specifies objectives for the testing of appliances for chemical reduction, microbiological treatment, and odour and chlorine reduction.

NOTE: All references to appliances or water treatment appliances are for domestic type applications.

1.2 APPLICATION

1.2.1 Water treatment appliances Water treatment appliances shall comply with this Section and Sections 2 to 5 as follows:

- (a) Section 2 Chemical reduction.
- (b) Section 3 Microbiological treatment.
- (c) Section 4 Mechanical filtration.
- (d) Section 5 Odour treatment.

1.2.2 Alternative Testing Test results from other internationally recognized bodies shall be considered, where the manufacturer or reseller can demonstrate that the product has been tested in accordance with this Standard.

1.3 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

- 2031 Selection of containers and preservation of water samples for chemical and microbiological analysis
- 2031.2 Part 2: Microbiological
- 3500 National Plumbing and Drainage Code
- 3500.1 Part 1: Water supply
- 3855 Suitability of plumbing and water distribution systems products for contact with potable water
- 4276 Water microbiology
- 4276.3.1 Part 3.1: Pour plate method using plate count agar

AS/NZS

- 3500 National Plumbing and Drainage Code
- 3500.0 Part 0: Glossary of terms

1.4 DEFINITIONS For the purpose of this Standard the definitions given in AS/NZS 3500.0 and those below apply.

1.4.1 Appliance—a device or piece of equipment which includes associated pipework and valves as supplied, viz. a total system.

1.4.2 Bactericidal treatment appliance—an appliance which is designed to kill vegetative (non-sporing) bacteria.

1.4.3 Bactericide—a chemical or physical agent that rapidly kills vegetative (non-sporing) bacteria.

1.4.4 Bacteriostatic treatment appliance—an appliance which, when the manufacturer's or agent's maintenance instructions are followed, limits the passage or growth of bacteria such that the bacterial population in the product water is not higher than that in the influent water, according to specified guidelines.

1.4.5 Base water—the water containing chemicals from which test water is made up.

1.4.6 Capacity—the service life, expressed as—

- (a) litres of water effectively treated by an appliance between servicing of the media (cleaning, regeneration or replacement) as specified by the manufacturer; or
- (b) litres of water treated as a function of time.

1.4.7 Chemical (inorganic) appliance—an appliance that partly or wholly claims reduction in one or more specified inorganic compounds or ions.

1.4.8 Chemical (organic) appliance—an appliance that partly or wholly claims reduction in one or more specified organic compounds or ions.

1.4.9 Component—a part or a subassembly of parts, that contributes to the construction of a total assembly by choice or design and which may offer variations of fitment for application to the major element of the product, whether produced by the same manufacturer or not. The component shall be deemed a vital part of the total assembly and shall not inhibit the product from complying with the relevant Australian Standard, or the appropriate specification, when submitted for type testing.

1.4.10 Consumable items—any medium or materials (included but not limited to cartridges), added to or replaced within the treatment appliance and intended as part of a maintenance process to restore the media or treatment process so that it can perform its stated water treatment function.

1.4.11 Contaminant—any undesirable physical, chemical or microbiological substance or parameter in water which may have an adverse health or aesthetic effect.

1.4.12 Disposable appliance—an appliance that is replaced at the end of each service cycle and has an estimated life of one year or less.

1.4.13 Drinking water—water which is intended for human consumption.

1.4.14 End of line appliance—an appliance that is attached to a delivery tap connected to the mains water supply. The attachment may be permanent by means of pipes, or temporary with a hose connected to the delivery tap.

1.4.15 Heterotrophic plate count—a procedure for estimating the number of live bacteria in water under specific conditions (temperature and time).

1.4.16 In-line appliance—an in-line or tap-mounted appliance used to treat some or all of the water at a single tap or multiple taps.

1.4.17 Influent—the water entering an appliance, system or process.

1.4.18 Mechanical filtration appliance—an appliance that mechanically reduces or removes particulate matter.

1.4.19 Microbiologically unsafe water—water that is known to contain disease causing microbiological agents or water that shows a positive test for an indicator organism or as determined by an appropriate health agency or regulatory authority.

1.4.20 Point-of-entry appliance (POE)—an in-line appliance used to treat all or part of the water for the premises.

1.4.21 Point-of-use appliance (POU)—a tap/water outlet connected or mounted and used to treat water from a single outlet.

1.4.22 Product water—treated water emerging from an appliance, system or process.

1.4.23 Stand-alone appliance—an appliance that is not connected to a mains water supply and operates without any external pressure being applied to it.

1.4.24 Taste and odour appliance—an appliance claimed by a manufacturer or reseller to reduce taste and odour levels.

1.4.25 Test water—the mixture of base water and contaminants presented to the unit. Equivalent to the influent challenge to the appliance.

1.5 DESIGN AND PRIMARY FUNCTIONS Regardless of the constituents or materials from which the consumable is constructed or otherwise composed, the minimum performance required of the consumable shall fulfil the primary functions shown below.

1.5.1 Consumable not to fail in service The design of the appliance shall be such that failure of the consumable shall be automatically obvious to the user through flow cessation or rapid reduction in flow, an alarm or simple explicit instructions for determining the need for servicing units to eliminate the possibility of a non-functioning appliance being relied upon by the consumer.

1.5.2 Materials to be food grade to recognized Standards All components and materials used in the consumable shall be food grade and shall conform to the appropriate Australian, British or FDA Standards.

1.5.3 Prevention of recontamination of treated water The method used to seal the consumable within the assembled appliance in its operational configuration shall be such that prevents any possibility of untreated water bypassing the treatment medium in order to enter the post-treatment water. Where a POE system is regenerable or backwashable a by-pass function shall be incorporated to ensure an uninterrupted supply. Details of the frequency of backwash shall comply to the manufacturer's recommendations in accordance with AS 3500.1.

1.6 MARKING

NOTE: Manufacturers making a statement of compliance with this Australian/New Zealand Standard on a product, packaging, or promotional material related to that product are advised to ensure that such compliance is capable of being verified.

SECTION 2 MICROBIOLOGICAL TREATMENT

2.1 GENERAL This Section specifies the microbiological requirements for tap connected/mounted, point-of-use (POU), point-of-entry (POE) and stand-alone appliances. In-line, tap connected/mounted POU and POE, and stand-alone appliances are required to comply with the tests set out in Appendix A and to pass the performance requirements of this Section.

Those appliances claiming microbiological treatment shall be evaluated using bacterial, viral and protozoan challenge organisms (*Schedule B* tests).

The testing protocol for stand-alone appliances is specified separately to that for appliances connected to the mains water supply.

Where removal of micro-organisms is not specifically claimed by the manufacturer, the manufacturer is required, using the protocol given in *Schedule A*, Appendix A, to demonstrate that the appliance will not result in a higher bacterial count in the product water compared with the influent water.

NOTE: Appendix A sets out methods to measure the efficiency of removal of microbiological substances from the appliance as new and after periods of operation, i.e. on/off stagnation periods reflecting the way in which the filter will be operated by the purchaser, i.e. projected field use conditions.

2.2 PERFORMANCE REQUIREMENTS When tested in accordance with Appendix A, an appliance shall meet the criteria listed as follows:

- (a) *Appliances making no microbiological claims* These shall include the following:
 - (i) Testing shall take into consideration the operational flushing requirements (if any) as specified by the manufacturer's user instructions.
 - (ii) Those appliances not making specific microbiological claims shall meet the acceptance criteria of *Schedule A*. The geometric mean of the heterotrophic plate count (37°C/48 hr) of the product water samples from both production appliances of a type should be no greater than the geometric mean of the influent water within a 20% measurement precision.
- (b) *Microbiological treatment appliances* This shall consist of the following:

Those appliances claiming to be microbiological treatment appliances shall demonstrate that the reduction requirements for bacteria, viruses and protozoa as specified in Table A1, Appendix A, can be continuously met or exceeded by both production units. Be aware that bacteria, viruses and protozoa shall all be removed as specified to qualify an appliance as a microbiological treatment appliance. Implicit in such a categorization is the ability to use such an appliance on water of unknown or dubious quality.

SECTION 3 CHEMICAL REDUCTION PROFICIENCY OF POU, POE AND STAND-ALONE APPLIANCES

3.1 GENERAL This Section specifies the chemical reduction proficiency of point-of-use (POU), point-of-entry (POE) and stand-alone appliances. POU, POE and tap connected appliances are required to undergo the tests set out in Appendix B and to pass the performance requirements of Clause 3.2.

Stand-alone appliances are required to undergo the tests set out in Appendix B, and to pass the performance requirements of Clause 3.2.

3.2 PERFORMANCE REQUIREMENTS Domestic appliances shall be tested for chemical reduction for those chemicals that the manufacturer or agents claims that the appliance is capable of reducing.

When tested according to Appendix B, an appliance shall record chemical reductions of 66% of the levels in the test water.

SECTION 4 MECHANICAL FILTRATION

4.1 GENERAL This Section specifies the requirements for consumables claiming mechanical filtration. Mechanical appliances are required to incorporate components in this Section and pass the performance requirements of Clauses 4.2 to 4.5.

4.2 PARTICULATE REDUCTION CLAIM Claims for particulate reduction may be made for the classes in Table 5.1. The units shall reduce the level of particulates of the micrometer (micron) sizes for a specific class, by at least 85% when tested in accordance with Appendix C. Further claims may be made for greater percent reduction or specific micrometer (micron) rating if substantiated by testing.

4.3 CYST REMOVAL For appliances claiming cyst reduction/removal, the appliance shall reduce the number and type of cysts from an influent challenge level of at least 10^4 particles per millilitre by at least 99.9%.

4.4 TURBIDITY REDUCTION (ORGANIC AND INORGANIC SOLIDS) For appliances claiming turbidity reduction, the appliance shall reduce an influent challenge level of 10 to 12 nephelometric turbidity appliance (NTU) to not more than 1.0 NTU.

4.5 FIBRE REDUCTION A manufacturer of an appliance claiming fibre reduction shall provide evidence that the appliance shall reduce an influent asbestos fibre concentration in the range of 10^7 to 10^8 per L by at least 99%.

4.6 MECHANICAL FILTRATION Appliances claiming mechanical filtration are required to meet the testing outlined in Appendix C.

SECTION 5 ODOUR TREATMENT

5.1 GENERAL This Section specifies the requirements of taste and odour levels by removal of free chlorine. Odour treatment appliances are required to incorporate components in this Section and pass the performance requirements when tested in accordance with Appendix D.

5.2 TASTE, ODOUR AND CHLORINE REDUCTION Taste, odour and chlorine reduction claims may be made for the classes of appliances set out in Table 5.1. The units shall reduce the concentration of free available chlorine from the influent challenge level of 2.0 mg/l to less than or equal to the level specified for each class tested in accordance with Appendix D.

TABLE 5.1
TASTE, ODOUR AND CHLORINE
REDUCTION CLASSES

Class	Chlorine %
I	75 or greater
II	50 to 75
III	25 to 50