AS/NZS 2007.1:2021

Australian/New Zealand Standard™

Performance of household electrical appliances — Dishwashers

Part 1: Methods for measuring performance, energy and water consumption

AS/NZS 2007.1:2021

This Joint Australian/New Zealand Standard™ was prepared by Joint Technical Committee EL-059, Dishwashers, Clothes Washers and Dryers. It was approved on behalf of the Council of Standards Australia on 24 November 2020 and by the New Zealand Standards Approval Board on 03 February 2021.

This Standard was published on 19 February 2021.

The following are represented on Committee EL-059:

Australian Industry Group
Business New Zealand
CHOICE
Consumer Electronics Suppliers Association
Consumers' Federation of Australia
Department of Agriculture, Water and the Environment (Australian Government)
Department of Industry, Science, Energy and Resources (Australian Government)
Electrical Compliance Testing Association of Australia
Energy Efficiency and Conservation Authority of New Zealand
Energy Safe Victoria

This Standard was issued in draft form for comment as DR AS/NZS 2007.1:2019.

Keeping Standards up-to-date

Ensure you have the latest versions of our publications and keep up-to-date about Amendments, Rulings, Withdrawals, and new projects by visiting:

www.standards.org.au

www.standards.govt.nz

ISBN 978 1 76113 206 3

Australian/New Zealand Standard™

Performance of household electrical appliances — Dishwashers

Part 1: Methods for measuring performance, energy and water consumption

Originated as AS 2007—1977.
Jointly revised and redesignated as AS/NZS 2007.1:1998.
Fifth edition 2005.
This edition AS/NZS 2007.1:2021.

Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-059, Dishwashers, Clothes Washers and Dryers, to supersede AS/NZS 2007.1:2005, *Performance of household electrical appliances — Dishwashers*, *Part 1: Energy consumption and performance*.

The objective of this Standard is to specify test procedures and minimum performance criteria for determining the performance characteristics of electric household dishwashers that are within the scope of the relevant legislation.

This Standard does not specify safety requirements.

The AS/NZS 2007 series comprises two parts, as follows:

AS/NZS 2007.1, *Performance of household electrical appliances — Dishwashers, Part 1: Methods for measuring performance, energy and water consumption* (this Standard)

AS/NZS 2007.2, *Performance of household electrical appliances — Dishwashers, Part 2: Energy efficiency labelling requirements*.

The parts of this series are summarized as follows:

(a) *Part 1* — Specifies performance test procedures and minimum performance criteria for dishwashers.

(b) *Part 2* — Includes algorithms for the calculation of the energy efficiency star rating and comparative energy consumption, performance requirements, details of the energy rating label and information on the requirements for the valid application for registration for energy efficiency labelling. It also includes information for registration for water efficiency labelling. Part 2 is to be used in conjunction with Part 1.

The overall objective of the AS/NZS 2007 series is to promote high levels of performance, energy efficiency and water efficiency in electric dishwashers.

The main changes in this Standard are as follows:

(i) Inclusion of an alternative reference machine.

(ii) Alternative soils are listed.

(iii) Addition of alternative load items.

(iv) The relevant legislation is described.

As documented in ISO 80000-1, *Quantities and units — Part 1: General*, the SI unit for litres may be either "L" or "l". For the purpose of this document, and in conformance with Australian and New Zealand Standards, "L" is used as the unit for litres.

This Standard has been developed in consultation with regulatory authorities and is intended to be considered with reference to the relevant legislation. This Standard refers to AS/NZS 2007.2 for energy efficiency labelling requirements. AS/NZS 6400, *Water efficient products — Rating and labelling*, references this Standard for water efficiency labelling requirements.

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

Contents

Introduction

For comparative testing, the most reliable results will be obtained from the methods of measurement given in this Standard when the measurements are conducted in the same laboratory, at one time, by the same operators.

For determination of the washing and drying indices, the procedures and timing in Appendices D and E are provided to ensure consistent results. For determination of washing performance in accordance with this Standard, it is essential to use a reference machine.

This Standard is based on concepts published in IEC 60436:2004, *Methods for measuring the performance of electric dishwashers* (Edition 3).

The reference program on the reference machine used in this Standard is Gentle 45 °C which is used to set a pass/fail for washing performance. IEC 60436:2004, uses the Universal 65 °C as the reference program as the washing reference. This was originally used to determine a relative performance index for declaration by the manufacturer (washing and drying performance was included on the EU energy label). The EU EcoDesign regulation (2009) set a minimum wash performance standard for dishwashers as a function of this reference. IEC 60436:2004, also uses the reference machine to determine drying performance whereas it is not used for determining drying performance in this Standard.

NOTE 1 This Standard uses the term "washing performance" to refer to the assessment of removing soil from the load. IEC 60436 refers to this assessment as the "cleaning performance".

This Standard differs from IEC 60436:2004, (with differences to IEC 60436:2015 (Edition 4) noted in brackets, where relevant) as follows:

(a) This Standard allows the use of an IEC load (without serving items). IEC also allow an AHAM (US) load as an alternative to the "European" load. (IEC 60436:2015 only specifies a European load and some load items have changed).

(b) There are slight differences in the ambient humidity requirements between this Standard (60 %) and IEC 60436:2004 (55 % or 65 % dependent on the soil drying method).

(c) Food items used for soiling the load in this Standard more closely resembles the soiling from IEC 60436:1981. This Standard still uses tomato juice while the IEC 60436:2004, uses milk treated in a microwave as well as minced meat. Some soil items (e.g. tinned spinach versus frozen spinach), the preparation of some items, and the allocation of soils to the load itself are also slightly different in some cases.

(d) Cold water supply temperature in this Standard is 20 °C while IEC 60436:2004 is 15 °C.

(e) Ambient temperature for testing in this Standard is 20 °C (while IEC 60436:2015 specifies an ambient temperature for testing of 23 °C).

(f) Water hardness in this Standard is soft (45 ppm $CaCO_3$ equivalent)) while IEC 60436:2004 specifies both soft (≤ 70 ppm) and hard (250 ppm) water alternatives.

(g) Water pressure in this Standard is 320 kPa while IEC 60436:2004 is 240 kPa.

(h) Reference detergent in this Standard is based on the old IEC type A (phosphate based with chlorine bleach), while IEC 60436:2004 specifies type C detergent (phosphate based with oxygen bleach and enzymes). IEC 60436:2004 also has two rinse aid formulations (types III and IV). (IEC 60436:2015 provides a new detergent specification type D detergent (non-phosphate based with oxygen bleach and enzymes) and only specifies one rinse aid (type III formulation) which is now called "rinse aid").

(i) This Standard requires the manufacturer to specify the amount of detergent to be used, whereas IEC 60436:2004 specifies a default detergent quantity where an amount is not specified by the manufacturer. This Standard and IEC 60436:2004 both specify maximum detergent quantities which may be used for testing.

(j) In this Standard the reference machine water softener is de-activated while in IEC 60436:2004 it is allowed to operate normally (noting that most IEC tests will be done with hard water and tests under this Standard use soft water). Most dishwashers in Australia and New Zealand do not have a water softener, or these are usually deactivated in soft water regions.

(k) This Standard uses the reference machine only for determining the washing performance while IEC 60436:2004 uses it for determining washing and drying performance.

NOTE 2 The reference machine specified in IEC 60436:2015, is now permitted as an alternative in this Standard.

(l) IEC allows the use of either oven drying or air drying of the soiled load prior to washing while this Standard only allows air drying.

(m) Both this Standard and IEC 60436:2004 specify the lighting conditions for washing and drying evaluations, making use of a viewing cabinet voluntary. Where used, specifications for a viewing cabinet are included in Appendix L of this Standard.

(n) This Standard and IEC 60436:2004 evaluation scoring systems are aligned.

(o) This Standard requires filter cleaning between test runs while IEC 60436:2004 specify that filters are not cleaned between runs. IEC 60436:2004 classify filters into three main categories and require a minimum of five tests (but could be as many as 10 tests) on each dishwasher, depending on variability and performance without filter cleaning.

(p) This Standard requires standby power measurements on a number of modes.

NOTE 3 IEC standby modes were introduced after the publication of AS/NZS 2007.1—2005 by IEC 60436:2004 Amendment 2 (2012), and while the modes defined are very similar there are some minor differences. Both Standards reference IEC 62301 as the measurement method (IEC 60436:2015 has introduced some small adjustments to mode definitions and measurement requirements for low power modes).

(q) IEC requires that the load be pre-conditioned in a dishwasher with IEC rinse aid prior to use in a performance test. This Standard does not specify any particular requirements other than the load is clean prior to use.

Australian/New Zealand Standard

Performance of household electrical appliances — Dishwashers

Part 1: Methods for measuring performance, energy and water consumption

Section 1 Scope and general

1.1 Scope

This Standard specifies test procedures and minimum performance criteria for determining the performance characteristics of electric household **dishwashers** that are within the scope of the **relevant legislation**.

In particular, this Standard specifies the following:

(a) States and defines the principal performance characteristics of electric **dishwashers**, which are —

(i) washing performance;

(ii) drying performance (irrespective of whether the **dishwasher** has a specific drying **operation** within the selected **program**);

(iii) energy and water consumption; and

(iv) **standby power**.

(b) Specifies methods of measuring these characteristics.

(c) Sets levels of acceptable performance for washing and drying.

1.2 Application

This Standard **shall** be read in conjunction with AS/NZS 2007.2.

1.3 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 2700, *Colour standards for general purposes*

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

AS/NZS 2007.2, *Performance of household electrical appliances — Dishwashers, Part 2: Energy efficiency labelling requirements*

AS/NZS IEC 62301, *Household electrical appliances — Measurement of standby power*

IEC 60436, *Electric dishwashers for household use — Methods for measuring the performance*

1.4 Terms and definitions

For the purposes of this Standard the definitions below apply.

NOTE The following defined terms are bolded in this Standard.