Australian/New Zealand Standard™

Performance of household electrical appliances—Dishwashers

Part 1: Energy consumption and performance

Standards Australia

STANDARDS NEW ZEALAND
Paerewa Aotearoa

This Joint Australian/New Zealand Standard was prepared by Joint Technical Committee EL-015, Quality and Performance of Household Electrical Appliances. It was approved on behalf of the Council of Standards Australia on 28 March 2003 and on behalf of the Council of Standards New Zealand on 4 April 2003. It was published on 10 April 2003.

The following are represented on Committee EL-015:

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Australian Electrical and Electronic Manufacturers Association
Australian Industry Group
Australian Retailers Association
Consumer Electronics Suppliers Association, Australia
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Performance of household electrical appliances—Dishwashers

Part 1: Energy consumption and performance

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PREFACE

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-015, Quality and Performance of Household Electrical Appliances, to supersede AS/NZS 2007.1:1998, *Performance of household electrical appliances—Dishwashers*, Part 1: *Energy consumption and performance* on 1 April 2004.

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

AS/NZS	
2007	Performance of household electrical appliances—Dishwashers
2007.1	Part 1: Energy consumption and performance (this Standard)
2007.2	Part 2: Energy labelling requirements

The Parts of AS/NZS 2007 are summarized as follows:

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

(b) *Part 2* Includes algorithms for the calculation of the energy efficiency star rating and projected energy usage, performance requirements, details of the energy label and requirements for the valid application thereof. It has been structured to be suitable for reference in regulatory legislation and to be used in conjunction with Part 1.

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

This Standard includes a number of requirements from the recently revised IEC 60436 committee draft for voting (59A/108/CDV) which will bring this Standard closer to the forthcoming IEC Standard. It also incorporates the following significant changes in comparison to AS/NZS 2007.1:1998 which it supersedes:

(i) Test methods have generally been made more repeatable and reproducible.

In particular, the wash performance test now has a 15 hour soil drying time prior to washing to ensure that the soil is in a uniform state, as per the forthcoming revised IEC Standard.

(ii) An IEC test load (without serving utensils and bowls) is now allowed as an alternative to the AS/NZS test load in this Standard.

NOTE: It is intended to phase out the AS/NZS test load in due course. The phase out date will be notified by an amendment to this Standard.

(iii) There is now a requirement to meet the specified washing and drying performance requirements on the program recommended for a normally soiled load. This program will be mandatory for energy labelling in Part 2.

(iv) Definitions in this Standard are now generally aligned with IEC definitions.

(v) The end of the cycle is now defined as when all activity ceases.

(vi) The reference program on the reference machine is now Gentle 45°C and the reference pass mark for wash performance is now set at 0.9.

(vii) There are improved instructions regarding the use of the reference machine.

(viii) Data has been provided to check the operation and calibration of the reference machine on the Gentle 45°C program (the new reference program).

(ix) Specific directions on the use of dishwashers that have a water softener.

(x) Improved specification of measurement accuracy has been included.

A summary of differences between this edition and the forthcoming IEC dishwasher Standard is included in the Foreword.

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

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. However, compliance with the performance and test requirements of this Standard should ensure that a dishwasher will give satisfactory performance in service.

For determination of the washing and drying indices, the recommended procedure and timing in Appendices D and E is 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 broadly based on IEC 60436:1981, *Methods for measuring the performance of electric dishwashers* and more recently has drawn from work undertaken within the IEC SC59A on a revised international dishwasher test method which was released as a committee draft for voting (59A/108/CDV) in 2002. The work within IEC has drawn on both European CENELEC Standard EN/50242 and US industry Standard AHAM DW-1. Acknowledgment is made of the assistance received from all of these Standards.

The forthcoming IEC Standard uses the Universal 65°C as the reference program, but this is used to determine a relative performance index for declaration by the manufacturer (wash and dry performance is included on the EU energy label). The reference program on the reference machine used in this Standard is Gentle 45°C which is used to set a pass/fail for wash performance, rather than a manufacturer declaration of wash performance as is the case in Europe. The forthcoming IEC Standard also uses the reference machine to assess drying performance whereas it is not used for assessing drying performance in this Standard.

This Standard has differences from and similarities to the forthcoming edition of IEC 60436 in a number of ways, as follows:

(a) This Standard now allows the use of an IEC load (without serving items) or the original AS/NZS load as an alternative. IEC also allow an AHAM (US) load as an alternative to the ‘European’ load.

(b) There are slight differences in the ambient humidity requirements between AS/NZS (60%) and IEC (55% or 65% dependent on the soil drying method).

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

(d) AS/NZS cold water supply temperature is 20°C while IEC is 15°C.

(e) AS/NZS water hardness is soft (45 ppm) while IEC specify both soft (≤70 ppm) and hard (250 ppm) water alternatives.

(f) AS/NZS water pressure is 320 kPA while IEC is 240 kPA.

(g) AS/NZS reference detergent is based on the old IEC type A (phosphate based with chorine bleach), while IEC specifies type C detergent (phosphate based with oxygen bleach and enzymes). IEC also have new rinse agent formulations (types III and IV).

NOTE: CENELEC still use detergent B and the older rinse aid formulations.

(h) AS/NZS requires the manufacturer to specify the amount of detergent to be used, whereas IEC specifies a default detergent quantity where an amount is not specified by the manufacturer. AS/NZS and IEC both specify maximum detergent quantities which may be used for testing.

(i) In AS/NZS the reference machine water softener is de-activated while in IEC it is allowed to operate normally (noting that most IEC tests will be done with hard water and tests under AS/NZS use soft water). Most dishwashers in Australia do not have a water softener.

(j) AS/NZS use the reference machine only for assessing the washing performance while IEC use it for assessing washing and drying performance.

(k) IEC allow the use of either oven drying or air drying of the soiled load prior to washing while AS/NZS only allow air drying.

(l) AS/NZS and IEC now specify the lighting conditions for washing and drying evaluations. The viewing cabinet previously mandatory in AS/NZS, has been moved to an informative Appendix L.

(m) AS/NZS and IEC evaluation scoring systems are now aligned.

(n) AS/NZS requires filter cleaning between test runs while IEC specify that filters are not cleaned between runs. IEC classify filters into 3 main categories and require a minimum of 5 tests (but could be as many as 10 tests) on each dishwasher, depending on variability and performance without filter cleaning.

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SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard sets out the method of determining the performance characteristics of electric **dishwashers** intended for household and similar use. This Standard does not specify safety requirements.

In particular this Standard—

(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**; and

  (iii) energy and water consumption;

(b) specifies the standard methods of measuring these characteristics; and

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

1.2 OBJECTIVE

The objective of this Standard is to provide test laboratories and others interested in performance testing with test methods and performance requirements so that the performance of **dishwashers** can be measured, compared and evaluated.

1.3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS	
2700	Colour Standards for general purposes
2706	Numerical values—Rounding and interpretation of limiting values
AS/NZS	
2007	Performance of household electrical appliances—Dishwashers
2007.2	Part 2: Energy labelling requirements
IEC	
60436	Electric dishwashers for household use—Methods for measuring the performance
ISO	
565	Test sieves—Metal wire cloth, perforated metal plate and electroformed sheet—Nominal sizes of openings
Guide	Guide to the expression of uncertainty in measurement