AS/NZS 2442.1:2021

Australian/New Zealand Standard™

Performance of household electrical appliances — Rotary clothes dryers

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

AS/NZS 2442.1:2021

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 18 November 2020 and by the New Zealand Standards Approval Board on 03 February 2021.

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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
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Australian/New Zealand Standard™

Performance of household electrical appliances — Rotary clothes dryers

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

Originated in Australia as part of AS 2442—1981.
Jointly revised in part and redesignated as AS/NZS 2442.1:1996.
Second edition 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 2442.1:1996, *Performance of household electrical appliances — Rotary clothes dryers, 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 rotary clothes dryers that are within the scope of the relevant legislation.

This Standard does not specify safety requirements.

The AS/NZS 2442 series comprises two parts, as follows:

AS/NZS 2442.1, *Performance of household electrical appliances — Rotary clothes dryers, Part 1: Methods for measuring performance, energy and water consumption* (this Standard)

AS/NZS 2442.2, *Performance of household electrical appliances — Rotary clothes dryers, 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 rotary clothes dryers.

(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. The application form 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 2442 series is to promote high levels of performance and energy efficiency (and water efficiency where applicable) in rotary clothes dryers.

The main changes in this Standard are as follows:

(i) Extension of the loading table from 10 kg up to 20 kg, aligning with market offerings and the AS/NZS 2040 series, *Performance of household electrical appliances — Clothes washing machines*.

(ii) Definition of relevant heating methods now includes electric resistance elements, heat pumps and radio frequency devices.

(iii) The test method has been modified to include the cool-down period up to the point of program termination, which more closely aligns with IEC.

(iv) The test voltage is specified as 230 V.

(v) 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 2442.2 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

AS 2442—1981 adopted some test procedures and methods from US Standard AHAM A197.6, which has been subsequently superseded and is now published as ANSI/AHAM HLD-1-2010, *Household Tumble Type Clothes Dryers.* AS 2442—1981 used the bone-dry load approach, developed in the United States, to calculate moisture content of the load items (where the mass of the load with nominally no moisture content is used as the reference point of 0 % moisture content). This Standard still uses the bone-dry load approach.

In 1992, the IEC published IEC 61121, *Method for measuring the performance of tumbler dryers for household use*. IEC 61121 is now in its fourth edition (2012) and uses a simplified load and uses the conditioned mass approach to determine moisture content. The conditioned mass is where the load is left in specific temperature and humidity conditions to reach equilibrium and this is defined as a reference moisture content of 0 %.

This Standard includes a requirement regarding maximum permitted clothes temperature under onerous conditions and a requirement that a load equal to rated capacity needs to be dried in a single setting without user intervention.

This Standard has many differences from ANSI/AHAM HLD-1-2010 and IEC 61121:2012. Some of the more significant differences are listed below.

Parameter	AS/NZS 2442.1	10 CFR 430 App D[a]	IEC 61121:2012
Scope	Electric tumble including washer-dryers	Gas and electric tumble	Electric tumble excluding washer-dryers
Test temperature	20 ± 2 °C	75 ± 3 °F (23.9 ± 1.7 °C)	23 ± 2 °C
Test humidity	60 ± 5 %	50 ± 10 %	55 ± 5 %
Conditioning	Bone-dry	Bone-dry	20 ± 2 °C, 65 ± 5 % or bone-dry
Test load[b]	Mixed cotton	Stuffer cloths	Three items, cotton
Load size	Any in 0.5 kg increments	Compact (3 lb) or standard (7 lb)	Any in 0.5 kg increments
Initial moisture content[c]	90 % ± 20 g bone-dry	70 % ± 3.5 % bone-dry	A = 70 % ± 1.0 % conditioned B = 60 % ± 1.0 % conditioned
Final moisture content[d]	≤ 6 % of bone-dry	2.5 % to 5 % bone-dry	0 % ± 3 % conditioned
Test termination[e]	Includes cool-down	Excludes cool-down	Includes cool-down
Energy correction[f]	Yes	No	Yes

[a] Requirements for dryers in ANSI/AHAM HLD-1-2010 are modified by the US Code of Federal Regulations Appendix D to Subpart B of Part 430, *Uniform test method for measuring the energy consumption of clothes dryers* when used to test dryers in accordance with US energy regulations. The requirements of the US regulations are shown here as these are most relevant.

[b] AS/NZS mixed cotton load is made up of nine different cotton load items. ANSI/AHAM load is made up of stuffer cloths 22" × 34" (559 mm × 864 mm), which are 50 % cotton and 50 % polyester. The IEC load is made of three cotton load items: sheets, pillowcases and huckaback towels (small European style towel).

[c] Initial moisture content for ANSI/AHAM is relatively high for a polyester cotton blend. IEC defines two initial moisture contents. European EcoDesign and energy labelling regulations specify an initial moisture content of 60 % conditioned mass (B), which is equivalent to 69.6 % moisture content using the bone-dry calculation approach. IEC also defines initial moisture content options for synthetic/blend loads.

[d] AS/NZS allows interpolation to 6 % final moisture for manual and timer dryers and a program must reach < 6 % for an autosensing dryer. IEC range specified is for dry cotton. IEC range is permitted for individual test runs, but the average of all (5) test runs must be ≤ +1.5 %. IEC corrects all data to a nominal final moisture content of 0 %. A conditioned moisture content of 0 % is approximately equal to a bone-dry moisture content of 6 %. IEC also specifies other final moisture contents (iron dry cotton (12 %), synthetic/blend textiles [2 %)].

[e] Previous editions of AS/NZS 2442.1 excluded the cool-down period. Cool-down has now been included in this edition so it aligns more closely with the IEC approach.

[f] AS/NZS energy correction only applies to certain manual and timer dryers, where a value is interpolated at 6 % moisture based on measurements close to this value. IEC correction is an overall linear correction from the initial moisture content. IEC also allows results for autosensing dryers to be corrected back to the nominal final moisture content.

NOTES

Australian/New Zealand Standard

Performance of household electrical appliances — Rotary clothes dryers

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 **rotary clothes dryers** that are within the scope of the **relevant legislation**.

NOTE Examples of appliances covered by this Standard include **vented dryers**, **condenser dryers** and **dryers** that use a heat pump as a heat source and the drying function of **combination washer/dryer units**.

In particular, this Standard specifies the following:

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

  (i) moisture removal;

  (ii) energy (and water where applicable) consumption;

  (iii) the maximum temperature reached by clothes; and

  (iv) the ability to dry clothes to the test requirements in one setting.

(b) Specifies methods of measuring these characteristics.

(c) Sets levels of acceptable performance.

1.2 Application

This Standard **shall** be read in conjunction with AS/NZS 2442.2.

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

AS/NZS 2040.1, *Performance of household electrical appliances — Clothes washing machines, Part 1: Methods for measuring performance, energy and water consumption*

AS/NZS 2442.2, *Performance of household electrical appliances — Rotary clothes dryers, Part 2: Energy efficiency labelling requirements*

1.4 Terms and definitions

For the purpose of this Standard, the definitions below apply.

NOTE The following defined terms are bolded in this Standard.