

AS/NZS 2442.2:2021

(Incorporating Amendments up to and including No. 2)



Australian/New Zealand Standard™

# Performance of household electrical appliances — Rotary clothes dryers

Part 2: Energy efficiency labelling requirements



AS/NZS 2442.2:2021

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.

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 2442.2:2019.

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ISBN 978 1 76113 209 4

Australian/New Zealand Standard™

# Performance of household electrical appliances — Rotary clothes dryers

## Part 2: Energy efficiency labelling requirements

Originated as AS/NZS 2442.2:1998.  
Previous edition 2000.  
Third edition 2021.  
Reissued incorporating Amendment No 1 (August 2021).  
Reissued incorporating Amendment No 2 (November 2021).

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## 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 2442.2:2000, *Performance of household electrical appliances — Rotary clothes dryers, Part 2: Energy efficiency labelling requirements*.

**2** This Standard incorporates Amendment No. 1 (August 2021) and Amendment No. 2 (November 2021). The start and end of changes introduced by the Amendment are indicated in the text by tags including the amendment numbers. **A2**

This objective of this Standard is to specify the energy efficiency labelling requirements for electric household rotary clothes dryers intended for household and similar use that are within the scope of the relevant legislation.

This Standard defines performance and energy efficiency labelling requirements that a household rotary clothes dryer is to meet in order to be supplied in Australia and New Zealand.

This Standard includes vented and condenser dryers, dryers that use a heat pump as a heat source and the dryer function of combination washer/dryer.

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*

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

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. It also includes information for registration for water efficiency labelling (where applicable). Part 2 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 2442 series is to promote high levels of performance and energy efficiency (and water efficiency where applicable) in rotary clothes dryers.

The main changes to this Standard are as follows:

- (i) Addition of a super-efficiency 10-star label and element alignment with other energy-regulated appliances.
- (ii) Extension of the loading table from 10 kg up to 20 kg, aligning with market offerings and AS/NZS 2442.1.
- (iii) The test voltage is specified as 230 V.
- (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. It refers to  AS/NZS 2442.1:2021  for test procedures. AS/NZS 6400, *Water efficient products — Rating and labelling* references this Standard for water efficiency labelling requirements.

When check testing is undertaken, it will be to the relevant legislation to which the model has been registered. Check testing tolerances for all parameters in this Standard (including energy and performance) are set out in the relevant legislation. Details concerning check testing policies and tolerances are available at: [www.energyrating.gov.au](http://www.energyrating.gov.au).

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.

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# Australian/New Zealand Standard

## Performance of household electrical appliances — Rotary clothes dryers

### Part 2: Energy efficiency labelling requirements

#### Section 1 Scope and general

##### 1.1 Scope

This Standard specifies the energy efficiency labelling requirements for 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) **Program for energy efficiency labelling** and water efficiency labelling (where applicable).
- (b) **Comparative energy consumption (CEC)**.
- (c) **Star rating** for energy efficiency labelling.
- (d) **Energy rating label** requirements.
- (e) Performance criteria.
- (f) Content, format and affixing requirements for **rotary clothes dryer energy rating labels**.
- (g) Test report content, example for the application for **registration** for energy efficiency labelling and water efficiency labelling.
- (h) Details concerning appliance **registration** with the relevant regulator.

##### 1.2 Application

This Standard **shall** be read in conjunction with AS/NZS 2442.1.

##### 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 2442.1, *Performance of household electrical appliances — Rotary clothes dryers, Part 1: Methods for measuring performance, energy and water consumption*

AS/NZS 60335.1, *Household and similar electrical appliances — Safety, Part 1: General requirements (IEC 60335-1 Ed 5.2, MOD)*

##### 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.

#### 1.4.1

##### base energy consumption

###### BEC

nominal energy consumption of a **rotary clothes dryer** of a given **rated load capacity** with a **star rating index** of 1.00

Note 1 to entry: Units: kilowatt-hours/year (kWh/year).

Note 2 to entry: See also Clause 2.6.

#### 1.4.2

##### check test

test to determine whether an appliance complies with the **relevant legislation**, which is intended to verify claims about a model in relation to one or more of the following:

- (a) *Energy consumption* — Indicated on the **energy rating label**.
- (b) *Water consumption* — Indicated on the water rating label.
- (c) *Product performance*.

Note 1 to entry: For water rating label refer to AS/ NZS 6400.

#### 1.4.3

##### comparative energy consumption

###### CEC

nominal energy consumption of a model of a **rotary clothes dryer**, based on the **PAEC<sub>av</sub>** estimated for the model

Note 1 to entry: The **CEC** appears on the **energy rating label**.

Note 2 to entry: Units: kilowatt-hours/year (kWh/year).

Note 3 to entry: See also Clause 2.4.

#### 1.4.4

##### dryer(s)

###### 1.4.4.1

##### condenser dryer(s)

heated air is passed through the load while it is being tumbled and the water vapour thus accumulated is separated from the air within the **dryer**, converted to a liquid, and either drained or stored for later removal

###### 1.4.4.2

##### vented dryer(s)

heated air is passed through the load while it is being tumbled with this air and accumulated water vapour discharged from the **dryer** to the atmosphere

#### 1.4.5

##### energy rating label

label that provides consumers with information concerning the energy consumption and energy efficiency of household **rotary clothes dryers**

Note 1 to entry:  The energy rating label displays the product's **CEC**, **star rating**, **rated load capacity**, **program for energy efficiency labelling** and the corresponding **program time**. 

Note 2 to entry: The base **energy rating label** shows 1 to 6 stars and the super efficiency **energy rating label** shows 7 to 10 stars, see Section 5 for labelling requirements.

**1.4.6****field use factor** $F_f$ 

takes account of over-drying, which occurs in timer and manual **dryers** compared to autosensing dryers

Note 1 to entry: See also Clause 2.3.

Note 2 to entry: Units: Dimensionless.

**1.4.7****may**

indicates the existence of an option

**1.4.8****moisture removed** $m_r$ 

mass of **moisture removed** from a test load during a moisture removal test in accordance with AS/NZS 2442.1

Note 1 to entry: Units: kilogram (kg).

**1.4.9****program**

series of operations pre-defined within the **rotary clothes dryer** for drying certain types of loads to certain dryness levels

**1.4.10****program for energy efficiency labelling**

**program**, including all associated specific settings, nominated by the supplier as recommended to dry a cotton load of specified moisture content at **rated load capacity** and which meets the performance criteria specified in Section 3

Note 1 to entry: See also Clause 2.3(b).

**1.4.101****program time**

duration of time measured from the initiation of the **program** (excluding any user programmed delay) until the end of **program** **1.4.101**

**1.4.11****projected annual energy consumption****PAEC**

estimation of energy used by a model or single unit on the **program for energy efficiency labelling** during one year's use, which assumes a particular number of uses in one year and includes the **field use factor**

Note 1 to entry: Units: kilowatt-hours/year (kWh/year).

Note 2 to entry: See also Clause 2.3.

**1.4.12****rated load capacity**

maximum mass of textile material, stated by the manufacturer for the applicable load material, in multiples of 0.5 kg, which the manufacturer claims can be treated in all operations by a **clothes dryer**, in accordance with the requirements of this Standard

Note 1 to entry: Under typical conditions of storage, cotton fabrics contain approximately 8 % moisture; therefore, the maximum mass includes an 8 % allowance for moisture above the bone-dry mass, i.e. the nominal bone-dry mass of a test load is equal to 92.6 % of rated capacity.

#### 1.4.13

##### **registration(s)**

process of registering products regulated for energy efficiency in Australia and New Zealand under the **relevant legislation** with the relevant regulator and meeting a number of legal requirements before they can be supplied or offered for **supply**

Note 1 to entry: For information on **registration**, see Appendix C.

#### 1.4.14

##### **relevant legislation**

legislative requirements governing the **supply** of electric household **rotary clothes dryers** in Australia and New Zealand

Note 1 to entry: For Australia, the **relevant legislation** is *Greenhouse and Energy Minimum Standards (Rotary Clothes Dryers) Determination* (GEMS Determination) and *Greenhouse and Energy Minimum Standards Act 2012* (Cth) (GEMS Act), which can be accessed at [www.legislation.gov.au](http://www.legislation.gov.au). The GEMS Determination covers **rotary clothes dryers** that are ordinarily supplied and used for household or similar use. The GEMS Determination covers household **rotary clothes dryers** irrespective of the context in which they are used. For example, the GEMS Determination applies to household **rotary clothes dryers** used in a commercial context.

Note 2 to entry: For New Zealand, the **relevant legislation** is *Energy Efficiency (Energy Using Products) Regulations 2002* (New Zealand Regulations), which can be accessed at [www.legislation.govt.nz/regulation/public/2002/0009/latest/DLM108730.html](http://www.legislation.govt.nz/regulation/public/2002/0009/latest/DLM108730.html).

#### 1.4.15

##### **rotary clothes dryer(s)**

electric appliance for the tumble-drying of clothing

Note 1 to entry: The terms **rotary clothes dryer** and **dryer** are used interchangeably in this Standard.

#### 1.4.16

##### **shall**

indicates that a statement is mandatory

#### 1.4.17

##### **should**

indicates a recommendation

#### 1.4.18

##### **star rating**

number of stars displayed on the **energy rating label**

Note 1 to entry: Available stars are between a minimum of one and a maximum of 10.

Note 2 to entry: The **star rating** is calculated from the **star rating index (SRI)** (see 1.4.20), see also Clause 2.8.

Note 3 to entry: Units: Dimensionless.

#### 1.4.19

##### **supply**

supplying (or offering to **supply**) electric household dishwashers that are within the scope of the **relevant legislation**

Note 1 to entry: For Australia, **supply** covers sale, exchange, gift, lease, loan, hire or hire purchase. **Supply** is defined in the **relevant legislation**.

Note 2 to entry: For New Zealand, **supply** is offered for sale, lease, hire or hire purchase. **Supply** is defined in the **relevant legislation**.

**1.4.20****star rating index****SRI**

indication of the claimed energy efficiency of a model

Note 1 to entry: A numerically larger **SRI** indicates a higher energy efficiency, as calculated in Clause 2.7.

Note 2 to entry: Units: Dimensionless.

**1.4.21****tested energy consumption** **$E_t$** 

measured energy consumption per load dried of a single unit when tested in accordance with AS/NZS 2442.1

Note 1 to entry: Units: kilowatt-hours (kWh).

**1.4.22****tested energy performance****TEP**

for a model or single appliance, the measured energy used relative to the mass of **moisture removed** from a test load for a valid test run under this Standard

Note 1 to entry: This does not include the **field use factor**.

Note 2 to entry: Units: kilowatt-hours/kilogram (kWh/kg), where kilogram refers to **moisture removed**.

Note 3 to entry: See also Clause 2.5.

**1.5 Measured quantities**

Quantities used in this Standard **shall** be measured in tests completed in accordance with AS/NZS 2442.1.

**1.6 Rounding**

Unless otherwise stated, calculated numbers **shall** be rounded and recorded to not less than five significant figures in accordance with AS 2706.

**NOTE** Spreadsheets carry more than five significant figures in their calculations therefore specific adjustments to spreadsheets to conform with the rounding requirements in this Standard are not required.

## Section 2 Test requirements, calculations and algorithms for the energy rating label

### 2.1 General

This Section sets out the test requirements, equations and procedures for calculating values of the **comparative energy consumption (CEC)**, and **star rating**, which appear on an **energy rating label**.

The process consists of measuring the **tested energy consumption ( $E_t$ )** and **moisture removed ( $m_r$ )** of each unit tested, then calculating the **tested energy performance (TEP)** and the **projected annual energy consumption (PAEC)** of the unit.

The values of **PAEC** for the units tested are used to determine the **CEC** for the model. The **CEC** and the **rated load capacity** are then used to calculate the **star rating index (SRI)** and the **star rating**.

NOTE For an example of calculations carried out on a set of test results, see Appendix A.

### 2.2 Processing of data

#### 2.2.1 Number of units required

For the purpose of determining the **CEC** of a model for energy labelling, three separate units of the nominated model **shall** be tested for energy consumption in accordance with AS/NZS 2442.1. At the supplier's discretion, more than three units **may** be tested.

#### 2.2.2 Number of tests per unit

Each unit **shall** be subjected to at least one valid test run to obtain a value of  $E_t$  for that unit. Results **shall** be documented in a test report.

NOTE Refer to [\[A2\]](#) AS/NZS 2442.1:2021 [\[A2\]](#) Appendix G.

#### 2.2.3 Multiple test runs

Where more than one test run is performed on a unit, the values of  $E_t$  and  $m_r$  **shall** be recorded for each run. For subsequent calculations, the values of  $E_t$  and  $m_r$  **shall** each be averaged and treated as the result for that unit.

#### 2.2.4 Results

After **testing** three or more separate units in accordance with Clause 2.2.1, the separate values of  $m_r$  and **PAEC** **shall** be averaged and referred to as  $m_{r(av)}$  and  $PAEC_{av}$  respectively. The results **shall** be documented in a test report.

### 2.3 Projected annual energy consumption (PAEC)

The **PAEC** of a single **rotary clothes dryer** unit **shall** be calculated from Equation 2.1:

$$PAEC = 52 \times F_f \times E_t \quad (\text{kWh/year}) \quad 2.1$$

where

$F_f$  = **field use factor**. It accounts for the over-drying of clothes by timer and manual dryers. It is equal to 1.1 for timer and manual controlled **clothes dryers** and 1.0 for autosensing dryers

$E_t$  = **tested energy consumption** (rounded to the nearest 0.001 kWh)