

Australian/New Zealand Standard™

**Performance of electrical appliances—
Air conditioners and heat pumps**

**Part 2: Energy labelling and minimum
energy performance standards (MEPS)
requirements**



AS/NZS 3823.2:2013

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The following are represented on Committee EL-056:

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Australian Building Codes Board
Australian Industry Group
CHOICE
Consumer Electronics Association of New Zealand
Consumer Electronics Suppliers Association (CESA)
Department of Climate Change and Energy Efficiency
Electrical Compliance Testing Association
Energy Efficiency & Conservation Authority of New Zealand
Energy Safe Victoria
Institute of Refrigeration Heating and Air Conditioning Engineers New Zealand
Institution of Professional Engineers New Zealand
NSW Department of Trade and Investment, Regional Infrastructure and Services
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Australian/New Zealand Standard™

Performance of electrical appliances— Air conditioners and heat pumps

Part 2: Energy labelling and minimum energy performance standards (MEPS) requirements

Originated as AS/NZS 3823.2:1998.
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PREFACE

This Standard was prepared by the Joint Standards Australia Standards New Zealand Committee EL-056, Room Air Conditioners, to supersede AS/NZS 3823.2:2011.

The AS/NZS 3823 series comprises the following parts:

AS/NZS

- 3823 Performance of electrical appliances—Airconditioners and heat pumps
- 3823.1.1 Part 1.1: Non-ducted airconditioners and heat pumps—Testing and rating for performance (ISO 5151:2010, MOD)
- 3823.1.2 Part 1.2: Ducted airconditioners and air-to-air heat pumps—Testing and rating for performance (ISO 13253:2011, MOD)
- 3823.1.3 Part 1.3: Water-source heat pumps—Water-to-air and brine-to-air heat pumps—Testing and rating for performance (ISO 13256-1:1998, MOD)
- 3823.1.4 Part 1.4: Multiple split-system airconditioners and air-to-air heat pumps—Testing and rating for performance (ISO 15042:2011, MOD)
- 3823.2 Part 2: Energy labelling and minimum energy performance standard (MEPS) requirements (this Standard)
- 3823.3 Part 3: Calculation of performance for minimum energy performance standard (MEPS) requirements

The overall objective of the AS/NZS 3823 series of Standards is to promote high levels of performance and energy efficiency in air conditioners and heat pumps. The Parts of the AS/NZS 3823 series are summarized as follows:

- (a) Part 1.1 includes performance test procedures for rating **non-ducted air conditioners** and heat pumps, to be used in conjunction with Part 2.
- (b) Part 1.2 includes performance test procedures for rating **ducted air conditioners** and heat pumps, to be used in conjunction with Part 2.
- (c) Part 1.3 includes performance test procedures for rating water-to-air heat pumps and air conditioners with water cooled condensers, to be used in conjunction with Part 2.
- (d) Part 1.4 includes performance test procedures for rating **multi-split system** air-cooled air conditioners and air-to-air heat pumps, to be used in conjunction with Part 2.
- (e) Part 2 specifies minimum energy performance standard (MEPS) requirements and includes algorithms for the calculation of the energy efficiency **star rating**, performance requirements, details of energy labels and requirements for valid applications for **registration**.
- (f) Part 3 specifies procedures for calculating the performance (simulation) of air conditioners of the vapour compression type, in lieu of physical tests.

This Standard is published with the approval of the combined state and territory regulatory authorities and is structured to be suitable for reference in legislation calling up minimum energy performance standards and also for reference in energy labelling regulatory legislation.

The Council of Australian Governments (COAG), at its meeting in Darwin on 2 July 2009, announced the signing of the National Partnership Agreement on Energy Efficiency, which will deliver a nationally-consistent and cooperative approach to energy efficiency. COAG also announced a comprehensive 10-year strategy to accelerate energy efficiency improvements as a key component of the overall approach to combat climate change. The Ministerial Council on Energy agreed to the increased MEPS levels included in this revision at the conclusion of Regulatory Impact Statement process during 2010.

Similar to the previous revisions of this Standard it is possible to use either physical tests or simulated performance tests (described in AS/NZS 3823.3) to demonstrate compliance with the MEPS requirements for units that do not carry an energy label.

Only physical tests in a calorimeter can be used to demonstrate compliance for products that carry an energy label. Suppliers of three-phase and single-phase ducted and single-phase commercial units may choose to fix energy labels to those products. In such cases, the products must be registered for energy labelling and all of the usual requirements for energy labelling will apply (including the requirement for a physical test in a calorimeter). The status of energy labelling and MEPS Australian regulatory programs and their date of implementation, for the various air conditioning equipment configurations, is provided in Appendix E.

The main changes in this edition of the Standard are in accordance with the relevant Regulatory Impact Statement, as follows:

- (i) Introduction of cooling and heating MEPS levels for **multi-split system** air-cooled air conditioners and air-to-air heat pumps within the scope of AS/NZS 3823.1.4 from 1 April 2014.
- (ii) The use of simulation is generally only permitted for products including multi-split products with a **rated capacity** of 30 kW or greater.

The technical details with respect to each of these changes are set out in the body of this Standard.

In Australia, all appliances within the scope of this Standard, manufactured or imported for sale in Australia on or after 1 April 2014, are required to be registered to this Standard. Products registered in Australia to previous editions of this Standard will be grandfathered on the applicable date if they do not meet the requirements of this Standard.

In New Zealand, this Standard will be incorporated by reference into New Zealand regulations at a date to be notified. It is anticipated that New Zealand will accept **registrations** to this Standard on publication and will continue to allow **registrations** to the 2011 Part 2 Standard for the time being. Once this Standard is incorporated by reference in New Zealand regulations, **registrations** to previous editions will cease and will be grandfathered under normal transition provisions. New Zealand **registration** holders **should** consult the relevant regulatory authority.

Section 4 of this Standard sets out the transition provisions for energy labelling and MEPS under this Standard.

Administrative arrangements during the transition period may vary so **registration** holders **should** contact their regulator to obtain detailed requirements with respect to **registration** requirements (see also Section 4 and Appendix F of this Standard). An overview of the regulatory requirements in New Zealand for energy labelling and MEPS is included in Appendix F.

Check testing, where applicable, will be undertaken to the version of the test Standard or the appropriate MEPS levels which have been used to support the **registration** for that model. A summary of the Administrative Guidelines has been included in Appendix F for the information of users of this Standard.

Governments have indicated that Seasonal Energy Efficiency Ratings will be considered as part of the next regulatory change for air conditioners, providing a system of testing and calculating seasonal performance factors from a series of standardized test points has been developed and internationally agreed.

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.

Statements expressed in mandatory terms in footnotes to tables are deemed to be requirements of this Standard.

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STANDARDS AUSTRALIA/STANDARDS NEW ZEALAND

Australian/New Zealand Standard**Performance of electrical appliances—Air conditioners and heat pumps****Part 2: Energy labelling and minimum energy performance standards
(MEPS) requirements**

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

This Standard specifies the energy labelling requirements for single-phase **non-ducted air conditioners** of the vapour compression type within the scope of AS/NZS 3823.1.1 and the MEPS requirements for single-phase and three-phase air conditioners of the vapour compression type up to a rated total cooling capacity of 65 kW that fall within the scope of AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.3 or AS/NZS 3823.1.4.

Particular regulatory requirements for different categories of air conditioning equipment and validity dates are summarized in Appendix E of this Standard.

NOTE: Typical applicable products are shown in Appendix H.

This Standard does not specify electrical safety requirements.

This Standard specifies the following values for cooling and heating, as applicable:

- (a) **Rated power** (input).
- (b) **Rated capacity** (output).
- (c) Energy Efficiency Ratio (EER) for cooling.
- (d) **Coefficient of Performance (COP)** for heating.
- (e) **Annual Energy Efficiency Ratio (AEER)** for cooling.
- (f) **Annual Coefficient of Performance (ACOP)** for heating.
- (g) **Star Rating Index (SRI)**.
- (h) **Star rating**.
- (i) Some of the requirements for energy label validity.
- (j) The performance criteria for energy labelling validity.
- (k) Test report format.
- (l) Printing requirements for air conditioner appliance energy labels.
- (m) MEPS requirements for cooling and heating.
- (n) Power quality (power factor).

NOTE: Terms that are defined in Clause 1.6 are shown in bold text.

1.2 EXCLUSIONS

The following equipment is excluded from the scope of this Standard:

- (a) Close controlled air conditioners within the scope of AS/NZS 4965 and **chillers** within the scope of AS/NZS 4776.
- (b) Evaporative coolers or any other cooling systems that are not of the vapour compression type.
- (c) Ground-water-sourced or ground-loop-sourced heat pumps within the scope of AS/NZS 3823.1.3.
NOTE: Water loop heat pumps as defined in AS/NZS 3823.1.3 are included within the scope of this Standard.
- (d) **Unbalanced air conditioners** and **spot coolers** (these include some portable types). Regulatory requirements for these types are under consideration.
- (e) Single phase models within the scope of AS/NZS 3823.1.1 where the requirements of (i), (ii) and (iii) below are met, are not required to display an Energy Rating label but are still required to be registered for MEPS—
 - (i) designed for non-residential applications; and
 - (ii) not on display for sale through retail outlets; and
 - (iii) not promoted in any catalogue or advertising material that could be interpreted as suitable for some residential applications.
- (f) Air conditioners powered by mains electricity specifically designed and sold only for installation in end-use mobile applications such as caravans, mobile homes, camper vans, boats, rail cars, crane cabins and specialised high temperature applications such as operate in furnace and industrial applications. (excludes portable buildings)
- (g) Models that have been granted exemption by the relevant Australian/New Zealand regulatory authority due to their specific design for application such as process heating or cooling, or for heating or cooling of spaces to conditions that are not intended for human comfort.
- (h) Products that deliver solely conditioned outdoor air to an indoor conditioned space.

1.3 APPLICATION

This Standard **shall** be read in conjunction with AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.3, AS/NZS 3823.1.4 and AS/NZS 3823.3, as applicable.

Solar-boosted air conditioners and heat-pumps fall within the scope of this Standard and **shall** meet the relevant labelling and/or MEPS requirements for the cooling and/or heating function when configured to operate as an air source air conditioner or heat pump (with any solar input minimized or disconnected, as far as possible). For these products, the cooling and heating performance **shall** be determined and declared in accordance with AS/NZS 3823.1.1, AS/NZS 3823.1.2 or AS/NZS 3823.1.4, as applicable.

Products with water-cooled condensers as well as water-source heat pumps fall within the scope of this Standard and **shall** meet the relevant labelling and/or MEPS requirements for the cooling and/or heating function. For these products, the cooling and heating performance **shall** be determined and declared in accordance with AS/NZS 3823.1.3. Cooling only products with water-cooled condensers that are included within the scope of AS/NZS 3823.1.1 and AS/NZS 3823.1.2 **shall** be tested to AS/NZS 3823.1.3, wherever possible.

Air cooled, **multi-split systems** **shall** be tested using a representative configuration in accordance with Clause 3.11.

1.4 OBJECTIVE

The objective of this Standard is to—

- (a) provide detailed information on the performance and energy labelling requirements that an air conditioning appliance has to meet in order to carry a valid energy efficiency label;
- (b) provide detailed information on the performance requirements that an air conditioning appliance has to meet in order to comply with MEPS requirements; and
- (c) describe the circumstances in which alternatives to physical testing may be used to demonstrate and verify compliance with MEPS requirements.

1.5 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

2706 Numerical values—Rounding and interpretation of limiting values

AS/NZS

3823 Performance of household electrical appliances—Air conditioners and heat pumps

3823.1.1 Part 1.1: Test methods—Non-ducted air conditioners and heat pumps—Testing and rating for performance

3823.1.2 Part 1.2: Test methods—Ducted air conditioners and air-to-air heat pumps—Testing and rating for performance

3823.1.3 Part 1.3: Water-source heat pumps—Water-to-air and brine-to-air heat pumps—Testing and rating for performance

3823.1.4 Part 1.4: Multi-split system air-cooled air conditioners and air-to-air heat pumps—Testing and rating for performance

3823.3 Part 3: Calculation of performance for minimum energy performance standard (MEPS) requirements

4755 Framework for demand response capabilities and supporting technologies for electrical products—Demand response capabilities and supporting technologies for electrical products

4755.3.1 Part 3.1: Demand response capabilities and supporting technologies for electrical products—Interaction of demand response enabling devices and electrical products—Operational instructions and connections for air conditioners

4776 Liquid-chilling packages using the vapour compression cycle

4965 Performance of close control air conditioners

IEC

62301 Household electrical appliances—Measurement of standby power

The following documents are referred to in Clause 3.11 of this Standard:

ISO

5151 Non-ducted air conditioners and heat pumps—Testing and rating for performance

15042 Multiple split-system air-conditioners and air-to-air heat pumps—Testing and rating for performance

EN

14511 Air conditioners liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling

JIS	
B 8615-1	Non-ducted air conditioners and heat pumps—Testing and rating for performance
GB/T	
7725	Room air conditioners
18837	Multi-connected air-condition (heat pump) unit
KS	
C 9306	Air conditioning
AHRI	
1230	Performance rating of variable refrigerant flow (VRF) multi-split air-conditioning and heat pump equipment
CNS	
14464	Non-ducted air conditioners and heat pumps—testing and rating for performance

1.6 DEFINITIONS

For the purposes of this Standard the definitions given in AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.3, AS/NZS 3823.1.4 and those below apply.

1.6.1 Annual Coefficient of Performance (ACOP)/Coefficient of Performance (COP)

Annual Coefficient of Performance as defined in accordance with Clause 2.5. Coefficient of Performance is calculated as the rated total heating capacity divided by the effective power input for heating.

1.6.2 Annual Energy Efficiency Ratio (AEER)

Annual Energy Efficiency Ratio as defined in accordance with Clause 2.5.

1.6.3 Average true power factor

The **average true power factor** over a given time is the kWh divided by the kVAh.

NOTE: It is not the average of regular instantaneous power factor measurements.

1.6.4 Check test/Check testing

A full or part load test in accordance with AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.3, AS/NZS 3823.1.4 or a simulation assessment to AS/NZS 3823.3, as applicable, to verify the performance or energy consumption, or both, of an individual model.

1.6.5 Circumvention device

Any control, control device, software, component or part that alters the operating characteristics during any test procedure, resulting in measurements that are unrepresentative of the appliance's true characteristics that may occur during normal use under comparable conditions. Generally, **circumvention devices** save energy during an energy test, but not during normal use.

An example of a **circumvention device** would be a mechanism that de-activates a crankcase heater or other energy-consuming devices during the test.

1.6.6 Demand response capable

An air conditioner that is supplied with the necessary interface, circuitry and components to comply fully with AS 4755.3.1.

NOTE: Air conditioners that are assembled from components on site are **demand response capable** if all components necessary to make the assembly **demand response capable** are supplied with every unit, and the installation instructions require all components to be assembled.

1.6.7 Ducted air conditioners

An air conditioner model configuration where the indoor side is situated remote to the space to be conditioned. The conditioned air is supplied or extracted via a duct.

1.6.8 Family of models

A range of models of the one brand, for which a single set of test reports is applicable and where each of the models has the same relevant physical characteristics, energy performance characteristics and refrigerant. The term 'model' is synonymous with '**family of models**'.

1.6.9 Grandfathering

Refer to the Administrative Guidelines and Paragraph F3 for details. 'Grandfathered' and 'superseded' have the same meaning.

1.6.10 Multi-split system

A **split system** air conditioner with a refrigeration system having two or more independently controlled indoor units and includes both fixed head and VRF.

1.6.10.1 Fixed head multi-split system

A **split system** air conditioner or heat pump incorporating a single refrigerant circuit with a single outdoor unit and two (2) or more indoor units, each of which can be individually controlled. The outdoor unit has a dedicated set of refrigeration ports for each individual indoor unit. The maximum number of indoor units that can be connected is limited by the number of dedicated ports on the outdoor unit.

1.6.10.2 VRF multi-split system

A **split system** air conditioner or heat pump incorporating a single refrigerant circuit with one (1) or more outdoor units and two (2) or more indoor units each of which can be individually controlled. The outdoor unit module has a set of refrigeration ports that services the network of indoor units through branch piping and/or distribution devices.

1.6.11 Non-ducted air conditioner

An air conditioner model configuration where the indoor side is situated partly or wholly within the space to be conditioned. The conditioned air is directly supplied to and extracted from the conditioned space.

1.6.12 Potentially demand response capable

An air conditioner that is potentially fully compliant with AS 4755.3.1, once a nominated standard part or component, which is not otherwise supplied with every unit, has been added or fitted, either at the time of manufacture or at any subsequent time, e.g. pre-delivery, at installation or after installation. The part may be factory-installed, e.g. in response to a prior order, but must also be capable of being fitted subsequently by an authorized person at any point in the service life of the product.

Where the supplier of an air conditioner model indicates that it is **potentially demand response capable**, the supplier must also identify the part or component needed to make it **demand response capable**, and must undertake to supply that part or component from the time this indication appears on the register to not less than 10 years after the model ceases to be registered.

1.6.13 Rated capacity

The nominal **rated capacity** claimed by the manufacturer of an air conditioner model determined as follows, as applicable:

- (a) *Rated total cooling capacity* As claimed by the manufacturer in accordance with AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.4 or AS/NZS 3823.3 for temperature CONDITION T1 or for products within the scope of AS/NZS 3823.1.3, Table 1 for cooling for water loop heat pumps, as applicable. (Units: W or kW.)
- (b) *Rated total heating capacity* As claimed by the manufacturer in accordance with AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.4 or AS/NZS 3823.3 for temperature CONDITION H1, H2 or for products within the scope of AS/NZS 3823.1.3, Table 2 for heating for water loop heat pumps, as applicable. (Units: W or kW.)

1.6.14 Rated power

Effective power input of the air conditioner model as claimed by the manufacturer in accordance with AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.3, AS/NZS 3823.1.4 or AS/NZS 3823.3 during the determination of rated total cooling capacity and rated heating capacity, H1 or H2 as applicable. (Units: W or kW.)

1.6.15 Registration

In Australia: The completion and submission of the prescribed application form to the Australian regulator as specified in the on-line **registration** system (see Clause 4.1). An approved **registration** means a record that has been reviewed and accepted by the regulator and marked with an approved status on the basis that the record is complete, all relevant documents have been provided, all relevant requirements of the Standard continue to be met and the relevant fee (where applicable) has been paid.

NOTE: Appendix F sets out special rules regarding goods from New Zealand that rely on the Trans Tasman Mutual Recognition Agreement (TTMRA) for enabling them to be sold in Australia.

In New Zealand: The completion and submission of the prescribed form to the authority.

NOTE: In New Zealand, unless the prescribed form has been completed and submitted to the relevant authority, the item may not be sold to a consumer. The authority is defined in the Energy Efficiency (Energy Using Products) Regulations 2002. A product to which this Standard applies may not be sold in New Zealand unless the prescribed form has been completed and submitted to the relevant New Zealand authority tasked with receiving and processing the prescribed forms. At the time of publication of this Standard, the authority is the Energy Efficiency and Conservation Authority.

The prescribed application form, which is suitable for the **registration** of a product in New Zealand or Australia, is given in Appendix B of this Standard. See Clause 4.2.1.

Regulators for the purposes of '**registration**' means those entities set out in the list of regulators maintained on the website www.energyrating.gov.au. A valid **registration** is one where the status remains approved on the relevant date. A **registration** status of 'expired', '**grandfathered**' or 'superseded' is valid only for existing stock that was manufactured or imported prior to the expiry, **grandfathering** or supersession date and where it had a status of 'approved' at the time of manufacture or importation. A **registration** status of 'cancelled' is not valid for any stock, irrespective of the date of manufacture or importation.

NOTE: In Australia, the term '**registration**' is normally used, while in New Zealand the term 'listing' is normally used. In this Standard, the term '**registration**' applies to both systems. For current details relating to regulatory requirements refer directly to the particular regulatory authority. (See <http://www.energyrating.gov.au/reg.html#contacts>)

1.6.16 Simulated value

Value determined in accordance with a simulation test in accordance with AS/NZS 3823.2

1.6.17 Single-phase model

A model where all components in the air conditioning system that require an external power supply require only single-phase power.

NOTE: Some components of an air conditioner system may be supplied a.c. or d.c. power via internal wiring.

1.6.18 Solar-boosted air conditioner

A single-phase or three-phase non-ducted, ducted or multi-split air conditioner of the vapour compression type up to a rated total cooling capacity of 65 kW, having provision for the input of energy from a solar source and which can be configured to operate as an air source air conditioner or heat pump (with little or no solar input).

1.6.19 Split system

An air conditioner with separate indoor and outdoor components that are connected with refrigerant piping. The indoor unit usually lies within the conditioned space and may be installed or portable/mobile.

NOTE: The indoor unit in some configurations may feed into a duct system. Some split ducted system indoor units may have no fan and are designed to operate with an existing system (e.g., gas heater).

1.6.20 Spot cooler

A **unitary air conditioner** that lies wholly within a conditioned space and that draws air for both the evaporator and condenser from the conditioned space and expels both of these back into the conditioned space.

1.6.21 Standby

A non-operative state where the user has switched the air conditioner so that it is not providing any active heating and/or cooling and/or air circulation from the user's perspective. A number of different **standby** modes may exist within an individual product. The power level in **standby** may be affected by ambient conditions and other factors such as the time since the refrigeration system last ran. **Standby** includes all power consumed by controls (including **demand response**) and any heaters or other power consumed.

NOTE: Refer to Clause 2.4 for power consumption in non-operative mode.

1.6.22 Star rating

The number of stars displayed on the energy label. Available stars are between a minimum of one and a maximum of six, shown in half star intervals and then 7 to 10 stars in whole star intervals. The **star rating** is calculated from the **Star Rating Index** (see Clause 2.6). (Dimensionless.)

1.6.23 Star rating index (SRI)

An indication of the claimed energy efficiency of a model at rated conditions. A higher **SRI** indicates a higher energy efficiency. It is derived from the measured **AEER** or measured **ACOP**, as applicable (see Clause 2.5).

1.6.24 Shall

Indicates that a statement is mandatory.

1.6.25 Should

Indicates a recommendation.

1.6.26 Tested value

Value determined in accordance with a physical test to either AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.3 or AS/NZS 3823.1.4, as applicable.

1.6.27 Three-phase model

A model where at least one component in the air conditioning system requires an external three-phase power supply.

1.6.28 Twin (or triple) split

A **split system** air conditioner comprising a single outdoor unit with two (or three) indoor units that are controlled by a single controller.

1.6.29 Unbalanced air conditioner

An **unbalanced air conditioner** is a **unitary air conditioner** that lies wholly within a conditioned space and that draws air from the conditioned space and expels this to outdoors. These units are typically portable or mobile.

1.6.30 Unitary air conditioner

An air conditioner where the evaporator, condenser and associated refrigeration components (e.g. compressor) are contained within a single casing. **Unitary air conditioners** may be non-ducted (e.g. window/wall units) or ducted (e.g. single packaged units).

1.7 MEASURED QUANTITIES

Quantities used in this Standard **shall** be measured during tests carried out in accordance with AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.3 or AS/NZS 3823.1.4, as applicable.

1.8 ROUNDING

Unless otherwise stated, numbers **shall** be rounded and recorded to five significant figures in accordance with AS 2706.

1.9 CLAIMS OF CAPACITY AND ENERGY CONSUMPTION

1.9.1 Qualifications to claims

Any unqualified claims of capacity and energy consumption **shall** be rated values for CONDITION T1, or H1 or H2, as applicable (see Clauses 1.6.13 and 1.6.14). Other claims of capacity and energy consumption **shall** be qualified by the conditions under which these values are determined.

1.9.2 Prohibition on the use of the term 'horsepower'

The use of 'horsepower' as a unit of measure for air conditioner output capacity **shall** not be used in advertising material or product literature because it does not directly correlate to the output capacity in kW and is therefore misleading.

1.9.3 Use of standard units for output

Units such as BTU/hour (British Thermal Units), kCal/hour (kilocalories per hour) or MJ/hour (megajoules per hour) **should** not be used as a unit of measure for air conditioner output capacity. Clause 1.6.13 requires that **rated capacity** to be stated in watts or kilowatts.

1.10 RATED CAPACITY

The **rated capacity** shall be stated on the product, in the product specification or the associated product literature.

The **rated capacity** appears on the energy label as 'Capacity Output' (heating and/or cooling as applicable. (Units: kW).

For variable output capacity equipment, the **rated capacity** of each model shall not exceed the maximum continuous output rating possible by the unit. Short term peak outputs shall not be used for **rated capacity**.

The term 'full load operation', as used in ISO test methods, and **rated capacity** shall have the same meaning and shall be the **rated capacity** stated in the model **registration**.

The **rated capacity** for variable capacity systems is set using the specified method described in the model **registration**.

SECTION 2 CALCULATIONS FOR THE ENERGY LABEL

2.1 SCOPE OF SECTION

This Section sets out the equations and procedures for calculating the capacity output, power input, **SRI** values and the **star rating**, which appear on an energy label. This Section applies to all single-phase non-ducted appliances that fall within the scope of AS/NZS 3823.1.1. Three-phase appliances and ducted appliances that the supplier elects to register for energy labelling **shall** also comply. Products within the scope of AS/NZS 3823.1.3 and AS/NZS 3823.1.4 shall not be registered for energy labelling.

Suppliers are not permitted to claim a **star rating** in product literature or advertising material unless the product has a valid **registration** for energy labelling in accordance with this Section.

2.2 GENERAL

Energy labels **shall** not be fixed to appliances that do not comply with the requirements of this Section. Energy labels are provided for cooling only units, heating only units and heating and cooling units. Units that have the capability to both heat and cool **shall** be labelled as a heating and cooling unit.

NOTE: Air conditioners where heating is provided only by means of resistive heating will not meet the MEPS requirements for heating performance specified in this Standard.

The capacity output and power input values shown on the energy label are based on the **rated capacity** and the **rated power**, as claimed by the manufacturer. The values on the energy label **shall** be consistent with the capacity on the model's rating nameplate or all other data in any associated product literature (or both) for the specified conditions. The **Star Rating Index** of the air conditioner **shall** be based on the **AEER**, and the **ACOP**, as applicable, for the unit(s) tested.

NOTE: Manufacturers are also permitted to indicate the rated heating output for CONDITION H2 on the energy label under certain conditions. Refer to the relevant requirements in Sections 3, 4 and 5.

The results of the unit(s) tested are used to assess the validity of the **rated capacity** and the **rated power**. The determination of tested capacity (cooling and heating) and tested total effective power input for the unit(s) used for the purposes of energy labelling **shall** be conducted using the calorimeter test method as specified in AS/NZS 3823.1.1, or AS/NZS 3823.1.2 for CONDITION T1 for cooling or CONDITION H1 and/or H2, for heating, as applicable. Determinations using the indoor air-enthalpy/psychrometric test method of these Standards or determinations using the simulation method specified in AS/NZS 3823.3 are not acceptable for energy labelling.

2.3 NUMBER OF TESTS AND PROCESSING OF DATA

2.3.1 Number of units required

For the purposes of verification of the rated values of a model, at least one unit of the nominated model **shall** be tested for capacity, effective power input and EER for CONDITION T1 for cooling and capacity, effective power input and **COP** for CONDITION H1 for heating in accordance with AS/NZS 3823.1.1 or AS/NZS 3823.1.2, as applicable. At the supplier's discretion more than one unit may be tested.

2.3.2 Number of tests per unit

Only one valid test from each unit tested **shall** be considered when determining the energy label data in accordance with AS/NZS 3823.1.1 or AS/NZS 3823.1.2.

2.3.3 Verification of rated values

As a prerequisite to the determination of values for an energy label (and MEPS), the unit(s) tested **shall** each comply with all of the following validity criteria for cooling and heating, as applicable:

- (a) Tested effective power input for each unit $\leq 1.05 \times \text{rated power}$.
- (b) Tested cooling and heating capacity for each unit $\geq 0.95 \times \text{rated capacity}$.

This tolerance is an allowance for possible variation in test samples due to production variability in a model.

NOTE: Clause 2.9 sets out additional validity criteria for energy labelling claims. Clause 3.5 sets out additional validity criteria for MEPS.

For verification tests, the unit **shall** be operated at **rated capacity** at CONDITION T1, or H1 and/or H2 (as applicable) in accordance with AS/NZS 3823.1.1, AS/NZS 3823.1.2 or AS/NZS 3823.1.4 for the determination of measured cooling or heating capacity, effective power input, energy efficiency ratio and/or **coefficient of performance** and compliance with applicable MEPS requirements. The unit under test **shall** be installed and tested as specified in Clause 2.2 and **shall** be operated in accordance with the settings for **rated capacity** using the method described in the model **registration**.

NOTE: Results of testing conducted by third parties where the settings for **rated capacity**, as registered, are not applied during any test, **should** not be used for comparison purposes with manufacturers' data without a clear statement specifying the test method and settings used.

2.4 POWER CONSUMPTION IN NON-OPERATIVE MODE

The non-operative power of an air conditioner is the average power consumption of the air conditioner when not providing a cooling or heating or air circulation function for the user and **shall** be determined in accordance with Appendix G.

The non-operative power **shall** be determined for cooling mode and for heating mode, as applicable.

The non-operative power for a reverse cycle product **shall** be determined firstly as a cooling only product then secondly as a heating only product.

2.5 ANNUAL EFFICIENCY

The **AEER** of an air conditioner is defined as follows:

$$\text{AEER} = \frac{[\text{Cooling output (rated or tested)} \times 2000]}{[\text{Cooling effective power input} \times 2000] + [P_{\text{noc}} \times 6.76]} \quad \dots 2.5(1)$$

where

Cooling output (rated or tested) is the measured value in kW.

Cooling effective power input (rated or tested) is the measured value in kW.

2000 is a factor that is the assumed hours of operation per year in cooling mode.

P_{noc} is the non-operative power in watts in cooling mode, as defined in Clause 2.4.

6.76 is a factor that converts power (watts) to energy (kWh) for (8760 – 2000) hours per year.

The **ACOP** of an air conditioner is defined as follows:

$$\text{ACOP} = \frac{[\text{Heating output (rated or tested)} \times 2000]}{[\text{Heating effective power input} \times 2000] + [P_{\text{noh}} \times 6.76]} \quad \dots 2.5(2)$$

where

Heating output (rated or tested) is the measured value in kW.

Heating effective power input (rated or tested) is the measured value in kW.

2000 is a factor that is the assumed hours of operation per year in heating mode.

P_{noh} is the non-operative power in watts in heating mode, as defined in Clause 2.4.

6.76 is a factor that converts power (watts) to energy (kWh) for (8760 – 2000) hours per year.

NOTE: The calculation of both rated and **tested values** for **AEER** and **ACOP** are required to meet MEPS using the above methods as applicable.

2.6 STAR RATING INDEX (SRI)

2.6.1 General

The **SRI** for a model of air conditioner for cooling and heating, as applicable, **shall** be determined in accordance with Clauses 2.6.2 and 2.6.3 respectively, using the tested **AEER** and tested **ACOP** for the unit(s) as defined in Clause 2.5. The value for tested **AEER** and tested **ACOP** **shall** be in watts per watt.

NOTE: The equations for SRI in the following Clauses were derived from a market analysis in 2005 and were introduced in the 2009 edition of this Standard.

2.6.2 SRI cooling

The **SRI** for cooling is calculated by the following equation:

$$\text{SRI cooling} = \frac{[(\text{AEER} \times 8) - 18]}{4} \quad \dots 2.6(1)$$

2.6.3 SRI heating

The **SRI** for heating is calculated by the following equation:

$$\text{SRI heating} = \frac{[(\text{ACOP} \times 8) - 18]}{4} \quad \dots 2.6(2)$$

2.7 STAR RATING

The **star rating** is based on the **SRI** and is obtained from Table 2.1.

TABLE 2.1
DERIVATION OF STAR RATING

Star Rating Index (SRI)	Star rating
$SRI < 1.5$	1.0
$1.5 \leq SRI < 2.0$	1.5
$2.0 \leq SRI < 2.5$	2.0
$2.5 \leq SRI < 3.0$	2.5
$3.0 \leq SRI < 3.5$	3.0
$3.5 \leq SRI < 4.0$	3.5
$4.0 \leq SRI < 4.5$	4.0
$4.5 \leq SRI < 5.0$	4.5
$5.0 \leq SRI < 5.5$	5.0
$5.5 \leq SRI < 6.0$	5.5
$6.0 \leq SRI < 7.0$	6.0
$7.0 \leq SRI < 8.0$	7.0
$8.0 \leq SRI < 9.0$	8.0
$9.0 \leq SRI < 10.0$	9.0
$10.0 \leq SRI$	10.0

2.8 EXAMPLE OF ENERGY EFFICIENCY CALCULATIONS

For a complete example of calculations carried out on a typical set of test results refer to Appendix A.

2.9 ENERGY LABEL VALIDITY (CHECK TESTING)

The energy label **shall** be accepted as valid when a single sample of a model, tested for an initial screening test, meets the following criteria for cooling and heating, as applicable:

- (a) Tested effective power input $\leq 1.10 \times \text{rated power}$.
- (b) Tested cooling and heating capacity $\geq 0.90 \times \text{rated capacity}$.
- (c) Tested **AEER** $\geq 0.90 \times \text{rated AEER}$.
- (d) Tested **ACOP** $\geq 0.90 \times \text{rated ACOP}$.

If the above criteria do not apply, the label **shall** be accepted as valid if up to three additional units are tested and the average values for these additional units are as follows:

- (i) Tested average effective power input $\leq 1.10 \times \text{rated power}$.
- (ii) Tested average cooling and heating capacity $\geq 0.90 \times \text{rated capacity}$.
- (iii) Tested **AEER** $\geq 0.90 \times \text{rated AEER}$.
- (iv) Tested **ACOP** $\geq 0.90 \times \text{rated ACOP}$.

During a verification test by a third party, a measured value of P_{noc} and/or P_{noh} , where available, may be used to assess the validity of tested **AEER** and **ACOP**.

The values in this Clause **shall** not be applied as a tolerance on the original test measurements that are used to support an application for **registration**. The tolerances above are only an allowance for possible variation in test results for test samples due to production variability, sampling error and all measurement uncertainties in or between laboratories, which is applied when assessing a **check test** result.

NOTE: The Administrative Guidelines (summarized in Appendix F) set out important information and the methodology used by government for **check testing** of a product registered to this Standard. These guidelines can be found on www.energyrating.gov.au. Note that different criteria are applied to the verification of MEPS compliance and energy labelling validity. This Clause only sets out validity for energy label claims. Clause 3.5 sets out additional validity criteria for MEPS.

Check testing shall be undertaken using the conditions (e.g. settings, duct pressure, air flow rates and compressor frequency) specified in the application for **registration** for MEPS and energy labelling (where applicable).

Where circumvention is suspected during a **check test**, including in non-operative mode, a laboratory **shall** subject the appliance to various measures in an attempt to detect such devices. Details of any such action and their effect **shall** be included in the test report.

2.10 MAXIMUM COOLING TEST

Appliances that are registered for energy labelling **shall** meet the requirements of the maximum cooling test set out in AS/NZS 3823.1.1, or AS/NZS 3823.1.2, as applicable, when tested to temperature CONDITION T1 as specified for the maximum cooling test. This test may be conducted using either a calorimeter or the indoor air-enthalpy/psychrometric test method.

The design of a model and therefore all production is required to meet the maximum cooling tests requirements of AS/NZS 3823.1.1 or AS/NZS 3823.1.2 as applicable. Only one unit need be tested to confirm this for the purposes of energy labelling and MEPS. Evidence of such a test report **shall** be provided on **registration**.

SECTION 3 PERFORMANCE CRITERIA

3.1 GENERAL

The performance criteria set out in Clauses 3.2 to 3.11 **shall** be met by all units, as applicable.

NOTE: Where a system has more than one power supply (e.g., a **split system**), the whole system is considered to be three-phase for the purposes of this Standard where at least one of the external power supply systems is three-phase. See Clause 1.6.27 for a definition of a **three-phase model**.

An air conditioner **shall** not contain a **circumvention device**.

3.2 MINIMUM ENERGY PERFORMANCE STANDARD (MEPS)

Air conditioners manufactured in or imported into Australia or New Zealand after the dates specified **shall** meet or exceed the requirements in Table 3.1 for air conditioners within scope of AS/NZS 3823.1.1, AS/NZS 3823.1.2 and AS/NZS 3823.1.4 or Table 3.2 for air conditioners within scope of AS/NZS 3823.1.3.

Reverse cycle products **shall** meet the requirements for both heating and cooling. In the case of reverse cycle products, the MEPS levels for heating and cooling are based on the rated total cooling capacity. For the purposes of determining the relevant MEPS level in Table 3.1 or Table 3.2, **rated capacity shall** be rounded to the nearest 0.1 kW.

TABLE 3.1

MEPS—MINIMUM REQUIREMENTS FOR AIR TO AIR HEAT PUMPS AND
AIR CONDITIONERS AT RATED CAPACITY (MEPS_{rated capacity})

Greenhouse and Energy Minimum Standards (GEMS) Product Class	Product description	Minimum AEER for New Zealand only	Minimum AEER and/or ACOP for Australia. Minimum ACOP for New Zealand
1	Non-ducted unitary, <10 kW	2.84	3.10
2	Non-ducted unitary, 10 kW to <19 kW	3.10	3.10
3	Non-ducted split systems, <4 kW*	3.33	3.66
4	Non-ducted split systems, 4 kW to <10 kW*	2.93	3.22
5	Non-ducted split systems, 10 kW to <19 kW*	3.10	3.10
6	Ducted systems, <10 kW*	2.75	3.10
7	Ducted systems, 10 kW to <19 kW*	3.10	3.10
8	Multi-split systems, <4 kW	3.66†	3.66†
9	Multi-split systems, 4 kW to <10 kW	3.22†	3.22†
10	Multi-split systems, 10 kW to <19kW	3.10†	3.10†
11	All configurations, 19 kW to 39 kW	3.10†	3.10†
12	All configurations, >39 kW to 65 kW	2.90†	2.90†

* Excludes **multi-split systems**.

† The **AEER** and **ACOP** values **shall** apply for the first time to the equivalent **rated capacity multi-split system** air-cooled air conditioners and air-to-air heat pumps within the scope of AS/NZS 3823.1.4 from 1 April 2014.

TABLE 3.2
MEPS—MINIMUM REQUIREMENTS FOR WATER SOURCE
HEAT PUMPS AND AIR CONDITIONERS AT RATED
CAPACITY (MEPS_{rated capacity})

Greenhouse and Energy Minimum Standards (GEMS) Product Class	Cooling and/or heating capacity	Minimum AEER and/or ACOP
13	<39.0 kW	3.50
14	≥39.0 kW	3.20

3.3 COMPLIANCE WITH MINIMUM ENERGY PERFORMANCE STANDARD (MEPS) REQUIREMENTS

Evidence of minimum energy performance standard requirements compliance **shall** be provided by a report on a physical test to AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.3 or AS/NZS 3823.1.4 requirements or, for certain product types, a report on a simulation test to AS/NZS 3823.3 requirements as specified in Clause 3.5. The report, together with data and documentation on the determination of non-operative power specified in Clause 2.4, **shall** demonstrate that each appliance meets or exceeds the **AEER** cooling requirement and the **ACOP** heating requirement, as applicable, at the **rated capacity**. Both the rated values and the tested (or **simulated**) values submitted for the purposes of **registration shall** comply with MEPS requirements. The claimed capacity and power consumption for both cooling and heating, if applicable, **shall** be substantiated by physical testing or simulation of appliance performance for the standard rating conditions set out in Clause 3.4.

NOTE: An example of air conditioner assessment for MEPS is provided in Appendix A.

The unit **shall** be operated at **rated capacity** under the total cooling capacity test under CONDITION T1, and/or the total heating capacity test under CONDITION H1 (as applicable) in accordance with AS/NZS 3823.1.1, AS/NZS 3823.1.2 or AS/NZS 3823.1.4 as applicable, for the determination of total cooling capacity, heating capacity, effective power input, energy efficiency ratio and coefficient of performance. For products within the scope of AS/NZS 3823.1.3, the determination of total cooling or heating capacity, effective power input, energy efficiency ratio and/or **coefficient of performance shall** be determined in accordance with AS/NZS 3823.1.3 Table 1 for cooling and AS/NZS 3823.1.3 Table 2 for heating for water loop heat pumps, as applicable. The non-operative power (Clause 2.4) **shall** be used to calculate **AEER** and **ACOP**, where applicable, in order to assess compliance with MEPS.

Products that have variable capacity control (which is more efficient at part-load conditions) but do not meet the minimum energy performance standard requirements at **rated capacity** under CONDITION T1 and/or CONDITION H1 in AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.3 or AS/NZS 3823.1.4 as applicable, are deemed to comply with MEPS if they meet the following requirements:

- (a) The **AEER** and/or **ACOP** (rated and tested) at **rated capacity** is not less than 95% of specified MEPS level.
- (b) The **AEER** and/or **ACOP** (tested) of a part load point selected by the supplier and documented with a test report supplied with the **registration** demonstrates that the model meets or exceeds either one of the following two requirements:
 - (i) For an output in the range 83.3% to 100% of **rated capacity**, the **AEER** and/or **ACOP** (tested) meets or exceeds the MEPS level.
 - (ii) For an output in the range 50% to 83.3% of **rated capacity**, the **AEER** and/or **ACOP** (tested) meets or exceeds the $MEPS_{partload}$ given in the following equation:

$$MEPS_{\text{partload}} \geq \left[1.25 - \frac{\text{Output}_{\text{partload}}}{\text{Output}_{\text{rated capacity}}} \times 0.3 \right] \times MEPS_{\text{rated capacity}} \quad \dots 3.3$$

NOTE: $MEPS_{\text{rated capacity}}$ is from Table 3.1 or Table 3.2, as applicable.

Suppliers that use the part load allowance above in order to comply with MEPS **shall** also provide data for **AEER** and/or **ACOP** (as applicable) in Section 8 at a nominal 50% load output during the **registration** of their product. Suppliers may use a combination of acceptable part load and full load data to register a product. Products that rely on simulation in accordance with AS/NZS 3823.3 to demonstrate compliance with MEPS are not eligible to use the part load provisions of this Clause. The tested output at nominal 50% **shall** be a value between 47.5% and 62.5% of the **rated capacity**. Refer to Appendix B, Section 8 of the application form.

3.4 NUMBER OF TESTS, PROCESSING OF DATA AND PERMITTED TEST METHODS

For the purposes of demonstrating compliance with minimum energy performance standard requirements a report **shall** be on at least one unit as follows:

- (a) For units registered for energy labelling (on either a mandatory or voluntary basis) and MEPS. One physical test conducted in a calorimeter in accordance with AS/NZS 3823.1.1 or AS/NZS 3823.1.2 for CONDITION T1 for cooling and CONDITION H1 for heating.
- (b) For units registered for MEPS only with a **rated capacity** <30 kW. Either—
 - (i) one physical test conducted in accordance with AS/NZS 3823.1.1, AS/NZS 3823.1.2 or AS/NZS 3823.1.4 for CONDITION T1 for cooling and CONDITION H1 for heating; or
 - (ii) one physical test conducted in accordance with AS/NZS 3823.1.3 to Table 1 for cooling and Table 2 for heating, as applicable.
- (c) For units registered for MEPS only with a **rated capacity** of 30 kW or greater. Either—
 - (i) a simulation of performance as specified in AS/NZS 3823.3; or
 - (ii) one physical test conducted in accordance with AS/NZS 3823.1.1, AS/NZS 3823.1.2 or AS/NZS 3823.1.4 for CONDITION T1 for cooling and CONDITION H1 for heating; or
 - (iii) one physical test conducted in accordance with AS/NZS 3823.1.3 to Table 1 for cooling and Table 2 for heating, as applicable.
- (d) For ducted units or any configuration of multi-split units registered for MEPS only with a **rated capacity** <30 kW and where the supplier provides an undertaking that sales of that model will be less than 10 units per year in Australia and New Zealand: a report using a simulation of performance as specified in AS/NZS 3823.3. The use of simulation is conditional on the supplier agreeing to supply annual calendar year sales data in Australia and New Zealand to the relevant regulator for all specified models from the same supplier (irrespective of how they are tested). The expiry date for the **registration** will only be extended (where applicable) where sales data is provided by 31 March of the following year. The supplier undertakes to immediately re-register the product using a test report under (b) above if at any point the sales of the product exceeds 10 in Australia and New Zealand in any calendar year. Products registered using simulation tests under this provision where sales exceed 10 in any calendar year may have their **registration** immediately cancelled by the regulator.

Information on non-operative power in accordance with Clause 2.4 **shall** be provided in the reports above or in separate documentation.

Where the technology cannot be accurately modelled, there is no alternative to a physical test (e.g. unitary systems where there is thermal interaction between internal components, water cooled units and non steady state behaviour). These are examples of configurations not within the scope of AS/NZS 3823.3, so simulation of performance cannot be used as an alternative.

The applicability of energy labelling and MEPS program elements together with relevant application dates **shall** be in accordance with the provisions of Appendix E.

As a prerequisite to the verification of MEPS compliance, any physical test result used to support an application for MEPS **shall** meet the validity criteria for cooling and heating, as applicable, as set out in Clause 2.3.3. For a product registered using simulation to AS/NZS 3823.3, the **rated capacity shall** not exceed the capacity obtained by simulation.

3.5 MEPS VALIDITY (CHECK TESTING)

Check testing of a product **shall** be either by a physical test or a simulation test, where permitted in Clause 3.4. In the case of a dispute, test results obtained by physical testing, using the procedures defined in AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.3 or AS/NZS 3823.1.4 as applicable, take precedence over test results obtained using a simulation model in accordance with AS/NZS 3823.3. In the case of a dispute, test results obtained using the a calorimeter or enthalpy method as applicable, take precedence over test results obtained using simulation methods. In the case of a physical test, **check testing shall** be undertaken using the method applicable to the model type at the time of **registration**.

Screening tests are conducted on a single unit. The rated values **shall** be accepted as valid if the test results confirm that the model meets all of the following criteria (as applicable). If the single unit fails any of the following criteria, the supplier can accept the failure and de-register the model or nominate to undertake a second round of check testing in accordance with the requirements of the applicable Regulator:

- (a) Tested effective power input, cooling and heating at **rated capacity** $\leq 1.10 \times \text{rated power}$.
- (b) Tested cooling and heating capacity output at **rated capacity** $\geq 0.90 \times \text{rated capacity}$.
- (c) Tested **AEER** at the MEPS rating point (**rated capacity** or part load as applicable) $\geq \text{MEPS limit}$.
- (d) Tested **ACOP** at the MEPS rating point (**rated capacity** or part load as applicable) $\geq \text{MEPS limit}$.
- (e) Tested **AEER** at **rated capacity** $\geq 0.90 \times \text{rated AEER at rated capacity}$.
- (f) Tested **ACOP** at **rated capacity** $\geq 0.90 \times \text{rated ACOP at rated capacity}$.
- (g) Tested **COP** for H2 at claimed H2 output $\geq \text{H2 MEPS limit}$ defined in Clause 3.7.

During a verification test by a third party, a measured value of P_{noc} and/or P_{noh} , where available, may be used to assess the validity of tested **AEER** and **ACOP**.

The values in this Clause **shall** not to be applied as a tolerance on the original test measurements that are used to support an application for **registration**. The tolerances above are only an allowance for possible variation in test results for test samples due to production variability, sampling error and all measurement uncertainties in or between laboratories, which is applied when assessing a **check test** result.

NOTES:

- 1 Simulation models provide an estimate of system optimum performance under idealized operating conditions. Modelling may not take into account variables introduced in the physical manufacture of a system, such as airflow across the coils. For this reason actual tests may show a performance lower than that estimated by the simulation model. Physical tests take priority in this Standard and performance claims based on a simulation model are made at the applicant's own risk.
- 2 The administrative guidelines (summarized in Appendix F) set out important information and the methodology used by government for **check testing** of products registered to this Standard. These guidelines can be found on www.energyrating.gov.au. Note that different criteria are applied to the verification of MEPS compliance and energy labelling validity. This Clause only sets out validity for MEPS. Clause 2.9 sets out additional validity criteria for energy labelling claims, where applicable.
- 3 During a verification test, if a complying test period of one or two defrost cycle duration fails the stated MEPS requirement for a transient H2 test, then the test period **should** be extended to a minimum of 3 whole defrost cycles in order to assess whether a period with representative defrost control cycles meets the verification requirements.

Where a physical **check test** is undertaken to validate a **registration** that is based on a simulation, the laboratory **should** provide all relevant physical measurements (such as pressure drops and refrigerant temperatures, etc.) that will allow the physical **check test** to be fully compared with the original test report or the simulation result.

NOTE: Refer to Appendix C.

Check testing shall be undertaken using the conditions (e.g. settings, duct pressure air flow rates, compressor frequency and representative combination) specified in the application for **registration** for MEPS and energy labelling (where applicable) where these comply with the requirements of the relevant Standard. For **multi-split systems** the indoor unit combination tested **shall** be the 'representative combination' nominated at **registration**.

Where circumvention is suspected during a **check test**, including in non-operative mode, a laboratory **shall** subject the appliance to various measures in an attempt to detect such devices. Details of any such action and their effect **shall** be included in the test report.

3.6 VARIABLE OUTPUT COMPRESSORS

Products that have variable output compressors (e.g. variable speed, digital scroll or multi stage) have this indicated on the www.energyrating.gov.au website and on the energy label (where applicable).

Products with variable capacity control that is more efficient at part-load conditions may register **AEER** and **ACOP** figures (as applicable) at a nominal 50% of the **rated capacity** for CONDITIONS T1 and H1 in AS/NZS 3823.1.1, AS/NZS 3823.1.2, AS/NZS 3823.1.3 or AS/NZS 3823.1.4 (as applicable). Suppliers may use a combination of acceptable part load and full load data to register a product.

NOTE: Such products can have a high relative efficiency at part load. If these products are identified to the relevant regulatory authority and supporting test data is provided, the part load performance figures will be displayed on the website www.energyrating.gov.au. A nominal output in the range of 50% to 60% of **rated capacity** is acceptable for this listing (the **tested value** can lie in the range 47.5% to 62.5% of **rated capacity** once the acceptance criteria of Clause 2.3.3 are applied). Investigations into a seasonal rating approach are under consideration.

While it will remain a requirement to supply to regulators any information on how to fix the output of variable output systems during testing as part of the **registration** process, manufacturers **should** make such information readily available to facilitate third party testing. Wherever possible, manufacturers **should** design their products in a way that the capacity of variable output systems can be fixed for testing purposes using controls on the product or using equipment normally supplied with the product (i.e. without the need for special test equipment supplied by the manufacturer).

3.7 COEFFICIENT OF PERFORMANCE AT LOW TEMPERATURE

This Clause specifies minimum requirements for air to air heat pumps where the supplier elects to claim the heating output under low temperature conditions (H2) and claim suitability of operation in these conditions.

For products that carry an energy label when tested at **rated capacity** for heating with CONDITION H2 in accordance with AS/NZS 3823.1.1 or AS/NZS 3823.1.2, as applicable, the tested **coefficient of performance (COP)** shall be tested in a calorimeter.

For products not required to carry an energy label when tested at **rated capacity** for heating with CONDITION H2 in accordance with AS/NZS 3823.1.1, AS/NZS 3823.1.2 or AS/NZS 3823.1.4, the tested and rated **coefficient of performance** may be tested in a calorimeter or enthalpy type rooms as applicable.

The results shall be not less than the levels specified below for each air to air heat pump type:

- (a) For non-ducted unitary systems not less than 2.3.
- (b) For non-ducted **split systems** less than 4 kW not less than 2.5.
- (c) For non-ducted **split systems** greater than or equal to 4 kW not less than 2.3.
- (d) For ducted systems not less than 2.5.
- (e) For **multi-split systems** not less than 2.5.

For products that carry an energy label, the values shown on the energy label shall be based on rated values. The text on the energy label for heating capacity at CONDITION H2 shall comply with the requirements of Section 5 and Appendix D. Only products registered with regulators to display this information on the energy label for the particular model are permitted to display this version of the energy label.

NOTE: Simulations to AS/NZS 3823.3 are not permitted for H2 declarations under this Clause.

Values for **rated capacity** and rated **COP** for condition H2 as recorded in the **registration** system may be assessed for validity as set out in Clause 3.5.

3.8 NON-OPERATIVE POWER

All products shall have the non-operative power determined in accordance with the requirements of Clause 2.4.

During **registration**, the information with respect to non-operative power shall be provided as set out in Appendix B. These data are used to calculate the **AEER** and **ACOP** (as applicable) specified in Clause 2.5.

NOTE: Relevant data are displayed on the www.energyrating.gov.au website.

3.9 DEMAND RESPONSE CAPABILITY

Where an air conditioner is **demand response capable** or **potentially demand response capable**, the following information shall be included in the application for **registration** in Appendix B:

- (a) Whether the model is **demand response capable** or **potentially demand response capable**.
- (b) If the model is **potentially demand response capable**, the identifier of the part or component required to make it **demand response capable**, together with an undertaking to make that part or component available for supply to customers for the defined period.
- (c) The **demand response** mode or modes (as defined in AS 4755.3.1) of which the product is capable, or potentially capable.

NOTE: This information is included in public listings on www.energyrating.gov.au

The supplier of an air conditioner that is **demand response capable** may elect to indicate the demand response modes of which the product is capable on the energy label, as defined in Clause 5.5. The supplier of an air conditioner that is **potentially demand response capable shall** use the same energy label as a product that is not **demand response capable** (i.e. the only way for the public to identify products that are **potentially demand response capable** will be the product **registration**).

3.10 POWER FACTOR

The **average true power factor** during cooling and/or heating, as applicable, at **rated capacity** rating tests **shall** be reported for all products. The **average true power factor shall** be determined over a period of not less than 5 minutes of operation at **rated capacity**. Products that rely on simulation to AS/NZS 3823.3 for performance **shall** also have **average true power factor** measured from an equivalent physical test as per AS/NZS 3823.3 Section 2.

Air conditioners **shall**, when operated at **rated capacity** for cooling and heating, as applicable, have a measured **average true power factor** as follows:

- (a) Air conditioners that have a **rated power** input of less than or equal to 850 W **shall** have—
 - (i) a measured input that does not exceed 1000 VA; and
 - (ii) a measured **average true power factor** greater than or equal to 0.5.
- (b) Air conditioners that have a **rated power** input of greater than 850 W and a **rated capacity** of less than or equal to 15 kW **shall** have a measured **average true power factor** greater than or equal to 0.85.
- (c) Air conditioners that have a **rated capacity** of greater than 15 kW and less than or equal to 20 kW **shall** have a measured **average true power factor** greater than or equal to—

$$0.85 - \left(\frac{\text{rated capacity (kW)} - 15}{100} \right)$$

- (d) Air conditioners that have a **rated capacity** of greater than 20 kW **shall** have a measured **average true power factor** greater than or equal to 0.80.

3.11 SPECIFIC REQUIREMENTS FOR MULT-SPLIT SYSTEMS

Fixed head **multi-split systems shall** be tested in accordance with AS/NZS 3823.1.4 or simulated to AS/NZS 3823.3 as permitted in 3.4(c) and 3.4(d). The outdoor unit **shall** have a dedicated set of refrigeration ports for each individual indoor unit. The maximum number of indoor units that can be connected is limited by the number of dedicated ports on the outdoor unit.

VRF **multi-split systems shall** be tested in accordance with AS/NZS 3823.1.4 or an alternate applicable International or regional standard listed in Table 3.3 or simulated AS/NZS 3823.3 as permitted in Clause 3.4, Items (c) and (d). The outdoor unit module **shall** have a set of refrigeration ports that services the network of indoor units through branch piping and/or distribution devices. Where an alternate International or regional standard is used the supply voltage and frequency used during the test **shall** be 230 V single phase or 400 V three phase at 50 Hz.