

FULL OVERVIEW document *v1*

Comparison of AS/NZ (and draft IEC) standards with EN and ISO standards - **Refrigerating Appliances**

The standards below were compared:

Draft IEC 62552 Edition 2 (201X) Parts 1,2,3 (supplied as IEC Committee Drafts 59M/35/CD), as a future replacement to AS/NZS 4474.1, see below. The three parts are referred to as :1, :2 & :3 respectively in the table below.

And:

AS/NZS 4474.2 2013 Performance of household electrical appliances – Refrigerating Appliances Part 2: Energy labelling and minimum energy performance standard requirements (draft as supplied).

With:

BS EN 153 2006 Methods of measuring the energy consumption of electric mains operated household refrigerators, frozen food storage cabinets, food freezers and their combinations, together with associated characteristics. This standard is required for EU energy labelling. However, it contains few details, referring directly to BS EN ISO 15502:2005 with some minor modifications.

Where relevant these differences have been noted in the Tables below.

Summary

While these standards are for the same products and are aimed at determining similar properties, there are significant differences between them. Fundamentally, the AS/NZS contains some minimum performance requirements and also cover mandatory labelling regulation and administrative details, while the EN contains methods and assessments only - the labelling requirements are in separate EU legislation.

The version of AS/NZS 4474.2 was supplied in a draft version with some editorial comments; for this exercise the comparison was made on the text as written. AS/NZS 4474.2 states that the previous version of Part 1 of this standard will be replaced by IEC 62552 Edition 2 parts 1, 2 & 3 when AS/NZS 4474.2 is published.

With regard to the application of the IEC, AS/NZS 4474.2 Clause 2.1 states that the energy consumption shall generally be determined in accordance with IEC 62552 Edition 2, but different settings and calculations are applied relating to the energy label and Minimum Energy Performance Standards (MEPS). The implication is that if a supplier wishes to declare general energy consumption they should follow IEC 62552 Edition 2, while for the energy label they shall follow the modified requirements in AS/NZS4474.2.

The Tables below list the main areas of difference, where different methodology, operating conditions etc. are used in both and also where one standard or other standard has additional assessments.

The comparisons are made on the following basis:

Table A

- Compares what will replace AS/NZS 4472.1, i.e. IEC 62552 Edition 2 (as IEC Committee Drafts 59M/35/CD) as the base document to assess any differences between it and ISO 15502 (and EN 153).

Table B

- Compares AS/NZS4474.2 2013 as the base document to assess differences to those parts of IEC 62552 Ed 2 specifically referenced in AS/NZS 4474.2 and differences to the equivalent parts in ISO 15502 (and EN153).

Any modifications introduced by EN 153 on ISO 15502 are noted in italics in the Tables.

Notes

- ISO 15502:2005 relates to appliances available at its time of publication. Appliances have subsequently become more sophisticated in their operation, controls and features and the latest IEC 62252 reflects this change, with more detail given on appliance settings and test conditions. Thus in general ISO 15502 has fewer definitions and simpler calculations etc. than IEC 62552.

- The format used in the Tables below is that the AS/NZS 4474.2 and the IEC Committee Drafts 59M/35/CD's are used as the basis for comparison. Only differences are listed (i.e. where different standards have test requirements with similar methodology etc. they are not mentioned). Numbers/letters at the beginning of the text in each section refer to the relevant standard part (where necessary), clause or appendix number (as "A" for Appendix A etc.).
- Tables A and B are designed to stand alone, thus there is some duplication where the AS/NZS has similar tests to IEC 62552 but the ISO 15502 or EN 153 differs to IEC 62552

Nomenclature

"N/P" means attribute not present.

Table A

A comparison of draft IEC 62552 Edition 2 (201X), which will replace AS/NZS 4474:1, with BS EN ISO 15502:2005 and as modified by BS EN 153:2006

Attribute	Draft IEC 62552 (201X):1, :2, :3	BS EN ISO 15502:2005 <i>and BS EN 153:2006 if different</i>
Instrumentation	:1.A.2 Requirements for measuring length, mass, time and voltage/frequency and other factors	8.7. Only specifies instrumentation needs for temperature, humidity and electrical power
Test Room	:1.A.3.1. For energy consumption, room temperature to be 16°C & 32°C. For other tests, 25°C.	8.2.b. For energy consumption and associated tests, room temperature to be 25°C, 32°C for class T. <i>For all energy consumption and associated tests and classes, 25°C.</i>
	:1.A.3.2. Range of voltages permitted	8.6.3.1. Test at rated voltage. <i>If rated between 220 V and 240V, test at 230V</i>
Installation of appliance	:1.B. Requirements for installation, running in etc. of appliance	N/P (Follow manufacturer's instructions)
	3.A.2.5. Anti-condensation heaters that are user adjustable shall be tested both on and off, and at highest and lowest settings, where relevant	8.6.2. Tested both on and off and at highest setting only

Attribute	Draft IEC 62552 (201X):1, :2, :3	BS EN ISO 15502:2005 and BS EN 153:2006 if <i>different</i>
Test packages	:1.C. Only 50x100x100 size packages are specified	8.5. Various smaller and larger size packages specified
Measurement of storage temperatures	:1.D. Very detailed requirements for loading and location of temperature sensors	8. & 13. Slightly different requirements for loading and location of temperature sensors, less detail.
Wine storage Appliances	:1.H. Terms, definitions and requirements	N/P
Storage temperature	:2.4.5. Temperatures specified for different types <hr/> :2.4.5. Very detailed figures and text describing how to load and set up different types/shapes of appliance	6. Temperatures not specified for pantry compartment <hr/> 13. Less detail and many differences partly due to difference in size of test packs permitted
Cooling capacity	:2.2 Cooling fresh food performance	N/P
Freezing capacity	:2.6.3.2. Configuration and settings specified as for worst-case scenario <hr/> :2.6.4.3. Light load specified as 3.5kg/100 litres of -18°C compartments <hr/> :2.6. Very detailed guidance and specifications for loading and evaluation of results	17.2.2. Configuration and settings specified as for best case scenario <hr/> 17.2.4.3. Light load specified as manufacturer's stated weight to be frozen in 24 h. <hr/> 17. Less detail
Ice-making capacity	:2.7. Automatic ice makers only, detailed guidance given for configuration and setting up <hr/> :2.7.2.1. Ambient and water at 25°C only	18. Automatic and manual (ice trays), additional requirements etc. given for ice tray capacity, less detail given <hr/> 8.2.b. Ambient and water at 25°C except for Class T at 32°C
Wine appliance and compartment storage	:2.B. Storage of wine performance	N/P

Attribute	Draft IEC 62552 (201X):1,;2,;3	BS EN ISO 15502:2005 <i>and BS EN 153:2006 if different</i>
Water vapour condensation	:2.D. Extent of condensation on exterior surfaces	14. (N/P)
Volume	:3.3.8 & H. Limited guidance given on determining the volume of different types, none on how to measure the gross volume <hr/> N/P	7.2. Volume shall be calculated by dividing the total volume into convenient units of geometric shapes that can be measured <hr/> 7.1. & 7.3. Determination of linear dimensions and area of shelves etc.
Definitions	:3.2. Additional definitions relating to more complex testing/appliances	N/P
Target temperatures for compartments	:3.4.1. Temperatures specified for 10 compartment types	6. Compartments not mentioned: Pantry, wine storage, vegetable, zero star.
Control settings for energy consumption	:3.4.2. Appliances shall have at least one (or combination) control setting capable of achieving the target temperatures for each compartment (above)	6. Implicit requirement, appliance shall be capable of maintaining the specified storage temperatures
Energy consumption	:3.5.4 & A. Complex procedures and calculations to determine that steady state conditions have been attained and how to determine steady state energy consumption. Energy consumption is measured for a steady state period (undefined) in watts. The daily energy consumption for each control setting and ambient is calculated by multiplying the steady state consumption in watts by 24. <hr/> :3.5.8.3. The annual energy consumption for each ambient and control setting is calculated by multiplying the daily consumption (above) by	15. Simpler process based on energy consumption and storage temperatures over two successive 24h test periods being valid and in agreement (within 3% and 0.5K respectively). Energy consumption is then measured over at least 24h, then calculated for a period of exactly 24 h and reported as kW h/24h. (15.2.1. <i>If the test ambient deviates from 25°C, the daily energy consumption is corrected to 25°C with a specified equation, using the measured storage temperatures and volumes for each compartment</i>) <hr/> N/P

Attribute	Draft IEC 62552 (201X):1, :2, :3	BS EN ISO 15502:2005 and BS EN 153:2006 if different
	365/1000 to obtain the result in kWh per year. :3.5.8.5. The total energy consumption can be estimated by interpolation from the energy consumptions at 16°C and 23°C and adding the energy consumptions of any auxiliaries.	N/P
Defrost and recovery	:3.5.5. Determination of additional energy and temperature changes during automatic defrost/recovery	N/P
Defrost interval	:3.5.6. Determination of the interval between auto defrosts	N/P
Load processing energy	:3.6. & G. Test to determine the additional energy to remove a known amount of energy from warm water when placed in the appliance	N/P
Energy of specified auxiliaries	:3.5.8.4. Determination of the energy (separately) of a specific auxiliary within an appliance	N/P
Air tightness doors, seals etc.	N/P	9. (not for EN 153)
Opening force doors, lids etc.	N/P	10. (not for EN 153)
Durability doors lids etc.	N/P	11. (not for EN 153)
Mechanical strength shelves etc.	N/P	12. (not for EN 153)
Circumvention	:3.6 Definition of what does/does not constitute a circumvention device for energy consumption	N/P
Uncertainty of measurement	:3.7. For all energy measurements, the uncertainties shall be determined and reported.	N/P (Only for instruments used)

Attribute	Draft IEC 62552 (201X):1,;2,;3	BS EN ISO 15502:2005 and BS EN 153:2006 if <i>different</i>
Percentage running time	N/P	B. Informative, test and calculation specified
Absence of taste and odour	N/P	C. Informative, subjective test specified
Rated characteristics and control procedures	N/P	E. Informative, maximum tolerances specified for the difference between measured and declared (rated) values (<i>Normative</i>)
Various informative annexes	:3.I. Examples of power consumption calculations	N/P
	:3.J. Development of the IEC global test method for refrigerating appliances	N/P
	:3.K. Approaches to analysis of test data	N/P

Table B A Comparison of AS/NZS4474.2 2013 with IEC 62552 Ed 2 and the equivalent parts in ISO 15502 (and EN153)

Attribute	AS/NZS 4474:2(2013)	Draft IEC 62552:1,;2,;3	BS EN ISO 15502:2005 and BS EN 153:2006 if <i>different to the ISO</i>
Scope	1.1. Mains powered and used to store foodstuffs	N/P	N/P (<i>Mains powered</i>)
	Specifies performance attributes to be measured	N/P	N/P (<i>Energy consumption and associated characteristics</i>)
Exclusions	1.2. Several, e.g. small portables, vapour compression only	N/P	N/P

Attribute	AS/NZS 4474:2(2013)	Draft IEC 62552:1,:2,:3	BS EN ISO 15502:2005 and BS <i>EN 153:2006 if different to the ISO</i>
Definitions	1.6. Several additional and many that define administrative requirements e.g., registration, variant, categorisation for applying MEPS and energy labelling rules (very detailed), good, family of models	:1,:2,:3.3. Fewer definitions, none for administrative matters	3. Even fewer definitions
Energy consumption determinations for energy labelling (see below for settings to be used)	<p>2.2: Steady state power consumption as IEC 62252:3 A</p> <hr/> <p>Defrost and recovery energy as IEC 62552:3 C</p> <hr/> <p>Defrost frequency as IEC 62552:3 D</p> <hr/> <p>Energy consumption of specific auxiliaries as IEC 62552:3 F</p> <hr/> <p>Processing efficiency as IEC 62552:3 G</p>	(Not relevant)	<p>15. (see Table A above) Simpler process based on energy consumption and storage temperatures measured over at least 24h and reported as kW h/24h. <i>(15.2.1. The daily energy consumption is corrected to 25°C)</i></p> <hr/> <p>N/P</p> <hr/> <p>N/P</p> <hr/> <p>N/P</p> <hr/> <p>N/P</p>

Attribute	AS/NZS 4474:2(2013)	Draft IEC 62552:1,;2,;3	BS EN ISO 15502:2005 and BS <i>EN 153:2006 if different to the ISO</i>
Specific settings for energy labelling tests	2.2. Table 2.1: Classification tested for Climate class SN only	:1.4.1. Climate classes for SN,N,ST & T	4.1. Climate classes for SN,N,ST & T
	230V, 50 Hz only	:1.A.3.2. 3 other voltages permitted	6.3.1. Test at rated voltage. (<i>If rated between 220 V and 240V, test at 230V</i>)
	Energy consumption, storage temperatures etc. tested at 16°C & 32°C	:1.A.3.1. Test at 16°C & 32°C.	:1.A.3.1. Test at 16°C & 32°C. (<i>8. Test at 25°C only</i>)
	Interpolation method for daily energy consumption as IEC 636652:3.E.		N/P
	Manual anti-condensation heaters set on or at highest setting only	:3.A.2.5. Heaters set to both on and off or highest and lowest settings	:3.A.2.5. Heaters set to both on and off or highest and lowest settings (<i>on and off and highest only</i>)
	Load processing energy efficiency test at 32°C only.	:3.G. Test at 16°C & 32°C	N/P
	Load processing energy efficiency test load is defined as a deemed value	:3.G. Test load is calculated based on internal volume	N/P
	Load processing energy efficiency either measured or	:3.G. Value to be measured	N/P

Attribute	AS/NZS 4474:2(2013)	Draft IEC 62552:1,;2,;3	BS EN ISO 15502:2005 and BS <i>EN 153:2006 if different to the ISO</i>
	<p>deemed to be 0.5</p> <hr/> <p>Circumvention devices are disabled or their impact on energy consumption estimated and used to adjust the daily overall energy consumption</p>	<hr/> <p>6. Circumvention mentioned but no general guidance on action to be taken, only for ice-makers, defrost and anti-condensation heaters</p>	<hr/> <p>N/P</p>
Specific settings and requirements for Minimum Energy Performance Standards (MEPS)	2.3. Table 2.2: Test at 32°C only. Similar requirements to energy label tests, all following the IEC with some minor qualifications	N/P (No requirements for performance standards)	N/P (No requirements for performance standards)
Humidity probabilities for energy labelling calculations	2.4. Tables 2.3 & 2.4., Australian data used for labelling, US for MEPS	N/P (:3.F.2.4 requires regions to provide data for local indoor conditions)	N/P
Calculations for energy labelling	3.2.1. Three units to be tested, number of runs per unit to enable a valid value of Projected Annual Energy Consumption (PAEC) to be determined	:3.5.3. No number of units specified, one run or two or more if different settings for separate compartments is needed.	N/P
	3.3. PAEC for each unit calculated using the daily energy consumption at 32°C multiplied by 175 and at 16°C multiplied by 190, and including adjustments for any	N/P (some guidance given in Annexe I, informative)	N/P

Attribute	AS/NZS 4474:2(2013)	Draft IEC 62552:1,;2,;3	BS EN ISO 15502:2005 and BS <i>EN 153:2006 if different to the ISO</i>
	<p>ant-condensation heaters and for load processing. PAEC's for each unit are averaged.</p>		
	<p>3.4. The Comparative Energy Consumption (CEC) is a declared value that is not less than the average PAEC (above)</p>	N/P	N/P
	<p>3.6. The Base Energy Consumption (BEC) is calculated on the basis of the volume of the appliance (normalised) and various factors (defined in the standard).</p>	N/P	N/P
	<p>3.7. & 8. The Star Rating Index (SRI) is calculated from the CEC and BEC (above) and an adjustment factor. The Star Rating for an appliance is obtained from where the SRI fits in a table in the standard.</p>	N/P	N/P
	<p>3.9. Specific guidance and requirements are given for dealing with multi-group</p>	N/P	N/P

Attribute	AS/NZS 4474:2(2013)	Draft IEC 62552:1,;2,;3	BS EN ISO 15502:2005 and BS <i>EN 153:2006 if different to the ISO</i>
	products.		
Performance Criteria Specific compliance requirements are given	<p>4. : Measured volumes shall be within specified limits of declared values</p> <hr/> <p>Pull down time shall be less than 6 hours</p> <hr/> <p>Storage temperatures shall meet specified standard requirements</p> <hr/> <p>Appliances shall not exceed a calculated energy consumption value (MEPS 2015 cut-off level) based on its volume</p> <hr/> <p>Any automatic defrost system shall work under normal use without any user intervention</p> <hr/> <p>Any declared automatic controls shall be declared; when present, the appliance shall meet the MEP's with or without the controls operating. Information shall be provided on the energy</p>	<p>N/P</p> <hr/> <p>N/P</p> <hr/> <p>:2.4.1 Similar requirement</p> <hr/> <p>N/P</p> <hr/> <p>N/P</p> <hr/> <p>N/P</p> <hr/> <p>N/P</p>	<p>N/P</p> <hr/> <p>N/P</p> <hr/> <p>6. Similar requirement (see Table A)</p> <hr/> <p>N/P</p> <hr/> <p>5.6. Requirements for collection and disposal of defrost water only</p> <hr/> <p>N/P</p>

Attribute	AS/NZS 4474:2(2013)	Draft IEC 62552:1,;2,:3	BS EN ISO 15502:2005 and BS <i>EN 153:2006 if different to the ISO</i>
	<p>impact of such controls etc.</p> <hr/> <p>Circumvention devices are not permitted</p> <hr/> <p>N/P</p>	N/P	<p>N/P</p> <hr/> <p>5.1. Requirements for the construction to ensure adequate performance and durability in use</p>
Application and test reports	5. & E. Requirements for producers to apply, register etc. for energy label (test report format under review)	N/P (except for test report format, under review)	19. Test report content required to contain results of all specified tests (<i>19. Reduced report omitting tests not carried out for energy labelling</i>)
Energy label format	6. Requirements for design and location of labels	N/P	N/P
Additional information	Appendices give worked examples, information etc. for energy label calculations and administrative procedures	:3.1. Informative, examples of energy calculations	N/P