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Australian/New Zealand Standard™

# Household refrigerating appliances — Characteristics and test methods

## Part 2: Performance requirements



AS/NZS IEC 62552.2:2018

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Business New Zealand  
CHOICE  
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Consumers' Federation of Australia  
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Australian/New Zealand Standard™

# Household refrigerating appliances — Characteristics and test methods

## Part 2: Performance requirements

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## Preface

This Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-060, Household Refrigerating Appliances, to supersede part of AS/NZS 4474.1:2007, *Performance of household electrical appliances—Refrigerating appliances, Part 1: Energy consumption and performance*.

**A1** Amendment No. 1 to this Standard was prepared by the Joint Standards Australia/Standards New Zealand Committee EL-060, Household Refrigerating Appliances. **A1**

The objective of this Standard is to specify the essential characteristics of household refrigerating appliances cooled by internal natural convection or forced air circulation, and specifies test methods for checking the characteristics. This part of AS/NZS IEC 62552 describes the methods for the determination of performance requirements. Although there is some commonality in the set-ups for different tests (and so it may be an advantage to apply them all to one sample), these are separate tests to evaluate specific characteristics of the sample being tested. This part of AS/NZS IEC 62552 does not specify a procedure to generalize the results from sample test results to a prediction of the characteristics of the whole population from which that sample was selected.

**A1** This Standard is identical with, and has been reproduced from, IEC 62552-2:2015, *Household refrigerating appliances — Characteristics and test methods — Part 2: Performance requirements* and its Amendment No. 1 (2020). **A1**

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## NOTES

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**HOUSEHOLD REFRIGERATING APPLIANCES –  
CHARACTERISTICS AND TEST METHODS –****Part 2: Performance requirements****FOREWORD**

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**IEC 62552-2 edition 1.1 contains the first edition (2015-02) [documents 59M/62/FDIS and 59M/65/RVD] and its amendment 1 (2020-11) [documents 59M/127/FDIS and 59M/133/RVD].**

**This Final version does not show where the technical content is modified by amendment 1. A separate Redline version with all changes highlighted is available in this publication.**

International Standard IEC 62552-2 has been prepared by subcommittee 59M: Performance of electrical household and similar cooling and freezing appliances, of IEC technical committee 59: Performance of household and similar electrical appliances

IEC 62552-1, IEC 62552-2 and IEC 62552-3 together constitute a technical revision and include the following significant technical changes with respect to IEC 62552:2007:

- a) All parts of the standard have been largely rewritten and updated to cope with new testing requirements, new product configurations, the advent of electronic product controls and computer based test-room data collection and processing equipment.
- b) In Part 1 there are some changes to test room equipment specifications and the setup for testing to provide additional flexibility especially when testing multiple appliances in a single test room.
- c) For more efficient analysis and to better characterise the key product characteristics under different operating conditions, the test data from many of the energy tests in Part 3 is now split into components (such as steady state operation and defrost and recovery). The approach to determination of energy consumption has been completely revised, with many internal checks now included to ensure that data complying with the requirements of the standard is as accurate as possible and of high quality.
- d) Part 3 of the standard now provides a method to quantify each of the relevant energy components and approaches on how these can be combined to estimate energy under different conditions on the expectation that different regions will select components and weightings that are most applicable when setting both their local performance and energy efficiency criteria while using a single set of global test measurements.
- e) For energy consumption measurements in Part 3, no thermal mass (test packages) is included in any compartment and compartment temperatures are based on the average of air temperature sensors (compared to the temperature in the warmest test package). There are also significant differences in the position of temperature sensors in unfrozen compartments.
- f) The energy consumption test in Part 3 now has two specified ambient temperatures (16°C and 32°C).
- g) While, in Part 2 (this part) test packages are still used for the storage test to confirm performance in different operating conditions, in Part 1 they have been standardised to one size (100 mm × 100 mm × 50 mm) to simplify loading and reduce test variability. A clearance of at least 15 mm is now specified between test packages and the compartment liner.
- h) A load processing energy efficiency test has been added in Part 3.
- i) A tank-type ice making energy efficiency test has been added in Part 3.
- j) A cooling capacity test has been added in Part 2 (this part).
- k) A pull-down test has been added in Part 2 (this part).
- l) Shelf area and storage volume measurement methods are no longer included. In Part 3 the volume measurement has been revised to be the total internal volume with only components necessary for the satisfactory operation of the refrigeration system considered as being in place.
- m) Tests (both performance (Part 2 – this part) and energy (Part 3)) have been added for wine storage appliances.

The following print types are used in this international standard:

- requirements: in roman type;
- test variables: in *italic type*;
- notes: in small roman type.
- words in **bold** are defined in IEC 62552-1:2015.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2

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- reconfirmed,
- withdrawn,
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- amended.

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## INTRODUCTION

IEC 62552 is split into 3 parts as follows:

- Part 1: Scope, definitions, instrumentation, test room and set up of refrigerating products;
- Part 2: General performance requirements for **refrigerating appliances** and methods for testing them (this part);
- Part 3: **Energy consumption** and **volume** determination.

# HOUSEHOLD REFRIGERATING APPLIANCES – CHARACTERISTICS AND TEST METHODS –

## Part 2: Performance requirements

### 1 Scope

This part of IEC 62552 specifies the essential characteristics of household and similar **refrigerating appliances** cooled by internal natural convection or forced air circulation, and establishes test methods for checking these characteristics.

This part of IEC 62552 describes the methods for the determination of performance requirements. Although there is some commonality in the set-ups for different tests (and so it may be an advantage to apply them all to one sample), these are separate tests to evaluate specific characteristics of the sample being tested. This part of IEC 62552 does not specify a procedure to generalise the results from sample test results to a prediction of the characteristics of the whole population from which that sample was selected.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62552-1:2015, *Household refrigerating appliances – Characteristics and test methods – Part 1: General requirements*

IEC 62552-3:2015, *Household refrigerating appliances – Characteristics and test methods – Part 3: Energy consumption and volume*

### 3 Terms, definitions and symbols

For the purposes of this document, the terms, definitions and symbols given in IEC 62552-1:2015 apply.

### 4 Performance requirements and tests covered in this standard

#### 4.1 General

This standard sets out tests to assess the performance of household and similar **refrigerating appliances**. While this standard does not require these tests to be performed, when they are performed, they shall be carried out as specified.

#### 4.2 Storage test

The storage test is used to establish whether the **refrigerating appliance** is capable of maintaining suitable internal **storage temperatures** in a range of ambient conditions defined under the climate classes for which it is **rated**. See Clause 6.

### 4.3 Cooling capacity test

The **cooling capacity** test is used to measure the load processing capability of **fresh food compartments** by determining the time to pull down a specified test load from ambient to a specified temperature. See Clause 7.

### 4.4 Freezing capacity test

The **freezing capacity** test is used to measure the load processing capability of **frozen compartments** by determining the time to pull down a specified test load from ambient to a specified temperature. This test is required to establish whether a **frozen compartment** also qualifies for a **four-star** performance rating. See Clause 8.

### 4.5 Automatic ice-making capacity test

The **ice-making capacity** test is used to determine the quantity of new ice cubes that can be produced over a specified period of time. See Clause 9.

### 4.6 Other tests

Other tests that may not be required to be performed are found in the annexes.

These tests are

- a) Pull-down test (Annex A): This test is used to measure the reserve refrigerating capacity of a **refrigerating appliance**.
- b) Wine storage test (Annex B): This test is used to check compliance with the requirements of Part 2 at appropriate **ambient temperatures** for the various climate classes.
- c) Temperature rise test (Annex C): This test is used to determine the time taken for the temperature to rise in the warmest test package from  $-18^{\circ}\text{C}$  to  $-9^{\circ}\text{C}$  after the power is disconnected. It is applicable to **refrigerating appliances** with one or more **three-star** or **four-star compartments**.
- d) Water vapour condensation test (Annex D): This test is used to determine the extent of water condensation on the external surface of the **refrigerating appliance** under specified ambient conditions.

### 4.7 Test summary

Table 1 provides a summary of the tests to be performed.

**Table 1 – Test summary**

| Clause / Annex and Test                                                                                                                    | Ambient                                  |              | Pantry and cellar                                            | Fresh food    | Chill        | Zero star       | 1 and 2 star                         | 3 and 4 star | Temperature requirements after test has started |
|--------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|--------------|--------------------------------------------------------------|---------------|--------------|-----------------|--------------------------------------|--------------|-------------------------------------------------|
| Clause 6 Storage                                                                                                                           | Various                                  | Packages     | No                                                           |               | Type b       | No              | 1 star: Type a<br>Other: Type a or b |              | To hold initial values                          |
|                                                                                                                                            |                                          | Initial temp | Mean                                                         |               | Instant      | Mean            | Max                                  |              |                                                 |
| Clause 7 Cooling capacity                                                                                                                  | 25 °C                                    | Packages     | No                                                           | Type b        | No           | No              | No                                   |              | For test load final only                        |
|                                                                                                                                            |                                          | Initial temp | Table 2                                                      | +4 °C ± 0,5 K | Table 2      | Maximum/minimum | Average/minimum                      |              |                                                 |
| Clause 8 Freezing capacity                                                                                                                 | 25 °C                                    | Packages     | M-packages only<br>Type b                                    |               | Type b       | No              | Type a                               |              | Yes excursion and final                         |
|                                                                                                                                            |                                          | Initial temp | Table 2                                                      |               | Not measured | Maximum/minimum |                                      |              |                                                 |
| Clause 9 Auto ice-making                                                                                                                   | 25 °C                                    | Packages     | No                                                           |               |              |                 |                                      |              | No                                              |
|                                                                                                                                            |                                          | Initial temp | As for Table 2                                               |               |              |                 | Maximum/minimum                      |              |                                                 |
| Annex A Pull-down                                                                                                                          | Max                                      | Packages     | No                                                           |               |              |                 |                                      |              | Final only                                      |
|                                                                                                                                            |                                          | Initial temp | Maximum temperature according climate class rating           |               |              |                 |                                      |              |                                                 |
| Annex C Temp rise                                                                                                                          | 25 °C                                    | Packages     | No                                                           |               | Type b       | No              | Type a                               |              | For –18 °C compartments only                    |
|                                                                                                                                            |                                          | Initial temp | Not specified                                                |               |              |                 |                                      |              |                                                 |
| Annex D Condensation                                                                                                                       | 25 °C for SN and N<br>32 °C for ST and T | Packages     | No                                                           |               |              |                 |                                      |              | To hold initial values                          |
|                                                                                                                                            |                                          | Initial temp | ≤ energy test temperatures as in Table 1 in IEC 62552-3:2015 |               |              |                 |                                      |              |                                                 |
| NOTE 1 For definitions of symbols, see 3.7 in IEC 62552-1:2015.                                                                            |                                          |              |                                                              |               |              |                 |                                      |              |                                                 |
| NOTE 2 In the event of any discrepancy between data in this table and the individual test procedures, the test procedures take precedence. |                                          |              |                                                              |               |              |                 |                                      |              |                                                 |
| NOTE 3 Wine storage test parameters are specified in Annex B.                                                                              |                                          |              |                                                              |               |              |                 |                                      |              |                                                 |

Table 2 – Compartment temperatures

| °C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |                          |              |           |           |                           |                            |                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------------------|--------------|-----------|-----------|---------------------------|----------------------------|-----------------------------|
| Compartment type                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |                          |              |           |           |                           |                            |                             |
| Fresh food                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           | Three-star and four-star | Two-star     | One-star  | Zero-star | Chill                     | Cellar                     | Pantry                      |
| $T_{1m}, T_{2m}, T_{3m}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | $T_{ma}$  | $T^{***a}$               | $T^{**a}$    | $T^{*a}$  | $T_{zma}$ | $T_{cci}$                 | $T_{cma}$                  | $T_{pma}$                   |
| $0 \leq T_{1m}, T_{2m}, T_{3m} \leq +8$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | $\leq +4$ | $\leq -18^b$             | $\leq -12^b$ | $\leq -6$ | $\leq 0$  | $-3 \leq T_{cci} \leq +3$ | $+2 \leq T_{cma} \leq +14$ | $+14 \leq T_{pma} \leq +20$ |
| average                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | average   | maximum                  | maximum      | maximum   | average   | instantaneous             | average                    | average                     |
| <p><sup>a</sup> The superscripts attached to the symbol <math>T</math> correspond to the <b>three-star</b> and <b>four-star</b>, <b>two-star</b> or <b>one-star</b> compartment temperature.</p> <p><sup>b</sup> During a <b>defrost and recovery period</b>, these <b>storage temperatures</b> of <b>frost-free refrigerating appliances</b> are permitted to rise by no more than 3 K with respect to the <b>storage temperature</b> during period S (see 6.4). The <b>storage temperature</b> is defined as the maximum temperature of any M-package during a given time period (see Figure 3).</p> |           |                          |              |           |           |                           |                            |                             |
| NOTE For definitions of symbols, see 3.7 in IEC 62552-1:2015                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                          |              |           |           |                           |                            |                             |

## 5 General test conditions

Unless otherwise noted, test room set-up and instrumentation shall be as specified in Annex A of IEC 62552-1:2015.

Unless otherwise noted, installation and set-up of **shelves**, drawers, bins, flaps and controls etc. shall be as specified in Annex B of IEC 62552-1:2015.

## 6 Storage test

### 6.1 Objective

The purpose of this test is to check that the **refrigerating appliance** is capable of maintaining specified internal temperatures at different **ambient temperatures**.

Under the conditions specified in this clause (Clause 6) and at the **ambient temperatures** for the appropriate climate classes as specified in A.3.2.3 of IEC 62552-1:2015, the **refrigerating appliance** shall be capable of maintaining, simultaneously, the required **compartment temperatures** (within the permitted temperature deviations during the **defrost and recovery period**) as given in Table 2.

To meet these test requirements, there shall be, for any **ambient temperature** between and including the minimum and maximum ambient temperatures defined by the **rated** climate class, at least one control setting at which all **compartments** meet the specified internal temperatures. The control(s) however, may be adjusted for testing at different **ambient temperatures**.

NOTE Because the **frozen compartment** loading is largely the same as that for the **freezing capacity** test, there may be an advantage in doing these tests consecutively.

### 6.2 Preparation of refrigerating appliance

The test room ambient shall be as specified in A.3.2.3 of IEC 62552-1:2015.