AS/NZS IEC 62552.1:2018
IEC 62552-1:2015
IEC 62552-1:2015/AMD1:2020
(Incorporating Amendment No. 1)

Australian/New Zealand Standard™

Household refrigerating appliances — Characteristics and test methods

Part 1: General requirements

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AS/NZS IEC 62552.1:2018

This Joint Australian/New Zealand Standard® was prepared by Joint Technical Committee EL-060, Household Refrigerating Appliances. It was approved on behalf of the Council of Standards Australia on 11 December 2017 and by the New Zealand Standards Approval Board on 20 December 2017.

This Standard was published on 22 January 2018.

The following are represented on Committee EL-060:

Airconditioning and Refrigeration Equipment Manufacturers Association of Australia
Australian Industry Group
Business New Zealand
CHOICE
Consumer Electronics Suppliers Association
Consumers' Federation of Australia
Department of the Environment and Energy (Australian Government)
Electrical Compliance Testing Association of Australia
Energy Efficiency and Conservation Authority of New Zealand
Energy Safe Victoria

This Standard was issued in draft form for comment as DR AS IEC 62552.1:2017.

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AS/NZS IEC 62552.1:2018
IEC 62552-1:2015
IEC 62552-1:2015/AMD1:2020
(Incorporating Amendment No. 1)

Australian/New Zealand Standard™

Household refrigerating appliances — Characteristics and test methods

Part 1: General requirements

Originated in Australia as AS B116—1956.
Originated in New Zealand as NZS 6205:1982.
Previous edition AS/NZS 4474.1:1997.
Second edition 2007.
Republished and redesignated (in part) as AS/NZS IEC 62552.1:2018.
Reissued incorporating Amendment No 1 (May 2023).

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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 establishes test methods for checking the characteristics. For the purposes of declaration, the tests defined in this part of AS/NZS IEC 62552 are considered to be type tests to assess the fundamental design and operation of a refrigerating appliance. This part of AS/NZS IEC 62552 does not define requirements for production sampling or conformity assessment or certification.

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

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HOUSEHOLD REFRIGERATING APPLIANCES – CHARACTERISTICS AND TEST METHODS –

Part 1: General requirements

FOREWORD

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IEC 62552-1 edition 1.1 contains the first edition (2015-02) [documents 59M/61/FDIS and 59M/64/RVD] and its amendment 1 (2020-11) [documents 59M/126/FDIS and 59M/132/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.

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International Standard IEC 62552-1 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, -2 and -3 constitute a technical revision and includes 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 (this part) 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 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 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 simply 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.

k) A pull-down test has been added in Part 2.

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) 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 Clause 3.

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

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A list of all parts in the IEC 62252 series, published under the general title *Household refrigerating appliances – characteristics and test methods*, can be found on the IEC website.

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
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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 (this part);
- Part 2: General performance requirements for **refrigerating appliances** and methods for testing them;
- Part 3: **Energy consumption** and **volume** determination.

NOTE For the safety requirements applicable to household **refrigerating appliances**, see IEC 60335-2-24; for noise requirements applicable to household **refrigerators** and **freezers**, see IEC 60704-2-14.

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HOUSEHOLD REFRIGERATING APPLIANCES – CHARACTERISTICS AND TEST METHODS –

Part 1: General 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.

NOTE Annex F lists the items that can be included in a test report.

For the purposes of declaration, the tests defined in this part of IEC 62552 are considered to be type tests to assess the fundamental design and operation of a **refrigerating appliance**. This part of IEC 62552 does not define requirements for production sampling or conformity assessment or certification.

This part of IEC 62552 does not define a regime for verification testing as this varies by region and country. When verification of the performance of a **refrigerating appliance** of a given type in relation to this standard is necessary, it is preferable, wherever practicable, that all the tests specified be applied to a single unit. The tests can also be made individually for the study of a particular characteristic.

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 62552-2:2015, *Household refrigerating appliances – Characteristics and test methods – Part 2: Performance requirements*
IEC 62552-2:2015/AMD1:2020

IEC 62552-3:2015, *Household refrigerating appliances – Characteristics and test methods – Part 3: Energy consumption and volume*
IEC 62552-3:2015/AMD1:2020

3 Terms, definitions and symbols

For the purposes of this document, the following terms, definitions and symbols apply.

3.1 General terms and definitions

3.1.1
refrigerating appliance
insulated cabinet with one or more **compartments** that are controlled at specific temperatures and are of suitable size and equipped for household use, cooled by natural convection or a forced convection system whereby the cooling is obtained by one or more energy-consuming means

Note 1 to entry: From the point of view of installation, there are various types of household **refrigerating appliances** (free-standing, portable, wall-mounted, built-in, etc.).

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3.1.2
refrigerator
refrigerating appliance intended for the storage of **foodstuff**, with at least one **fresh food compartment**

3.1.3
refrigerator-freezer
refrigerating appliance having at least one **fresh food compartment** and at least one **freezer compartment**

3.1.4
frost-free refrigerating appliance
refrigerating appliance in which all **compartments** are automatically defrosted with automatic disposal of the defrosted water and at least one **compartment** is cooled by a **frost-free** system

3.1.5
freezer
refrigerating appliance with only **frozen compartments**, at least one of which is a **freezer compartment**

3.1.6
wine storage appliance
refrigerating appliance that has no **compartment** other than one or more **wine storage compartment**(s)

Note 1 to entry: An appliance containing any **compartments** which do not fulfil all requirements as specified for **wine storage compartments** under Annex G cannot be categorised as a **wine storage appliance**.

3.1.7
built-in appliance
refrigerating appliance intended to be used whilst fastened in an enclosure or secured in a prepared recess in a wall or similar location

3.1.8
foodstuff
food and beverages intended for consumption

3.1.9
rated
value declared by the manufacturer (e.g. **volume, energy consumption**, usage)

3.1.10
normal use
operation when the **refrigerating appliance** is subjected to a range of different conditions that could occur during use including operation in a range of:

– indoor temperatures (including those defined in the Storage Test, see Clause 6 of IEC 62552-2:2015),
– different humidity levels and
– user-related actions, such as door openings (which may be regular, infrequent or a mixture thereof) and the addition and removal of **foodstuff** or other stored items

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3.2 Terms and definitions related to refrigerating system

3.2.1
refrigerant
fluid used for heat transfer in a refrigerating system, which absorbs heat at a low temperature and at a low pressure of the fluid and rejects heat at a higher temperature and at a higher pressure of the fluid, usually involving changes of phase of the fluid

3.2.2
condenser
heat exchanger from which heat in the **refrigerant** is rejected to an external cooling medium (usually the air surrounding the appliance)

3.2.3
evaporator
heat exchanger which absorbs heat from the **compartment** to be refrigerated and transfers this to the **refrigerant**

3.3 Compartments and sections

3.3.1
compartment
enclosed space within a **refrigerating appliance**, which is directly accessible through one or more external doors, which may itself be divided into **sub-compartments**

Note 1 to entry: The requirements for the following **compartment** types are specified in Table 2 of IEC 62552-2:2015 and Table 1 of IEC 62552-3:2015

Note 2 to entry: Throughout this standard, unless specified otherwise, "**compartment**" shall be taken to mean **compartment** and/or **sub-compartment** as appropriate for the context.

Note 3 to entry: A non-enclosed space in the **refrigerating appliance** having one or more external doors, which are only used to access this space, is considered to be a **compartment.**

3.3.2
sub-compartment
permanent enclosed space within a **compartment** which has a different operating temperature range from the **compartment** within which it is located

3.3.3
convenience feature
enclosure, or a container (either fixed or removable by the user), in which suitable storage conditions are provided for designated types of **foodstuff**

Note 1 to entry: These conditions may be different from those of the **compartment** in which it is located.

3.3.4
variable temperature compartment
compartment intended for use as two (or more) alternative **compartment** types (e.g. a **compartment** that can be either a **fresh food compartment** or **freezer compartment**) and which is capable of being set by a user to continuously maintain the operating temperature range applicable for each **compartment** type claimed

Note 1 to entry: A **compartment** intended for use as a single type but that can also meet additional types (e.g. a **chill compartment** that may also fulfil **zero-star** requirements) is not a **variable temperature compartment.**

Note 2 to entry: See B.2.5.2 for requirements regarding **energy consumption** declarations for products with **variable temperature compartments**.

3.3.5
freezer compartment
compartment that meets **three-star** or **four-star** requirements

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Note 1 to entry: T**wo-star sections** and/or **sub-compartments** are permitted within the **compartment.**

3.3.6
fresh food compartment
compartment for the storage and preservation of unfrozen **foodstuff**

3.3.7
cellar compartment
compartment for the storage of **foodstuff** at a temperature that is warmer than that of a **fresh food compartment**

3.3.8
pantry compartment
compartment for the storage of **foodstuff** at a temperature that is warmer than that of a **cellar compartment**

3.3.9
chill compartment
compartment for the storage of highly perishable **foodstuff**

3.3.10
ice-making compartment
compartment specifically for the making and storage of ice

Note 1 to entry: an **ice-making compartment** is classified as a **zero-star compartment** or a **frozen compartment**.

3.3.11
ice mould
form in an automated icemaker which is automatically filled with water and from which the ice cubes are automatically ejected

3.3.12
ice cube tray
removable tray which is manually filled with water and from which ice cubes are manually ejected

Note 1 to entry: **Ice cube trays** with water are used as load in order to determine **load processing efficiency**. See Annex G of IEC 62552-3:2015.

3.3.13
zero-star compartment
compartment in which the temperature is not warmer than 0 °C that can be used for the making and storage of ice but is not suitable for the preservation of highly perishable **foodstuff**

3.3.14
wine storage compartment
compartment specifically for the storage and maturation of wine

Note 1 to entry: Temperature requirements for **wine storage compartments** are specified in Annex G.

3.3.15
unfrozen compartment
any of the following **compartment** types: **zero-star, chill, fresh food, cellar, wine storage** or **pantry**

Note 1 to entry: although **ice-making compartments** and **zero star compartments** operate below zero, they are configured as **unfrozen compartments** for energy and performance tests in this standard.

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3.3.16
frozen compartment
any of the following **compartment** types: **one-star, two-star, three-star, four-star**

Note 1 to entry: **frozen compartments** are classified according to temperature, see 3.3.16.1 to 3.3.16.4.

3.3.16.1
one-star
compartment where the **storage temperature** is not warmer than –6 °C

3.3.16.2
two-star
compartment where the **storage temperature** is not warmer than –12 °C

3.3.16.3
three-star
compartment where the **storage temperature** is not warmer than –18 °C

Note 1 to entry: **Two-star sections** and/or **sub-compartments** are permitted within the **compartment**.

3.3.16.4
four-star
compartment where the **storage temperature** meets **three-star** conditions and where the minimum **freezing capacity** meets the requirements of Clause 8 of IEC 62552-2:2015/AMD1:2020

Note 1 to entry: T**wo-star sections** and/or **sub-compartments** are permitted within the **compartment.**

3.3.17
two-star section
part of a **three-star** or **four-star compartment**, which is not self-contained (i.e., does not have its own individual access door or lid) and which meets **two-star** requirements

Note 1 to entry: Any **two-star** section in the **compartment** shall not exceed 20 % of the total **compartment volume**.

3.3.18
vegetable drawer or crisper
convenience feature provided primarily to retard dehydration of fruits and vegetables

Note 1 to entry: A **vegetable drawer** is usually considered as a removable **convenience feature** but is normally left in situ for testing purposes.

3.4 Physical aspects and dimensions

3.4.1
top-opening type
refrigerating appliance in which the **compartment**(s) are accessible from the top (usually via a lid)

3.4.2
upright type
refrigerating appliance in which the **compartment**(s) are accessible from the front

3.4.3
overall dimensions
space taken up by the **refrigerating appliance** (height, width and depth) with doors or lids closed

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3.4.4
space required in use
space taken up by the **refrigerating appliance** (height, width and depth) necessary for **normal use** with doors or lids closed, including space necessary for air circulation and any handles, as shown in Figure 5

3.4.5
overall space required in use
total space taken up by the **refrigerating appliance** (height, width and depth) necessary for **normal use** with doors or lids open, as shown in Figure 5

3.4.6
volume
space within the inside liner of the **refrigerating appliance**, or a **compartment** or **sub compartment** as determined in IEC 62552-3

3.4.7
shelf
horizontal surface on which **foodstuff** can be placed

Note 1 to entry: A **shelf** can be formed by one component or by components fitted side by side, which can be fixed or removable.

3.4.8
load limit
surface enveloping a storage space and intended for the storage of **foodstuff** or other items

Note 1 to entry: A **load limit** may be a natural obvious feature or a marked line.

3.4.9
storage plan
arrangement of test packages within a **refrigerating appliance** when testing specific aspects of performance in accordance with this standard

3.4.10
h-line
vertical line through a **compartment** used to measure the effective height and to define the height positions of sensors in a **compartment**

3.5 Terms and definitions relating to performance characteristics

3.5.1
energy consumption
energy used by a **refrigerating appliance** over a specified period of time or for a specified operation as determined in accordance with IEC 62552-3 stated in kWh (kilowatt hour)

3.5.2
average power consumption
average rate of **energy consumption** of a **refrigerating appliance** for a specific test condition or operation as determined in accordance with IEC 62552-3 measured in watt (W)

3.5.3
storage temperature
temperature which the **refrigerating appliance** is capable of maintaining in accordance with 6.5 of IEC 62552-2:2015

3.5.4
target temperature
reference **compartment** temperature which is used for determining energy and **average power consumption** attributes in IEC 62552-3

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Note 1 to entry: **Target temperatures** are air temperatures. See Annex D.

3.5.5 Defrosting

3.5.5.1
automatic defrost
defrosting where no action is necessary by the user to initiate the removal of frost accumulation at all **temperature-control settings** or to restore normal operation, and the disposal of the defrost water is automatic

Note 1 to entry: **Automatic defrost** can be achieved by active heating of the evaporator (typically using a resistive heater) or by other means, such as stopping the cooling function of the evaporator without active heating, reverse cycle defrost or hot gas bypass defrosting.

3.5.5.2
manual defrost
defrost that is not an **automatic defrost**

3.5.5.3
cyclic defrost
automatic defrost system where the refrigerated surfaces which cool a **compartment** (usually an **unfrozen compartment)** in an appliance are automatically defrosted and defrosting occurs during each cycle of the refrigeration system

Note 1 to entry: **Cyclic defrost** systems do not have a **defrost control cycle.**

3.5.5.4
variable defrost
automatic defrost system designed to minimise **energy consumption** which adjusts the time intervals between successive defrosts under **normal use** to better match the actual frost load on the **evaporator** by the assessment of an operating condition (or conditions) other than, or in addition to, elapsed time or compressor run time

Note 1 to entry: Demand defrost, (directly measuring the frost on the **evaporator** and defrosting accordingly) is a form of **variable defrost.**

3.5.6
stable operating conditions
conditions in which a **refrigerating appliance** mean temperatures and **energy consumption** comply with the relevant stability requirements as defined in IEC 62552-2 or IEC 62552-3 as applicable

3.5.7
steady state
stable operating conditions that meet the criteria as specified in Annex B of IEC 62552-3:2015

3.5.8
ambient temperature
measured temperature in the space surrounding the **refrigerating appliance** under test

Note 1 to entry: The **ambient temperature** for each test type is measured as specified in Annex A of this Part and its value is as specified in IEC 62552-2:2015 and IEC 62552-3:2015 of this standard as applicable for the particular test.

3.5.9
control event
change in operating conditions

Note 1 to entry: **Control events** include but are not limited to—

a) starts, stops or speed changes of compressors;

b) changes of baffle position, fan operation, or other modulating control or device;

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c) changes in operation of the **refrigerant** circuit;

d) defrost heater on and off;

e) icemaker operation.

3.5.10
frost-free
automatic defrost system to prevent the permanent formation of frost on a remote **evaporator** or **evaporators**

3.5.11
temperature control
device that is intended to automatically regulate the temperature within one or more **compartments**

Note 1 to entry: Unless otherwise stated, a two position (e.g. open or closed) control is not included within the meaning of a **temperature control**.

3.5.12
user-adjustable temperature control
temperature control intended for adjustment by the user to vary the temperature within one or more **compartments** within a **refrigerating appliance**

3.5.13
temperature control setting
setting of a **user-adjustable temperature control** selected for the measurement of energy or performance in accordance with this standard

3.5.14
cooling time
time taken for a specified load in a **fresh food compartment** to be cooled as defined in Clause 7 of IEC 62552-2:2015

3.5.15
cooling capacity
rate at which a specified load in a **fresh food compartment** can be cooled as defined in Clause 7 of IEC 62552-2:2015

3.5.16
freezing time
time to freeze in a **freezer** or **freezer compartment** a set amount of load as defined in Clause 8 of IEC 62552-2:2015/AMD1:2020

3.5.17
freezing capacity
rate of heat extraction by the refrigeration system from a load in a **freezer** or **freezer compartment** as defined in Clause 8 of IEC 62552-2:2015/AMD1:2020

3.5.18
ice-making capacity
quantity of ice the **refrigerating appliance** is capable of producing in an automatic icemaker in accordance with Clause 9 of IEC 62552-2:2015

3.5.19
temperature rise time
time taken, after the operation of the refrigerated system has been interrupted, for the temperature to increase a defined amount when tested as specified in Annex C of IEC 62552-2:2015

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3.5.20
ballast load
combination of test and M-packages already at **storage temperature** and in the **freezer** or **freezer compartment** when the **light load** is added during the **freezing capacity** test

3.5.21
light load
combination of test and M-packages at **ambient temperature** that are loaded into a **freezer compartment** during the **freezing capacity** test

3.5.22
load processing efficiency test
test in which a specified water load is introduced to the appliance to determine how much extra energy is needed to cool it down (and, in **frozen compartments**, freeze it)

Note 1 to entry: See Annex G of IEC 62552-3:2015.

3.5.23
processing load
energy equivalent of a user **processing load** in Wh/day

3.5.24
load processing efficiency
ratio of additional energy used by the **refrigerating appliance** to cool a specified **processing load** to the calculated heat energy removed from that **processing load**

3.6 Operating states as shown in Figure 1

3.6.1
temperature control cycle
definite repetitive swings in temperature caused by operation of a **temperature control** device (on/off or otherwise)

Note 1 to entry: The period of a **temperature control cycle** is the time between a **control event** and its repetition on the next cycle. Where the **control events** cannot be discerned, the period of a **temperature control cycle** is the time between two successive temperature warmest points or two successive temperature coldest points.

3.6.2
defrost control cycle
period commencing at the end of **stable operating conditions** prior to the initiation of an **automatic defrost** and terminating at a like point prior to the next **automatic defrost**

Note 1 to entry: The commencement and finish points of the **defrost control cycle** prior to **automatic defrosting** shall be:

a) for a refrigerating system with on/off cycles, the period commencing at the end of the last regular **temperature control cycle** (for example the end of last off period);

b) for a refrigerating system without on/off cycles but with regular temperature cycles, at the last power/speed/cooling change that relates to a regular temperature maximum; and

c) for a refrigerating system without on/off cycles and without regular temperature cycles, at the end of stable temperature operation.

Note 2 to entry: **Cyclic defrost** systems do not have a **defrost control cycle.**

3.6.3
defrosting operation
period from the initiation of a **defrost control cycle** until the initiation of the refrigeration system cooling after defrosting

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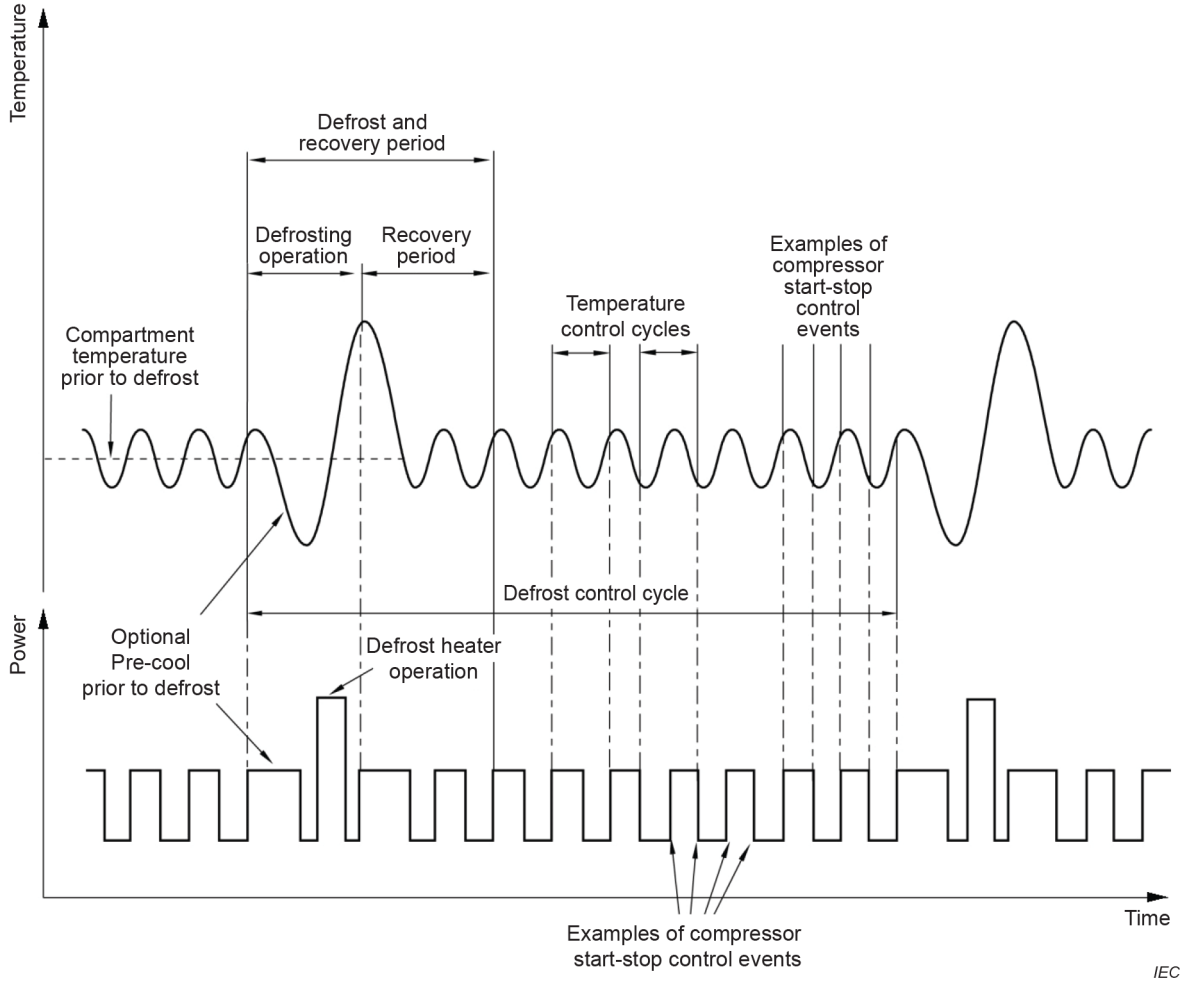
3.6.4
defrost and recovery period
period from the initiation of a **defrost control cycle** until **stable operating conditions** are established

Note 1 to entry: For products that do not reach **stable operating conditions** (for example that have a temperature that is continually decreasing after a **defrosting operation**), the **defrost and recovery period** could be equal to the **defrost control cycle**.

3.6.5
recovery period
period from the end of the **defrosting operation** until the end of the **defrost and recovery period**



NOTE Components of refrigerator operation depicted in this figure are illustrative only and are intended to be representative of common products. Not all products exhibit all the features, and some products can operate in a different manner. Written definitions have precedence over depictions in this figure.

Figure 1 – Illustration of selected typical refrigerator operations

3.7 Symbols

TMP temperature measurement point

T temperature

t time

i subscript representing a certain sensor location

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	Instantaneous temperature value	Integrated time average temperature[a] (*im*)	Instantaneous average compartment temperature[b] (*a*)	Time averaged compartment temperature[c] (*ma*)	Maximum compartment temperature[d]
Fresh food	T_i	T_{im}	T_a	T_{ma}	
Frozen food (*f*)	T_{fi}	T_{fim}	T_{fa}	T_{fma}	T^{***}, T^{**}, T^{*}
Zero star (*z*)	T_{zi}	T_{zim}	T_{za}	T_{zma}	
Pantry (*p*)	T_{pi}	T_{pim}	T_{pa}	T_{pma}	
Cellar (*c*)	T_{ci}	T_{cim}	T_{ca}	T_{cma}	
Chill (*cc*)	T_{cci}	T_{ccim}	T_{cca}	T_{ccma}	
Wine (*w*)	T_{wi}	T_{wim}	T_{wa}	T_{wma}	
Ambient (*a*)	T_{ai}	T_{aim}	T_{aa}	T_{ama}	

[a] The integrated time average temperature is obtained by integrating the instantaneous temperature values over time and dividing it by the time period.

[b] The instantaneous average **compartment** temperature is the arithmetic average of all instantaneous temperatures values measured in the **compartment** at one time.

[c] The time averaged **compartment** temperature is the integrated time average of the instantaneous average **compartment** temperature or the arithmetic average of the integrated time averaged temperatures (both methods give the same result).

[d] The maximum **compartment** temperature is the maximum temperature of any M-package during the test period (in performance requirements, see IEC 62552-2:2015).

4 Classifications

Refrigerating appliances conforming to this standard are classified into one (or more) of four climate classes. The range of **ambient temperatures** in which the appliances are intended to be used, and for which the required **storage temperatures** are to be met (see Table 2 of IEC 62552-2:2015), shall be as specified in Table 1.

Table 1 – Climate classes

Description	Class	Ambient temperature range °C
Extended temperate	SN	+10 to +32
Temperate	N	+16 to +32
Subtropical	ST	+16 to +38
Tropical	T	+16 to +43

5 Marking

5.1 Rating information

The following information is recommended and should be marked in a permanent and legible manner on the appliance:

a) the type of **refrigerating appliance** (e.g. “**refrigerator**”, with the designation being prefixed by the term “**frost-free**” if applicable);

b) the serial number and/or date of manufacture, which may be coded;

c) the total **volume** (alternatively, the **volume** for each **compartment** type may be listed);

d) information relating to the energy source;

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e) for **four-star** appliances or appliances with **four-star compartments** the **rated freezing capacity**, in kg/12 h;

f) the letters indicating the climatic class or classes (SN, N, ST, T);

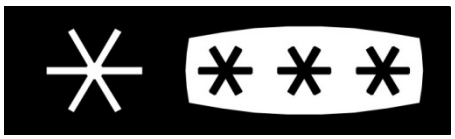
Items a) to f) should be visible when the **refrigerating appliance** is in its position of **normal use**. Other marking should either be readily visible in **normal use** or when the **refrigerating appliance** is away from a wall or after the removal, without any tool, of a flap or grille etc. Climate classes which are wholly covered by other climate classes do not need to be noted.

More detailed information regarding marking on the appliance is specified in IEC 60335-2-24 and other regional standards.

5.2 Identification of frozen compartments

When identified, **four-star compartments** shall be identified by a symbol readily visible from the front, externally or internally, in accordance with that shown in Figure 2.

Additionally, in the case of a **two-star section** in an identified **freezer compartment**, the standard **two-star** symbol (see Figure 3) shall be placed to clearly indicate this section.

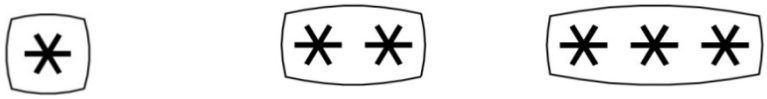


Symbol ISO 7000-0500 (2004-01), for further details, see Figure E.1.

Figure 2 – Identification symbol for a four-star compartment

When identified, one, two or **three-star frozen compartments** or cabinets shall be identified by a symbol as shown in Figure 3, readily visible from the front, externally or internally. In the case of a **two-star section** in an identified **three-star** or **four-star compartment**, the **two-star** symbol shall be located so that it clearly identifies the **two-star section**.

The symbols shown in Figure 2 and Figure 3 shall not make use of more than two colours or exhibit more than two contrasting surface finishes. The colour (or surface finish) of the large star shall be different from that of the three other stars. For the purpose of this requirement, white and black are considered as colours. There shall be no marking or decoration anywhere on the **refrigerating appliance** which could be confused with the **four-star compartment** identification symbol shown in Figure 2.



1 2 3

For further details, see Figure E.2

Key

1 **one-star compartment** symbol ISO 7000-0497 (2004-01)

2 **two-star compartment** symbol ISO 7000-0498 (2004-01)

3 **three-star compartment** symbol ISO 7000-0499 (2004-01)

Figure 3 – Star identification symbols for frozen compartments (except four-star)

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5.3 Load limit lines

Load limit lines are permitted only in relation to **freezer volumes** and **three-star** frozen storage space in cabinets or **compartments** with an independent external door.

No load-limit line is necessary within the space of any cabinet or **compartment** suitable for **three-star** storage if:

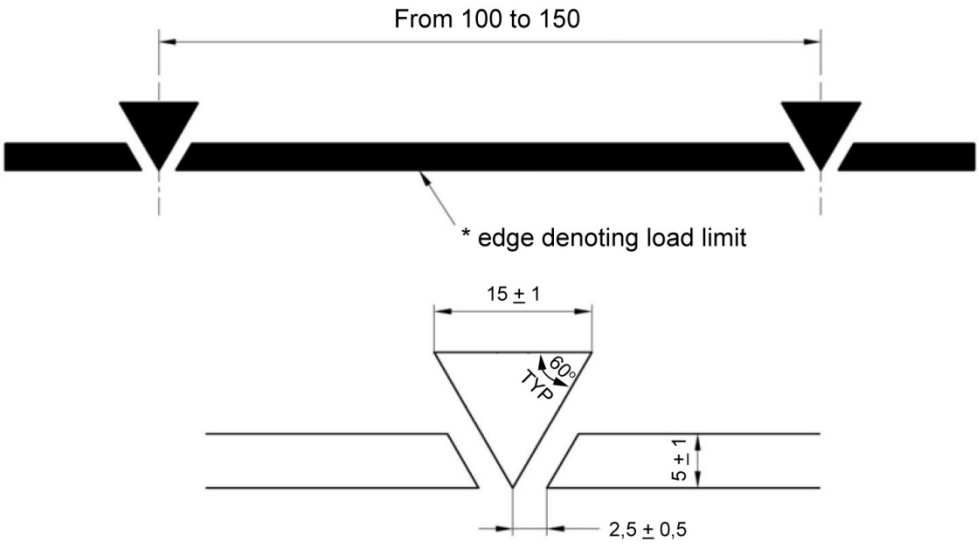
– no space is acknowledged as being unsuitable for three or **four-star** storage, or

– the **load limits** are determined by the particular construction (baskets, containers, flaps, etc.), or

– the **load limits** are determined by natural **load limits** (see Figure 1b in IEC 62552-2:2015) and the loading conditions are specially described in the instructions.

In all other cases, the limits of three or **four-star** storage space shall be indicated in a conspicuous and permanent way by a load-limit line or lines in the form shown in Figure 4.

The manufacturer should avoid, as far as possible, the provision of storage spaces outside the **load limits** and outside any **two-star compartment** or sections.



Dimensions in millimetres

Figure 4 – Marking of load limit

6 Technical and commercial product information

6.1 General

Whenever technical and commercial product information is supplied, all declared performance data (together with the relevant measurement units) shall be in accordance with this standard.

6.2 Determination of linear dimensions

Linear dimensions shall be measured to the nearest millimetre.

The **overall dimensions** shall be measured as the height, width and depth of the rectangular parallelepiped, whose base is horizontal, within which the **refrigerating appliance** is inscribed to include the complete appliance except for the handle, the protrusion of which if

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any, is to be specified separately (see Figure 5). The height shall exclude the feet if these are fitted at the time of installation.

The **space required in use** shall be measured as the height, width and depth, including the handle, increased by the space necessary for free circulation of the cooling air when the **refrigerating appliance** is in service (see Figure 5).

The **overall space required in use** shall be measured as the height, width and depth, including the handle, increased by the space necessary for free circulation of the cooling air when the **refrigerating appliance** is in service, plus the space necessary to allow opening of the means of access to that minimum angle permitting removal of all removable parts such as containers and **shelves**, including a drip tray that has to be removed and any water container that has to be emptied manually (see Figure 5).

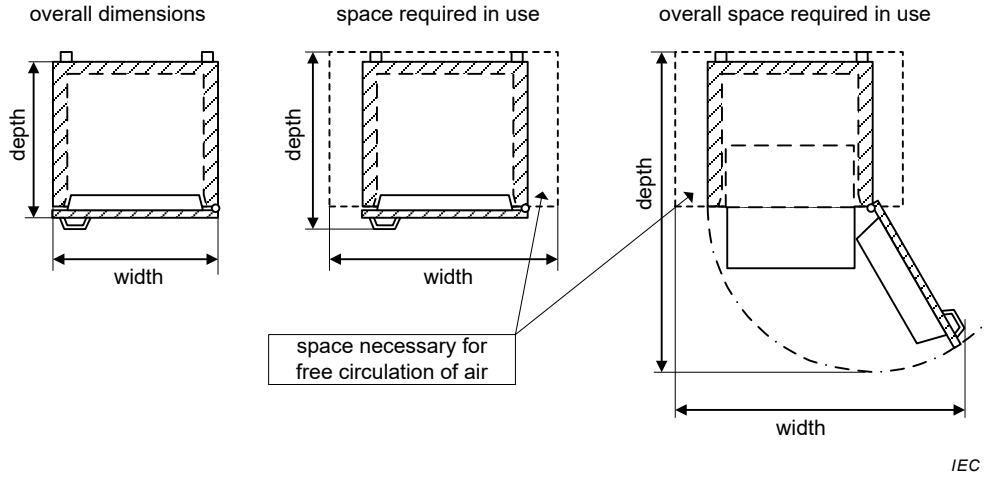

Figure 5 – Linear dimensions (example: top view for upright type)

7 Instructions

Every **refrigerating appliance** should be accompanied on delivery by instructions for its installation, use, user maintenance and safe disposal. These should be in the language of the country where it is for sale. Different countries may have local requirements regarding this type of information.

Instructions should include the following where applicable:

a) the installation requirements (best location, levelling, connections to energy source, connection – if required – for water supply or for defrost water);

b) the **space required in use** and the **overall space required in use** with sketches showing the **refrigerating appliance** dimensions and minimum clearances required with the means of access (open and closed);

c) for a **refrigerating appliance** which is intended to be built-in, the recess dimensions together with any additional ventilation requirements;

d) the limit values of the range of **ambient temperature** for the **rated** climate classes and a warning that if the **refrigerator** operates outside the climate class (**ambient temperature** range) for which it is **rated** then it may not be able to maintain satisfactory internal temperatures;

e) operating instructions (starting and stopping procedures, use of the various controls – **temperature-control** devices, fast-freeze switch, indicator lights, air circulation and defrosting control, water and ice dispensers etc.);

f) the care required for best performance, such as

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1) loading the **refrigerating appliance** – especially when there are sections with different star ratings within the same **compartment** and when no load-limit lines exist,
2) the arrangement of food for storage, in particular the need to avoid cross-contamination,
3) the arrangement of food for storage and for freezing, where applicable, particularly including advice that food to be frozen is not to be placed in direct contact with food in storage and, if appropriate, that it could be necessary to reduce the quantity to be frozen if freezing every day is anticipated,
4) in the case of **refrigerating appliances** with **chill compartment**, a statement to the effect that some types of fresh vegetables and fruits are sensitive to cold, and that therefore they are not suitable for storage in this kind of **compartment**,
5) the placing of ice-cube tray(s) in order to achieve optimal ice-freezing;

g) the user maintenance and cleaning of the **refrigerating appliance**;

h) for **manual defrost** products, any precautions with respect to defrosting and damage to stored food during this process;

i) the action to be taken when the **refrigerating appliance** is switched off and taken out of service temporarily or for an extended period (e.g. emptied, cleaned and dried, and the door(s) or lid(s) propped ajar);

j) the necessity that, for doors or lids fitted with locks and keys, the keys be kept out of the reach of children and not in the vicinity of the **refrigerating appliance**, in order to prevent children from being locked inside;

k) removal of doors and lids on disposal to prevent entrapment;

l) recovery of **refrigerant** and recycling of components on disposal of the **refrigerating appliance**.

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