IEC 62552-2

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INTERNATIONAL STANDARD

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AMENDMENT 1
AMENDEMENT 1

Household refrigerating appliances – Characteristics and test methods – Part 2: Performance requirements

Appareils de réfrigération à usage ménager – Caractéristiques et méthodes d'essai – Partie 2 – Exigences de performances

IEC 62552-2:2015-02/AMD1:2020-11(en-fr)

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FOREWORD

This amendment 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.

The text of this amendment is based on the following documents:

FDIS	Report on voting
59M/127/FDIS	59M/133/RVD

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website 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- withdrawn,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
- amended.

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1 Scope

Replace the first paragraph with the following new content:

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.

Table 1 – Test summary

Replace Table 1 with the following new table:

Table 1 – Performance 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 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 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					–18 °C	
Annex D Condensa-tion	25 °C for SN and N 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

Replace the content of footnote b with the following new content:

During a **defrost and recovery period**, these **storage temperatures** of **frost-free refrigerating appliances** are permitted to rise by no more than 3 K with respect to the **storage temperature** during period S (see 6.4). The **storage temperature** is defined as the maximum temperature of any M-package during a given time period (see Figure 3)

6.1 Objective

Replace the last paragraph with the following new content:

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**.

6.2 Preparation of refrigerating appliance

Replace the 6th paragraph with the following new content:

The unloaded **refrigerating appliance** should be set up and operated until it has reached equilibrium at, or close to, the temperatures specified in Table 2.

Thermal storage devices shall be placed in the dedicated positions in the respective **compartments**, in accordance with the manufacturer's instructions, and shall be independent of the location of the test packages. Instructions for loose placement of thermal storage devices in the appliance do not define dedicated positions.

NOTE An instruction without specific indication of location or placement of the thermal storage devices is an example of loose placement.

If dedicated positions are absent, the thermal storage devices shall be removed from the **compartment**.

6.3.1 Unfrozen compartments (except chill compartment and wine storage compartment)

Replace the 1st paragraph with the following new content:

For determining the **storage temperatures** of these **compartment**s, air temperature sensors shall be located in accordance with D.2.2 of IEC 62552-1:2015/AMD1:2020.

6.3.2 Chill compartments

Replace 6.3.2 with the following new content:

6.3.2 Chill compartments

6.3.2.1 General

All test packages and M-packages shall be as specified in Clause C.2 b) of IEC 62552-1:2015.

For determining the **storage temperature** of any **chill compartment**, the storage load shall be in accordance with 6.3.2.2.

The temperatures of the **chill compartment** T_{cci} are the instantaneous temperatures of each M-package in that **compartment**. The temperatures and conditions specified in Table 2 shall apply.

All test packages and M-packages shall be positioned or suspended so that their largest surface is horizontal. They may be positioned directly on the floor of the **compartment** or drawer, but shall always be at least 25 mm away from all walls and ceilings and from the other

packages of the test load. The test packages and M-packages shall be positioned as far as possible in the corners of the **compartment** and at two vertical levels:

a) bottom level, which is the lowest horizontal surface intended for storage;

b) top level, where the packages have 25 mm clearance from the **compartment** ceiling. Supports can be used to position the packages.

Loading of packages shall be in the following order:

1) front left corner of the bottom level;
2) back right corner of the top level;
3) front right corner of the top level;
4) left back corner of the bottom level;
5) front left corner of the top level;
6) back right corner of the bottom level;
7) front right corner of the bottom level;
8) left back corner of the top level;
9) centre of the bottom level;
10) centre of the top level.

Loading shall start using M-packages, up to the amount specified in Table 3. After the last M-package, normal test packages shall be loaded until the total number of packages is reached.

If a package cannot be placed in accordance with the required order, its position shall be skipped, and the number of packages shall be reduced. The number of M-packages shall not be reduced.

In the case of a **compartment** with special subdivisions (**shelves**, etc.) that are part of the design, if the dimensions are too small to allow the horizontal positioning of the M-packages, it is permissible to position them vertically.

If the dimensions are too small to accommodate an M-package (for example in door shelves), a special support shall be used to position the M-package next to the shelf and as close as possible to the door liner.

6.3.2.2 Chill compartment storage load

The **compartment** shall be loaded with the number of packages specified in Table 3.

Table 3 – Chill compartment storage load

Volume, V, of chill compartment (l)	Total number of packages	M-packages
V < 10	2	2
10 ≤ V < 20	3	2
20 ≤ V < 30	4	2
30 ≤ V < 40	5	3
40 ≤ V < 50	6	3
50 ≤ V < 60	7	4
60 ≤ V < 70	8	4
70 ≤ V < 80	9	5
V ≥ 80	10	5

6.3.3.3.1 General

Replace the last paragraph of item c) with the following:

Surfaces intended for storage with ribs, depressions, slight inclinations, etc. are treated as horizontal surfaces. If necessary, packers may be used to stabilise stacks (see Figure 5).

NOTE Inclinations of less than 15 mm per 100 mm, which are equal to the width or length of a test package, are considered slight inclinations.

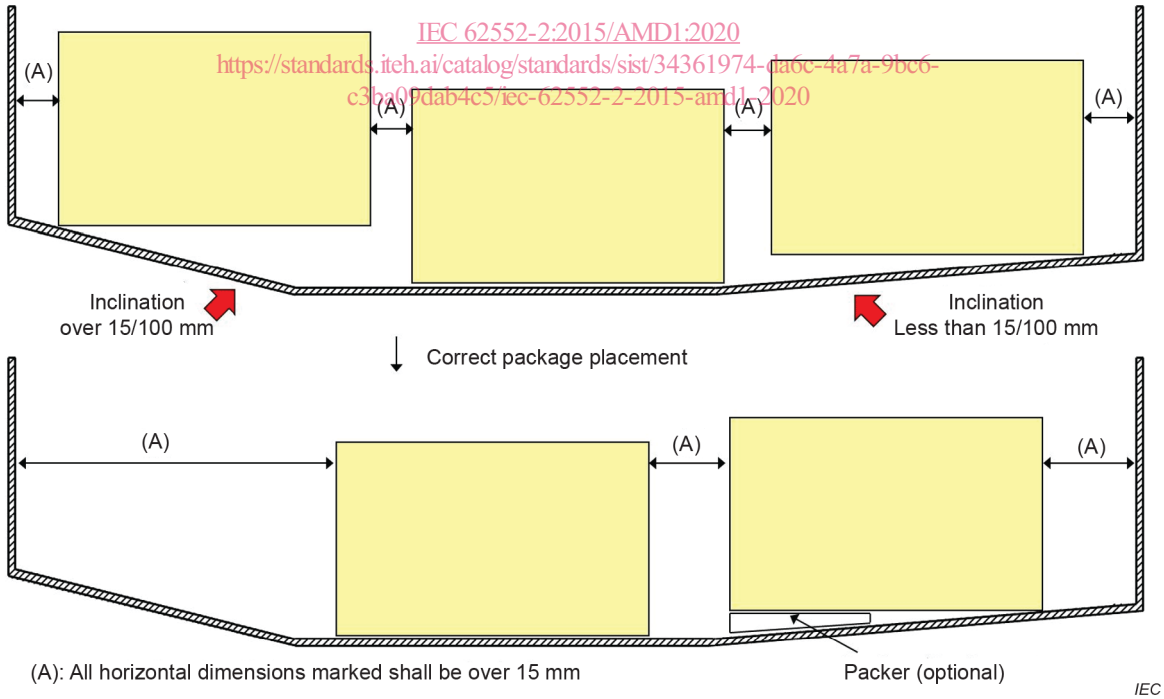

Figure 5 – Package placement illustration for non flat surfaces

Table 4 – Requirements for periods *S* and *E*

Replace Table 4 with the following:

Table 4 – Requirements for periods *S* and *E*

Item	Are there temperature control cycles?	Without defrost control cycles	With more than one defrost control cycles starting within a 24 h test	With only one defrost control cycle starting within a 24 h test
Length of periods *S* and *E*	No	Each period shall be at least 3 h long		
	Yes	Each period shall consist of the same integral number of **temperature control cycles** totalling not less than 3 h.		
Location of period *S*	No	Any convenient time	Period *S* ends just before a **defrost and recovery period** begins.	
	Yes			
Location of period *E*	No	Period *E* ends at least 24 h after period *S* begins	Period *E* ends just before the first **defrost and recovery period** that begins after 24 h after the start of period *S*	Period *E* ends at least 24 h after period *S* begins and before the beginning of the next **defrost and recovery period**
	Yes	Period *E* ends with the conclusion of a **temperature control cycle** that is in progress at least 24 h after the beginning of period *S*	Period *E* ends with the conclusion of the last **temperature control cycle** completed before the first defrost **and recovery period** that begins after 24 h after the start of period *S*	Period *E* ends with the conclusion of a **temperature control cycle** that is in progress at least 24 h after period *S* begins and before the beginning of the next **defrost and recovery period**

Figure 3 – Storage test sequence

Replace Figure 3 and its title with the following:

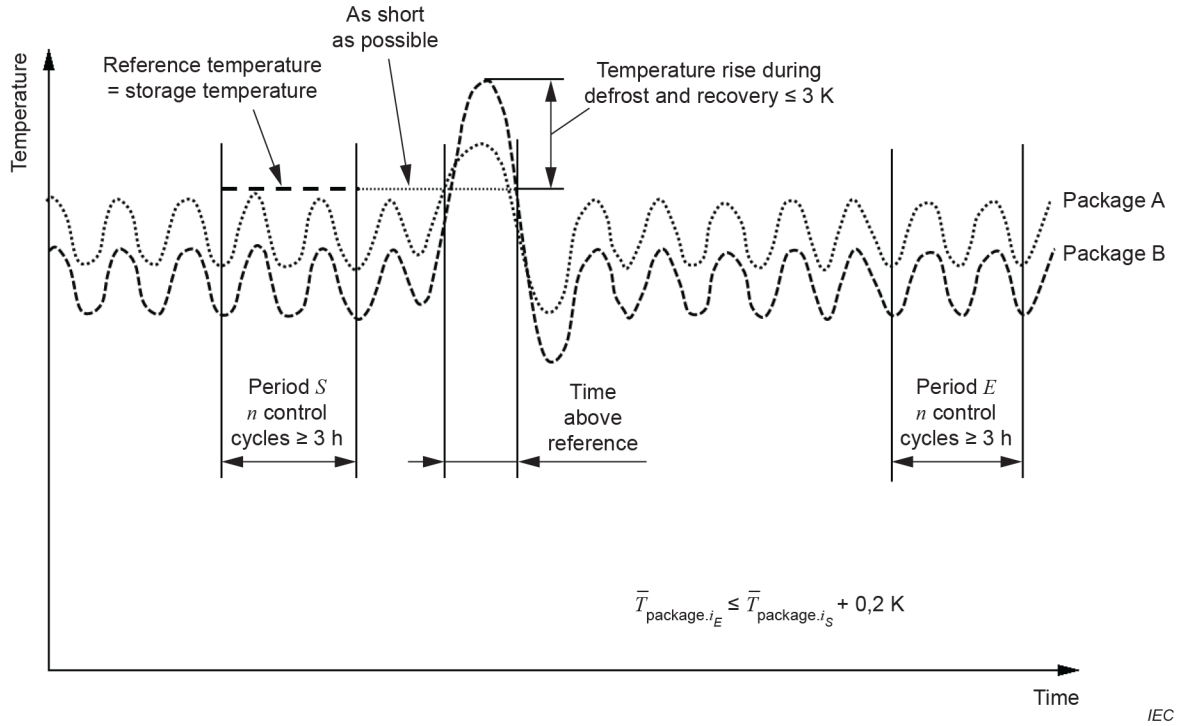

Figure 3 – Storage test sequence illustration

7.2.2 Installation

Replace the sixth paragraph with the following new content:

Before the test load is added, all **compartments** shall be empty. Their temperatures shall be determined as specified in Annex D of IEC 62552-1:2015 and IEC 62552-1:2015/AMD1:2020.

7.2.4 Arrangement of shelves

Replace the first paragraph with the following new content:

If adjustable, a **shelf** shall be positioned at each of three levels so that the centres of M-packages placed directly on the **shelves** (or bottom of the baskets etc.) have the smallest possible vertical distance to the temperature measurement points TMP_1, TMP_2 and TMP_3 as specified in Annex D of IEC 62552-1:2015 and IEC 62552-1:2015/AMD1:2020.

Replace the third paragraph with the following new content:

If no appropriate position can be found for 3 levels in **refrigerating appliances** with little height [e.g. box **evaporators** as shown in a) of Figure D.3 of IEC 62552-1:2015/AMD1:2020] only levels TMP_1 and TMP_2 shall be used for testing.

8 Freezing capacity test

Replace Clause 8 with the following new content:

8 Freezing capacity test

8.1 Objective

The purpose of this test is to measure the **freezing capacity** of **freezer compartment(s)** by adding warm test packages (the **light load**) into the **compartment**. If the **freezing capacity** is greater than, or equal to, the specified minimum capacity (see 8.4.3), the **compartment(s)** may be rated as a **four-star compartment(s)**.

8.2 Method overview

Apart from space for the **light load**, ballast packages are loaded into the **frozen compartment(s)** as for the storage test (Clause 6). The **refrigerating appliance** is operated until temperatures are stable and in compliance with Table 2. Then a load of packages at +25 °C is added. This is the so-called **light load** representing a food load to be processed. The time to freeze this load to −18 °C is measured. When this can be achieved in no more than 24 h and other maximum temperature-excursion conditions are met, a **four-star compartment** rating may be claimed

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

8.3 Set-up procedure

8.3.1 Ambient temperature

The **ambient temperature** shall be 25 °C (see A.3.2.3 of IEC 62552-1:2015).

8.3.2 Preparation of the refrigerating appliance

8.3.2.1 General

The **refrigerating appliance** shall be installed in accordance with Annex B of IEC 62552-1:2015.

If the configuration of the **refrigerating appliance** can be changed by the user, the configuration with the greatest volume at the lowest temperatures shall be used for this test.

Refrigerating appliances with anti-condensation heater(s) which are permanently on during **normal use** shall be tested with the heater(s) operating.

Anti-condensation heaters which can be manually controlled by the user shall be switched on and, if adjustable, they shall be set at their maximum heating rate.

Anti-condensation heaters which are automatically controlled shall be allowed to operate normally.

Thermal storage devices shall be placed in the dedicated positions in the respective **compartments**, in accordance with the manufacturer's instructions, and shall be independent of the location of the test packages. Instructions for loose placement of thermal storage devices in the appliance do not define dedicated positions.

NOTE Instructions without specific indication of location or placement of the thermal storage devices is an example of loose placement.

If dedicated positions are absent, the thermal storage devices shall be removed from the **compartment**.

The unloaded **refrigerating appliance** should be set up and operated until it has reached equilibrium at, or close to, the temperatures specified in Table 2.

8.3.2.2 Measurement of temperature of chill compartment and all compartments operating above 0 °C

During the test, the **chill compartment** temperature is not measured, but it shall be loaded with test packages as for the **storage temperature** measurement (see 6.3.2). For determining the **storage temperature** of the **compartments** normally operating above 0 °C, measurement points shall be as per Annex D of IEC 62552-1:2015 and IEC 62552-1:2015/AMD1:2020, but with M-packages used instead of cylinders.

8.3.3 Loading of refrigerating appliance

8.3.3.1 Frozen compartment(s) – ballast load

8.3.3.1.1 General

Apart from space for the **light load** in the appropriate −18 °C **compartment(s)**, ballast packages are brought to the approximate **compartment** temperatures and loaded into the **frozen compartment(s)**, as for the storage test (Clause 6).

A load stack can be comprised of one or more load packages.

In the −18 °C **compartment(s)**, **ballast load** may be removed to accommodate the **light load**.

Light load positioning shall take into account the instructions regarding the location to be used for freezing. If no instructions are given, the packages shall be placed such that they are likely to be frozen as rapidly as possible.

Furthermore, the following constraints shall be fulfilled:

a) the minimum number of stacks shall be removed;

b) the height of a **light load** stack shall be 2 packages, with the following exceptions:

   1) if the **light load** is to be composed of an odd number of packages, then one **light load** stack of 1 package is allowed;

   2) if the **ballast load** to be removed only exists out of stacks of 1 package, then it is allowed to replace these by **light load** stacks of 1 package;

   3) if the **ballast load** stack to be removed contains 6 or more packages, then it shall be replaced with a **light load** stack of half the number of packages in the **ballast load** stack (rounded down).

c) the minimum **ballast load** is 1 M-package;

d) **light load** packages shall be placed flat;

e) **light load** positioning shall take into account the instructions regarding the location to be used for freezing. If no instructions are given, the packages shall be placed such that they are likely to be frozen as rapidly as possible;

f) **light load** packages shall be separated by at least 15 mm from **ballast load** packages. The use of spacers between adjacent stacks of packages is permitted, but other spacing methods are not (see 6.3.3.2).

8.3.3.1.2 M-package placement in the ballast load to accommodate the light load

The M-packages in the **ballast load** shall be placed in the same manner as for the storage test, apart from in any locations that are disrupted by the need to leave space for the **light load**. In that case, the M-packages shall be placed in the nearest equivalent position to that specified for the storage test and the new positions recorded. If there are stacks of **ballast load** packages beside the **light load**, an M-package shall also replace the top test package in at least one of those stacks on each side of the **light load**. If there is **ballast load** above the **light load**, an M-package shall replace a test package in the centre of the layer immediately above the **light load**. If there is **ballast load** below the **light load**, an M-package may replace a test package in the centre of the layer immediately below the **light load.**

8.3.3.2 Refrigerating appliances with separate three-star compartment

If a **refrigerating appliance** has a separate **three-star compartment** with its own external access door or lid, and the instructions recommend that, before freezing, frozen food already in storage be placed in that **compartment** while leaving space in the **freezer compartment** to receive the load for freezing (i.e. the **three-star compartment** is to be regarded as an extension of the **freezer compartment**), a **freezing time** claim based upon this method of use is permissible, provided that:

a) when tested according to this method of use, the claimed **freezing time** is confirmed and the temperature requirements for the other **compartments** (see 8.5 a) to g)), if applicable, are fulfilled during the **freezing capacity test,** and

b) the **light load** used in the **freezer compartment** is at least equivalent to 3,5 kg/100 l of the combined **volumes** of the **freezer compartment** and **three-star compartment**.

8.4 Test procedure

8.4.1 Starting conditions

After all relevant control devices have been adjusted as required, the loaded **refrigerating appliance** is left to run until **stable operating conditions** are reached.

After **stable operating conditions** have been attained, internal temperature(s) shall be in accordance with Table 2, except that the starting temperature of any **compartment(s)** with no lower temperature limit(s) specified in that table shall be no more than 2 K below the **target temperature.**