IEC®

IEC 62552-1

Edition 1.0 2020-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

AMENDMENT 1
AMENDEMENT 1

Household refrigerating appliances – Characteristics and test methods – Part 1: General requirements

Appareils de réfrigération à usage ménager – Caractéristiques et méthodes d'essai – Partie 1: Exigences générales

IEC 62552-1:2015-02/AMD1:2020-11(en-fr)

IEC 62552-1

Edition 1.0 2020-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

AMENDMENT 1
AMENDEMENT 1

Household refrigerating appliances – Characteristics and test methods – Part 1: General requirements

Appareils de réfrigération à usage ménager – Caractéristiques et méthodes d'essai – Partie 1: Exigences générales

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 97.030

ISBN 978-2-8322-9066-8

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/126/FDIS	59M/132/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- withdrawn,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.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

---

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.

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

2 Normative references

Replace the reference IEC 62552-2:2015 as follows:

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

Replace the reference IEC 62552-3:2015 as follows:

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

3.3.1
compartment

Add a note to entry:

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.**

3.3.4
variable temperature compartment

Add the following note to entry:

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

Replace the content of Note 1 to entry by the following:

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

3.3.16.3
three-star

Add the following new note to entry:

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

3.3.16.4
four-star

Replace the definition with:

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

Replace the content of Note 1 to entry by the following:

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

Add the following new term and definition:

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**

3.5.5.1
automatic defrost

Add the following Note 1 to entry:

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.

3.5.16
freezing time

Replace the definition with:

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

Replace the definition with:

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

3.5.22
processing load efficiency test

Replace the term by:

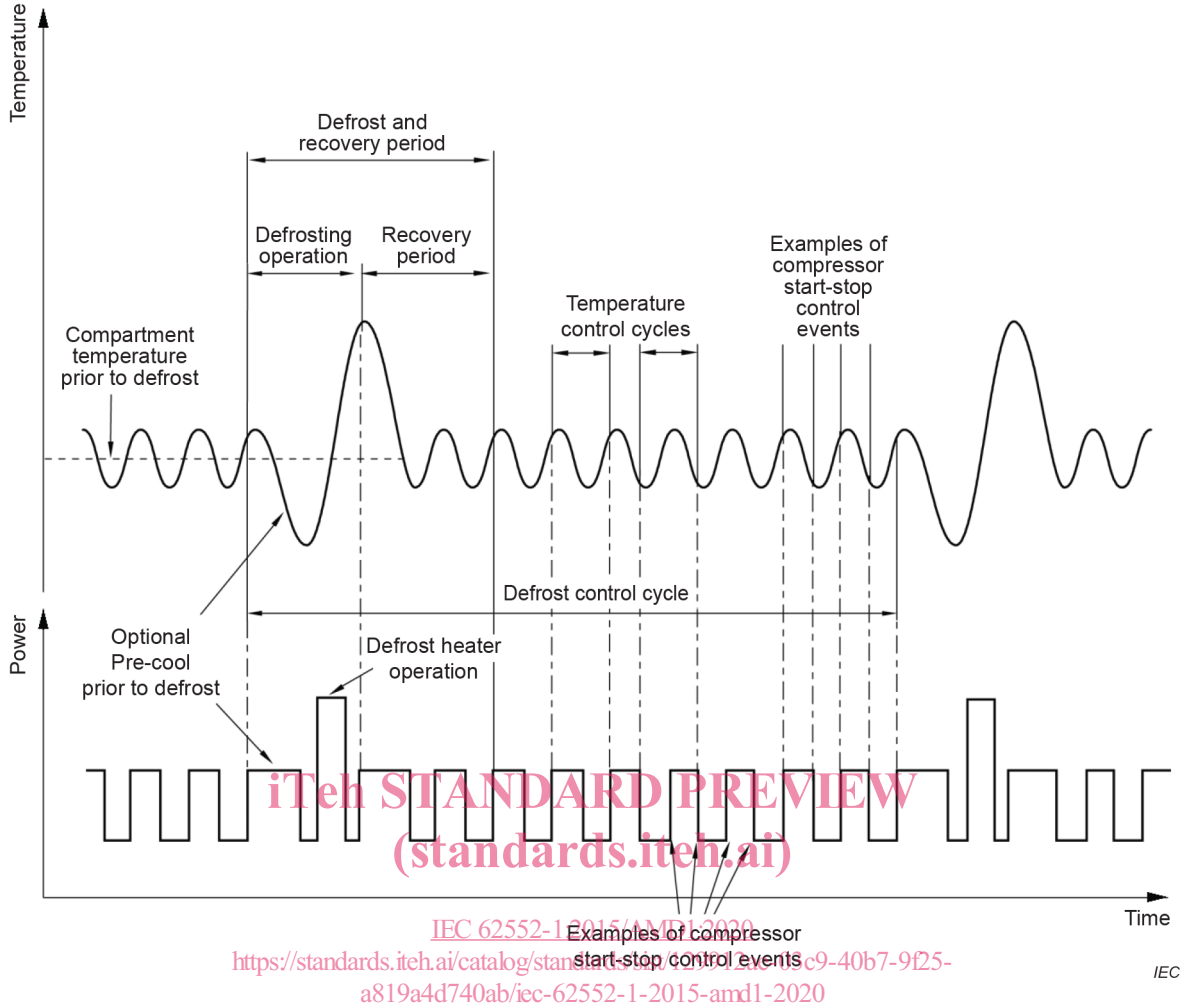
load processing efficiency test

3.5.25
processing load recovery period

Delete this term and definition.

Figure 1 – Illustration of selected definitions

Replace Figure 1 and its title with the following new figure and title:



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

A.3.2.3 Temperature values

Replace item a) with:

a) For assessing the **storage temperatures**:

+10 °C and +32 °C for class SN **refrigerating appliances**;

+16 °C and +32 °C for class N **refrigerating appliances**;

+16 °C and +38 °C for class ST **refrigerating appliances**;

+16 °C and +43 °C for class T **refrigerating appliances**.

For products **rated** for multiple climate classes, tests only need to be performed at the extreme **ambient temperatures** of all the relevant **rated** classes. Testing details are specified in Clause 6 of IEC 62552-2:2015 and IEC 62552-2:2015/AMD1:2020.

EXAMPLE For **refrigerating appliances rated** from SN to T, tests are performed at +10 °C and at +43 °C

In addition, verification tests may be carried out at any ambient temperature between the minimum and maximum temperature defined by the climate class in order to confirm compliance with the storage temperature requirements at any ambient temperature.

Replace item c) with:

c) For assessing the **temperature rise time**, **freezing capacity**, **cooling capacity** and automatic **ice-making capacity** of all **refrigerating appliances**, as applicable and specified in Clauses 7 to 9 and Annex C of IEC 62552-2:2015 and IEC 62552-2:2015/AMD1:2020:

+25 °C for all classifications of **refrigerating appliances**;

Replace item d) with:

d) For assessing the pull-down performance test as specified in Annex A of IEC 62552-2:2015:

at the maximum ambient temperature in accordance with the climate class specified;

B.2.5.2 Variable temperature compartments

Replace the content with the following new content:

Where the **compartment** is a **variable temperature compartment** type (that spans the operating range of several **compartment** types), it shall be classified.

a) For the storage test (IEC 62552-2): each **variable temperature compartment** shall be capable of maintaining specified internal temperatures for each claimed **compartment** type at **ambient temperatures** across the rated **range**.

b) For the **cooling capacity** test (IEC 62552-2): if the **variable temperature compartment** can be used as a fresh food compartment, it shall be operated as a **fresh food compartment** type where this test is performed.

c) For the **freezing capacity** and **temperature rise time** tests (IEC 62552-2): if the **variable temperature compartment** can be used as a **three-star** or **four-star compartment**, it shall be operated as a **three-star** or **four-star compartment** type where this test is performed.

d) For the **energy consumption**, water vapour condensation and **ice-making capacity** tests (IEC 62552-2 and IEC 62552-3), as applicable: the **variable temperature compartment** shall operate as the compartment type which has the highest **energy consumption** for the energy test.

Additional requirements regarding each compartment type are specified in IEC 62552-3:2015, Table 1 during the **energy consumption** test. In the **energy consumption** test, where a **refrigerating appliance** has **variable temperature compartments** that can operate as more than one **compartment** type, additional **compartment** classifications may be tested, if required, in addition to the primary classification specified above.

C.1 Dimensions and tolerances

Add a note after the second paragraph:

NOTE In IEC 62552:2007, 1 kg packs were defined (200 mm × 100 mm × 50 mm) that can be reused under this document by combining 2 packages vertically to form stacks with a footprint of 100 mm × 100 mm.

C.2 Composition

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

Where test packages are required, packages of type a) or b) can be used, except:

1) For **unfrozen compartments**, only packages b) shall be used, for example:
   a) during the **freezing capacity** test;
   b) for a **chill compartment** during the storage temperature test;
   c) for a **fresh food compartment** during the **cooling capacity** test.
2) For the **light load** during the **freezing capacity** test, only packages a) shall be used.

3) For **one-star compartments**, only packages a) shall be used.

4) For the **temperature rise time** test, only packages a) shall be used.

C.3 M-packages

Replace the existing content with the following new content:

Some of the 500 g packages (50 mm × 100 mm × 100 mm) shall be equipped for temperature measurement and shall be known as M-packages. These shall be fitted with thermocouples or other temperature-measuring transducers, which shall be inserted in the geometric centre of the packages in direct contact with the filling material. All precautions shall be taken to minimize extraneous conduction of heat. All M-packages located close to the compartment door's gasket shall be oriented such that the sensor enters the package from the side furthest away from the door's gasket. The composition and the limitations of their use shall be in accordance with Clauses C.1 and C.2.

D.2 Location of sensors

Replace the existing content with the following new content:

D.2.1 General

The position specified for a temperature sensor is the geometric centre of the sensor (metal mass), except where minimum clearances are specified, in which case, clearance is to the outer surface of the metal mass.

Temperature sensor positions are specified in the following paragraphs. Clearances or heights specified are determined from the surface of the **compartment** at the specified positions. The surface may be the **compartment** liner or the surface of a convenience feature or a **sub-compartment**. Any fixed feature shall be treated as a surface.

The full height of a **compartment** (h_1) is defined as the height at the front of the **compartment** or **sub-compartment** in accordance with D.2.4.2. When the liner at the door seal is curved, the inner radius shall be taken as reference (see Figure D.6). The full height is used to define the number of sensors and to classify compartments as small or low-height compartments.

The effective height of a **compartment** (h), which is used to define the height of sensors in a **compartment**, is defined as the height along a vertical line through temperature measurement point TMP_3 for unfrozen compartments (D.2.2) and TMP_{14} for frozen compartments (D.2.3). This vertical line is defined as the **h-line**. The measurement is taken from the point where the **h-line** reaches the bottom surface of the compartment to the point where the **h-line** reaches the top surface of the compartment. Partitions or shelves are ignored when calculating the effective height. Where the surface of the **compartment** has a step change (edge) exactly at the **h-line**, the surface that is furthest away from the door is used to determine measurements.

NOTE Where the position of TMP_3 or TMP_{14} is shifted to meet clearance requirements, the h-line passes through the new position.

For **frozen compartments** having a partial width **convenience feature** where the side gap to the liner is 100 mm or greater and where the **h-line** is limited by this **convenience feature**, the **convenience feature** shall be considered not in place for the determination of the **h-line**.

NOTE This case applies, for example, to ice makers placed inside a **frozen compartment,** which can be placed on the left or right top side. As TMP_{14} is defined on the right side, this would result in different sensor positions in height whether the ice maker is placed on the left or the right. Using mirrored positions, as mentioned in D.2.4.1, does not resolve this inconsistency.

Items such as controls and vent housings shall be ignored, as shall other features or protrusions with a **volume** of less than 2 l.

D.2.2 Unfrozen compartments

Except as set out in D.2.4, three air temperature sensors in **unfrozen compartments** shall be located at the following vertical positions defined by the **h-line** (from the bottom):

- at ¾ h (TMP_1);
- at ½ h (TMP_2);
- at 50 mm (TMP_3).

These positions are illustrated in Figure D.1, Figure D.2, Figure D.3 and Figure D.8 a), and with reference to D.2.4, as applicable.

A box evaporator of any shape within an **unfrozen compartment** where the evaporator is not configured to provide a separate storage space (i.e. not a **sub-compartment**) shall be treated as if it were a **convenience feature** [see Figure D.2 c)].

D.2.3 Frozen compartments

Except as set out in D.2.4, either five or seven air temperature sensors in **frozen compartments** shall be located in vertical positions as follows:

- two at 50 mm from the top surface of the **compartment** (TMP_{12} front and TMP_{13} rear);
- at ¾ h from the bottom defined by the **h-line** if h_1 exceeds 1 000 mm (TMP_{16});
- at ½ h from the bottom defined by the **h-line** (TMP_{11});
- at ¼ h from the bottom defined by the **h-line** if h_1 exceeds 1 000 mm (TMP_{17});
- two at 50 mm from the bottom surface of the **compartment** (TMP_{14} front and TMP_{15} rear).

For TMP_{12}, TMP_{13}, TMP_{14} and TMP_{15}, the vertical distance is measured at the local position of the sensor in the horizontal plane.

Eliminate TMP_{13} if the clearance between TMP_{12} and TMP_{13} is less than 25 mm and eliminate TMP_{15} if the clearance between TMP_{14} and TMP_{15} is less than 25 mm.

These positions are illustrated in Figure D.4, Figure D.5, Figure D.6, Figure D.7 and Figure D.8, and with reference to D.2.4, as applicable.

D.2.4 Equivalent positions and other requirements for all compartment types

D.2.4.1 General

The equivalent sensor locations for special configurations (or features) and other requirements for all **compartment** types are set out below.

If it is not possible to place sensors in the positions shown in Figures D.1 to D.8, the first option is to use a mirror image of the positions, as applicable, as illustrated in Figure D.9.

Where it is not possible to place the temperature sensors in one of these positions, they shall be positioned as near as practicable to the specified locations in a position which will provide an equivalent result, taking note of the intent above. The position of such locations shall be recorded in the test report.

D.2.4.2 Compartment full height

The full height of a **compartment** (h_1) is defined as the height at the front of the **compartment** or **sub-compartment** adjacent to the door seals from the bottom to the top. When the liner at the door seal is curved, the inner radius shall be taken as reference (see Figure D.6). For

top-opening **compartments**, the full height is taken from the lowest bottom surface to the gasket sealing surface.

D.2.4.3 Compartment depth

TMP_1, TMP_2 and TMP_3 for **unfrozen compartments**, except for small or low-height **compartments**, and TMP_{11}, TMP_{16} and TMP_{17} for **frozen compartments**, shall be located at the midpoint between the front and back of the **compartment** at the given vertical position. For all front opening **compartments**, the front of the **compartment** is the gasket sealing surface. The back of the compartment is defined as the rear surface at the vertical position of the sensor.

D.2.4.4 Compartment width

TMP_1, TMP_2 and TMP_3 for **unfrozen compartments**, except for small or low height **compartments**, and TMP_{11}, TMP_{16} and TMP_{17} for **frozen compartments**, shall be located at the midpoint between the left and right surface of the **compartment** at the given vertical position**.**

D.2.4.5 Small compartments, sub-compartments or convenience features

For a **compartment/sub-compartment** or **convenience feature** where the full height (h_1) of the **compartment/sub-compartment/convenience feature** is not more than 150 mm or the **volume** is not more than 25 l and where temperature measurements are required, two temperature sensors shall be used. Each shall be located 50 mm from the lower surface of the **compartment/sub-compartment/convenience feature**, one at the front left and the other at the right rear at $d/4$ and $w/4$. Refer to Figure D.3a).

D.2.4.6 Low height compartments, sub-compartments or convenience features

For **unfrozen compartments**, **sub-compartments** or **convenience features** where the full height (h_1) is 300 mm or less, and this is less than 0,7 of either the width (measured at the door sealing surface) or the maximum depth (between the door sealing surface and back wall), the temperature sensors shall be located in positions as shown in Figure D.3 b). In cases where the width or depth is greater than 700 mm, the positions shown in Figure D.3 b) shall also be used if the ratio of full height (h_1) to either depth or width is less than 0,6.

For **frozen compartments** where the full height (h_1) is 200 mm or less and the **volume** is 40 l or less, the temperature sensors shall be located in positions as shown in Figure D.3 b).

D.2.4.7 Clearance from internal fittings (other than shelves)

Except where otherwise specified, the clearance of temperature sensors shall be at least 25 mm from any internal fittings, walls or features. Clearance in this context means the distance from the surface of the internal fitting, wall or feature to the closest external surface of the temperature sensor (metal mass).

Where a temperature sensor would have less than 25 mm clearance from a fixed **sub-compartment**/feature that is not full width, the sensor shall be moved so that the specified height is maintained while a clearance of 25 mm is maintained from the surface of the **sub-compartment**/feature. Where a temperature sensor has to be placed next to a **convenience feature** that has a gap on each side, the sensor shall be placed in the gap that is the larger. Where the gap sizes are equal, the sensor shall be placed in the left gap for sensor positions that are above the centre of the effective height and on the right gap for sensor positions that are at or below the centre of the effective height. Refer also to Figure D.1 and Figure D.2.

D.2.4.8 Shelf and temperature sensor placement

The following rules regarding shelf placement shall be applied:

- Shelves shall be installed in accordance with the manufacturer's instructions (where available).
- Where no positions are specified in manufacturer instructions, where possible, one shelf in the largest **unfrozen compartment** type (where applicable) shall be located below temperature sensor position TMP_1 (while maintaining a minimum clearance of 25 mm) and above TMP_2, and one shelf shall be located below temperature sensor position TMP_2 (while maintaining a minimum clearance of 25 mm) and above TMP_3. As far as possible, any remaining **shelves** shall be evenly spaced through the **compartment**.

The following rules regarding temperature sensor placement shall be applied:

- Where the shelves' positions are specified or where there is limited adjustability, temperature sensors that have less than 25 mm clearance from the shelf shall be relocated to a position above the shelf with a clearance of 25 mm.
- Where a temperature sensor would have less than 50 mm clearance above or below a refrigerated **shelf** surface, or any evaporator surface (such as plate or box evaporator) that temperature sensor shall be relocated to a position with 50 mm clearance above the relevant refrigerated shelf, where possible, and shall maintain 50 mm clearance in all horizontal directions.

Door **shelves**, drawers, bins, sliding baskets or items with dedicated but interchangeable positions shall all be kept in place but organised to minimise their interference with temperature sensors.

Items which are not intended to be in place during **normal use**, as specified in the instructions, are removed.

D.2.4.9 Convenience feature and temperature sensor placement

Where a **convenience feature** interferes with the position of a temperature sensor, the same rules as for part width **compartments** (see D.2.4.7) and for **shelves** (see D.2.4.8) apply. If the sensor in the **compartment** lies in the **convenience feature**, it shall be moved to the nearest position outside it.

D.2.4.10 Frozen compartment sensors and door shelves

Where a deep door **shelf** interferes with or encloses the location for sensor positions TMP_{12} or TMP_{14}, (refer to Figure D.5 and Figure D.6) or the air space clearance is less than 25 mm, then the centre line of the sensor shall be moved by up to 50 mm further into the **compartment** (i.e. a maximum depth of 150 mm from the door gasket) in order to satisfy the clearance. If this does not satisfy the requirements, the sensor shall be located inside the door **shelf** as close as possible to the original position while maintaining a clearance of 30 mm from the centre of the sensor to the wall and 50 mm from the centre of the sensor to the floor of the door **shelf**.

Where a **two-star section** only comprises door **shelves,** three sensors shall be positioned diagonally, similar to the low-height **compartments** (see Figure D.3b). The **h-line** is to be determined from the bottom surface of the **two-star section** to the top surface using TMP_{23} as reference. In the absence of top and/or bottom surfaces, the door or volume borders (see IEC 62552-3:2015/AMD1:2020, Clause H.4) shall be taken as the limit for the **h-line** and sensor positions. The sensor positions shall be:

- TMP_{21} at 50 mm from the top surface;
- TMP_{22} at ½ h defined by the **h-line;**
- TMP_{23} at 50 mm from the bottom surface.

The sensor positions shall be in width direction (if these positions are not available, the sensors shall be shifted to the nearest position at the given height level that maintains minimum clearances):

- TMP_{21} at 50 mm from the section border closest to the hinge;
- TMP_{22} at the midpoint measured at the height level ½ *h*;
- TMP_{23} at 50 mm from the section border at the opposite side from TMP_{21}.

In the depth direction, the three sensors shall be placed at the midpoint where the depth is measured from the door surface to the volume border, this for each sensor at its corresponding height level.

If a **three-star** or **four-star compartment** has multiple doors, a **two-star section** contained in it shall not cover multiple doors. If required, a **two-star section** can be defined in each door.

D.2.4.11 Placement of temperature sensors within drawers and bins

Where a drawer or bin is located at the top of the compartment, the effective height (*h*) shall be taken from the lowest fixed point above the drawer or bin as it slides in and out (effectively equal to the top of the tallest object that could be placed into the drawer or bin without catching).

Where a temperature sensor is required within or in the vicinity of a drawer or bin, the sensor shall be located inside the drawer or bin, and the drawer or bin shall be treated as the inside of the liner (Figure D.8). Effectively, this means that the effective height (*h*) shall be taken from the bottom of the lowest drawer or bin.

When drawers and/or bins wholly or predominantly occupy the space within a **compartment**, sensors shall be placed within these drawers or bins in positions specified in D.2.2 or D.2.3, as applicable. In the case of solid drawers or bins, temperature sensors shall lie inside the relevant drawer or bin (see D.2.4) while maintaining all clearances (see D.2.4.7) and treating the base of the bin as a **shelf** (see D.2.4.8).

Where the available space is so small that the clearances specified cannot be achieved, the clearance from the temperature sensor to the bin bottom (25 mm) shall be maintained as far as possible while reducing the clearance to the **compartment** top.

The positions of temperature sensors within drawers and bins are illustrated in Figure D.8.

If a space within the **compartment** or **sub-compartment** is covered with an inner door (flap), the placement of the sensors shall follow the procedure as given for bins or drawers.

D.2.5 Consideration of convenience features

For the purposes of the tests in this document, a **convenience feature** is not subject to the temperature measurement requirements that apply to **sub-compartments**. However, this is conditional upon the requirement that the sum of the **volumes** of

a) fixed **convenience features** in a **compartment** shall not exceed 25 % of the **compartment volume**; or

b) the sum of fixed and removable **convenience features** in a **compartment** shall not exceed 40 % of the **compartment volume**.

Where the **volume** of **convenience features** in any **compartment** exceeds these limits, a sufficient number of fixed **convenience features** shall be selected and deemed to be **sub-compartments** (and therefore classified and tested accordingly) until the above **volume** requirement on **convenience features** is met according to the following rules:

i) firstly, those with separate **temperature controls** (including those with 2 position controls) in decreasing size order; then

ii) those without separate **temperature controls** in decreasing size order.

Where the above rules give two or more **convenience features** an equal ranking, the first selected shall be the one farthest from the centre of the space in which **compartment** temperature sensors are located.

Details of temperature-control setting for **convenience features** are set out in B.2.5.3.

Where a **compartment** consists wholly or mainly of drawers and/or bins, these generally would not all be considered as **convenience features**.

Replace Figures D.1 to D.9 with the following new figures:

NOTE All dimensions in Figures D.1 to D.9 are given in millimetres.

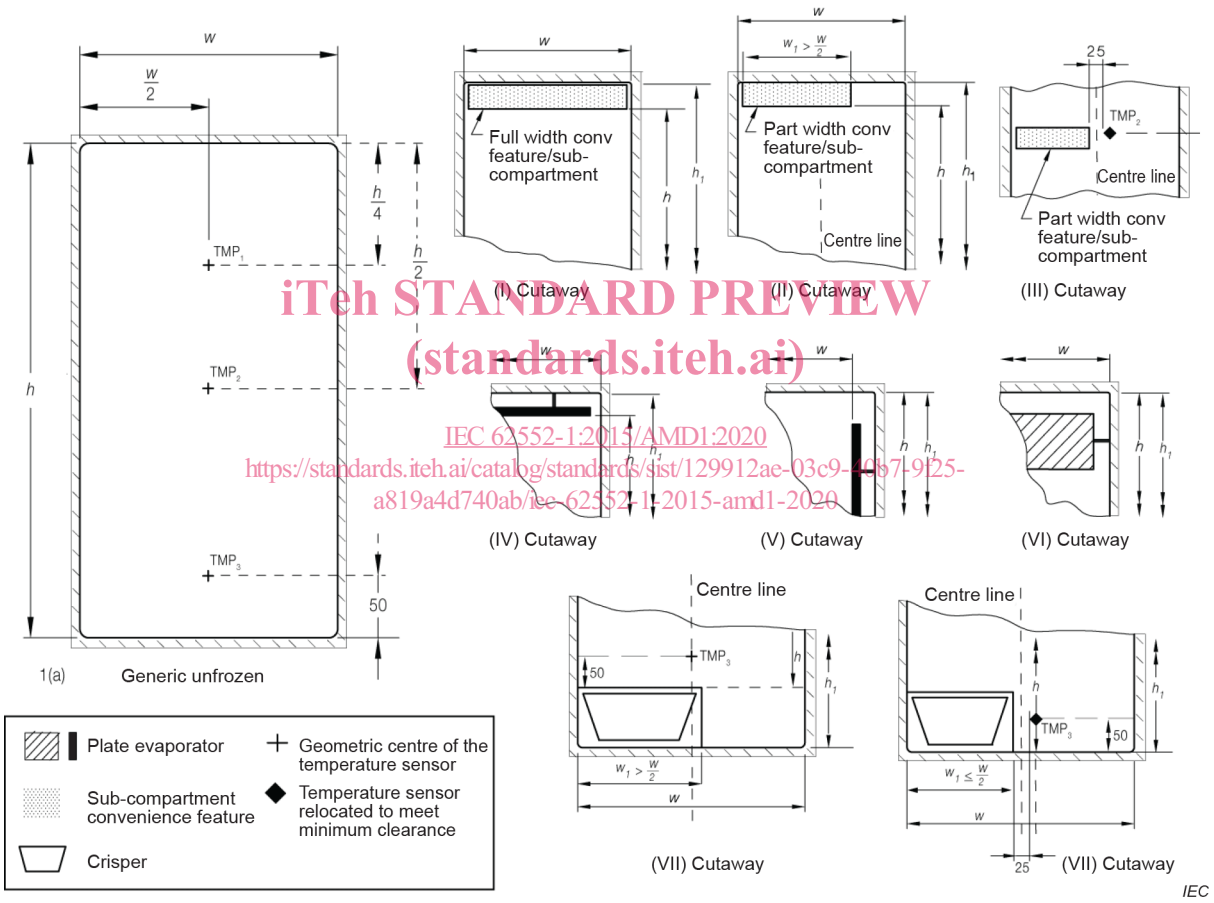
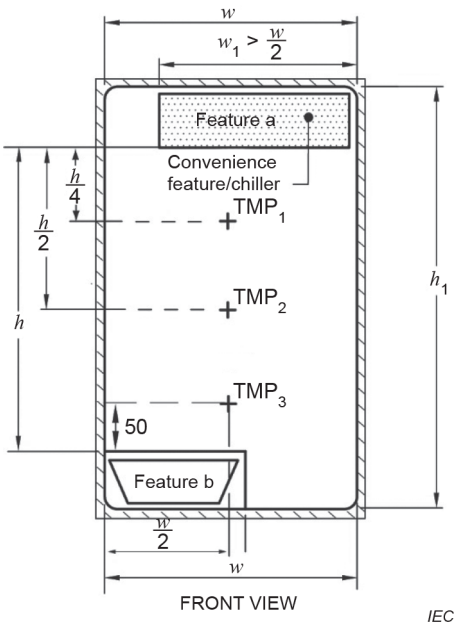
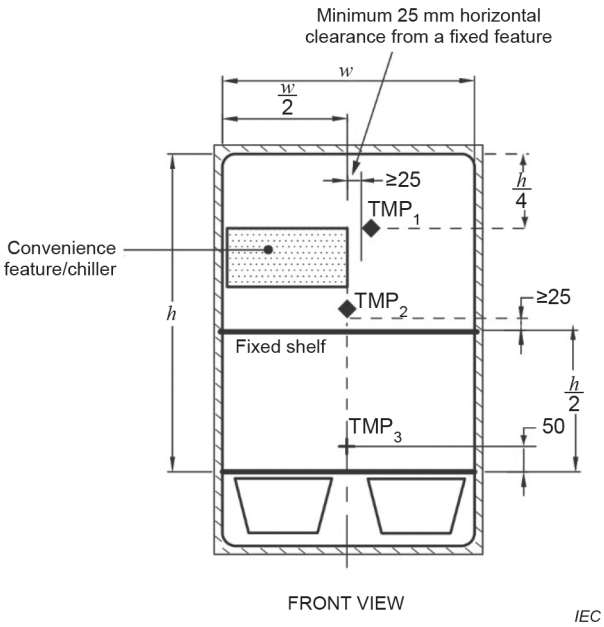


Figure D.1 – Air-temperature measuring points – unfrozen compartments with plate or concealed evaporators and effective height and width examples (all front views)

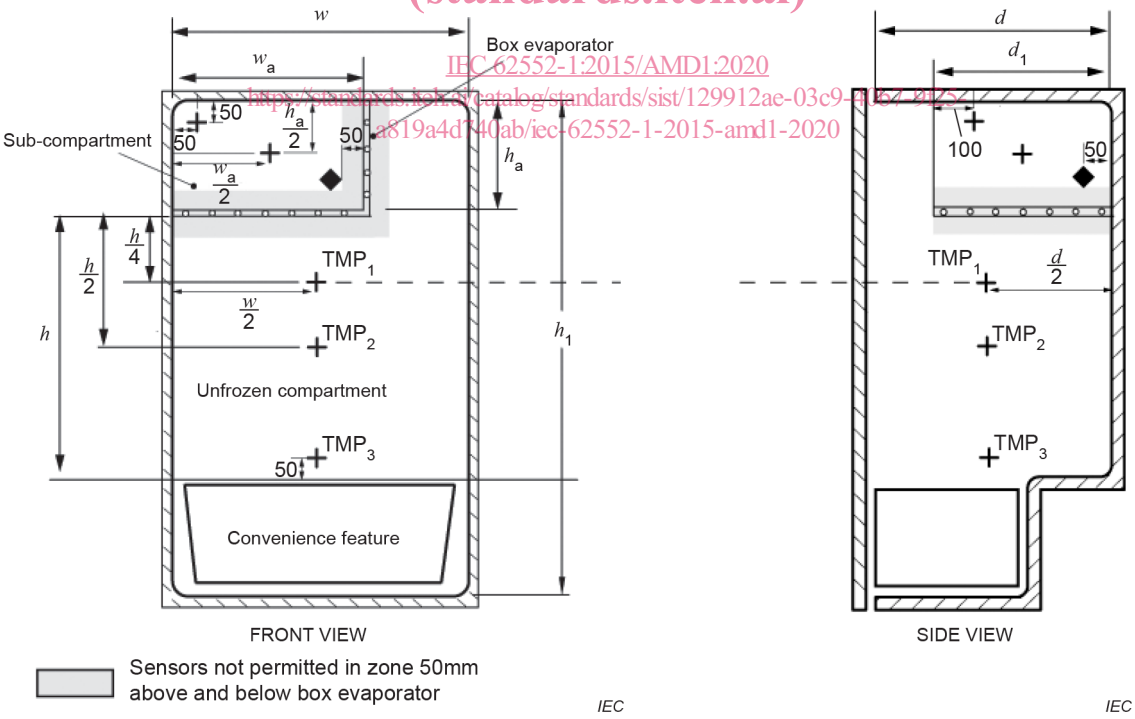


Example 1 Generic with part width crisper, chiller at top



Example 2 Generic with crisper – relocation of temperature sensors to maintain clearances

a) Examples of generic compartments with crisper and convenience features



This example shows where the inside of the box evaporator is a sub-compartment, so the temperature is separately measured. This example is a low height compartment.

b) Box evaporator as a sub-compartment