
Ice-cream freezers — Classification, requirements and test conditions

*Congélateurs pour crèmes glacées — Classification, exigences et
conditions d'essai*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 86, *Refrigeration and air-conditioning*, Subcommittee SC 7, *Testing and rating of commercial refrigerated display cabinets*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 44, *Commercial and professional refrigerating appliances and systems, performance and energy consumption*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Ice-cream freezers — Classification, requirements and test conditions

1 Scope

This document specifies the classification for horizontal closed ice-cream freezer with access of the product from the top via transparent or solid lid(s) and specifies their requirements and test methods.

The ice-cream freezers defined in this document are different from supermarket segment freezers, as they work with static air cooling, with a skin evaporator (no evaporator fan) and are used specifically for the storage and display of pre-packed ice-cream.

This document is only applicable to integral type refrigeration systems. It is not applicable to remote and secondary system type cabinets. Ice-cream freezers defined in this document are intended to have a net volume ≤ 600 l. For transparent lid ice-cream freezers only, they are intended to have a net volume/TDA $\geq 0,35$ m.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 817, *Refrigerants — Designation and safety classification*

ISO 5149-2, *Refrigerating systems and heat pumps — Safety and environmental requirements — Part 2: Design, construction, testing, marking and documentation*

EN 60335-1, *Household and similar electrical appliances — Safety — Part 1: General requirements (IEC 60335-1)*

EN 60335-2-89, *Household and similar electrical appliances — Safety — Part 2-89: Particular requirements for commercial refrigerating appliances with an incorporated or remote refrigerant condensing unit or compressor (IEC 60335-2-89)*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 General

3.1.1

ice-cream freezer

horizontal closed refrigerated cabinet intended to store and/or display and sell pre-packed ice cream where access by the consumer to the pre-packed ice cream is gained by opening a lid (solid or transparent) from the top

Note 1 to entry: See [Annex A](#) for the designation of the ice-cream freezer family.

3.2 Parts of ice-cream freezers

3.2.1

condensing unit

combination of one or more compressors, condensers and liquid receivers (when required) and the regularly furnished accessories

3.2.2

night cover

top cover permanently integrated into the *ice-cream freezer* (3.1.1) used to reduce the heat ingress (e.g. by infrared radiation or convection) during the period when there are no sales

3.3 Physical aspects and dimensions

3.3.1

depth

horizontal distance between the front and the rear of the *ice-cream freezer* (3.1.1)

3.3.2

width

horizontal distance between the two external sides of the *ice-cream freezer* (3.1.1)

3.3.3

height

vertical distance from the bottom to the top of the *ice-cream freezer* (3.1.1)

3.3.4

load limit

boundary surface consisting of a plane or several planes within which all *M-packages* (3.5.1) can be maintained within the limits for the declared M-package temperature class

3.3.5

load limit line

permanently marked boundary line denoting the edge of the *load limit* (3.3.4) surface

3.3.6

net volume

V_N

storage volume inside the appliance which can be used for storage of products

Note 1 to entry: The calculation method in 6.2.5 shall be applied.

3.3.7

gross volume

volume within the inside walls of the *ice-cream freezer* (3.1.1) or compartment, including internal fittings and the lid when closed

3.3.8

equivalent volume

V_{eq}

reference volume corrected for compartment temperature classification

Note 1 to entry: The calculation method in Annex B shall be applied.

3.3.9

total display area

TDA

total visible foodstuffs area, including visible area through the glazing, defined by the sum of horizontal and vertical projected surface areas of the *net volume* (3.3.6)

Note 1 to entry: For the calculation method see Annex C.

3.3.10**footprint**

surface occupied by the *ice-cream freezer* (3.1.1)

3.4 Performance characteristics**3.4.1****normal conditions of use**

operating conditions which exist when the *ice-cream freezer* (3.1.1), including all permanently located accessories, has been set up and situated in accordance with the recommendations of the manufacturer and is in service

Note 1 to entry: The effects of actions by non-technical personnel for the purposes of, e.g. loading, unloading, cleaning, defrosting, the manipulation of accessible controls and of any removable accessories, according to the manufacturer's instructions are applicable within this definition. The effects of actions resulting from interventions by technical personnel for the purposes of maintenance or repair are outside this definition.

3.4.2**defrost**

removal of frost, snow and ice from an *ice-cream freezer* (3.1.1)

3.4.3**total energy consumption**

TEC

total amount of energy used by an *ice-cream freezer* (3.1.1)

3.4.4**specific energy consumption for ice-cream freezers**

SEC

index of the efficiency of the *ice-cream freezer* (3.1.1), expressed as the ratio of TEC divided by *equivalent volume* (3.3.8) (TEC/Equivalent volume)

3.4.5**product temperature**

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one of the classifications document establishing the performance level of the *ice-cream freezer* (3.1.1)

Note 1 to entry: Defined in Table 1.

3.4.6**relative compressor running time**

ratio of compressor running time to overall duration of a measurement cycle excluding defrost time

3.5 Test environment**3.5.1****M-package**

test package fitted with a temperature measuring device

3.5.2**climate class**

classification of the test room climate according to the dry bulb temperature and relative humidity

3.5.3**M-package temperature class**

classification of *M-package* (3.5.1) temperature according to the temperatures of the warmest M-packages during the temperature test

3.5.4**ice-cream freezer classification**

designation given by the combination of *climate class* (3.5.2) and *M-package temperature class* (3.5.3)