
Refrigerated display cabinets —
Part 1:
Vocabulary

Meubles frigorifiques de vente —
Partie 1: Vocabulaire



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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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

ISO 23953-1 was prepared by European Committee for Standardization (CEN) in collaboration with ISO/TC 86, *Refrigeration and air-conditioning*, Subcommittee SC 7, *Testing and rating of commercial refrigerated display cabinets*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 23953-1:2005 and ISO 23953-1:2005/Amd 1:2012), which has been technically revised. ISO 23953-1 reports new terms and definitions also taking into account Directive 2009/125/EC “establishing a framework for the setting of ecodesign requirements for energy-related products”, oriented to an energy rating management. Moreover, new terms and definitions were added on test environment. Some existing terms were updated consistently to the modifications of ISO 23953-2.

ISO 23953 consists of the following parts, under the general title *Refrigerated display cabinets*:

- *Part 1: Vocabulary*
- *Part 2: Classification, requirements and test conditions*

Refrigerated display cabinets —

Part 1: Vocabulary

1 Scope

This part of ISO 23953 establishes a vocabulary of terms and definitions relative to refrigerated display cabinets used for the sale and display of foodstuffs. It is not applicable to refrigerated vending machines or cabinets intended for use in catering or similar non-retail applications.

NOTE In addition to terms in English and French, two of the three official ISO languages, this part of ISO 23953 gives the equivalent terms in German, Italian, and Spanish; these are published under the responsibility of the member bodies for Germany (DIN), Italy (UNI), and Spain (AENOR). However, only the terms and definitions given in the official languages can be considered as ISO terms and definitions.

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.

ISO 23953-2:2015, *Refrigerated display cabinets — Part 2: Classification, requirements and test conditions*

3 Terms and definitions

3.1 Cabinet families and types

See [Annex A](#).

3.1.1

refrigerated display cabinet

cabinet cooled by a refrigerating system which enables chilled and frozen foodstuffs placed therein for display to be maintained within prescribed temperature limits

3.1.2

vertical refrigerated display cabinet

refrigerated display cabinet, either semi-vertical multi-deck, roll-in, or glass door

3.1.3

semi-vertical refrigerated display cabinet

vertical refrigerated display cabinet whose overall height does not exceed 1,5 m and having either a vertical or inclined display opening

3.1.4

horizontal refrigerated display cabinet (counter)

refrigerated display cabinet (counter) with horizontal display opening on its top and accessible from above

3.1.5

closed refrigerated display cabinet

refrigerated display cabinet where access to the foodstuffs is gained by opening a door or lid

3.1.6

**assisted service refrigerated display cabinet
serve-over counter**

horizontal refrigerated display cabinet which requires that a person serve the consumer with fresh-cut or packed foodstuffs

3.1.7

**self-service refrigerated display cabinet
self-service counter**

horizontal refrigerated display cabinet from which the consumer selects the prepacked foodstuffs

3.1.8

serve-over counter with integrated storage

refrigerated display cabinet for assisted service, including refrigerated storage which is normally placed in its base

3.1.9

combined refrigerated display cabinet with glass door top

refrigerated display cabinet consisting of a refrigerated bottom, open or with glass lid, and a glass-door, refrigerated top

3.1.10

combined refrigerated display cabinet with open top

refrigerated display cabinet consisting of a refrigerated bottom, open or with glass lid, and an open refrigerated top

3.1.11

multi temperature combined refrigerated display cabinet

refrigerated display cabinet with different temperatures for chilled or frozen foodstuffs in the top and the bottom

3.1.12

**movable front cabinet
roll-in cabinet**

cabinet which enables goods to be displayed directly on their pallets or rolls which can be placed inside by lifting, swinging, or removing the lower front part, where fitted

3.1.13

back-wall service cabinet

refrigerated cabinet in assisted service, placed behind the serving personnel, with or without an added back storage

Note 1 to entry: See [Figure 1](#).

3.2 Refrigerated display cabinet shapes

3.2.1

island run

shop-around line of multiplexed cabinets (horizontal, vertical, or combined), possibly provided with an end cabinet so that the consumer has access to all sides

Note 1 to entry: See [Figure 1](#).

3.2.2

internal angle

cabinet that ensures the geometrical continuity between two cabinets whose extremities form an angle of between 0° and 90°

Note 1 to entry: See [Figure 1](#).

3.2.3

external angle

cabinet that ensures the geometrical continuity between two cabinets whose extremities form an angle of between 0° and 90°

Note 1 to entry: See [Figure 1](#).

3.2.4

end wall

panel closing a cabinet or a line-up or the side of a line-up

Note 1 to entry: See [Figure 1](#).

3.2.5

line-up run

line consisting of multiplexed modular refrigerated cabinets even if not in a straight segment

Note 1 to entry: See [Figure 1](#).

3.2.6

technical line-up zone

line made up of multiplexed modular refrigerated cabinets even if not in a straight segment but with shared safety and temperature control devices

Note 1 to entry: See [Figure 1](#).

3.2.7

wall cabinet

cabinet (horizontal, vertical, or combined) intended to be located with its back to a wall or back to back with another cabinet

Note 1 to entry: See [Figure 1](#).

3.2.8

island cabinet

shop-around or other cabinet intended to be multiplexed as a part of island run

Note 1 to entry: See [Figure 1](#).

3.2.9

island cabinet with air discharge in the middle

island with air discharge positioned in the middle of the cabinet so that the product storage room consists of two separate volumes

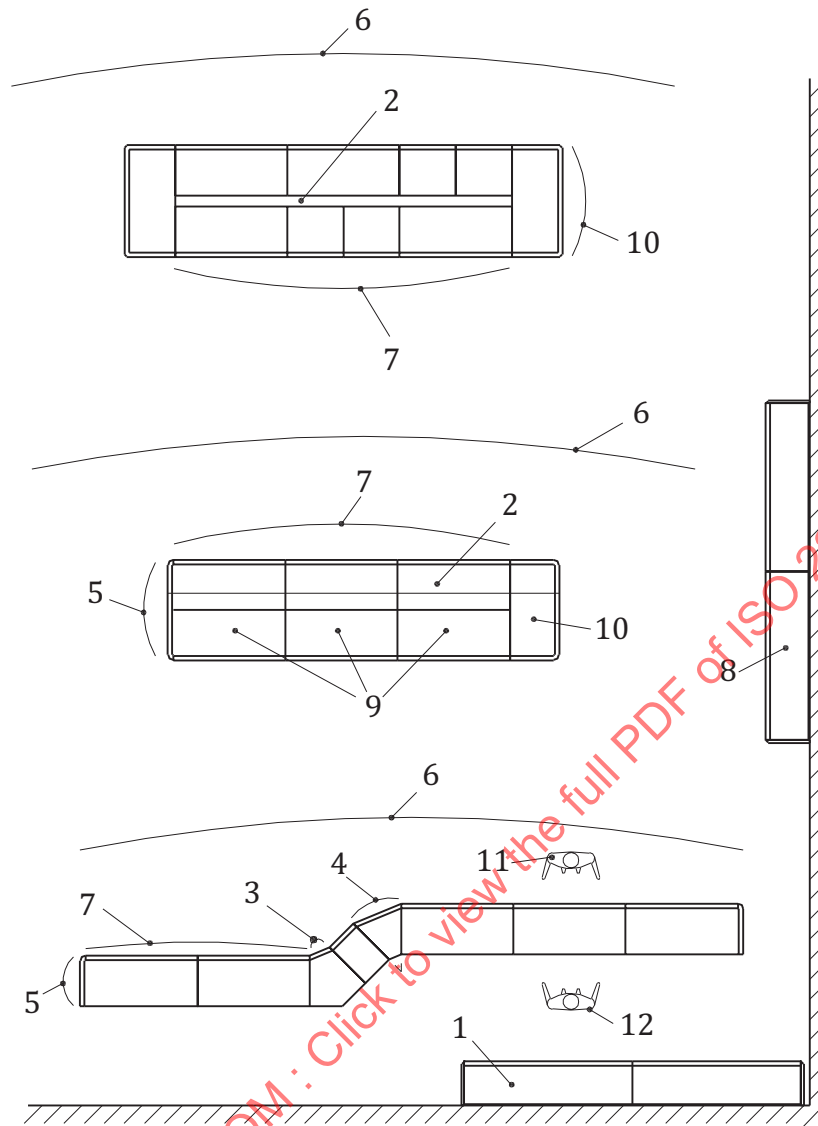
Note 1 to entry: Two open wall cabinets mounted back to back are not considered to be an “island cabinet with air discharge in the middle”.

3.2.10

end cabinet

cabinet intended to be located at the end of an island run

Note 1 to entry: See [Figure 1](#).



Key

- 1 back wall service cabinet
- 2 island run
- 3 internal angle
- 4 external angle
- 5 end wall
- 6 line-up/run
- 7 technical line-up/zone
- 8 wall cabinet
- 9 island cabinet
- 10 end cabinet
- 11 consumer
- 12 serving personnel

Figure 1 — Refrigerated display cabinet shapes

3.3 Parts of refrigerated display cabinets

3.3.1

air discharge

opening at which the air curtain comes out

Note 1 to entry: See [Figure 2](#).

3.3.2

air return

opening at which the air curtain flows back inside the cabinet air ducts

Note 1 to entry: See [Figure 2](#).

3.3.3

shelf

surface, excluding the base deck, on which the goods are displayed

Note 1 to entry: See [Figure 2](#).

3.3.4

price marking rail

ticket holder

profile fitted along the cabinet shelves which enables different types of labels for consumer information to be displayed

Note 1 to entry: See [Figure 2](#).

3.3.5

kickplate

vertical plate or plinth that covers the gap between the floor and base of the cabinet

Note 1 to entry: See [Figure 2](#).

3.3.6

night cover

lid, blind, or other cover used to reduce the heat ingress (e.g. by infrared radiation or convection) into an open refrigerated display cabinet

Note 1 to entry: See [Figure 2](#).

3.3.7

night blind

type of night cover, curtain to be pulled on the cabinet display opening in order to close it and which can be moved automatically

Note 1 to entry: See [Figure 2](#).

3.3.8

canopy

upper front part of a vertical cabinet

Note 1 to entry: See [Figure 2](#).

3.3.9

front panel(s)

group of aesthetic pieces of the cabinet front, visible to the consumer

Note 1 to entry: See [Figure 2](#).

3.3.10

front

side of the cabinet facing the consumer or in the case of an island cabinet, the side on which the manufacturer affixes his identification plate

Note 1 to entry: See [Figure 2](#).

3.3.11

front riser

device for retaining the goods within the display surface

Note 1 to entry: See [Figure 2](#).

3.3.12

handrail

upper front profile covering the edge that is normally touched by the consumer

Note 1 to entry: See [Figure 2](#).

3.3.13

condensing unit

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

Note 1 to entry: See [Figure 2](#).

3.3.14

base deck

lowest display surface of a cabinet

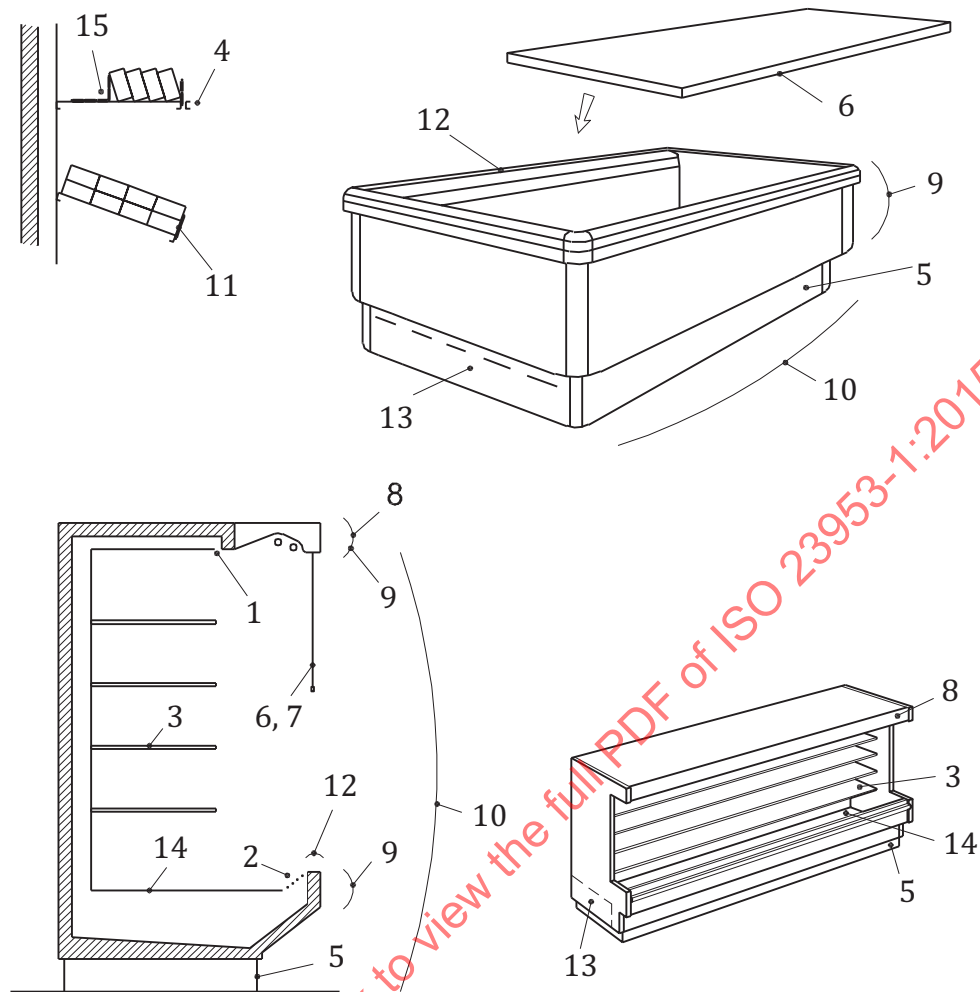
Note 1 to entry: See [Figure 2](#).

3.3.15

shelf sham

device intended to limit the loading of a display surface

Note 1 to entry: See [Figure 2](#).



Key

- 1 air discharge
- 2 air return
- 3 shelf
- 4 price marking rail/ticket holder
- 5 kickplate
- 6 night cover
- 7 night blind
- 8 canopy
- 9 front panel(s)
- 10 front
- 11 front riser
- 12 handrail
- 13 possible location of condensing unit
- 14 base deck
- 15 shelf sham

Figure 2 — Parts of refrigerated display cabinets

3.4 Dimensional characteristics

3.4.1

refrigerated shelf area

refrigerated display area where the vertical clearance above any shelf or base deck is greater than or equal to 100 mm, measured perpendicularly above the plane of the shelf or base deck and within the bounds of any load limit

3.4.2

overall external dimensions at installation

dimensions of the right parallelepiped bounded by the length, depth, and height of the cabinet, including its projecting accessories

3.4.3

overall external dimensions in service

dimensions necessary for the installation as well as the space to allow circulation of the air cooling the condenser, the opening and closing of doors and other devices for access to foodstuffs or which allow foodstuffs to be loaded, evacuation of defrost water, etc.

3.4.4

display

space in which the consumer can see the goods contained in the cabinet

3.4.5

display opening area

area obtained by multiplying the smallest length and width (or height as appropriate) for the opening area of the refrigerated cabinet

3.4.6

load limit

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

3.4.7

load limit line

permanently marked boundary line denoting the edge of the load limit surface

3.4.8

net volume

volume containing foodstuffs within the load limit

3.4.9

gross volume

volume within the inside walls of the cabinet or compartment, excluding internal fittings, doors, or lids, if any, with these being closed and with the load limit being taken into account if the cabinet has no door or lid

3.4.10

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

Note 1 to entry: See ISO 23953-2:2015, Annex A.

3.4.11

visibility of products by arc method

VPA

total visible foodstuffs area, including visible area through the glazing, defined by the arc method in accordance with ISO 23953-2:2015, Annex B

3.5 Operating characteristics

3.5.1

air curtain

air flow going from the air discharge towards the air return, thereby limiting both heat and mass transfers between the cabinet's gross volume and the surrounding environment

3.5.2

normal conditions of use

operating conditions which exist when the cabinet, 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 purposes of loading, unloading, cleaning, defrosting, the manipulation of accessible controls and of any removable accessories, etc., according to the manufacturer's instructions are within this definition. The effects of actions resulting from interventions by technical personnel for the purposes of maintenance or repair are outside this definition.

3.5.3

defrosting

removal of frost, snow, and ice from a refrigerated display cabinet

3.5.3.1

automatic defrosting

defrosting where no action is necessary by the user to initiate the removal of frost accumulation and to restore normal operation

Note 1 to entry: It includes automatic removal of defrost water.

3.5.3.2

semi-automatic defrosting

defrosting where an action is necessary by the user to initiate the removal of frost accumulation and normal operation is restored automatically

Note 1 to entry: It either includes automatic removal of defrost water or entails manual removal of defrost water.

3.5.3.3

manual defrosting

defrosting where an action is necessary by the user to initiate the removal of frost accumulation and restoration to normal operation requires a further action by the user

Note 1 to entry: It either includes automatic removal of defrost water or entails manual removal of defrost water.

3.5.3.4

hot gas defrosting

defrosting with a partial flow of hot gas through the evaporator

3.5.4

compression-type refrigerating system

system in which refrigeration is affected by the vaporization at low pressure in a heat exchanger (evaporator) of a liquid refrigerant, the vapour thus formed being restored to the liquid state by mechanical compression to a higher pressure and subsequent cooling in another heat exchanger (condenser)

3.5.5

indirect-type refrigerating system

system in which a secondary refrigerant circulating system is installed between a central refrigerating system and a refrigerated cabinet

3.5.6

defrost water removal

process through which defrost water is removed from a refrigerated display cabinet

3.5.7

automatic removal of defrost water

removal and/or evaporation of defrost water that does not require any action by the user

3.5.8

manual removal of defrost water

removal of defrost water that requires an action by the user

3.5.9

secondary refrigerant

liquid or liquid-solid or gas-liquid fluid used in an indirect type refrigerating system to transfer heat

3.5.10

suction superheat

difference between the temperature of the suction vapour at a given point and the saturation temperature derived from the pressure at this point by the use of the thermodynamic data for the refrigerant specified

3.5.11

heat extraction rate

amount of energy to be removed per unit time from the refrigerated display cabinet at the specified operating conditions

3.5.12

direct electrical energy consumption

DEC

energy consumption of electrical components of the cabinet

3.5.13

refrigeration electrical energy consumption

REC

energy consumption of a conventional refrigeration system necessary to operate the cabinet

3.5.14

pumping electrical energy consumption

PEC

energy consumption of a conventional pumping system for secondary refrigerant necessary to operate the cabinet

3.5.15

total energy consumption

TEC

sum of DEC and REC

3.5.16

anti-condensate energy consumption

AEC

total daily energy consumption used in condensate removal on the outside of the commercial refrigerated display cabinet, which typically includes fan and condensate heater energy

3.5.17

defrost energy consumption

DFEC

energy consumed by defrost heaters during defrost period

3.5.18

fan energy consumption

FEC

energy consumed by fan motors

3.5.19**lighting energy consumption****LEC**

energy consumed by lights fitted in the refrigerated display cabinet

3.5.20**condensate evaporator pan energy consumption****PEC**

amount of heat energy required to change condensate from liquid to a vapour in the pan of an automatic water evacuation system of a cabinet with an incorporated condensing unit

3.5.21**compressor energy consumption****CEC**

energy consumed by the compressor of a condensing unit incorporated in a refrigerated display cabinet

3.5.22**total revised energy consumption****TECR**

sum of the revised refrigeration energy consumption (RECR) with the recalculated value of direct electrical energy consumption (DEC) when alternate electric components are used in a cabinet intended for a remote compression type or indirect type refrigerating system

3.5.23**additional refrigeration energy consumption**

additional indirect effect of alternate electric component(s) on the refrigeration electrical energy consumption for a cabinet intended for a remote compression type or indirect type refrigerating system

3.5.24**published standard rating**

statement of the assigned values of those performance characteristics, under stated standard rating conditions, by which a unit may be chosen for its application

Note 1 to entry: The term published standard rating includes the rating of all performance characteristics shown on the unit or published in specifications, advertising, or other literature controlled by the manufacturer, at stated standard rating.

3.5.25**standard rating**

rating based on tests performed at standard rating conditions

3.5.26**rating conditions**

set of operating conditions under which a single level of performance results and which causes only that level of performance to occur

3.5.27**standard rating conditions**

rating conditions used as the basis of comparison for performance characteristics

3.5.28**incorporated compressor coefficient of performance****COP_{ic}**

ratio between the cooling capacity in watts and the electric power input values in watts at any given set of rating conditions for an incorporated compressor

3.6 Test environment

3.6.1

M-package

test package fitted with a temperature measuring device

3.6.2

test package

package without temperature measuring device

Note 1 to entry: This package may be a box of plastic material in which the content shall be water soaked into a porous material such as natural, plastics, or cellulose sponge.

3.6.3

climate class

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

Note 1 to entry: See ISO 23953-2.

3.6.4

M-package temperature class

classification of M-package temperature according to temperatures of warmest and coldest M-packages during the temperature test according to ISO 23953-2

3.6.5

cabinet classification

designation given by the combination of climate class and M-package temperature class

EXAMPLE A cabinet tested in a test room climate class 3 with an M1 class would be designated as 3M1.

3.6.6

product temperature

one of the classifications defined in ISO 23953-2:2015, 4.2.2, Table 1.

Note 1 to entry: The product temperature establishes the performance level of the refrigerated display cabinets.

3.7 General

3.7.1

product family

group of cabinets

Note 1 to entry: See [Annex A](#).

3.7.2

consumer

purchaser or end user of the goods

Note 1 to entry: See [Figure 1](#).

3.7.3

serving personnel

store personnel who prepare and serve goods for consumers

Note 1 to entry: See [Figure 1](#).

3.7.4

goods

items to be sold

3.7.5
foodstuffs
goods for consumption

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Annex A

(informative)

Designation of refrigerated display cabinet families

Application	Temperature positive		Temperature negative	
To be used for	Chilled foodstuffs		Frozen, quick frozen foodstuffs, and ice cream	
Horizontal	Chilled, serve-over counter open service access	HC1	Frozen, serve-over counter open service access	HF1
	Chilled, serve-over counter with integrated storage open service access	HC2		
	Chilled, open, wall site	HC3	Frozen, open, wall site	HF3
	Chilled, open, island	HC4	Frozen, open, island	HF4
	Chilled, glass lid, wall site	HC5	Frozen, glass lid, wall site	HF5
	Chilled, glass lid, island	HC6	Frozen, glass lid, island	HF6
	Chilled, serve-over counter closed service access	HC7	Frozen, serve-over counter closed service access	HF7
	Chilled, serve-over counter with integrated storage closed service access	HC8		
Vertical	Chilled, semi-vertical	VC1	Frozen, semi-vertical	VF1
	Chilled, multi-deck	VC2	Frozen, multi-deck	VF2
	Chilled, roll-in	VC3		
	Chilled, glass door	VC4	Frozen, glass door	VF4
Combined	Chilled, open top, open bottom	YC1	Frozen, open top, open bottom	YF1
	Chilled, open top, glass lid bottom	YC2	Frozen, open top, glass lid bottom	YF2
	Chilled, glass door top, open bottom	YC3	Frozen, glass door top, open bottom	YF3
	Chilled, glass door top, glass lid bottom	YC4	Frozen, glass door top, glass lid bottom	YF4
	Multi-temperature, open top, open bottom			YM5
	Multi-temperature, open top, glass lid bottom			YM6
	Multi-temperature, glass door top, open bottom			YM7
	Multi-temperature, glass door top, glass lid bottom			YM8
R Remote condensing unit		V Vertical		
I Incorporated condensing unit		Y Combined		
A Assisted service		C Chilled		
S Self-service		F Frozen		
H Horizontal		M Multi-temperature		
General classification can be used as follows: HC1, VF1, YM5. When necessary, the classification can be more precise, for example, RHC1A, IVF1S.				
NOTE Serve-over counters are primarily in assisted service but can be in self-service. Chilled multi-deck cabinets are primarily in self-service but can be in assisted service.				

Annex B (normative)

Equivalent terms in other languages

English	Français	Deutsch	Italiano	Español
Refrigerated display cabinet	Meuble frigorifique de vente	Verkaufskühlmöbel	Mobile refrigerato per esposizione e vendita	Mueble frigorífico comercial
Vertical refrigerated display cabinet	Meuble frigorifique de vente vertical	Vertikales Verkaufskühlmöbel	Mobile refrigerato ad esposizione verticale	Mueble frigorífico comercial vertical
Semi-vertical refrigerated display cabinet	Meuble frigorifique de vente semi-vertical	Halbhohes vertikales Verkaufskühlmöbel	Mobile refrigerato ad esposizione verticale a mezza altezza	Mueble frigorífico comercial semi-vertical
Horizontal refrigerated display cabinet	Meuble frigorifique de vente horizontal	Horizontales Verkaufskühlmöbel	Mobile refrigerato di vendita orizzontale	Mueble frigorífico comercial horizontal
Closed refrigerated display cabinet	Meuble frigorifique de vente fermé	Geschlossenes Verkaufskühlmöbel	Mobile refrigerato di vendita chiuso	Mueble frigorífico comercial cerrado
Assisted service refrigerated display cabinet/serve-over counter	Meuble frigorifique de vente à service assisté	Verkaufskühlmöbel mit Bedienung/Bedienungstheke	Mobile refrigerato di vendita a servizio assistito	Mueble frigorífico comercial servicio tradicional/Vitrina tradicional
Self-service refrigerated display cabinet/self-service counter	Meuble frigorifique de vente libre-service	Verkaufskühlmöbel zur Selbstbedienung	Mobile refrigerato di vendita a libero servizio	Mueble frigorífico comercial autoservicio
Serve-over counter with integrated storage	Meuble à service assisté avec réserve réfrigérée	Bedienungstheke mit eingebautem Vorratsfach	Mobile tradizionale con riserva refrigerata	Vitrina tradicional con reserve refrigerada
Combined refrigerated display cabinet with glass door top	Meuble frigorifique de vente combiné avec superstructure à portillon vitré	kombiniertes Verkaufskühlmöbel mit einem Glastürenaufsatz	Mobile refrigerato di vendita combinato con alzata a sportelli	Mueble frigorífico comercial mixto con puertas de cristal en la parte superior
Combined refrigerated display cabinet with open top	Meuble frigorifique de vente combiné avec superstructure ouverte	kombiniertes Verkaufskühlmöbel mit einem offenem Aufsatz	Mobile refrigerato di vendita combinato con alzata aperta	Mueble frigorífico comercial mixto con la parte superior abierta
Multitemperature combined refrigerated display cabinet	Meuble frigorifique de vente combiné multitempérature	kombiniertes Verkaufskühlmöbel für verschiedene Temperaturen	Mobile refrigerato di vendita multitemperatura	Mueble frigorífico comercial mixto multitemperatura
Movable front cabinet/roll-in cabinet	Meuble à façade mobile/Meuble à chariots	Möbel mit beweglicher Front/Containerregal	Mobile a caricamento anteriore	Mueble para carros con frente elevable
Back wall service cabinet	Meuble arrière à service assisté	rückwärtiges Bedienungsmöbel	Mobile posteriore di servizio	Mueble servicio trasero
Island run	Îlot	Inselmöbelreihe/Gondel	Gondola	Isla
Internal angle	Angle fermé	Innenecke	Angolo chiuso	Ángulo interior