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**COMMISSION REGULATION (EU) 2019/2024**

**of 1 October 2019**

**laying down ecodesign requirements for refrigerating appliances with a direct sales function  
pursuant to Directive 2009/125/EC of the European Parliament and of the Council**

**(Text with EEA relevance)**

**(OJ L 315, 5.12.2019, p. 313)**

Amended by:

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**COMMISSION REGULATION (EU) 2019/2024****of 1 October 2019****laying down ecodesign requirements for refrigerating appliances with a direct sales function pursuant to Directive 2009/125/EC of the European Parliament and of the Council****(Text with EEA relevance)***Article 1***Subject matter and scope**

1. This Regulation establishes ecodesign requirements for the placing on the market or the putting into service of electric mains-operated refrigerating appliances with a direct sales function, including appliances sold for refrigeration of items other than foodstuffs.

2. This Regulation does not apply to:

- (a) refrigerating appliances with a direct sales function that are only powered by energy sources other than electricity;
- (b) the remote components, such as the condensing unit, compressors or water condensed unit, to which a remote cabinet needs to be connected in order to function;
- (c) food processing refrigerating appliances with a direct sales function;
- (d) refrigerating appliances with a direct sales function specifically tested and approved for the storage of medicines or scientific samples;
- (e) refrigerating appliances with a direct sales function that have no integrated system for producing cooling, and function by ducting chilled air that is produced by an external air chiller unit; this does not include remote cabinets nor does it include category 6 refrigerated vending machines, as defined in Table 5 of Annex III;
- (f) professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers as defined in Regulation (EU) 2015/1095;
- (g) wine storage appliances and minibars.

3. The requirements in point 1 and point 3(k) of Annex II do not apply to:

- (a) refrigerating appliances with a direct sales function that do not use a vapour compression refrigeration cycle;
- (b) refrigerating appliances with a direct sales function for the sale and display of live foodstuffs, such as refrigerating appliances for the sale and display of living fish and shellfish, refrigerated aquaria and water tanks;
- (c) saladettes;

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- (d) horizontal serve-over counters with integrated storage designed to work at chilled operating temperatures;

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- (e) corner/curved and carousel cabinets;

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- (f) vending machines designed to work at frozen operating temperatures;
- (g) serve-over fish counters with flaked ice.

*Article 2***Definitions**

For the purpose of this Regulation, the following definitions shall apply:

1. ‘refrigerating appliance with a direct sales function’ means an insulated cabinet with one or more compartments that are controlled at specific temperatures, cooled by natural or forced convection through one or more energy consuming means and is intended for displaying and selling, with or without assisted serving, foodstuffs and other items at specified temperatures below the ambient temperature to customers, accessible directly through open sides or through one or more doors, or drawers or both, including refrigerating appliances with a direct sales function with areas used for storage of foodstuffs and other items not accessible by customers, and excluding minibars and wine storage appliances;
2. ‘foodstuffs’ means food, ingredients, beverages, including wine, and other items primarily used for consumption which require refrigeration at specified temperatures;
3. ‘condensing unit’ means a product integrating at least one electrically driven compressor and one condenser, capable of cooling down and continuously maintaining low or medium temperature inside a refrigerated appliance or system, using a vapour compression cycle once connected to an evaporator and an expansion device, as defined in Regulation (EU) 2015/1095;
4. ‘remote cabinet’ means a refrigerating appliance with a direct sales function which consists of a factory-made assembly of components that in order to function as a refrigerating appliance with a direct sales function, needs to be connected additionally to remote components (condensing unit and/or compressor and/or water condensed unit) which are not an integral part of the cabinet;
5. ‘food processing refrigerating appliance with a direct sales function’ means a refrigerating appliance with a direct sales function specifically tested and approved for carrying out food processing such as ice-cream makers, microwave-equipped refrigerated vending machines or ice makers; this does not include refrigerating appliances with a direct sales function equipped with one compartment specifically designed for carrying out food processing which is equivalent to less than 20 % of the appliance total net volume;

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6. ‘net volume’ means the part of the gross volume of any compartment which is left after deduction of the volume of components and spaces unusable for the storage or display of foodstuffs and other items, in cubic decimetres (dm<sup>3</sup>) or litres (L);
7. ‘gross volume’ means the volume within the inside liners of the compartment, without internal fittings and with door or lid closed, in cubic decimetres (dm<sup>3</sup>) or litres (L);
8. ‘specifically tested and approved’ means that the product complies with all the following requirements:
  - (a) it has been specifically designed and tested for the mentioned operating condition or application, according to the Union legislation mentioned or related acts, relevant Member State legislation, and/or relevant European or international standards;
  - (b) it is accompanied by evidence, to be included in the technical documentation in the form of a certificate, a type approval mark or a test report, that the product has been specifically approved for the mentioned operating condition or application;
  - (c) it is placed on the market specifically for the mentioned operating condition or application, as evidenced at least by the technical documentation, information provided for the product and any advertising, information or marketing materials;
9. ‘wine storage appliance’ means refrigerating appliance with only one type of compartment for the storage of wine, with precision temperature control for the storage conditions and target temperature, and equipped with anti-vibration measures, as defined in Regulation (EU) 2019/2019;
10. ‘compartment’ means an enclosed space within a refrigerating appliance with a direct sales function, separated from other compartment(s) by a partition, container, or similar construction, which is directly accessible through one or more external doors and may itself be divided into sub-compartments. For the purpose of this Regulation, unless specified otherwise, compartment refers to both compartments and sub-compartments;
11. ‘external door’ is the part of a refrigerating appliance with a direct sales function that can be moved or removed to at least allow inserting the load from the exterior to the interior or extracting the load from the interior to the exterior of the refrigerating appliance with a direct sales function;
12. ‘sub-compartment’ means an enclosed space in a compartment having a different operating temperature range from the compartment in which it is located;
13. ‘minibar’ means a refrigerating appliance with a total volume of maximum 60 litres, which is primary intended for the storage and sales of foodstuffs in hotel rooms and similar premises, as defined in Regulation (EU) 2019/2019;
14. ‘refrigerated drum vending machine’ means a refrigerated vending machine with rotating drums each divided in partitions, in which the foodstuffs and other items are placed on a horizontal surface, and are retrieved through individual delivery doors;

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15. 'refrigerated vending machine' means a refrigerating appliance with a direct sales function designed to accept consumer payments or tokens to dispense chilled foodstuffs or other items without on-site labour intervention;
16. 'saladette' means a refrigerating appliance with a direct sales function with one or more doors or drawer fronts in the vertical plane that has cut-outs in the top surface into which temporary storage bins can be inserted for easy-access storage of foodstuffs such as pizza toppings or salad items;
17. 'horizontal serve-over counter with integrated storage' means a horizontal cabinet for assisted service, which includes refrigerated storage which is of at least 100 litres (L) per meter (m) length and which is normally placed at the serve-over counter's base;
18. 'horizontal cabinet' means a refrigerating appliance with a direct sales function with horizontal display, opening on its top, and accessible from above;
19. 'chilled operating temperature' means a temperature between -3,5 degrees Celsius (°C) and 15 degrees Celsius (°C) for appliances equipped with energy management systems for saving energy and between -3,5 degrees Celsius (°C) and 10 degrees Celsius (°C) for appliances not equipped with energy management systems for saving energy;
20. 'operating temperature' means the reference temperature inside a compartment during testing;

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21. 'corner/curved cabinet' means a refrigerating appliance with a direct sales function used to achieve geometrical continuity between two linear cabinets that are at an angle to each other and/or that form a curve. A corner/curved cabinet does not have a recognisable longitudinal axis or length since it consists only of a filling shape (wedge or similar) and is not designed to function as a stand-alone refrigerated unit. The two ends of the corner/curved cabinet are inclined at an angle between 30 ° and 90 °;

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22. 'frozen operating temperature' means a temperature below -12 degrees Celsius (°C);
23. 'serve-over fish counter with flaked ice' means a cabinet for horizontal assisted service, designed and marketed specifically for fresh fish display. It is characterised by having on its top a bed of flaked ice used to maintain the temperature of the displayed fresh fish, and it also has a built in drain outlet;
24. 'equivalent model' means a model which has the same technical characteristics relevant for the technical information to be provided, but which is placed on the market or put into service by the same manufacturer, importer or authorised representative as another model with a different model identifier;
25. 'model identifier' means the code, usually alphanumeric, which distinguishes a specific product model from other models with the same trade mark or the same manufacturer's, importer's or authorised representative's name;

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26. ‘product database’ means a collection of data concerning products, which is arranged in a systematic manner and consists of a consumer-oriented public part, where information concerning individual product parameters is accessible by electronic means, an online portal for accessibility and a compliance part, with clearly specified accessibility and security requirements, as referred to in Regulation (EU) 2017/1369 of the European Parliament and of the Council <sup>(1)</sup>;
27. ‘beverage cooler’ means a refrigerating appliance with a direct sales function designed to cool, at a specified speed, packaged non-perishable beverages, excluding wine, loaded at ambient temperature, for sale at specified temperatures below the ambient temperature. A beverage cooler allows accessing the beverages directly through open sides or through one or more doors, drawers or both. The temperature inside the cooler may increase during periods of no demand, for the purpose of energy saving, in view of the non-perishable nature of beverages;
28. ‘energy efficiency index’ (EEI) means an index number for the relative energy efficiency of a refrigeration appliance with a direct sales function expressed in percentage, calculated in accordance with point 2 of Annex III;

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29. ‘carousel cabinet’ means a round/circular shape supermarket cabinet which can be installed as a standalone unit or as a unit connecting two linear supermarket cabinets. Carousel cabinets can also be equipped with a turning system which makes visible the display of foodstuff at 360 °;
30. ‘supermarket cabinet’ means a refrigerating appliance with a direct sales function intended for the sale and display of foodstuffs and other items in retail applications, such as in supermarkets. Beverage coolers, refrigerated vending machines, gelato-scooping cabinets and ice-cream freezers are not considered supermarket cabinets.

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For the purposes of the Annexes, additional definitions are set out in Annex I.

*Article 3***Ecodesign requirements**

The ecodesign requirements set out in Annex II shall apply from the dates indicated therein.

*Article 4***Conformity assessment**

1. The conformity assessment procedure referred to in Article 8 of Directive 2009/125/EC shall be the internal design control system set out in Annex IV to that Directive or the management system set out in Annex V to that Directive.

<sup>(1)</sup> Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU (OJ L 198, 28.7.2017, p. 1).

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2. For the purposes of conformity assessment pursuant to Article 8 of Directive 2009/125/EC, the technical documentation shall contain a copy of the product information provided in accordance with point 3 of Annex II and the details and the results of the calculations set out in Annex III to this Regulation.

3. Where the information included in the technical documentation for a particular model has been obtained:

- (a) from a model that has the same technical characteristics relevant for the technical information to be provided but is produced by a different manufacturer; or
- (b) by calculation on the basis of design or extrapolation from another model of the same or a different manufacturer; or both,

the technical documentation shall include the details of such calculation, the assessment undertaken by the manufacturer to verify the accuracy of the calculation and, where appropriate, the declaration of identity between the models of different manufacturers.

The technical documentation shall include a list of all equivalent models, including the model identifiers.

4. The technical documentation shall include the information in the order and as set out in Annex VI of Delegated Regulation (EU) 2019/2018. Except for products referred to in point 3 of Article 1, for market surveillance purposes, manufacturers, importers or authorised representatives may, without prejudice to Annex IV, point 2(g) of Directive 2009/125/EC, refer to the technical documentation uploaded to the product database which contains the same information laid down in Delegated Regulation (EU) 2019/2018.

#### *Article 5*

##### **Verification procedure for market surveillance purposes**

Member States shall apply the verification procedure set out in Annex IV when performing the market surveillance checks referred to in point 2 of Article 3 of Directive 2009/125/EC.

#### *Article 6*

##### **Circumvention and software updates**

The manufacturer, importer or authorised representative shall not place on the market products designed to be able to detect they are being tested (e.g. recognising the test conditions or test cycle), and to react specifically by automatically altering their performance during the test with the aim of reaching a more favourable level for any of the parameters declared by the manufacturer, importer or authorised representative in the technical documentation or included in any of the documentation provided.

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The energy consumption of the product and any of the other declared parameters shall not deteriorate after a software or firmware update when measured with the same test standard originally used for the declaration of conformity, except with explicit consent of the end-user prior to update. No performance change shall occur as a result of rejecting the update.

A software update shall never have the effect of changing the product's performance in a way that makes it non-compliant with the ecodesign requirements applicable for the declaration of conformity.

*Article 7***Benchmarks**

The benchmarks for the best-performing products and technologies available on the market at the time of adopting this Regulation are set out in Annex V.

*Article 8***Review**

The Commission shall review this Regulation in the light of technological progress and present the results of this assessment, including, if appropriate, a draft revision proposal, to the Consultation Forum no later than 25 December 2023.

This review shall among other matters assess:

- (a) the level of energy efficiency index requirements;
- (b) the appropriateness of modifying the EEI formula, including the modelling parameters and the correction factors;
- (c) the appropriateness of further segmentation of the product categories;
- (d) the appropriateness to set additional resource efficiency requirements in accordance with the objectives of the circular economy, including whether more spare parts should be included;
- (e) the appropriateness to set energy efficiency requirements and additional information requirements for saladettes, horizontal serve-over counters with integrated storage working at chilled operating temperatures, corner cabinets, vending machines designed to work at a frozen operating temperature and serve-over fish counters with flaked ice;
- (f) the appropriateness to base the [equivalent volume] of a beverage cooler on the net volume instead of the gross volume;



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- (g) the appropriateness to introduce an EEI formula for supermarket cabinets based on the net volume instead of total display area;
- (h) the level of the tolerances.

*Article 9***Entry into force and application**

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

It shall apply from 1 March 2021.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

**▼B***ANNEX I***Definitions applicable for the Annexes**

The following definitions shall apply:

- (1) ‘spare part’ means a separate part that can replace a part with the same or similar function in a product;
- (2) ‘professional repairer’ means an operator or undertaking which provides services of repair and professional maintenance of refrigerating appliances with a direct sales function;
- (3) ‘door gasket’ means a mechanical seal which fills the space between the door and the cabinet of the refrigerating appliance with a direct sales function to prevent leakage from the cabinet to the outdoor air;
- (4) ‘vacuum insulation panel’ (VIP) means an insulation panel consisting of a firm, highly-porous material encased in a thin, gas-tight outer envelope, from which the gases are evacuated and which is sealed to prevent outside gases from entering the panel;
- (5) ‘ice-cream freezer’ means a horizontal 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 achieved by opening a non-transparent or transparent lid from the top, with a net volume  $\leq 600$  litres (L) and, only in the case of transparent lid ice-cream freezers, a net volume divided by the total display area  $\geq 0,35$  meters (m);
- (6) ‘transparent lid’ means a door made of a transparent material that covers at least 75 % of the door surface and that allows the end-user to see items through it;
- (7) ‘total display area’ (TDA) means the total visible foodstuffs and other items area, including visible area through glazing, defined by the sum of horizontal and vertical projected surface areas of the net volume, expressed in square meters (m<sup>2</sup>);
- (8) ‘guarantee’ means any undertaking by the retailer or a manufacturer, importer or authorised representative to the consumer, to:
  - (a) reimburse the price paid; or
  - (b) replace, repair or handle refrigerating appliances with a direct sales function in any way if they do not meet the specifications set out in the guarantee statement or in the relevant advertising;
- (9) ‘gelato-scooping cabinet’ means a refrigerating appliance with a direct sales function in which ice-cream can be stored, displayed and scooped, within prescribed temperature limits as set out in Annex III, Table 5;
- (10) ‘annual energy consumption’ (*AE*) means the average daily energy consumption multiplied by 365 (days per year), expressed in kilowatt hour per year (kWh/a), calculated in accordance with point 2(b) of Annex III;
- (11) ‘daily energy consumption’ (*E<sub>daily</sub>*) means the energy used by a refrigerating appliance with a direct sales function over 24 hours at reference conditions, expressed in kilowatt hour per day (kWh/24h);
- (12) ‘standard annual energy consumption’ (*SAE*) means the reference annual energy consumption of a refrigeration appliance with a direct sales function, expressed in kilowatt hour per year (kWh/a), calculated in accordance with point 2(c) of Annex III;

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- (13) ‘M’ and ‘N’ means modelling parameters that take into account the total display area or volume-dependence of the energy use, with values as set out in Table 4, Annex III;
- (14) ‘temperature coefficient’ (C) means a correction factor that accounts for the difference in operating temperature;
- (15) ‘climate class factor’ (CC) means a correction factor that accounts for the difference in ambient conditions for which the refrigerating appliance is designed for;
- (16) ‘P’ means a correction factor that accounts for the differences between integral and remote cabinets;
- (17) ‘integral cabinet’ means a refrigerating appliance with a direct sales function that has an integrated refrigeration system which incorporates a compressor and condensing unit;
- (18) ‘refrigerator’ means a refrigerating appliance with a direct sales function that continuously maintains the temperature of the products stored in the cabinet at chilled operating temperature;
- (19) ‘freezer’ means a refrigerating appliance with a direct sales function that continuously maintains the temperature of the products stored in the cabinet at frozen operating temperature;
- (20) ‘vertical cabinet’ means a refrigerating appliance with a direct sales function with a vertical or inclined display opening from the front;
- (21) ‘combined cabinet’ means a refrigerating appliance with a direct sales function which combines display and opening directions from a vertical and a horizontal cabinet;

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- (22) ‘declared values’ means the values provided by the manufacturer, importer or authorised representative for the stated, calculated or measured technical parameters in accordance with Article 4, for the verification of compliance by the Member State authorities;

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- (23) ‘roll-in cabinet’ means a supermarket 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;
- (24) ‘M-package’ means a test package fitted with a temperature measuring device;
- (25) ‘multi-temperature vending machine’ means a refrigerated vending machine including at least two compartments with different operating temperatures.

**▼B***ANNEX II***Ecodesign requirements**

## 1. Energy efficiency requirements:

- (a) From 1 March 2021, the EEI of refrigerating appliances with a direct sales function shall not be above the values as set out in Table 1.

*Table 1***Maximum EEI for refrigerating appliances with a direct sales function, expressed in %**

	EEI
Ice-cream freezers	80
All other refrigerating appliances with a direct sales function	100

- (b) From 1 September 2023, the EEI of refrigerating appliances with a direct sales function, except for refrigerated drum vending machines, shall not be above the values as set out in Table 2.

*Table 2***Maximum EEI for refrigerating appliances with a direct sales function, expressed in %**

	EEI
Ice-cream freezers	50
All other refrigerating appliances with a direct sales function, except refrigerated drum vending machines	80

## 2. Resource efficiency requirements:

From 1 March 2021, refrigerating appliances with a direct sales function shall meet the following requirements:

## (a) Availability of spare parts

- (1) Manufacturers, importers or authorised representatives of refrigerating appliances with a direct sales function shall make available to professional repairers at least the following spare parts:

- thermostats;
- starting relays;
- no-frost heating resistors;
- temperature sensors;
- software and firmware including reset software;
- printed circuit boards; and
- light sources;

for a minimum period of eight years after placing the last unit of the model on the market.

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- (2) Manufacturers, importers or authorised representatives of refrigerating appliances with a direct sales function shall make available to professional repairers and end-users at least the following spare parts:

- door handles and door hinges;
- knobs, dials and buttons;
- door gaskets; and
- peripheral trays, baskets and racks for storage;

for a minimum period of eight years after placing the last unit of the model on the market.

- (3) Manufacturers, importers or authorised representatives of refrigerating appliances with a direct sales function shall ensure that the spare parts mentioned in points (1) and (2) can be replaced with the use of commonly available tools and without permanent damage to the appliance.
- (4) The list of spare parts concerned by point (1) and the procedure for ordering them shall be publicly available on the free access website of the manufacturer, importer or authorised representative, at the latest two years after the placing on the market of the first unit of a model and until the end of the period of availability of these spare parts.
- (5) The list of spare parts concerned by point (2) and the procedure for ordering them and the repair instructions shall be publicly available on the manufacturer's, the importer's or authorised representative's free access website, at the moment of the placing on the market of the first unit of a model and until the end of the period of availability of these spare parts.

(b) Maximum delivery time of spare parts

During the period mentioned under point (a), the manufacturer, importer or authorised representatives shall ensure the delivery of the spare parts for refrigerating appliances with a direct sales function within 15 working days after having received the order.

In the case of spare parts available concerned by point a(1) the availability of the spare parts may be limited to professional repairers registered in accordance with point c(1) and (2).

(c) Access to repair and maintenance information

After a period of two years after the placing on the market of the first unit of a model or of an equivalent model, and until the end of the period mentioned under (a), the manufacturer, importer or authorised representative shall provide access to the appliance repair and maintenance information to professional repairers in the following conditions:

- (1) the manufacturer's, importer's or authorised representative's website shall indicate the process for professional repairers to register for access to information; to accept such a request, manufacturers, importers or authorised representative may require the professional repairer to demonstrate that:
- (i) the professional repairer has the technical competence to repair refrigerating appliances with a direct sales function and complies with the applicable regulations for repairers of electrical equipment in the Member States where it operates. Reference to an official registration system as professional repairer, where such system exists in the Member States concerned, shall be accepted as proof of compliance with this point;
  - (ii) the professional repairer is covered by insurance covering liabilities resulting from its activity regardless of whether this is required by the Member State.

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- (2) the manufacturers, importers or authorised representatives shall accept or refuse the registration within 5 working days from the date of the request;
- (3) manufacturers, importers or authorised representatives may charge reasonable and proportionate fees for access to the repair and maintenance information or for receiving regular updates. A fee is reasonable if it does not discourage access by failing to take into account the extent to which the professional repairer uses the information.

Once registered, a professional repairer shall have access, within one working day after requesting it, to the requested repair and maintenance information. The information may be provided for an equivalent model or model of the same family, if relevant.

The available repair and maintenance information shall include:

- the unequivocal appliance identification;
- a disassembly map or exploded view;
- technical manual of instructions for repair;
- list of necessary repair and test equipment;
- component and diagnosis information (such as minimum and maximum theoretical values for measurements);
- wiring and connection diagrams;
- diagnostic fault and error codes (including manufacturer-specific codes, where applicable);
- instructions for installation of relevant software and firmware including reset software; and
- information on how to access data records of reported failure incidents stored on the refrigerating appliance with a direct sales function (where applicable).

(d) Requirements for dismantling for material recovery and recycling while avoiding pollution

- (1) Manufacturers, importers or authorised representatives shall ensure that refrigerating appliances with a direct sales function are designed in such a way that the materials and components referred to in Annex VII to Directive 2012/19/EU can be removed with the use of commonly available tools.
- (2) Manufacturers, importers and authorised representatives shall fulfil the obligations laid down in point 1 of Article 15 of Directive 2012/19/EU.
- (3) If the refrigerating appliances with a direct sales function contains vacuum insulation panels, the refrigerating appliance with a direct sales function shall be labelled with the letters 'VIP'.

3. Information requirements:

From 1 March 2021, instruction manuals for installers and end-users, and free access websites of manufacturers, importers and authorised representatives shall include the following information:

- (a) the recommended setting of temperatures in each compartment for optimum food preservation;
- (b) an estimation of the impact of temperature settings on food waste;

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- (c) for beverage coolers: ‘This appliance is intended to operate in climates where the maximum temperature and the humidity are [fill in the applicable warmest temperature of the beverage cooler and the applicable relative humidity of the beverage cooler of Table 7] respectively.’;
- (d) for ice-cream freezers: ‘This appliance is intended to operate in climates where the temperature and the humidity ranges from [fill in the applicable minimum temperature of Table 9] to [fill in the applicable maximum temperature of Table 9] and from [fill in the applicable minimum relative humidity of Table 9] to [fill in the applicable maximum relative humidity of Table 9] respectively.’;
- (e) instructions for the correct installation and end-user maintenance, including cleaning, of the refrigerating appliance with a direct sales function;
- (f) for integral cabinets: ‘If the condenser coil is not cleaned [the recommended frequency for cleaning the condenser coil, expressed in times per year], the efficiency of the appliance will decrease significantly.’;
- (g) access to professional repair such as internet webpages, addresses, contact details;
- (h) relevant information for ordering spare parts, directly or through other channels provided by the manufacturer, importer or authorised representative such as internet webpages, addresses, contact details;
- (i) the minimum period during which spare parts, necessary for the repair of the refrigerating appliance with a direct sales function, are available;
- (j) the minimum duration of the guarantee of the refrigerating appliance with a direct sales function offered by the manufacturer, importer or authorised representative;
- (k) instructions on how to find the model information in the product database, as set out in Delegated Regulation (EU) 2019/2018 by means of a weblink that links the model information as stored in the product database or a link to the product database and information on how to find the model identifier on the product.

**▼B***ANNEX III***Measurement methods and calculations**

For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements and calculations shall be made using harmonised standards, or other reliable, accurate and reproducible methods, which take into account the generally recognised state-of-the-art methods and are in line with the following provisions set out below. The reference numbers of these harmonised standards have been published for this purpose in the *Official Journal of the European Union*.

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Where a parameter is declared pursuant to Article 4, its declared value shall be used by the manufacturer, importer or authorised representative for the calculations in this Annex.

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1. General conditions for testing:
  - (a) the ambient conditions shall correspond to Set 1, except for ice-cream freezers and gelato-scooping cabinets which shall be tested in ambient conditions corresponding to Set 2, as set out in Table 3;
  - (b) where a compartment can be set to different temperatures, it shall be tested at the lowest operating temperature;
  - (c) refrigerated vending machines with compartments with variable volumes shall be tested with the net volume of the compartment with the highest operating temperature adjusted to its minimum net volume;
  - (d) for beverage coolers, the specified cooling speed shall be according to the half reload recovery time.

*Table 3*  
**Ambient conditions**

	Dry bulb temperature, ° C	Relative humidity, %	Dew point, ° C	Water vapour mass in dry air, g/kg
Set 1	25	60	16,7	12,0
Set 2	30	55	20,0	14,8

2. Determination of the EEI:
  - (a) For all refrigerating appliances with a direct sales function, the EEI, expressed in % and rounded to the first decimal place, is the ratio of the *AE* (in kWh/a) and the reference *SAE* (in kWh/a) and is calculated as:

$$EEI = AE/SAE.$$

- (b) The *AE*, expressed in kWh/a and rounded to two decimal places, is calculated as follows:

$$AE = 365 \times E_{daily};$$

with:

— *E<sub>daily</sub>* is the energy consumption of the refrigerating appliance with a direct sales function over 24 hours, expressed in kWh/24h and rounded to three decimal places.



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- (c) The *SAE* is expressed in kWh/a and rounded to two decimal places. For refrigerating appliances with a direct sales function with all compartments having the same temperature class and for refrigerated vending machines, the *SAE* is calculated as follows:

$$SAE = 365 \times P \times (M + N \times Y) \times C.$$

For refrigerating appliances with a direct sales function with more than one compartment having different temperature classes, with the exception of refrigerated vending machines, the *SAE* is calculated as follows:

$$SAE = 365 \times P \times \sum_{c=1}^n (M + N \times Y_c) \times C_c;$$

where:

- (1) *c* is the index number for a compartment type ranging from 1 to *n*, with *n* being the total number of compartment types.
- (2) The values of *M* and *N* are given in Table 4.

*Table 4*  
**M and N values**

Category	Value for M	Value for N
Beverage coolers	2,1	0,006
Ice-cream freezers	2,0	0,009
Refrigerated vending machines	4,1	0,004
Gelato-scooping cabinets	25,0	30,400
Vertical and combined super-market refrigerator cabinets	9,1	9,100
Horizontal supermarket refrigerator cabinets	3,7	3,500
Vertical and combined super-market freezer cabinets	7,5	19,300
Horizontal supermarket freezer cabinets	4,0	10,300
Roll-in cabinets (from 1 March 2021)	9,2	11,600
Roll-in cabinets (from 1 September 2023)	9,1	9,100

- (3) The values of *C*, the temperature coefficient, are given in Table 5.

**▼B**

Table 5

**Temperature conditions and corresponding temperature coefficient values, C****(a) Supermarket cabinets**

Category	Temperature class	Highest temperature of warmest M-package (°C)	Lowest temperature of coldest M-package (°C)	Highest minimum temperature of all M-packages (°C)	Value for C
Vertical and combined supermarket refrigerator cabinets	M2	$\leq +7$	$\geq -1$	n.a.	1,00
	H1 and H2	$\leq +10$	$\geq -1$	n.a.	0,82
	M1	$\leq +5$	$\geq -1$	n.a.	1,15
Horizontal supermarket refrigerator cabinets	M2	$\leq +7$	$\geq -1$	n.a.	1,00
	H1 and H2	$\leq +10$	$\geq -1$	n.a.	0,92
	M1	$\leq +5$	$\geq -1$	n.a.	1,08
Vertical and combined supermarket freezer cabinets	L1	$\leq -15$	n.a.	$\leq -18$	1,00
	L2	$\leq -12$	n.a.	$\leq -18$	0,90
	L3	$\leq -12$	n.a.	$\leq -15$	0,90
Horizontal supermarket freezer cabinets	L1	$\leq -15$	n.a.	$\leq -18$	1,00
	L2	$\leq -12$	n.a.	$\leq -18$	0,92
	L3	$\leq -12$	n.a.	$\leq -15$	0,92
Vertical and combined supermarket refrigerator cabinets	M0	$\leq +4$	$\geq -1$	n.a.	1,30
Horizontal supermarket refrigerator cabinets	M0	$\leq +4$	$\geq -1$	n.a.	1,13

**▼M1****▼B****(b) Gelato-scooping cabinets**

Temperature class	Highest temperature of warmest M-package (°C)	Lowest temperature of coldest M-package (°C)	Highest minimum temperature of all M-package (°C)	Value for C
G1	-10	-14	n.a.	1,00
G2	-10	-16	n.a.	1,00
G3	-10	-18	n.a.	1,00
L1	-15	n.a.	-18	1,00
L2	-12	n.a.	-18	1,00
L3	-12	n.a.	-15	1,00
S	Special classification			1,00

**▼B****(c) Refrigerated vending machines**

Temperature class (**)	Maximum measured product temperature ( $T_V$ ) (°C)	Value for C
Category 1	7	$1+(12-T_V)/25$
Category 2	12	
Category 3	3	
Category 4	$(T_{V1}+T_{V2})/2$ (*)	
Category 6	$(T_{V1}+T_{V2})/2$ (*)	

**(d) other refrigerating appliances with a direct sales function**

Category	Value for C
Other appliances	1,00

Notes:

► **M1** (\*) For multi-temperature vending machines,  $T_V$  shall be the average of  $T_{V1}$  (the maximum measured product temperature in the warmest compartment) and  $T_{V2}$  (the maximum measured product temperature in the coldest compartment), rounded to one decimal. ◀

(\*\*) category 1 = refrigerated closed fronted can and bottle machines where the products are held in stacks, category 2 = refrigerated glass fronted can and bottle, confectionery & snack machines, category 3 = refrigerated glass fronted machines entirely for perishable foodstuffs, category 4 = refrigerated multi-temperature glass fronted machines, category 6 = combination machines consisting of different categories of machine in the same housing and powered by one chiller.

n.a = not applicable

(4) Coefficient Y is calculated as follows:

(a) for beverage coolers:

$Y_c$  is the equivalent volume of the compartments of the beverage cooler with target temperature  $T_c$ , ( $Ve_{qc}$ ), calculated as follows:

$$Y_c = Ve_{qc} = \text{GrossVolume}_c \times ((25 - T_c)/20) \times CC;$$

where  $T_c$  is the average compartment temperature and  $CC$  is the climate class factor. The values for  $T_c$  are set out in Table 6. The values for  $CC$  are set out in Table 7.

Table 6

**Temperature classes and corresponding average compartment temperatures ( $T_c$ ) for beverage coolers**

Temperature class (*)	$T_c$ (°C)
K1	+3,5
K2	+2,5
K3	-1,0
K4	+5,0

**▼B**

Table 7

**Operating conditions and corresponding CC values for beverage coolers**

Warmest ambient temperature (°C)	Ambient relative humidity (%)	CC
+25	60	1,00
+32	65	1,05
+40	75	1,10

(b) for ice-cream freezers:

$Y_c$  is the equivalent volume of the compartments of the ice-cream freezer with target temperature  $T_c$ , ( $Ve_{q_c}$ ), calculated as follows:

$$Y_c = Ve_{q_c} = \text{NetVolume}_c \times ((12 - T_c)/30) \times CC;$$

where  $T_c$  is the average compartment temperature and  $CC$  is the climate class factor. The values for  $T_c$  are set out in Table 8. The values for  $CC$  are set out in Table 9.

Table 8

**Temperature classes and corresponding average compartment temperatures ( $T_c$ ) for ice-cream freezers**

Temperature class		$T_c$ (°C)
Warmest M-package temperature colder or equal to in all tests (except lid opening test) (°C)	Warmest M-package maximum temperature rise allowed during the lid opening test (°C)	
-18	2	-18,0
-7	2	-7,0

Table 9

**Operating conditions and corresponding CC values for ice-cream freezers**

	Minimum		Maximum		CC
	Ambient temperature (°C)	Ambient relative humidity (%)	Ambient temperature (°C)	Ambient relative humidity (%)	
Ice-cream freezer with transparent lid	16	80	30	55	1,00
			35	75	1,10
			40	40	1,20
Ice-cream freezer with non-transparent lid	16	80	30	55	1,00
			35	75	1,04
			40	40	1,10

**▼B**

(c) for refrigerated vending machines:

$Y$  is the net volume of the refrigerated vending machine, which is the sum of the volumes of all compartments within which the products directly available for vending are contained and the volume through which the products pass during the dispensing process, expressed in litres (L) and rounded to the nearest integer.

(d) for all other refrigerating appliances with direct sales function:

$Y_c$  is the sum of the TDA of all compartments of the same temperature class of the refrigerating appliance with a direct sales function, expressed in square meters ( $m^2$ ), and rounded to two decimal places.

(5) The values for  $P$  are set out in Table 10.

*Table 10*

**P values**

<i>Cabinet type</i>	<i>P</i>
Integral supermarket cabinets	1,10
Other refrigerating appliances with a direct sales function	1,00

**▼B***ANNEX IV***Verification procedure for market surveillance purposes****▼M1**

The verification tolerances defined in this Annex relate only to the verification by Member State authorities of the declared values and shall not be used by the manufacturer, importer or authorised representative as an allowed tolerance to establish the values in the technical documentation or in interpreting these values with a view to achieving compliance or to communicate better performance by any means.

**▼B**

Where a model has been designed to be able to detect it is being tested (e.g. by recognising the test conditions or test cycle), and to react specifically by automatically altering its performance during the test with the objective of reaching a more favourable level for any of the parameters specified in this Regulation or included in the technical documentation or included in any of the documentation provided, the model and all equivalent models shall be considered not compliant.

►**M1** As part of verifying ◀ the compliance of a product model with the requirements laid down in this Regulation pursuant to point 2 of Article 3 of Directive 2009/125/EC, for the requirements referred to in this Annex, the authorities of the Member States shall apply the following procedure:

1. The Member State authorities shall verify one single unit of the model.
2. The model shall be considered to comply with the applicable requirements if:
  - (a) the values given in the technical documentation pursuant to point 2 of Annex IV to Directive 2009/125/EC (declared values), and, where applicable, the values used to calculate these values, are not more favourable for the manufacturer, importer or authorised representative than the results of the corresponding measurements carried out pursuant to paragraph (g) thereof; and
  - (b) the declared values meet any requirements laid down in this Regulation, and any required product information published by the manufacturer, importer or authorised representative does not contain values that are more favourable for the manufacturer, importer or authorised representative than the declared values; and
  - (c) when the Member States authorities check the unit of the model, they find that the manufacturer, importer or authorised representative has put in place a system that complies with the requirements in the second paragraph of Article 6; and
  - (d) when the Member States authorities check the unit of the model, it complies with the requirements in the third paragraph of Article 6, the resource efficiency in point 2 of Annex II and the information requirements in point 3 of Annex II; and
  - (e) when the Member State authorities test the unit of the model, the determined values (the values of the relevant parameters as measured in testing and the values calculated from these measurements) comply with the respective verification tolerances as given in Table 11.

**▼M1****▼B**

3. If the results referred to in point 2(a), (b), (c) or (d) are not achieved, the model and all equivalent models shall be considered not to comply with this Regulation.

**▼B**

4. If the result referred to in point 2(e) is not achieved the Member State authorities shall select three additional units of the same model for testing. As an alternative, the three additional units selected may be of one or more equivalent models.
5. The model shall be considered to comply with the applicable requirements if, for these three units, the arithmetical mean of the determined values complies with the respective verification tolerances given in Table 11.
6. If the result referred to in point 5 is not achieved, the model and all equivalent models shall be considered not to comply with this Regulation.

**▼M1**

7. The Member State authorities shall provide all relevant information to the authorities of the other Member States and to the Commission without delay after a decision being taken on the non-compliance of the model according to points 3, 6 or the second paragraph of this Annex.

**▼B**

The Member State authorities shall use the measurement and calculation methods set out in Annex III.

The Member State authorities shall only apply the verification tolerances that are set out in Table 11 and shall use only the procedure described in points 1 to 7 for the requirements referred to in this Annex. For the parameters in Table 11, no other tolerances, such as those set out in harmonised standards or in any other measurement method, shall be applied.

*Table 11*

**Verification tolerances**

Parameters	Verification tolerances
Net volume, and net compartment volume where applicable	The determined value <sup>(a)</sup> shall not be more than 3 % or 1 L lower — whichever is the greater value — than the declared value.
Gross volume, and gross compartment volume where applicable	The determined value <sup>(a)</sup> shall not be more than 3 % or 1 L lower — whichever is the greater value — than the declared value
TDA, and compartment TDA where applicable	The determined value <sup>(a)</sup> shall not be more than 3 % than the declared value.
$E_{daily}$	The determined value <sup>(a)</sup> shall not be more than 10 % higher than the declared value
$AE$	The determined value <sup>(a)</sup> shall not be more than 10 % higher than the declared value.

<sup>(a)</sup> in the case of three additional units tested as prescribed in point 4, the determined value means the arithmetical mean of the values determined for these three additional units.



## ANNEX V

**Benchmarks**

At the time of entry into force of this Regulation, the best available technology on the market for refrigerating appliances with a direct sales function in terms of their EEI was identified as outlined below.

	TDA (m <sup>2</sup> ), net volume (L) or gross volume (L) as applicable	T <sub>1</sub> or T <sub>V</sub>	AE (kWh/a)
Supermarket cabinets (Vertical supermarket refrigerator)	3,3		4526 (= 12,4 kWh/24 h)
Supermarket cabinets (Horizontal supermarket refrigerator)	2,2		2044 (= 5,6 kWh/24 h)
Supermarket cabinets (Vertical supermarket freezer)	3		9709 (= 26,6 kWh/24 h)
Supermarket cabinets (Horizontal supermarket freezer)	1,4		1621 (= 4,4 kWh/24 h)
	2,76		6424 (= 17,6 kWh/24 h)
Can and bottle refrigerated vending machine	548	7 °C	1547 (= 4,24 kWh/24 h)
Spiral refrigerated vending machine	472	3 °C	2070 (= 5,67 kWh/24 h)
Beverage cooler	506		475 (= 1,3 kWh/24 h)
Ice-cream freezer	302		329 (= 0,9 kWh/24 h)
Gelato-scooping cabinet	1,43		10862 (= 29,76 kWh/24 h)