

WORKING DOCUMENT

**In the framework of the implementation of Commission Regulation (EU)
No.../...implementing Directive 2009/125/EC of the European Parliament and of the
Council with regard to ecodesign requirements for refrigerated commercial display
cabinets**

(Text with EEA relevance)

**COMMISSION REGULATION (EU) No.../...
of XXX**

**implementing Directive 2009/125/EC of the European Parliament and of the Council
with regard to ecodesign requirements for refrigerated commercial display cabinets**

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Directive 2009/125/EC of the European Parliament and of the Council of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products¹ and in particular Article 15(1) thereof,

After consulting the Ecodesign Consultation Forum,

Whereas:

- (1) Under Directive 2009/125/EC ecodesign requirements should be set by the Commission for energy-related products representing significant volumes of sales and trade, having a significant environmental impact and presenting significant potential for improvement in energy efficiency through design in terms of their environmental impact without entailing excessive costs.
- (2) Article 16(1) of Directive 2009/125/EC provides, that in accordance with the criteria set out in Article 15, and after consulting the Ecodesign Consultation Forum, the Commission shall establish a working plan, setting out the indicative list of products which will be considered as priorities for the adoption of implementing measures for the following three years.
- (3) The Commission has established the first Working Plan under Directive 2009/125/EC on 21 October 2008², covering the years 2009 to 2011, and which identifies refrigerating and freezing equipment, including refrigerated commercial display cabinets, as a priority for the adoption of implementing measures.
- (4) The Commission has carried out a preparatory study on the technical, environmental and economic aspects of refrigerating and freezing equipment typically used in the Union, including refrigerated commercial display cabinets which are further differentiated into supermarket segment cabinets, beverage coolers, small ice-cream freezers, soft scoop ice-cream cabinets, and vending machines. The study was devised

¹ OJ L 285, 31.10.2009, p. 10.

² (COM 2008 660)

together with stakeholders and interested parties from the Union and third countries, and the results have been made publicly available.

- (5) As refrigerants are addressed under Regulation (EC) No 842/2006 of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases³, and as a review of this Regulation has been proposed by the Commission on 7 November 2012⁴, no specific requirements on refrigerants are set in this Regulation⁵.
- (6) It is not judged appropriate to set ecodesign requirements for direct greenhouse gas emissions related to the use of refrigerants, as these account for not more than 2-3% of the combined direct and indirect emissions by refrigerated commercial display cabinets covered by this Regulation. Moreover, an increasing use of low-global warming potential (GWP) refrigerants registered in the last decade in the EU market, indicating that the manufacturers are already undertaking a gradual substitution towards refrigerants with reduced harmful impact on the environment, without the need of additional policy intervention by means of ecodesign.
- (7) The environmental aspect of refrigerated commercial display cabinets that has been identified as most significant for the purposes of this Regulation is energy consumption in the use phase.
- (8) The preparatory study has shown that requirements regarding the other ecodesign parameters referred to in Annex I, Part 1 of Directive 2009/125/EC can be limited to the provision of information. To further limit the environmental impact of refrigerated commercial display cabinets, manufacturers should provide information on disassembly, recycling and/or disposal.
- (9) Annual electricity consumption related to refrigerated commercial display cabinets was estimated to have been about 85 TWh (terawatt hour) in the Union in 2013, corresponding to 34 Mt CO₂ emissions. Unless specific measures are taken, annual energy consumption is expected to be about 82 TWh in 2020 and 87 TWh in 2030, corresponding to 31 and 30 Mt CO₂ respectively⁶. The combined effect of this Regulation, and of the Commission Delegated Regulation supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of refrigerated commercial display cabinets, is expected to result in annual electricity savings of about 18 TWh by 2020 and up to 58 TWh by 2030, if compared to what would happen if no measures were taken.
- (10) The preparatory study shows that the use-phase energy consumption can be significantly reduced by applying cost-effective non-proprietary technologies which lead to a reduction in the combined costs of purchasing and operating these products.
- (11) Ecodesign requirements should harmonise energy consumption requirements for supermarket segment display cabinets, vending machines, beverage coolers, soft scoop ice-cream cabinets, and small ice-cream freezers, throughout the Union, thus helping to make the internal market operate better and to improve the environmental performance of these products.

³ OJ L 161, 14.6.2006, p.1.

⁴ ~~COM(2012) 643 final~~

⁵ ~~COM(2012) 643 final and~~

http://ec.europa.eu/clima/policies/f-gas/legislation/docs/fluorinated_greenhouse_gases_en.pdf

⁶ The calculations incorporate correction factors for reduction of specific CO₂ emissions per kWh

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- (12) The ecodesign requirements should not affect the functionality or affordability of refrigerated commercial display cabinets from the end-user's perspective and should not negatively affect health, safety or the environment.
- (13) The ecodesign requirements should be introduced gradually to give manufacturers a sufficient timeframe to redesign their products subject to this Regulation. The timing should be such that cost impact for manufacturers is taken into account, while ensuring timely achievement of the objectives of this Regulation.
- (14) Measurements of the relevant product parameters should be performed through reliable, accurate and reproducible measurement methods, which take into account the recognised state of the art measurement methods including, where available, harmonised standards adopted by the European standardisation organisations, as listed in Annex I to Regulation (EU) 1025/2012 of the European Parliament and of the Council of 25 October 2012 on European standardisation⁷.
- (15) In accordance with Article 8(2) of Directive 2009/125/EC, this Regulation specifies which conformity assessment procedures apply.
- (16) To facilitate compliance checks, manufacturers should provide information in the technical documentation referred to in Annexes IV and V to Directive 2009/125/EC insofar as that information relates to the requirements laid down in this Regulation.
- (17) In addition to the legally binding requirements laid down in this Regulation, indicative benchmarks for best available technologies should be identified to ensure that information on the life-cycle environmental performance of refrigerated commercial display cabinets is widely available and easily accessible.
- (18) The measures provided for in this Regulation are in accordance with the opinion of the Committee established by Article 19(1) of Directive 2009/125/EC.

HAS ADOPTED THIS REGULATION:

ARTICLE 1

SUBJECT MATTER AND SCOPE

1. This Regulation establishes ecodesign requirements for the placing on the market of **electric** mains-operated refrigerated commercial display cabinets, including those sold for the refrigeration of items other than foodstuffs.
2. This Regulation shall not apply to:
 - (a) Refrigerated commercial display cabinets that are primarily powered by energy sources other than electricity;
 - (b) Cabinets that do not use a compression-type refrigerating cycle such as absorption and thermoelectric based systems;
 - (c) The part of the refrigeration system, typically the condensing unit, placed outside the cabinet in remote cabinets.
 - (d) Cabinets specifically designed for carrying out food processing such as ice-cream makers, ice makers, or microwave-equipped vending machines, other than cabinets equipped with one compartment, equivalent to less than 20% of the net volume, specifically designed for carrying out food processing.

⁷ OJ L 316, 14.11.2012, p. 12

- (e) Cabinets that are primarily intended for the refrigeration and storage of ~~items~~~~products~~, and not for the additional functions of display and sales of ~~items~~~~products~~;
- (f) Cabinets specifically designed for the storage of medicines and scientific samples;
- (g) Refrigerated cabinets for the sale and display of live foodstuff, such as living fish and shellfish, refrigerated aquaria and water tanks;
- (h) Wine storage appliances;
- (i) Built-in cabinets;
- ~~(j)~~ (j) Vertical static-air cabinets;
- ~~(k)~~ (k) ~~Saladettes~~;
- ~~(l)~~ (l) Products coming under scope of Commission regulation XXX with regard to professional refrigerated storage cabinets⁸ [DG ENTR Lot1] or under scope of Commission regulation 643/2009 with regard to household refrigerating appliances⁹.

ARTICLE 2

DEFINITIONS

1. In addition to the definitions set out in Article 2 of Directive 2009/125/EC, the following definitions shall apply for the purposes of this Regulation:
 - (a) ‘refrigerated commercial display cabinet’ or ‘cabinet’ means an appliance intended for the functions of storage and~~;~~ display to and/or access to customers, of items ~~or merchandise~~, at specified temperatures below the ambient temperature, with one or more compartments of chilled and/or frozen items, and are accessible directly through open sides or via one or more doors, and/or drawers;
 - (b) ‘remote cabinet’ means a factory made assembly of components that in order to function as a refrigerator or freezer, needs input of electricity and to be connected additionally to remote components (condensing unit and/or compressor) which are not an integral part of the cabinet;
 - (c) ‘compression-type refrigerating cycle cabinet’ means a cabinet or appliance in which refrigeration is effected by means of a motor-driven compressor;
 - (d) ‘absorption-type refrigerating cycle cabinet’ means a cabinet or appliance in which refrigeration is effected by means of an absorption process using heat as the energy source;
 - (e) ‘thermoelectric-type refrigerating cycle cabinet’ means a cabinet or appliance in which refrigeration is effected by means of a thermoelectric process;
 - (f) ‘foodstuffs’ means food, ingredients, beverages, and other items primarily intended for consumption which require refrigeration at specified temperatures;

⁸ OJ L XXX, DD.MM.YYYY, p.X.

⁹ OJ L 191, 23.07.2009, p.53.

- (g) ‘built-in cabinet’ means a fixed insulated refrigerating appliance intended to be installed in a prepared recess in a wall or similar location, and requiring furniture finishing;
- (h) ‘vertical cabinet’ means a cabinet with a vertical display opening from the front;
- (i) ‘horizontal cabinet’ means a cabinet with a horizontal display opening on its top and accessible from above;
- (j) ‘semi-vertical cabinet’ means a vertical cabinet whose overall height does not exceed 1.5m and having either a vertical or inclined display opening;
- (k) ‘combined cabinet’ means a cabinet which combines display and opening directions from a vertical, a horizontal or a semi-vertical cabinet;
- ~~(l)~~ (l) ‘static-air cabinet’ means a cabinet without internal forced-air circulation; a single static air compartment within the cabinet is not sufficient to designate the cabinet as a static air cabinet;
- ~~(m)~~ (m) ‘vertical static-air cabinet’ means a refrigerated commercial display cabinet with one or more vertical display openings, without internal forced-air circulation; a single static air compartment within the cabinet is not sufficient to designate the cabinet as a static air cabinet;
- (n) ‘condensing unit’ means a product integrating at least one electrically driven compressor and one condenser, capable of cooling down and continuously maintaining chilled and/or frozen operating temperatures inside a refrigerated appliance or system, using a compression-type refrigerating cycle once connected to an evaporator and expansion device;
- (o) ‘saladette’ means a cabinet 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, but not limited to, pizza toppings or salad items;
- ~~(p)~~ —

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

ARTICLE 3

ECODESIGN REQUIREMENTS AND TIMETABLE

1. The ecodesign requirements for refrigerated commercial display cabinets are set out in Annex II.
2. Ecodesign requirements shall apply in accordance with the following timetable:
 - (a) From 1 January 2017:
 - (1) Refrigerated commercial display cabinets shall comply with the requirements set out in Annex II, points 1(a)(i), ~~and 2(a)~~ and 3.2;
 - (b) From 1 January 2019:
 - (1) Refrigerated commercial display cabinets shall comply with requirements set out in Annex II, points 1(a)(ii) and 3.1;
 - (c) From 1 January 2021:

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- (1) Refrigerated commercial display cabinets shall comply with requirements set out in Annex II, points 1(a)(iii);
3. Compliance with ecodesign requirements for refrigerated commercial display cabinets shall be measured and calculated in accordance with the methods set out in Annex III and Annex IV.

ARTICLE 4
CONFORMITY ASSESSMENT

1. The conformity assessment procedure referred to in Article 8(2) of Directive 2009/125/EC shall be the internal design control set out in Annex IV to that Directive or the management system set out in Annex V to that Directive.
2. For the purposes of conformity assessment, the technical documentation shall contain the product information set out in point 2 of Annex II to this Regulation.

ARTICLE 5
VERIFICATION PROCEDURE FOR MARKET SURVEILLANCE PURPOSES

When performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC to ensure compliance with the requirements set out in Annex II to this Regulation, the Member States' authorities shall apply the verification procedure set out in Annex V to this Regulation.

ARTICLE 6
INDICATIVE BENCHMARKS

The indicative benchmarks for best-performing refrigerated commercial display cabinets available on the market at the time of entry into force of this Regulation are set out in Annex VI.

ARTICLE 7
REVIEW

The Commission shall review this Regulation in the light of technological progress and present the result of that review to the Ecodesign Consultation Forum no later than five years from the date of entry into force of this Regulation.

ARTICLE 8
ENTRY INTO FORCE

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

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

Done at Brussels,

For the Commission
The President

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ANNEX I
DEFINITIONS APPLICABLE FOR ANNEXES II TO VI

For the purposes of Annexes II to VI the following definitions shall apply:

- (1) ‘supermarket segment’ means the use of a cabinet for the sale and display of ~~items merchandise~~ in retail applications, including supermarkets. It does not include the use of a cabinet in catering or similar non-retail applications;
- (2) ‘beverage cooler’ means a cabinet designed to refrigerate (*pull down*) at a specified speed packaged non-perishable beverages loaded at ambient temperature, for sale at specified temperatures below the ambient temperature. The beverages are accessible directly through open sides or via one or more doors, and/or drawers. Because of the non-perishable nature of beverages, during periods of no demand the temperature inside the cooler may increase for energy saving purposes.
- (3) ‘vending machine’ means a refrigerated commercial display cabinet designed to accept consumer payments or tokens to dispense chilled or frozen items without on-site labour intervention.
- (4) ‘small ice-cream freezer’ means a horizontal freezer cabinet with a net volume under 500 litres intended to sell and display pre-packed ice-cream. These appliances are different to supermarket segment freezers, as they work as a static air cabinet and are also used for the storage of pre-packed ice-cream at the bottom.
- (5) ‘soft scoop ice-cream cabinet’ means a cabinet in which ice-creams can be stored, displayed and scooped, within prescribed temperature limits.
- (6) ‘compartment’ means each of the parts or spaces into which a cabinet is subdivided or partitioned to maintain a constant operating temperature within the subdivision or partition.
- (7) ‘refrigerator’ means a cabinet that maintains the temperature of the products inside the cabinet at chilled operating temperature;
- (8) ‘chilled operating temperature’ means that the temperature of products stored in the compartment or cabinet is continuously maintained between -1°C and 15°C;
- (9) ‘freezer’ means a cabinet that maintains the temperature of the products inside the cabinet at frozen operating temperature;
- (10) ‘frozen operating temperature’ means that the temperature of products stored in the compartment or cabinet is continuously maintained below -12°C;
- (11) ‘~~net~~-total display area’ means the total visible items area, including visible area through glazing, defined by the sum of horizontal and vertical projected surface areas of the net volume;
- (12) ‘gross volume’ means the volume within the inside liner of the compartment with an external door, in every case without internal fittings and with doors or lids closed.

- (13) 'net volume' means the part of the gross volume of any compartment that remains after deduction of the volume of components and spaces unusable for the storage and display of itemsmerchandise;
- (14) 'multi-temperature cabinet' means a cabinet including at least one compartment exclusively intended for use as refrigerator, and at least one compartment exclusively intended for use as freezer;
- (15) 'equivalent refrigerating appliance' means a refrigerating appliance model placed on the market with the same net volume or total display area, same technical, efficiency and performance characteristics, and same compartment types as another refrigerating appliance model placed on the market under a different commercial code number by the same manufacturer.
- (16) 'energy management device' means a device based on electronic control components that allows a refrigerated commercial display cabinet to control the power and/or activity of some of the components such as lights, compressors and fans and thereby use less energy for a certain time.
- (17) 'global warming potential' (GWP) means the measure of how much 1 kg of the refrigerant applied in the compression-type refrigerating cycle is estimated to contribute to global warming, expressed in kg CO₂ equivalents over a 100-year time horizon.
- (18) 'foaming or blowing agent' means the gas trapped in the bubbles forming the insulation panel (typically PUR foams in a closed-cell shape) of a cabinet, this gas provides the necessary expansion and support to the structure, together with the insulating properties.

ANNEX II
ECODESIGN REQUIREMENTS FOR ~~REFRIGERATED~~ REFRIGERATED COMMERCIAL
DISPLAY CABINETS

1. REQUIREMENTS FOR ENERGY EFFICIENCY

- (a) ~~Refrigerated~~ Commercial display cabinets within the scope of this Regulation shall comply with the following Energy Efficiency Index (EEI) limits:
- i) From 1 January 2017: $EEI < 150$
 - ii) From 1 January 2019: $EEI < 130$
 - iii) From 1 January 2021: $EEI < 110$

The EEI of refrigerated commercial display cabinets is calculated in accordance with the procedure described in Annex IV.

2. REQUIREMENTS FOR PRODUCT INFORMATION

- (a) From 1 January 2017 the following product information on refrigerated commercial display cabinets shall be provided, in the instruction booklet for installers and end-users, and in the free access websites of manufacturers, their authorised representatives and importers:
- i) the category, and if applicable, subcategory of the cabinet, namely whether it is:
 - a vertical or horizontal supermarket segment display cabinet; if applicable, the subcategory (remote vertical, roll-in, serve-over, etc.)
 - a beverage cooler;
 - a small ice-cream freezer;
 - a vending machine; if applicable, the subcategory (cans and bottles, chilled foodstuff, confectionery and snacks).
 - a soft scoop ice-cream cabinet.
 - ii) the intended operating temperature(s) of the cabinet and the temperature at which the energy consumption is defined, if the cabinet has different compartments working at different temperatures, the operating temperature of the different compartments;
 - iii) the net volume, expressed in litres, or the total display area, expressed in square metres, rounded to one decimal place. If the cabinet has different compartments working at different temperatures, the net volume or total display area of the different compartments;
 - iv) the annual energy consumption of the cabinet, expressed in kWh per year, rounded to two decimal places;
 - v) the EEI of the cabinet, rounded to two decimal places, calculated in accordance with Annex IV;
 - vi) any specific precautions that shall be taken when the cabinet is installed, used and maintained in order to optimise its energy efficiency;

- vii) ~~for all cabinets different from a remote cabinet~~~~in the case of integral equipment, category~~type, name and Global Warming Potential (GWP) of the refrigerant fluid contained in the cabinet and refrigerant charge (kg) rounded to two decimal places;
- viii) information relevant for disassembly, recycling and/or disposal at end-of-life, as specified in [point 3 of this Annex-VII](#):

Table 1 - Information requirements for refrigerated commercial display cabinets			
Model(s): [information identifying the model(s) to which the information relates]			
Intended use		Display and sale	
Operating temperature(s) [minimum/ average /maximum]		[...°C /... °C /... °C]	
Category /subcategory(if applicable)		-Supermarket segment display cabinet (horizontal or vertical) [subcategory of supermarket segment display cabinet] -Beverage cooler -Small ice-cream freezer -Vending machine [subcategory of vending machine] -Soft scoop ice-cream cabinet	
(for integral equipment): Refrigerant fluid(s): [information identify the refrigerant fluid(s), including GWP] (for all equipment) : Foaming agent(s): [information identify the blowing or foaming agent(s), including GWP]			
Item	Symbol	Value	Unit
Annual Energy Consumption	<i>AEC</i>	x,xx	kWh
Energy Efficiency Index	<i>EI</i>	x,xx	
Net volume (where applicable)	V_N	x,x	Litre (L)
Chilled operating temperature net volume	V_{NRef}	x,x	litre
Frozen operating temperature net volume	V_{NFrz}	x,x	litre
or			
Total Display Area (where applicable)	TDA_N	x,x	Square metre (m ²)
(for integral equipment)			
Refrigerant charge::		x,xx	kg
Contact details	Name and address of the manufacturer or its authorised representative.		

- (b) The technical documentation for the purposes of conformity assessment pursuant to Article 4 shall contain the following elements:
- i) Elements specified in point 2(a) from this Annex for refrigerated commercial display cabinets.
 - ii) Evidence of compliance with requirements set in point 3 from this Annex.
 - iii) Where the information included in the technical documentation file for a particular model has been obtained by calculation on the basis of design, or extrapolation from other equivalent refrigerating appliances, or both, the documentation shall include details of such calculations or extrapolations, or both, and of tests undertaken by suppliers to verify the accuracy of the calculations undertaken. The information shall also include a list of all other equivalent models where the information was obtained on the same basis.

3. END OF LIFE REQUIREMENTS

3.1. Requirements for electronic components

From 1 January 2019, manufacturers shall ensure that refrigerated commercial display cabinets are designed so that the following electric and electronic components (when present):

- printed circuit boards (larger than 10 cm²);
- electrolyte capacitors containing substances of concern (height > 25 mm, diameter > 25 mm or proportionately similar volume).
- Liquid crystal displays (LCD; larger than 100 cm²);
- mercury containing switches or backlighting lamps;
- gas discharged lamps;
- batteries

can be:

- easily identified. This can be ensured, for instance, by making the components directly visible to the recycling operator after removing the external covers or lids. If the components to be extracted are not directly visible (once the external covers or lids are removed), the appliances shall be marked to facilitate their location (e.g. by using, in the back panel of the appliance, labels, sketches, drawings or pictures with the location of these components).
- easily accessed. This can be ensured, for instance, by designing the appliances so that the targeted components are accessible in few dismantling steps after removing the external covers or lids of the appliance.
- extracted for recycling using only standard tools. These components shall be easy to separate manually (avoiding glued or welded parts). Manufacturers shall use only 'easy-to-disassemble' fasteners (screws and snap-fits) for all the dismantling steps leading to the extraction of the above listed.

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Upon request, manufacturers shall provide technical evidence of all the points above to the market surveillance authority and recyclers, for instance through graphic information (a sequence of pictures, drawings and/or video) or a technical folder illustrating the steps for the manual extraction (or automatized extraction, when possible) of the above listed electric and electronic components. The technical evidence can also be a standardized product information datasheet for dismantling that identifies the components to be extracted, their location, the sequence of steps for their extraction, and the type and number of fasteners.

3.2. Information requirements for foaming agents

From 1 January 2017 manufacturers of refrigerated commercial display cabinets shall mark clearly in the back panel of the appliances the chemical name of the principal component of the blowing agent used in the insulation of the appliance. In case of using flammable blowing agents, manufacturers shall mark the appliance with the symbol “Warning; Risk of fire/flammable materials”. For appliances which use flammable blowing agents in the insulation, the instruction shall also include information regarding the disposal of the appliance.

ANNEX III
MEASUREMENTS AND CALCULATIONS FOR ~~REFRIGERATED~~REFRIGERATED
COMMERCIAL DISPLAY CABINETS

- (a) For the purposes of compliance and verification of compliance with the requirements of this Regulation, measurements and calculations shall be made using harmonised standards the reference numbers of which have been published for this purpose in the *Official Journal of the European Union*, or using other reliable, accurate and reproducible methods that take into account the generally recognised state-of-the-art methods. In the case of refrigerated commercial display cabinets they shall meet the conditions and technical parameters set out in points (b) to (d).
- (b) For establishing the values of annual energy consumption and EEI for refrigerated commercial display cabinets, measurements shall be done using the following conditions:
- i) The ambient conditions shall correspond to climate class 3 as detailed in Table 2, except for small ice-cream freezers and soft scoop ice-cream cabinets which shall be tested in ambient conditions corresponding to climate class 4, as detailed in Table 2.
 - ii) If one or several compartment(s) is/are multi-temperature, it/they shall be tested at the lowest operating temperature at which it/they can be used.
- (c) The ambient conditions of the climate classes 3 and 4 are shown in Table 2.

Table 2 – Ambient conditions of the climate classes 3 and 4

Test room climate class	Dry bulb temperature, °C	Relative humidity, %	Dew point, °C	Water vapour mass in dry air, g/kg
3	25	60	16.7	12.0
4	30	55	20.0	14.8

- (d) The net volume (V_n) shall be expressed in litres and calculated with the following formula:

$$V_n \text{ cabinets} = \text{base surface} (h - (n \times 10))$$

where:

- base surface means the surface of the shelf containing the maximum configuration of test packages;
- h means the space from the top surface of the shelf in the lowest position to the load limit line;
- n means the number of shelves used based on the loading scheme, not including the shelf at the lowest position;
- 10 is a fixed value expressed in millimetres representing the thickness of the shelf.

For multi-temperature cabinets, the net volume is replaced by the adjusted net volume:

- $V_a = V_{n,ref} + V_{n,frz} \times 1.92$

Where:

- $V_{n,ref}$ is the sum of the net volume of all chilled compartments in litres
- $V_{n,frz}$ is the sum of the net volumes of all frozen compartments in litres
- The factor 1.92 is a calculated standard thermodynamic ratio which provides the volume of refrigerator compartment that consumes the same energy as a unit volume of the frozen compartment.

ANNEX IV
METHOD FOR CALCULATING THE ~~EEI ENERGY EFFICIENCY INDEX~~ FOR
REFRIGERATED COMMERCIAL DISPLAY CABINETS

For the calculation of the EEI of a refrigerated commercial display cabinet, the Annual Energy Consumption of the cabinet is compared to its Standard Annual Energy Consumption.

The EEI is calculated and rounded to the first decimal place, as:

- $EEI = (AEC/SAEC) \times 100$

Where:

- $AEC = E_{24h} \times 365$

With

AEC = Annual Energy Consumption of the cabinet in kWh/year,

E_{24h} = the energy consumption of the cabinet over 24 hours

and

- $SAEC = (MN + NM \times Y) \times 365$

With SAEC = Standard Annual Energy Consumption of the cabinet in kWh/year

For beverage coolers, small ice-cream freezers and vending machines:

Y = net volume of the appliance, which is the sum of net volumes of all compartments of the cabinet, expressed in litres.

For all other refrigerated commercial display cabinets:

Y = total display area, which is the sum of the display areas of all compartments of the cabinet, expressed in squared meters (m²).

M and N are given in Table 3.

Table 3 – M and N coefficient values		
Category	Value for M	Value for N
Beverage coolers	1.0	0.013
Small ice-cream freezers	1.0	0.009
Vending machines	4.1	0.004
Soft scoop ice-cream cabinets	10.4	30.4
Vertical, semi-vertical and combined supermarket freezer cabinets	1.6	19.1
Horizontal supermarket freezer cabinets	4.2	9.8
Vertical, semi-vertical and	9.1	9.1

combined supermarket refrigerator cabinets		
Horizontal supermarket refrigerator cabinets	3.7	3.5

ANNEX V
VERIFICATION PROCEDURE FOR MARKET SURVEILLANCE PURPOSES FOR
~~REFRIGERATED~~~~REFRIGERATED~~ COMMERCIAL DISPLAY CABINETS

When performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC, the authorities of the Member States shall apply the following verification procedure for the requirements set out in Annex II:

1. The Member State authorities shall test one single unit per model.
2. The model shall be considered to comply with the applicable requirements set out in Annex II to this Regulation if:
 - (a) the declared values comply with the requirements set out in Annex II;
 - (b) the measured volume or total display area shall not be more than 3% lower than the declared value;
 - (c) the measured value of the energy consumption shall not exceed the the declared value by more than 10 %.
3. If the result referred to in point 2 is not achieved, the Member State authorities shall randomly select three additional units of the same model for testing and provide the information on the test results to the authorities of the other Member States and to the Commission within one month of testing.
4. The model shall be considered to comply with the applicable requirements set out in Annex II to this Regulation if:
 - (a) the declared values comply with the requirements set out in Annex II;
 - (b) the arithmetic average of the three units for the measured volume or total display area shall not be more than 3% lower than the declared value
 - (c) the arithmetic average of the three units for the measured value of the energy consumption shall not be greater than the declared value by more than 10 %
5. If the results referred to in point 4 are not achieved, the model and all other equivalent commercial display cabinet models shall be considered not to comply with this Regulation. The Member State authorities shall provide the test results and other relevant information to the authorities of the other Member States and to the Commission within one month of the decision being taken on the non-compliance of the model.

Member State authorities shall use the measurement and calculation methods set out in Annexes III and IV.

ANNEX VI
INDICATIVE BENCHMARKS REFERRED TO IN ARTICLE 6

At the time of entry into force of this Regulation, the best available technology on the market for refrigerated commercial display cabinets in terms of their EEI was identified as follows:

	Total Display Area (m ² -square metres) (when applicable)	Net volume (L-litres) (when applicable)	Annual energy consumption (kilowatt-hour per year - kWh/yr)	EEI
Supermarket cabinets	1.52	-	573 (= 1.57 kWh/day)	17
Beverage cooler	-	520	511 (= 1.4 kWh/day)	18
Small ice-cream freezer	-	302	584 (= 1.6 kWh/day)	43
Vending machines	-	1018	949 (= 2.6 kWh/day)	36
Soft scoop ice-cream cabinet	1.43	-	10862 (= 29.76 kWh/day)	55

