EUROPEAN
COMMISSION

Brussels, XXX
[…](2014) XXX draft

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 professional storage cabinets, blast cabinets, condensing units and process chillers

(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 professional storage cabinets, blast cabinets, condensing units and process chillers

(Text with EEA relevance)

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 products[1] and in particular Article 15(1) thereof,

After consulting the Consultation Forum referred to in Article 18 of Directive 2009/125/EC,

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 through design in terms of their environmental impact without entailing excessive costs.

(2) The Commission established the first Working Plan in accordance with Directive 2009/125/EC on 21 October 2008[2], covering the years 2009 to 2011, identifying refrigerating and freezing equipment, including professional storage cabinets, blast cabinets, condensing units and process chillers, as a priority for the adoption of implementing measures.

(3) 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 professional storage cabinets, blast cabinets, condensing units and process chillers. The study was devised together with stakeholders and interested parties from the Union and third countries, and the results have been made publicly available.

(4) The fifth product of the refrigerating and freezing equipment lot — walk-in cold rooms — has been kept separate because of its unique characteristics within the group, and walk-in cold rooms should not be addressed by this Regulation at this time.

(5) As regards professional storage cabinets, it is not necessary to set ecodesign requirements for direct greenhouse gas emissions related to the use of refrigerants, as the increasing use of low global warming potential (GWP) refrigerants in the household and commercial refrigerator market sets a precedent that the professional storage cabinets sector could follow.

---

1 OJ L 285, 31.10.2009, p. 10.

2 (COM 2008 660).

(6) As regards process chillers, it is appropriate to set ecodesign requirements for direct greenhouse gas emissions related to the use of refrigerants, as this will further direct the market towards low global warming potential (GWP) refrigerants, which are at the same time often more energy efficient.

(7) As regards condensing units, non-proprietary technologies exist that reduce the direct greenhouse gas emissions related to the use of refrigerants through the use of refrigerants with reduced harmful impact on the environment. However, the cost-effectiveness and impact on energy efficiency of these technologies when applied to condensing units is still not fully established, as their diffusion is either negligible or represents only a small share of the market for condensing units today.

(8) 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 gases, and as a review of this Regulation was proposed by the Commission on 7 November 2012, no specific restrictions on the use of refrigerants should be set in this Regulation. However, a bonus should be proposed under the ecodesign requirements for condensing units and process chillers to steer the market towards the development of technologies based on the use of refrigerants with reduced harmful impact on the environment, as a bonus would lead to lower minimum energy efficiency requirements for condensing units and process chillers intended to be used with low GWP refrigerants.

(9) For the purposes of this Regulation, energy consumption in the use phase has been identified as the significant environmental aspect of professional storage cabinets, blast cabinets, condensing units and process chillers.

(10) The preparatory study has shown that requirements regarding the other ecodesign parameters referred to in Part 1 of Annex I to Directive 2009/125/EC are not necessary in the case of professional storage cabinets, blast cabinets, condensing units and process chillers.

(11) Annual electricity consumption in the Union related to condensing units, process chillers and professional storage cabinets was estimated to have been 116.5 TWh (terawatt hour) in 2012, corresponding to 47 Mt CO_2 emissions. Unless specific measures are taken, annual energy consumption is expected to be 134.5 TWh in 2020 and 154.5 TWh in 2030, corresponding to 54.5 and 62.5 Mt CO_2 respectively. The combined effect of this Regulation and the Commission Delegated Regulation supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of storage cabinets[3] is expected to result in annual electricity savings of 6.3 TWh by 2020 and 15.6 TWh by 2030, as compared with what would happen if no measures were taken.

(12) The preparatory study shows that the use-phase energy consumption can be significantly reduced by applying cost-effective non-proprietary technologies that reduce the combined costs of purchasing and operating these products.

(13) Ecodesign requirements should harmonise energy consumption requirements for professional storage cabinets, blast cabinets, condensing units and process chillers throughout the Union, thus helping to make the single market more efficient and to improve the environmental performance of those products.

---

[3] Number of the Regulation and OJ reference to be inserted before publication in the OJ.

(14) The ecodesign requirements should not affect the functionality or affordability of professional storage cabinets, blast cabinets, condensing units and process chillers from the end-user's perspective and should not negatively affect health, safety or the environment.

(15) The ecodesign requirements should be introduced gradually to give manufacturers sufficient time to redesign their products subject to this Regulation. The timing should be such that cost impacts for manufacturers are taken into account, while ensuring timely achievement of the objectives of this Regulation.

(16) Product parameters should be measured and calculated using reliable, accurate and reproducible methods that take into account recognised state-of-the-art measurement and calculation methods. These include, where available, harmonised standards adopted by European standardisation bodies following a request from the Commission, in accordance with the procedures laid down in Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations and of rules on Information Society services[4].

(17) In accordance with Article 8(2) of Directive 2009/125/EC, this Regulation specifies which conformity assessment procedures apply.

(18) 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.

(19) To further limit the environmental impact of professional storage cabinets, blast cabinets, condensing units and process chillers, manufacturers should provide information on disassembly, recycling or disposal.

(20) 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 professional storage cabinets, blast cabinets, condensing units and process chillers is widely available and easily accessible.

(21) 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 professional storage cabinets and blast cabinets.

This Regulation shall apply to electric mains-operated blast cabinets, and electric mains-operated professional storage cabinets including those sold for the refrigeration of items other than foodstuffs.

However, it shall not apply to the following products:

(a) professional storage cabinets that are primarily powered by energy sources other than electricity;

[4] OJ L 204, 21.7.1998, p. 37.

(b) professional storage cabinets operating with a remote condensing unit;

(c) open cabinets, where being open is a fundamental requirement for their primary functionality;

(d) cabinets specifically designed for food processing, where the mere presence of one compartment, with a net volume equivalent to less than 20 % of the cabinet's total net volume and specifically designed for food processing is not sufficient for exemption;

(e) cabinets specifically designed only for the purpose of thawing frozen foodstuffs in a controlled manner, where the mere presence of one compartment specifically designed for thawing frozen foodstuffs in a controlled manner is not sufficient for exemption;

(f) saladettes;

(g) serve-over counters and other similar forms of cabinet primarily intended for display and sale of foodstuffs in addition to refrigeration and storage;

(h) cabinets specifically designed for the storage of medicines and scientific samples;

(i) cabinets that do not use a vapour compression refrigeration cycle;

(j) blast cabinets and blast rooms with a capacity superior to 300 kg of foodstuffs;

(k) continuous-process blast equipment;

(l) custom-made professional storage cabinets and blast cabinets, made on a one-off basis and not equivalent functionally or materially to other professional storage cabinets or blast cabinets.

2. This Regulation also establishes ecodesign requirements for the placing on the market of condensing units operating at low and medium temperature.

However, it shall not apply to the following products:

(a) condensing units including an evaporator, which may be an integral evaporator, such as in monobloc units, or a remote evaporator, such as in split units;

(b) compressor packs or racks, which do not include a condenser;

(c) condensing units of which the condenser-side does not use air as heat transfer medium.

3. This Regulation also establishes ecodesign requirements for the placing on the market of process chillers intended to operate at low and medium temperature.

However, it shall not apply to the following products:

(a) process chillers intended to operate at high temperature;

(b) process chillers exclusively using evaporative condensing;

(c) process chillers assembled on site;

(d) process chillers using absorption technology.

Article 2
Definitions

1. The following definitions shall apply:

(a) ‘professional storage cabinet’ means an insulated refrigerating appliance integrating one or more compartments accessible via one or more doors or drawers, capable of continuously maintaining the temperature of foodstuffs within prescribed limits at chilled or frozen operating temperature, using a vapour compression cycle, and intended for the storage of foodstuffs in non-household environments but not for the display to or access by customers;

(b) ‘blast cabinet’ means an insulated refrigerating appliance primarily intended to rapidly cool hot foodstuffs to below 10 °C in the case of chilling and below -18 °C in the case of freezing;

(c) ‘foodstuffs’ means food, ingredients, beverages, including wine, and other items primarily intended for consumption which require refrigeration at specified temperatures;

(d) ‘built-in cabinet’ means a fixed insulated refrigerating appliance intended to be installed in a cabinet, in a prepared recess in a wall or similar location, and requiring furniture finishing;

(e) ‘roll-in cabinet’ means a professional storage cabinet including one unique compartment that allows wheeled racks of product to be wheeled in;

(f) ‘pass-through cabinet’ means a professional storage cabinet accessible from both sides;

(g) ‘static air cabinet’ means a professional storage cabinet without internal forced-air circulation, specifically designed to store temperature-sensitive foodstuffs or to avoid a drying effect on foodstuffs stored without a sealed enclosure, where a single static air compartment within the cabinet is not sufficient to designate the cabinet as a static air cabinet;

(h) ‘heavy-duty cabinet’ means a professional storage cabinet capable of continuously maintaining chilled or frozen operating temperature in ambient conditions corresponding to climate class 5, as detailed in Table 2 of Annex IV;

(i) ‘open cabinet’ means a professional storage cabinet whose refrigerated enclosure can be reached from the outside without opening a door or a drawer;

(j) ‘saladette’ means a professional storage 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 pizza toppings or salad items;

(k) ‘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;

(l) ‘low temperature’ means that the condensing unit is capable of delivering its rated cooling capacity at a saturated evaporating temperature of -35 °C;

(m) ‘medium temperature’ means that the condensing unit is capable of delivering its rated cooling capacity at a saturated evaporating temperature of -10 °C;

(n) ‘rated cooling capacity’ means the cooling capacity which the condensing unit allows the vapour compression cycle to reach, once connected to an evaporator

and an expansion device, when operating at full load, and measured at standard rating conditions with the reference ambient temperature set at 32 °C, expressed in kW;

(o) 'process chiller' means a product integrating at least one compressor and one evaporator, capable of cooling down and continuously maintaining the temperature of a liquid in order to provide cooling to a refrigerated appliance or system; it may or may not integrate the condenser, the coolant circuit hardware and other ancillary equipment;

(p) 'low temperature' means that the process chiller is capable of delivering its rated cooling capacity at an indoor heat exchanger outlet temperature of -25 °C, at standard rating conditions;

(q) 'medium temperature' means that the process chiller is capable of delivering its rated cooling capacity at an indoor heat exchanger outlet temperature of -8 °C, at standard rating conditions;

(r) 'high temperature' means that the process chiller is capable of delivering its rated cooling capacity at an indoor heat exchanger outlet temperature of 7 °C, at standard rating conditions;

(s) 'rated cooling capacity', expressed in kW, means the cooling capacity that the process chiller is able to reach, when operating at full load, and measured at standard rating conditions with the reference ambient temperature at 35 °C for air-cooled chillers and 30 °C water inlet temperature at the condenser for water-cooled chillers.

Article 3

Ecodesign requirements and timetable

1. The ecodesign requirements for professional storage cabinets and blast cabinets are set out in Annex II.

2. The ecodesign requirements for condensing units are set out in Annex V.

3. The ecodesign requirements for process chillers are set out in Annex VII.

4. Ecodesign requirements shall apply in accordance with the following timetable:

(a) From 1 July 2015:

(1) condensing units shall comply with the requirements set out in points 1(a) and 2 of Annex V;

(2) process chillers shall comply with the requirements set out in points 1(a) and 2 of Annex VII.

(b) From 1 January 2016:

(1) professional storage cabinets shall comply with the requirements set out in points 1(a)(i) and 2(a) of Annex II;

(2) heavy-duty cabinets shall comply with the requirements set out in point 1(b) of Annex II.

(c) From 1 July 2016:

(1) Blast cabinets shall comply with requirements set out in point 2(b) of Annex II.

(d) From 1 July 2017:

(1) professional storage cabinets shall comply with requirements set out in point 1(a)(ii) of Annex II.

(e) From 1 July 2018:

(1) condensing units shall comply with the requirements set out in point 1(b) of Annex V;

(2) process chillers shall comply with the requirements set out in point 1(b) of Annex VII.

(f) From 1 July 2019:

(1) professional storage cabinets shall comply with requirements set out in point 1(a)(iii) of Annex II.

5. The following professional storage cabinets are exempt from the requirements set out in Annex II, with the exception of points 2(a)(ii) and 2(a)(iii):

(a) built-in cabinets;

(b) roll-in and pass-through cabinets;

(c) static air cabinets.

6. Compliance with ecodesign requirements for professional storage cabinets and blast cabinets shall be measured and calculated in accordance with the methods set out in Annexes III and IV.

7. Compliance with ecodesign requirements for condensing units shall be measured and calculated in accordance with the methods set out in Annex VI.

8. Compliance with ecodesign requirements for process chillers shall be measured and calculated in accordance with the methods set out in Annex VIII.

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 its Annex IV or the management system set out in its Annex V.

2. For the purposes of conformity assessment pursuant to Article 8 of Directive 2009/125/EC, the technical documentation shall contain the information set out in point 2 of Annex II, point 2(b) of Annex V and point 2(b) of Annex VII to this Regulation.

Article 5

Verification procedure for market surveillance purposes

The authorities of the Member States shall apply the verification procedure set out in Annex IX, Annex X and Annex XI 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, Annex V and Annex VII to this Regulation.

Article 6
Indicative benchmarks

The indicative benchmarks for best-performing professional storage cabinets, condensing units and process chillers available on the market at the time of entry into force of this Regulation are set out in Annex XII.

Article 7
Review

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

1. for professional storage cabinets, an assessment of the appropriateness of introducing ecodesign requirements for cabinets listed in Article 1(1) and in Article 3(5);
2. for blast cabinets, an assessment of the appropriateness of introducing ecodesign requirements for these products;
3. for walk-in cold rooms, an assessment of the appropriateness of introducing ecodesign requirements for these products;
4. for condensing units and process chillers:
   (a) an assessment of the appropriateness of setting ecodesign requirements covering direct greenhouse gas emissions related to refrigerants;
   (b) an assessment of the appropriateness of setting ecodesign requirements for condensing units with a rated cooling capacity lower than 0.1 kW at low temperature and 0.2 kW at medium temperature and condensing units with a rated cooling capacity higher than 20 kW at low temperature and 50 kW at medium temperature;
   (c) an assessment of the appropriateness of setting ecodesign requirements for condensing units sold with an evaporator, compressor packs and racks which do not include a condenser, and condensing units which do not use air as heat transfer medium for the condenser;
   (d) an assessment of the appropriateness of setting ecodesign requirements for process chillers using evaporative condensing and process chillers using absorption technology.

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

EUROPEAN
COMMISSION

Brussels, XXX
[…](2014) XXX draft

ANNEXES 1 to 12

ANNEXES

to the Commission Regulation (EU) No .../...

of

implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for professional storage cabinets, blast cabinets, condensing units and process chillers

ANNEX I

Definitions applicable for Annexes II to XI

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

Definitions related to professional storage cabinets

(1) 'net volume' means the volume containing foodstuffs within the load limit;

(2) 'chilled operating temperature' means that the temperature of foodstuffs stored in the cabinet is continuously maintained at a temperature between -1 °C and 5 °C;

(3) 'frozen operating temperature' means that the temperature of foodstuffs stored in the cabinet is continuously maintained at a temperature lower than -15 °C;

(4) 'multi-use cabinet' means that a professional storage cabinet or separate compartment of the same cabinet may be set at different temperatures for chilled or frozen foodstuffs;

(5) 'combined cabinet' means a professional storage cabinet including two or more compartments with different temperatures for the refrigeration and storage of foodstuffs;

(6) 'refrigerator-freezer' means a type of combined cabinet including at least one compartment exclusively intended for chilled operating temperature and one compartment exclusively intended for frozen operating temperature;

(7) 'vertical cabinet' means a cabinet of overall height equal to or higher than 1 050 mm with one or more front doors or drawers accessing the same compartment;

(8) 'counter cabinet' means a cabinet of overall height lower than 1 050 mm with one or more front doors or drawers accessing the same compartment;

(9) 'light-duty cabinet' means a professional storage cabinet only capable of continuously maintaining chilled or frozen operating temperature in ambient conditions corresponding to climate class 3, as detailed in Table 2 of Annex IV; if the cabinet is able to maintain temperature in ambient conditions corresponding to climate class 4, it shall not be considered a light-duty cabinet;

(10) 'equivalent refrigerating appliance' means a refrigerating appliance model placed on the market with the same net volume, 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;

Definitions related to condensing units

(11) 'rated cooling capacity' (P_A) means the cooling capacity that the condensing unit enables the vapour compression cycle to reach, once connected to an evaporator and an expansion device, when operating at full load, and measured at standard rating conditions with the reference ambient temperature set at 32 °C, expressed in kW to two decimal places;

(12) 'rated power input' (D_A) means the electrical power input needed by the condensing unit (including the compressor, the condenser fan(s) and possible auxiliaries) to reach the rated cooling capacity, expressed in kW to two decimal places;

(13) ‘rated coefficient of performance’ (COP_A) means the rated cooling capacity, expressed in kW, divided by the rated power input, expressed in kW, expressed to two decimal places;

(14) ‘seasonal energy performance ratio’ (*SEPR*) is the efficiency ratio of a condensing unit for providing cooling at standard rating conditions, representative of the variations in load and ambient temperature throughout the year, and calculated as the ratio between annual cooling demand and annual electricity consumption, expressed to two decimal places;

(15) ‘annual cooling demand’ means the sum of each bin-specific cooling demand multiplied by the corresponding number of bin hours;

(16) ‘bin-specific cooling demand’ means the cooling demand for every bin in the year, calculated as the rated cooling capacity multiplied by the part load ratio, expressed in kW to two decimal places;

(17) ‘part load’ ($Pc(T_j)$) means the cooling load at a specific ambient temperature T_j, calculated as the full load multiplied by the part load ratio corresponding to the same ambient temperature T_j and expressed in kW at two decimal places;

(18) ‘part load ratio’ ($PR(T_j)$) at a specific ambient temperature T_j means the ambient temperature T_j minus 5 ºC divided by the reference ambient temperature minus 5 ºC, and — for medium temperature — multiplied by 0.4 and added to 0.6, and — for low temperature — multiplied by 0.2 and added to 0.8. For ambient temperatures higher than the reference ambient temperature, the part load ratio shall be 1. For ambient temperatures lower than 5 °C, the part load ratio shall be 0.6 for medium temperature and 0.8 for low temperature. The part load ratio can be expressed at three decimal places or in percentage, after multiplying by 100, at one decimal place;

(19) ‘annual electricity consumption’ is calculated as the sum of the ratios between each bin-specific cooling demand and the corresponding bin-specific coefficient of performance, multiplied by the corresponding number of bin hours;

(20) ‘ambient temperature’ means the dry bulb air temperature, expressed in degrees Celsius;

(21) ‘bin’ (bin_j) means a combination of an ambient temperature T_j and bin hours h_j, as set out in Table 6 of Annex VI;

(22) ‘bin hours’ (h_j) means the hours per year at which an ambient temperature occurs for each bin, as set out in Table 6 of Annex VI;

(23) ‘reference ambient temperature’ means the ambient temperature, expressed in degrees Celsius, at which the part load ratio is equal to 1. It is set at 32 °C;

(24) ‘bin-specific coefficient of performance’ (COP_j) means the coefficient of performance for every bin in the year, derived from the part load, the declared cooling demand and declared coefficient of performance for specified bins, and calculated for other bins by linear interpolation, corrected where necessary by the degradation coefficient;

(25) ‘declared cooling demand’ means the cooling demand at a limited number of specified bins, and calculated as the rated cooling capacity multiplied by the corresponding part load ratio;

(26) ‘declared coefficient of performance’ means the coefficient of performance at a limited number of specified bins, and calculated as the declared cooling capacity divided by the declared power input;

(27) ‘declared cooling capacity’ means the cooling capacity which the unit delivers to meet the specific cooling demand at a limited number of specified bins, expressed in kW to two decimal places;

(28) ‘declared power input’ means the electrical power input needed by the condensing unit to meet the declared cooling capacity, expressed in kW to two decimal places;

(29) ‘degradation coefficient’ (*Cdc*) is set at 0.25 and means the measure of efficiency loss due to the possible on/off cycling of condensing units necessary to satisfy the required part load in case the unit’s capacity control cannot unload to the required part load;

(30) ‘capacity control’ means the ability of a condensing unit to change its capacity by changing the volumetric flow rate of the refrigerant, to be indicated as ‘fixed’ if the unit cannot change its volumetric flow rate, ‘staged’ if the volumetric flow rate is changed or varied in series of not more than two steps, or ‘variable’ if the volumetric flow rate is changed or varied in series of three or more steps;

Definitions related to process chillers

(31) ‘rated cooling capacity’ (P_A), expressed in kW to two decimal places, means the cooling capacity that the process chiller is able to reach, when operating at full load, and measured at standard rating conditions with the reference ambient temperature at 35 °C for air-cooled chillers and 30 °C water inlet temperature at the condenser for water-cooled chillers;

(32) ‘rated power input’ (D_A) means the electrical power input needed by the process chiller (including the compressor, the condenser fan(s) or pumps(s), the evaporator pump(s) and possible auxiliaries) to reach the rated cooling capacity, expressed in kW to two decimal places;

(33) ‘rated energy efficiency ratio’ (EER_A) means the rated cooling capacity, expressed in kW, divided by the rated power input, expressed in kW, expressed to two decimal places;

(34) ‘seasonal energy performance ratio’ (*SEPR*) is the efficiency ratio of a process chiller for providing cooling at standard rating conditions, representative of variations in load and ambient temperature throughout the year, and calculated as the ratio between annual cooling demand and annual electricity consumption, expressed to two decimal places;

(35) ‘annual cooling demand’ means the sum of each bin-specific cooling demand multiplied by the corresponding number of bin hours;

(36) ‘bin-specific cooling demand’ means the rated cooling capacity multiplied by the part load ratio, for every bin in the year, expressed in kW to two decimal places;

(37) ‘part load’ ($Pc(T_j)$) means the cooling load at a specific ambient temperature T_j, calculated as the full load multiplied by the part load ratio corresponding to the same ambient temperature T_j and expressed in kW at two decimal places;

(38) ‘part load ratio’ ($PR(T_j)$) at a specific ambient temperature T_j means:

(a) for process chillers using an air-cooled condenser, the ambient temperature T_j minus 5 ºC divided by the reference ambient temperature minus 5 ºC. For ambient temperatures higher than the reference ambient temperature, the part load ratio shall be 1. For ambient temperatures lower than 5 °C, the part load ratio shall be 0.8;

(b) for process chillers using a water-cooled condenser, the ambient temperature T_j minus 9 °C divided by the reference ambient temperature minus 9 °C. For ambient temperatures higher than the reference ambient temperature, the part load ratio shall be 1. For ambient temperatures lower than 5 °C (9 °C water inlet temperature at the condenser), the part load ratio shall be 0.8;

The part load ratio can be expressed at three decimal places or in percentage, after multiplying by 100, at one decimal place

(39) 'annual electricity consumption' is calculated as the sum of the ratios between each bin-specific cooling demand and the corresponding bin-specific energy efficiency ratio, multiplied by the corresponding number of bin hours;

(40) 'ambient temperature' means:

(a) for process chillers using an air-cooled condenser, the air dry bulb temperature, expressed in degrees Celsius

(b) for process chillers using a water-cooled condenser, the water inlet temperature at the condenser, expressed in degrees Celsius;

(41) 'bin' (bin_j) means a combination of an ambient temperature T_j and bin hours h_j, as set out in Annex VIII;

(42) 'bin hours' (h_j) means the hours per year at which an ambient temperature occurs for each bin, as set out in Annex VIII;

(43) 'reference ambient temperature' means the ambient temperature, expressed in degrees Celsius, at which the part load ratio is equal to 1. It shall be set at 35 °C. For air-cooled process chillers, the air inlet temperature to the condenser is then defined as 35 °C while for water-cooled process chillers the water inlet temperature to the condenser is defined as 30 °C;

(44) 'bin-specific energy efficiency ratio' (EER_j) means the energy efficiency ratio for every bin in the year, derived from the part load, the declared cooling demand and declared energy efficiency ratio for specified bins, and calculated for other bins by linear interpolation, corrected where necessary by the degradation coefficient;

(45) 'declared cooling demand' means the cooling demand at a limited number of specified bins, and calculated as the rated cooling capacity multiplied by the corresponding part load ratio;

(46) 'declared energy efficiency ratio' means the energy efficiency ratio at a limited number of specified bins;

(47) 'declared power input' means the electrical power input needed by the process chiller to meet the declared cooling capacity;

(48) 'declared cooling capacity' means the cooling capacity delivered by the chiller to meet the declared cooling demand;

(49) ‘degradation coefficient’ (*Cc*) means the measure of efficiency loss due to cycling of process chillers at part load; if *Cc* is not determined by measurement, then the default degradation coefficient is *Cc* = 0.9;

(50) ‘capacity control’ means the ability of a process chiller to change its capacity by changing the volumetric flow rate of the refrigerant, to be indicated as ‘fixed’ if the process chiller cannot change its volumetric flow rate, ‘staged’ if the volumetric flow rate is changed or varied in series of not more than two steps, or ‘variable’ if the volumetric flow rate is changed or varied in series of three or more steps;

Common definitions:

(51) ‘global warming potential’ (GWP) means the measure of how much 1 kg of the refrigerant applied in the vapour compression cycle is estimated to contribute to global warming, expressed in kg CO_2 equivalents over a 100-year time horizon;

(52) GWP values considered will be those set out in Annex I to Regulation (EC) No 842/2006;[5]

(53) for fluorinated refrigerants, the GWP values shall be those published in the Fourth Assessment Report adopted by the Intergovernmental Panel on Climate Change[6] (2007 IPCC GWP values for a 100-year period);

(54) for non-fluorinated gases, the GWP values are those published in the first IPCC assessment over a 100-year period;

(55) GWP values for mixtures of refrigerants shall be based on the formula stated in Annex I to Regulation (EC) No 842/2006;

(56) for refrigerants not included in the above references, the Report of the 2010 Assessment of the Scientific Assessment Panel[7] (SAP) under the Montreal Protocol and the UNEP 2010 report on Refrigeration, Air Conditioning and Heat Pumps,[8] or newer, shall be used as references.

5 OJ L 161, 14.6.2006, p. 1.

6 IPCC Fourth Assessment Climate Change 2007, Report of the Intergovernmental Panel on Climate Change: http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml.

7 http://ozone.unep.org/Assessment_Panels/SAP/Scientific_Assessment_2010/index.shtml.

8 http://ozone.unep.org/teap/Reports/RTOC/.

ANNEX II
Ecodesign requirements for professional storage cabinets and blast cabinets

1. REQUIREMENTS FOR ENERGY EFFICIENCY

(a) Professional storage cabinets within the scope of this Regulation, with the exception of heavy-duty cabinets and refrigerator-freezers, shall comply with the following energy efficiency index (EEI) limits:

(i) From 1 January 2016: EEI < 115

(ii) From 1 July 2017: EEI < 100

(iii) From 1 July 2019: EEI < 90

The EEI of a professional storage cabinet shall be calculated in accordance with the procedure described in Annex III.

(b) From 1 January 2016, heavy-duty cabinets shall have an EEI lower than 115.

2. REQUIREMENTS FOR PRODUCT INFORMATION

(a) From 1 July 2015, the following product information on professional storage 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 of the appliance, namely whether it is vertical or counter;

(ii) where applicable, whether the cabinet is heavy-duty, light-duty, static air, built-in, roll-in, pass-through or refrigerator-freezer;

(iii) the intended operating temperature(s) of the cabinet – chilled, frozen or multi-use;

(iv) the net volume of each compartment, expressed in litres and rounded to one decimal place;

(v) the annual energy consumption of the cabinet, expressed in kWh per year;

(vi) the energy efficiency index of the cabinet;

(vii) for light-duty cabinets, it shall be indicated that the cabinet is not intended for use in ambient temperatures higher than 25 °C and therefore is not suitable for use in typical professional kitchens;

(viii) for heavy-duty cabinets, it shall be indicated that 'This appliance is capable of maintaining test conditions at climate class 5';

(ix) any specific precautions which are to be taken when the cabinet is installed, used and maintained in order to optimise its energy efficiency;

(x) the type, name and global warming potential (GWP) of the refrigerant fluid contained in the cabinet;

(xi) the refrigerant charge, expressed in kg and rounded to two decimal places;

(xii) information relevant for disassembly, recycling or disposal at end-of-life.

Table 1 — Information requirements for professional storage cabinets			
Model(s): [information identifying the model(s) to which the information relates]			
Intended use	**storage**		
Operating temperature(s)	chilled / frozen / multi-use		
Category	Vertical / counter		
(where applicable) Heavy-duty/light-duty/static air/built-in/ roll-in/pass-through			
Refrigerant fluid(s):[information to identify the refrigerant fluid(s), including GWP]			
Item	**Symbol**	**Value**	**Unit**
Annual Energy Consumption	*AEC*	x.xx	kWh
Energy Efficiency Index	*EEI*	x.xx	
Net volume	V_N	**x.x**	**litre**
(where applicable)			
Chilled volume	V_{NRef}	x.x	litre
Frozen volume	V_{NFrz}	x.x	litre
Refrigerant charge		x.xx	kg
Contact details	Name and address of the manufacturer or its authorised representative.		

(b) From 1 July 2016 the following indicative product information on blast 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) Full load capacity of the cabinet expressed in kg of foodstuffs, and rounded to two decimal places;

(ii) The standard temperature cycle, meaning from which temperature in °C down to which temperature in °C foodstuffs are intended to be cooled and in how many minutes;

(iii) The energy consumption, in kWh per kg of foodstuffs per standard temperature cycle and rounded to two decimal places;

(iv) In the case of integral equipment, type, name and GWP of the refrigerant fluid contained in the cabinet and refrigerant charge (kg) rounded to two decimal places. In the case of equipment designed to be used with a remote condensing unit (not supplied with the blast cabinet itself), the intended refrigerant charge when used with a recommended condensing unit and the intended refrigerant fluid type, name and GWP;

(c) The technical documentation for the purposes of conformity assessment pursuant to Article 4 shall contain the following elements:

(i) elements specified in points (a) and (b) for professional storage cabinets and blast cabinets respectively;

(ii) 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.

ANNEX III

Method for calculating the energy efficiency index for professional storage cabinets

For the calculation of the energy efficiency index (EEI) of a professional storage cabinet model, the annual energy consumption of the cabinet is compared to its standard annual energy consumption.

The EEI is calculated as:

- EEI = (AEC/SAEC) ×100

Where:

- AEC=E24h ×365

  AEC = annual energy consumption of the cabinet in kWh/year

  E24h = energy consumption of the cabinet over 24 hours

- SAEC= M × Vn +N

  SAEC = standard annual energy consumption of the cabinet in kWh/year

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

M and N are given in the Table 3.

Table 3 – M and N coefficient values

Category	Value for M	Value for N
Vertical Chilled	1.643	609
Vertical Frozen	4.928	1472
Counter Chilled	2.555	1790
Counter Frozen	5.840	2380

ANNEX IV
Measurements and calculations for professional storage cabinets

1. 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 that 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 professional storage cabinets, they shall meet the conditions and technical parameters set out in points (2) and (3).

2. For establishing the values of annual energy consumption and energy efficiency index for professional storage cabinets, measurements shall be made under the following conditions:

   (a) The temperature of test packages shall be between -1 °C and 5 °C for chilled cabinets and lower than -15 °C for frozen cabinets;

   (b) The ambient conditions shall correspond to climate class 4 as detailed in Table 2, except for light-duty cabinets which shall be tested in ambient conditions corresponding to climate class 3. Adjustment factors of 1.2 for light-duty cabinets at chilled operating temperature and 1.1 for light-duty cabinets at frozen operating temperature should then be applied to the testing results thus obtained for light-duty cabinets;

   (c) Professional storage cabinets shall be tested:

   - at chilled operating temperature in the case of a combined cabinet containing at least one compartment exclusively intended for chilled operating temperature;
   - at chilled operating temperature in the case of a professional storage cabinet which has solely one compartment exclusively intended for chilled operating temperature;
   - at frozen operating temperature in all other cases.

3. The ambient conditions of climate classes 3, 4 and 5 are shown in Table 2.

Table 2 — Ambient conditions of climate classes 3, 4 and 5

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
5	40	40	23.9	18.8

ANNEX V
Ecodesign requirements for condensing units

1. REQUIREMENTS FOR ENERGY EFFICIENCY

(a) From 1 July 2015, the coefficient of performance (*COP*) and the seasonal energy performance ratio (*SEPR*) of condensing units shall not fall below the following values:

Operating temperature	Rated capacity P_A	Applicable ratio	Value
Medium	0.2kW< P_A < 1kW	COP	1.2
	1kw< P_A < 5kW	COP	1.4
	5kW < P_A < 20kW	SEPR	2.25
	20kW < P_A < 50kW	SEPR	2.35
Low	0.1kW< P_A < 0.4kW	COP	0.75
	0.4kw< P_A < 2kW	COP	0.85
	2kW < P_A < 8kW	SEPR	1.5
	8W < P_A < 20kW	SEPR	1.6

(b) From 1 July 2018, the coefficient of performance (*COP*) and the seasonal energy performance ratio (*SEPR*) of condensing units shall not fall below the following values:

Operating temperature	Rated capacity P_A	Applicable ratio	Value
Medium	0.2kW< P_A < 1kW	COP	1.4
	1kw< P_A < 5kW	COP	1.6

	5kW < P_A < 20kW	SEPR	2.55
	20kW < P_A < 50kW	SEPR	2.65
Low	0.1kW< P_A < 0.4kW	COP	0.8
	0.4kw< P_A < 2kW	COP	0.95
	2kW < P_A < 8kW	SEPR	1.6
	8W < P_A < 20kW	SEPR	1.7

(c) For condensing units intended to be charged with a refrigerant fluid with a global warming potential lower than 150, COP and SEPR values can be lower than the values indicated in point 1(a) by a maximum of 15 % and in point 1(b) by a maximum of 10 %.

2. REQUIREMENTS FOR PRODUCT INFORMATION

From 1 July 2015, the following product information on condensing units shall be provided:

(a) the instruction manuals for installers and end-users, and free access websites of manufacturers, their authorised representatives and importers, shall contain the following elements:

(i) intended evaporating temperature, expressed in degrees Celsius (medium temperature -10 °C, low temperature -35 °C);

(ii) for condensing units with a rated cooling capacity lower than 5kW and 2kW for medium and low temperatures respectively:

- the rated COP, at full load and 32 °C ambient temperature, rounded to two decimal places, and rated cooling capacity and power input, expressed in kW and rounded to two decimal places;
- the COP value, at full load and 25 °C ambient temperature, rounded to two decimal places, and corresponding cooling capacity and power input, expressed in kW and rounded to two decimal places;

(iii) for condensing units with a rated cooling capacity higher than 5kW and 2kW for medium and low operating temperatures respectively:

- the SEPR value, rounded to two decimal places;
- the annual electricity consumption, expressed in kWh per year;
- the rated cooling capacity, rated power input and rated COP;
- the declared cooling capacity and declared power input, expressed in kW and rounded to three decimal places, and the COP value, rounded to two decimal places, at rating points B, C and D;

(iv) for condensing units intended for use at ambient temperature above 35 °C, the COP value, at full load and 43 °C ambient temperature, rounded to two decimal places, and corresponding cooling capacity and power input, expressed in kW and rounded to two decimal places;

(v) the type(s) and name(s) of refrigerant fluid(s) intended to be used with the condensing unit;

(vi) any specific precautions that are to be taken when the condensing unit is installed or maintained;

(vii) any specific precautions that are to be taken to optimise the efficiency of the condensing unit when it is integrated into a refrigerating appliance;

(viii) information relevant for disassembly, recycling or disposal at end-of-life.

(b) the technical documentation for the purposes of conformity assessment pursuant to Article 4 shall contain the following elements:

(i) the elements specified in point (a);

(ii) where the information relating to a specific model has been obtained by calculation on the basis of design or extrapolation from other combinations, the details of such calculations or extrapolations, and of any tests undertaken to verify the accuracy of the calculations, including details of the mathematical model for calculating the performance of such combinations and details of the measurements taken to verify that model.

Table 4 — Information requirements for condensing units with a rated cooling capacity lower than 5kW and 2kW for medium and low operating temperatures respectively.

Model(s): [information identifying the model(s) to which the information relates]

Refrigerant fluid(s):[information to identify the refrigerant fluid(s) intended to be used with the condensing unit]

Item	**Symbol**	**Value**		**Unit**
Evaporating temperature*	t	-10 °C	-35 °C	°C
Parameters at full load and ambient temperature 32°C				
Rated cooling capacity	P_A	x.xxx	x.xxx	kW
Rated power input	D_A	x.xxx	x.xxx	kW
Rated COP	COP_A	x.xx	x.xx	
Parameters at full load and ambient temperature 25°C				
Cooling capacity	P_2	x.xxx	x.xxx	kW
Power input	D_2	x.xxx	x.xxx	kW
COP	COP_2	x.xx	x.xx	
Parameters at full load and ambient temperature 43°C (where applicable)				
Cooling capacity	P_3	x.xxx	x.xxx	kW
Power input	D_3	x.xxx	x.xxx	kW

COP	COP_3	x.xx	x.xx	
Other items				
Capacity control	fixed/step/variable			
Contact details	Name and address of the manufacturer or its authorised representative.			
* For condensing units intended to operate at only one evaporating temperature, one of the two columns related to 'Value' can be deleted.				

Table 5 — Information requirements for condensing units with a rated cooling capacity higher than 5kW and 2kW for medium and low operating temperatures respectively

Model(s): [information identifying the model(s) to which the information relates]

Refrigerant fluid(s):[information to identify the refrigerant fluid(s) intended to be used with the condensing unit]

Item	**Symbol**	**Value**		**Unit**
Evaporating temperature*	*t*	-10 °C	-35 °C	°C
Annual electricity consumption	*Q*	x	x	kWh/a
Seasonal energy performance ratio	*SEPR*	x.xx	x.xx	
Parameters at full load and ambient temperature 32°C (Point A)				
Rated cooling capacity	P_A	x.xx	x.xx	kW
Rated power input	D_A	x.xx	x.xx	kW
Rated COP	$\boldsymbol{COP_A}$	**x.xx**	**x.xx**	
Parameters at part load and ambient temperature 25°C (Point B)				
Declared cooling capacity	P_B	x.xx	x.xx	kW
Declared power input	D_B	x.xx	x.xx	kW
Declared COP	$\boldsymbol{COP_B}$	**x.xx**	**x.xx**	
Parameters at part load and ambient temperature 15°C (Point C)				
Declared cooling capacity	P_c	x.xx	x.xx	kW
Declared power input	D_c	x.xx	x.xx	kW
Declared COP	$\boldsymbol{COP_C}$	**x.xx**	**x.xx**	
Parameters at part load and ambient temperature 5°C (Point D)				
Declared cooling capacity	P_D	x.xx	x.xx	kW
Declared power input	D_D	x.xx	x.xx	kW
Declared COP	$\boldsymbol{COP_D}$	**x.xx**	**x.xx**	
Parameters at full load and ambient temperature 43°C (where applicable)				
Cooling capacity	P_3	x.xx	x.xx	kW
Power input	D_3	x.xx	x.xx	kW
Declared COP	COP_3	x.xx	**x.xx**	
Other items				
Capacity control		fixed/step/variable		
Degradation coefficient for fixed and staged capacity units	*Cdc*	0.25		

Contact details	Name and address of the manufacturer or its authorised representative.
*****For condensing units intended to operate at only one evaporating temperature, one of the two columns related to 'Value' can be deleted.	

ANNEX VI
Measurements and calculations for condensing units

1. 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 that 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. They shall meet the conditions and technical parameters set out in point 2.

2. For establishing the values of cooling capacity, power input, coefficient of performance and seasonal energy performance ratio, measurements shall be made under the following conditions:

(a) the reference ambient temperature at the outdoor heat exchanger (condenser) shall be 32 °C;

(b) the saturated evaporating temperature at the indoor heat exchanger (evaporator) shall be -35 °C for low temperature and -10 °C for medium temperature;

(c) where applicable, the variations of ambient temperature throughout the year, representative of average climate conditions in the Union, and the corresponding number of hours when these temperatures occur, shall be as set out in Table 6;

(d) where applicable, the effect of the degradation of energy efficiency caused by cycling, depending on the type of capacity control of the condensing unit.

Table 6 — Variations of outdoor temperatures across the year under average climate conditions in Europe for condensing units

j	**T_j**	**h_j**
1	-19	0.08
2	-18	0.41
3	-17	0.65
4	-16	1.05
5	-15	1.74
6	-14	2.98
7	-13	3.79
8	-12	5.69
9	-11	8.94
10	-10	11.81
11	-9	17.29

12	-8	20.02
13	-7	28.73
14	-6	39.71
15	-5	56.61
16	-4	76.36
17	-3	106.07
18	-2	153.22
19	-1	203.41
20	0	247.98
21	1	282.01
22	2	275.91
23	3	300.61
24	4	310.77
25	5	336.48
26	6	350.48
27	7	363.49
28	8	368.91
29	9	371.63
30	10	377.32
31	11	376.53
32	12	386.42
33	13	389.84
34	14	384.45
35	15	370.45
36	16	344.96
37	17	328.02

38	18	305.36
39	19	261.87
40	20	223.90
41	21	196.31
42	22	163.04
43	23	141.78
44	24	121.93
45	25	104.46
46	26	85.77
47	27	71.54
48	28	56.57
49	29	43.35
50	30	31.02
51	31	20.21
52	32	11.85
53	33	8.17
54	34	3.83
55	35	2.09
56	36	1.21
57	37	0.52
58	38	0.40

ANNEX VII
Ecodesign requirements for process chillers

1. REQUIREMENTS FOR ENERGY EFFICIENCY

(a) From 1 July 2015, the seasonal energy performance ratio (*SEPR*) of process chillers shall not fall below the following values:

Heat transfer medium at the condensing side	Operating temperature	Rated cooling capacity P_A	Minimum SEPR value
Air	Medium	P_A < 300 kW	2.24
		P_A > 300 kW	2.8
	Low	P_A < 200 kW	1.48
		P_A > 200 kW	1.6
Water	Medium	P_A < 300 kW	2.86
		P_A > 300 kW	3.8
	Low	P_A < 200 kW	1.82
		P_A > 200 kW	2.1

(b) From 1 July 2018, the seasonal energy performance ratio (*SEPR*) of process chillers shall not fall below the following values:

Heat transfer medium at the condensing side	Operating temperature	Rated cooling capacity P_A	Minimum SEPR value
Air	Medium	P_A < 300 kW	2.58
		P_A > 300 kW	3.22
	Low	P_A < 200 kW	1.7
		P_A > 200 kW	1.84
Water	Medium	P_A < 300 kW	3.29
		P_A > 300 kW	4.37
	Low	P_A < 200 kW	2.09

		P_A > 200 kW	2.42

(c) For process chillers intended to be charged with a refrigerant fluid with a global warming potential lower than 150, SEPR values can be lower than the values indicated in points 1(a) and (b) by a maximum of 10 %.

2. REQUIREMENTS FOR PRODUCT INFORMATION

From 1 July 2015, the following product information on process chillers shall be provided:

(a) the instruction manuals for installers and end-users, and free access websites of manufacturers, their authorised representatives and importers, shall contain the following elements:

(i) intended operating temperature, expressed in degrees Celsius (medium temperature -8 °C, low temperature -25 °C);

(ii) the type of process chiller, either air-cooled or water-cooled;

(iii) the rated cooling capacity, rated power input, expressed in kW and rounded to two decimal places;

(iv) the rated energy efficiency ratio (EER_A), rounded to two decimal places;

(v) declared cooling capacity and declared power input at rating points B, C and D, expressed in kW and rounded to two decimal places;

(vi) declared EER at rating points B, C, and D, rounded to two decimal places;

(vii) the SEPR value, rounded to two decimal places;

(viii) the annual electricity consumption, in kWh per year;

(ix) type(s) and name(s) of refrigerant fluid(s) intended to be used with the process chiller;

(x) any specific precautions that are to be taken when the process chiller is installed or maintained;

(xi) information relevant for disassembly, recycling or disposal at end-of-life.

(b) the technical documentation for the purposes of conformity assessment pursuant to Article 4 shall contain the following elements:

(i) the elements specified in point (a);

(ii) where the information relating to a specific model has been obtained by calculation on the basis of design or extrapolation from other combinations, the details of such calculations or extrapolations, and of any tests undertaken to verify the accuracy of the calculations, including details of the mathematical model for calculating the performance of such combinations and details of the measurements taken to verify that model.

	Table 7 — Information requirements for process chillers

	Model(s): [information identifying the model(s) to which the information relates]			
	Type of condensing: [air-cooled / water-cooled]			
	Refrigerant fluid(s):[information identifying the refrigerant fluid(s) intended to be used with the process chiller]			
Item	**Symbol**	**Value**		**Unit**
Operating temperature	*t*	-8 °C	-25 °C	°C
Seasonal Energy Performance Ratio	*SEPR*	x.xx	x.xx	
Annual electricity consumption	*Q*	x	x	kWh/a
	Parameters at full load and reference ambient temperature (Point A)			
Rated cooling capacity	P_A	x.xx	x.xx	kW
Rated power input	D_A	x.xx	x.xx	kW
Rated EER	$\boldsymbol{EER_A}$	**x.xx**	**x.xx**	
	Parameters at rating point B			
Declared cooling capacity	P_B	x.xx	x.xx	kW
Declared power input	D_B	x.xx	x.xx	kW
Declared EER	$\boldsymbol{EER_B}$	**x.xx**	**x.xx**	
	Parameters at rating point C			
Declared cooling capacity	P_c	x.xx	x.xx	kW
Declared power input	D_c	x.xx	x.xx	kW
Declared EER	$\boldsymbol{EER_C}$	**x.xx**	**x.xx**	
	Parameters at rating point D			
Declared cooling capacity	P_D	x.xx	x.xx	kW
Declared power input	D_D	x.xx	x.xx	kW
Declared EER	$\boldsymbol{EER_D}$	**x.xx**	**x.xx**	
	Other items			
Capacity control		fixed/staged**/variable		
Degradation coefficient for fixed and staged capacity units*	*Cc*	x.xx	x.xx	
Contact details	Name and address of the manufacturer or its authorised representative.			

* If *Cc* is not determined by measurement then the default degradation coefficient shall be *Cc* = 0.9. Where the default *Cc* value is chosen, then results from cycling tests shall not be required. Otherwise, the cooling cycling test value shall be required.

** For staged capacity units, two values divided by a slash ('/') shall be declared in each box in the section referring to 'cooling capacity' and 'EER'.

For process chillers intended to operate at only one operating temperature, one of the two columns related to 'Value' can be deleted.

ANNEX VIII
Measurements and calculations for process chillers

1. 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 that 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. They shall meet the conditions and technical parameters set out in points 2 and 3.

2. For establishing the values of cooling capacity, power input, energy efficiency ratio and seasonal energy performance ratio, measurements shall be made under the following conditions:

(a) the reference ambient temperature at the outdoor heat exchanger shall be 35 °C for air-cooled chillers and 30 °C water inlet temperature at the condenser for water-cooled chillers;

(b) the outlet temperature of the liquid at the indoor heat exchanger shall be -25 °C for low temperature and -8 °C for medium temperature;

(c) the variations of ambient temperature throughout the year, representative of average climate conditions in the Union, and the corresponding number of hours when these temperatures occur, shall be as set out in Table 1;

(d) the effect of the degradation of energy efficiency caused by cycling depending on the type of capacity control of the process chiller.

3. For the average number of hours h_j by outdoor temperature T_j across the year under average climate conditions in Europe for process chillers, please refer to Table 6 in Annex VI.

ANNEX IX
Verification procedure for market surveillance purposes for professional storage cabinets

When performing the market surveillance checks referred to in Article 3(2) of Directive 2009/125/EC, the authorities of 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 where:

(a) the declared values comply with the requirements set out in Annex II;

(b) the measured volume is not lower than the rated value by more than 3 %;

(c) the measured value of energy consumption is not greater than the rated value (E24h) by more than 5 %.

3. Where 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.

4. The model shall be considered to comply with the applicable requirements set out in Annex II where:

(a) the declared values comply with the requirements set out in Annex II;

(b) the average of the three units for the measured volume is not lower than the rated value by more than 3 %;

(c) the average of the three units for the measured value of energy consumption is not greater than the rated value (E24h) by more than 5 %.

5. If the results referred to in point 4 are not achieved, the model and all other equivalent professional storage 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 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.

The verification tolerances set out in this Annex relate only to the verification of the measured parameters by Member State authorities and shall not be used by the supplier as an allowed tolerance to establish the values in the technical documentation. The values and classes on the label or in the product fiche shall not be more favourable for the supplier than the values reported in the technical documentation.

ANNEX X
Verification procedure for market surveillance purposes for condensing units

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

1. The Member State authorities shall test one single unit per model.

2. The condensing unit model shall be considered to comply with the applicable requirements set out in Annex V where:

(a) the declared values comply with the requirements set out in Annex V;

(b) for condensing units with a rated cooling capacity higher than 2 kW at low temperature and 5 kW at medium temperature, the seasonal energy performance ratio (*SEPR*) is not more than 5% lower than the declared value, with point A measured at the rated cooling capacity;

(c) for condensing units with a rated cooling capacity lower than 2 kW at low temperature and 5 kW at medium temperature, the rated coefficient of performance (COP_A) is not more than 5% lower than the declared value measured at the rated cooling capacity.

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.

4. The condensing unit model shall be considered to comply with the applicable requirements set out in Annex V where:

(a) the declared values comply with the requirements set out in Annex V;

(b) for condensing units with a rated cooling capacity higher than 2 kW at low temperature and 5 kW at medium temperature, the average of the three units for seasonal performance energy ratio (*SEPR*) is not more than 5% lower than the declared value, with point A measured at the rated cooling capacity;

(c) for condensing units with a rated cooling capacity lower than 2 kW at low temperature and 5 kW at medium temperature, the average of the three units for the rated coefficient of performance (COP_A) is not more than 5% lower than the declared value measured at the rated cooling capacity.

5. If the results referred to in point 4 are not achieved, the model shall be considered not to comply with this Regulation.

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

The verification tolerances set out in this Annex relate only to the verification of the measured parameters by Member State authorities and shall not be used by the supplier as an allowed tolerance to establish the values in the technical documentation. The values and classes on the label or in the product fiche shall not be more favourable for the supplier than the values reported in the technical documentation.

ANNEX XI
Verification procedure for market surveillance purposes for process chillers

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 VII:

1. The Member State authorities shall test one single unit per model.

2. The process chiller model shall be considered to comply with the applicable requirements set out in Annex VII where:

(a) the declared values comply with the requirements set out in Annex VII;

(b) the seasonal energy performance ratio (*SEPR*) is not more than 5 % lower than the declared value, with point A measured at the rated cooling capacity;

(c) the rated energy efficiency ratio (EER_A) is not more than 5 % lower than the declared value, measured at the rated cooling capacity.

3. Where 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.

4. The process chiller model shall be considered to comply with the applicable requirements set out in Annex VII where:

(a) the declared values comply with the requirements set out in Annex VII;

(b) the average of the three units for seasonal performance energy ratio (*SEPR*) is not more than 5 % lower than the declared value, with point A measured at the rated cooling capacity;

(c) the average of the three units for the rated energy efficiency ratio (EER_A) is not more than 5 % lower than the declared value, measured at the rated cooling capacity.

5. If the results referred to in point 4 are not achieved, the model shall be considered not to comply with this Regulation.

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

The verification tolerances set out in this Annex relate only to the verification of the measured parameters by Member State authorities and shall not be used by the supplier as an allowed tolerance to establish the values in the technical documentation. The values and classes on the label or in the product fiche shall not be more favourable for the supplier than the values reported in the technical documentation.

ANNEX XII
Indicative benchmarks referred to in Article 6

1. At the date of entry into force of this Regulation, the best available technology on the market for professional storage cabinets in terms of their energy efficiency index (EEI) was identified as follows:

	Net volume (litres)	Annual energy consumption	EEI
Chilled vertical	600	474.5	29.7
Chilled counter	300	547.5	21.4
Frozen vertical	600	1825	41.2
Frozen counter	200	1460	41.0

2. At the date of entry into force of this Regulation, the best available technology on the market for condensing units in terms of rated coefficient of performance and seasonal energy performance ratio was identified as follows:

Operating temperature	Rated capacity P_A	Applicable ratio	Benchmark value
Medium	0.2kW< P_A < 1kW	COP	1.9
	1kw< P_A < 5kW	COP	2.3
	5kW < P_A < 20kW	SEPR	3.6
	20kW < P_A < 50kW	SEPR	3.5
Low	0.1kW< P_A < 0.4kW	COP	1.0
	0.4kw< P_A < 2kW	COP	1.3
	2kW < P_A < 8kW	SEPR	2.0
	8W < P_A < 20kW	SEPR	2.0

3. At the date of entry into force of this Regulation, the best available technology on the market for process chillers in terms of seasonal energy performance ratio was identified as follows:

Heat transfer medium at the condensing side	Operating temperature	Rated cooling capacity P_A	Minimum SEPR value
Air	Medium	P_A < 300 kW	3.4
		P_A > 300 kW	3.7

	Low	P_A < 200 kW	1.9
		P_A > 200 kW	1.95
Water	Medium	P_A < 300 kW	4.3
		P_A > 300 kW	4.5
	Low	P_A < 200 kW	2.3
		P_A > 200 kW	2.7