Spanish Standard

UNE-EN 13215:2017+A1

June 2021

Condensing units for refrigeration

Rating conditions, tolerances and presentation of manufacturer's performance data

This standard was prepared by Technical Committee CTN 100 *Air conditioning*, the secretariat of which is held by AFEC.

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Condensing units for refrigeration. Rating conditions, tolerances and presentation of manufacturer's performance data.

Unités de condensation pour la réfrigération. Détermination des caractéristiques, tolérances et présentation des performances du fabricant.

This standard is the official Spanish version of European Standard EN 13215:2016+A1:2020.

This standard supersedes UNE-EN 13215:2017.

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EUROPEAN STANDARD
EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 13215:2016+A1

August 2020

ICS 27.200

Supersedes EN 13215:2016

Spanish version

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Unités de condensation pour la réfrigération. Détermination des caractéristiques, tolérances et présentation des performances du fabricant.

Verflüssigungssätze für die Kälteanwendung. Nennbedingungen, Toleranzen und Darstellung von Leistungsdaten des Herstellers.

This European Standard was approved by CEN on 24 September 2016 and includes Amendment 1 approved by CEN on 5 July 2020.

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European foreword

This document (EN 13215:2016+A1:2020) has been prepared by Technical Committee CEN/TC 113 *Heat pumps and air conditioning units*, the secretariat of which is held by UNE.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2021, and conflicting national standards shall be withdrawn at the latest by February 2021.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document includes Amendment 1 approved by CEN on 5 July 2020.

This document supersedes {A1 ►} EN 13215:2016 {◄A1}

The start and finish of text introduced or altered by amendment are indicated by the symbols {A1 ►} {◄A1}.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of European Directives.

For the relationship with EU Directives, see informative Annex ZA, which is an integral part of this document.

The main changes with respect to the previous edition are as follows:

a) part-load conditions are taken into account in accordance with mandate M/495 "Standardisation mandate to CEN, CENELEC and ETSI under Directive 2009/125/EC relating to harmonised standards in the field of Ecodesign";

b) calculation of the seasonal energy performance ratio (*SEPR*).

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies the rating conditions, tolerances and presentation of manufacturer's performance data for condensing units for refrigeration with compressors of the positive-displacement type. These include single-stage compressors and single- and two-stage compressors having an integrated means of fluid subcooling. This is required so that different condensing units can be compared. The data relate to the refrigerating capacity and power absorbed and include requirements for part-load performance where applicable.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

{A1►} EN 378-1:2016, *Refrigerating systems and heat pumps - Safety and environmental requirements - Part 1: Basic requirements, definitions, classification and selection criteria.*

EN 13771-2:2017, *Compressors and condensing units for refrigeration - Performance testing and test methods - Part 2: Condensing units.* ◄A1}

ISO 817, *Refrigerants - Designation and safety classification.*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in {A1 ►} EN 378-1:2016 {◄A1} and the following apply:

3.1 condensing unit:
combination of one or more compressors, condensers/gas coolers and, where applicable, liquid receivers and the regularly furnished accessories

{A1►} 3.2 evaporating temperature, $_{o}$:
temperature between the evaporating dew point and the evaporator inlet temperature of the refrigerant at the pressure of the condensing unit inlet, as calculated according to Annex B

NOTE 1 For refrigerants without glide, the evaporating temperature is equal to the dew-point temperature at the condensing unit inlet pressure. { ◄A1}.

{A1►} 3.3 {◄A1} refrigerating capacity, *Q*:
product of the mass flow of refrigerant through the condensing unit and the difference between the specific enthalpy of the refrigerant at the condensing unit inlet, the refrigerant being superheated above the suction dew-point temperature to the appropriate value (see Table 3), and the specific enthalpy of the liquid refrigerant at the condensing unit outlet

{A1►} 3.4 {◄A1} {A1►} subcooling { ◄A1}:
difference between the refrigerant bubble-point temperature corresponding to the condensing unit outlet pressure and the liquid refrigerant temperature at that outlet

{A1►} 3.5 {◄A2} superheat:
difference between the refrigerant dew-point temperature corresponding to the condensing unit inlet pressure and the refrigerant vapour temperature at that inlet

{A1►} 3.6 {◄A1} power absorbed, *P*:
power demand to drive the condensing unit

{A1►} 3.7 {◄A1} coefficient of performance, *COP (coefficient of performance)*:
ratio of refrigerating capacity to power absorbed

{A1►} 3.8 {◄A1} seasonal energy performance ratio, *SEPR* (*seasonal energy performance ratio*):
reference annual refrigeration demand divided by the annual electrical energy demand

{A1►} 3.9 glide:
difference between the dew-point temperature and the bubble-point temperature at a given pressure

[SOURCE: EN 14511-1:2018, 3.46]

3.10 condensing temperature:
arithmetic mean temperature between the condensing dew point and the bubble point at the compressor discharge pressure { ◄A1}.

4 Symbols and abbreviations

Table 1 - Symbols and abbreviations

Symbol	Designation	SI unit
LT	Low evaporating temperature	–
MT	Medium evaporating temperature	–
HT	High evaporating temperature	–
COP	Coefficient of performance	–
CR	Capacity ratio	–
d	Duration	h
E	Annual electrical energy demand	kWh
P	Power	W
q	Refrigeration demand ratio	–
Q	Refrigerating capacity	W
SEPR	Seasonal energy performance ratio	–
t	Temperature	°C

Table 2 - Indices

Index	Designation
LT	Low evaporating temperature
MT	Medium evaporating temperature
amb	ambient
cor	corrected
dm	demand
low	low
A, B, C and D	rating conditions
j	number of bins
R	rated

5 Parameters for the presentation of performance data

The parameters shown in Table 3 shall be used for the presentation of performance data.

Table 3 - Parameters for the presentation of performance data

Refrigerant parameters	Suction temperature (°C) or superheat (K) at the condensing unit inlet	Condensing unit application
Halocarbons and hydrocarbons including refrigerant mixtures	32 °C	Refrigerators/freezers household and similar
	20 °C or 10 K	Other applications
R717	5K	Any application using ammonia
R744	32 °C	Household and similar appliances
	10 K	Other applications using CO2

6 General requirements

The performance data of a condensing unit for refrigeration shall be presented in either tabular or graphical form as specified in 7.3. Data outside the allowable operating range of the condensing unit shall not be included.

The performance of the condensing unit at the standard reference points in Table 4 shall also be stated.

For calculation of performance at other suction temperatures/superheats and other compressor speeds, correction factors shall be given as specified in Clause 10.

Refrigerants shall be identified in accordance with ISO 817. The source of the thermodynamic properties shall be stated.

An example should be provided illustrating the use of the performance data and correction factors.

Other data may also be shown, such as displacement/swept gas volume, number of cylinders and speed range.

7 Performance data

7.1 General

Published performance shall be based on data obtained from tests carried out in accordance with {A1►} EN 13771-2:2017 { ◄A1}.

{A1►} It shall be stated whether the arithmetic mean temperature, thermodynamic mean temperature or dew-point evaporating temperature has been used; see also Annex B.

The manufacturer may choose to rate the condensing unit at the dew-point temperature even for refrigerants with glide. { ◄A1}

Performance data shall be presented as specified in Clause 8 and for:

- externally driven compressors without motor at rated speed;

- compressor motors at rated voltage and frequency.

7.2 Part-load performance data

Performance data with capacity control shall be presented for:

- all capacity-control stages in condensing units with 2 and 4 stages, for example, unloaded suction, condensing units with more than one compressor or multi-speed compressor motors;
- condensing units with more than 4 stages or other variable capacity (for example, variable or nearly stepless speed) at maximum capacity, minimum capacity and one additional intermediate stage within the control range.

Where performance is non-linear between the published values, the interpolation method required to remain within the tolerances shall be specified.

Part-load data in accordance with Annex A shall also be declared for calculation of *SEPR.*

7.3 Tabular or graphical form

The performance data to be presented in tabular or graphical form shall comprise:

a) the refrigerating capacity, in legible values with an accuracy of ± 2%;

b) the power absorbed, in legible values with an accuracy of ± 2%;

c) {A1►} the evaporating temperature, at intervals less than or equal to 5 K { ◄A1}.

7.4 Determination of the power absorbed by the condensing unit

7.4.1 Condensing units including the compressor motor

The power absorbed is the sum of the electrical power supplied to the compressor motor and the power of the fans and other electrical auxiliary components.

7.4.2 Motors with factory-assembled or factory-specified means for variable speed

The motor power is the electrical power supplied at the terminals of the frequency inverter or variable-speed device.

7.4.3 Externally driven compressors without motor

The power absorbed is the sum of the compressor shaft power and the power of the fans and other electrical auxiliary components.

8 Rating conditions

8.1 General

A rating condition is defined by a reference point in Table 4 and an ambient temperature in accordance with 8.3 for air-cooled condensing units, or a condensing temperature in accordance with 8.4 for water-cooled condensing units.

The following data shall be supplied:

- refrigerating capacity;

- the subcooling value at the condensing unit outlet;

- power absorbed, including fan motors and factory-supplied accessories;

- the *COP.*

If requested, the following information shall be available:

- application limits relating to air or water temperature (minimum - maximum);

- for air-cooled condensing units: air flow rate;

- for water-cooled condensing units: water flow rate and pressure drop.

8.2 Standard reference points

The standard reference points shall be in accordance with Table 4.

Table 4 - Standard reference points

Condensing unit applications Reference points	Temperature evaporating low (LT)	Temperature evaporating medium (MT)	Temperature evaporating high (HT)	Household appliances and similar
Evaporating temperature (°C) {A1►} *Text deleted* {◄A1}	–35	–10	+5	–25
Suction temperature (°C) or superheat (K)	+ 20 10 o 5[a]	+ 20 10 o 5[a]	+ 20 10 o 5[a]	+ 32
Applicable at evaporating temperatures (°C)	≤ –20	-20 < *t* < –5	≥ –5	n.a.
Ambient temperature for condensing units air-cooled	See 8.3			
Condensing temperature for water-cooled units (°C)	See 8.4			

a For R717.

8.3 Air-cooled condensing units

8.3.1 General

The performance of the condensing unit shall be referred to an ambient temperature of 32 °C. The stated performance applies to a clean condenser.

Performance data shall be declared for an ambient temperature of

– + 32 °C,

- + 25 °C, and

- + 43 °C, if the condensing unit is designed for this.

8.3.2 Data for calculation of *SEPR*

For condensing units with a refrigerating capacity greater than 2 kW at low evaporating temperature and greater than 5 kW at medium evaporating temperature, the 32 °C ambient-temperature condition shall be considered the highest refrigerating capacity.

Performance data for the highest refrigerating capacity shall be declared for an ambient temperature of

– + 32 °C,

– + 25 °C,

- + 15 °C,

- + 5 °C, and

- + 43 °C, if the condensing unit is designed for this.

The SEPR value and the annual electrical energy demand (E) shall be declared; see Annex A. Where COPcor is calculated using a special control scheme, this shall be stated (for example, on/off cycling at the highest-capacity stage rather than starting at several stages).

8.4 Water-cooled condensing units

{A1>} The standard reference points shall be at a condensing temperature of 40 °C corresponding to the pressure at the condensing unit outlet {<A1}. The water inlet temperature shall be 30 °C and the fouling factor shall be 5 × 10-5 m^2 K/W.

9 Tolerances

The following tolerances shall apply to the performance stated by the manufacturer in relation to the data obtained by measurement at the standard reference points in Table 4. These tolerances allow for manufacturing differences during production.

The refrigerating capacity or mass flow rate and the COP shall not be lower than shown in Table 5. The power absorbed shall not exceed the percentage specified in Table 5.

Table 5 - Actual performance in relation to published data

Condensing unit applications Tolerances	Low evaporating temperature	Medium evaporating temperature	High evaporating temperature	Part-load condition	Refrigerators/ freezers household and similar
Refrigerating capacity or mass flow rate	90,0% [b] o 87,5%	90,0%	92,5%	87,5%	92,5% or -10 W
Power absorbed	112,5%	110,0%	107,5%	112,5%	107,5% or +10 W

a In no case shall the COP be lower than 90%.
b The 90.0% limit applies at an ambient temperature of 32 °C.
c Maximum deviation for values below 100 W.

The SEPR, calculated in accordance with Annex A, shall not be lower than 90% of the value published by the manufacturer.

10 Correction factors

10.1 Superheat

The correction factors applicable to performance data relating to superheat (see Clause 6) shall comprise:

a) the change in refrigerating capacity (or mass flow rate) as a function of superheat;

b) the change in power absorbed as a function of superheat.

The conversion factors or calculation method for different superheat values shall be based on experimental data.

10.2 Compressor speed

The correction factors applicable to performance data relating to rated speed (see 7.1) shall include:

a) the refrigerating capacity (or mass flow rate) as a function of the various compressor speeds;

b) the power absorbed as a function of the various compressor speeds.

These correction factors do not apply to compressor motors.

Annex A (normative)

Calculation of *SEPR*

A.1 General

The energy efficiency of condensing units shall be stated at one rating condition for lower capacity or at four rating conditions for higher capacity (see 8.3), together with a SEPR value calculated from the four rating conditions for condensing units of the highest capacity.

The methodology for calculating this SEPR value is described here.

The SEPR is calculated on the basis of the COP values determined for operation at the four rating conditions A, B, C and D; see Table A.1. The determination is as follows:

The refrigeration demand at a given ambient temperature is obtained from Formula (A.12) for medium-temperature refrigeration (MT) and from Formula (A.10) for low-temperature refrigeration (LT).

For nearly continuous capacity control, where capacity matches the demand within ± 3% defined at the ambient temperature specified by the rating condition, the COP remains constant.

A.2 Condensing unit without capacity control

For condensing units with on/off cycle control (i.e. without capacity control), the COP is corrected using a coefficient of 0.25 in accordance with Formula (A.1) for rating conditions B, C and D.

For rating condition A, the COP is not corrected.

The refrigerating capacity QR is the capacity at the ambient temperature specified in the rating condition.

$$COP_{\mathrm{cor}} = COP_{\mathrm{R}} \left(1 - 0{,}25 \times \left(1 - CR\right)\right) \tag{A.1}$$

$$CR = \frac{Q_{\mathrm{R,A}} \times q}{Q_{\mathrm{R}}} \tag{A.2}$$

$$P = \frac{Q_{\mathrm{R}}}{COP_{\mathrm{cor}}} \tag{A.3}$$

A.3 Condensing unit with stepwise capacity control

For stepwise capacity control, COPcor is interpolated between two given capacity-control steps QR and QR,low without degradation, or between a capacity-control step and off mode with degradation in accordance with Formula (A.1), where QR is the value for the selected capacity-control step.

$$COP_{\text{cor}} = COP_{\text{R,low}} + \frac{\left(COP_{\text{R}} - COP_{\text{R,low}}\right) \times \left(q \times Q_{\text{R,A}} - Q_{\text{R,low}}\right)}{\left(Q_{\text{R}} - Q_{\text{R,low}}\right)} \quad \text{(A.4)}$$

Table A.1 - Data required for SEPR calculation

Rating condition	t_{amb}	Q_{dm}	Q_{R}	COP_{R}	$Q_{\text{R,low}}$	$COP_{\text{R,low}}$	COP_{cor}
A	32						
B	25						
C	15						
D	5						

A.4 Calculation of SEPR

For each ambient temperature tamb,j, the value of COPcor,j is calculated; see Table A.2. COPcor,j is linearly interpolated between the four rating conditions A, B, C and D according to the ambient temperature between the two nearest rating conditions. For tamb,j below rating condition D, COPcor,j is kept at the value for condition D; above condition A, the COP is kept at the value for A.

The SEPR is calculated using 58 values for the annual duration dj for each ambient-temperature step tamb,j.

$$SEPR = \frac{\sum_{\text{j}=1}^{58}\left(Q_{\text{dm,j}} \times d_{\text{j}}\right)}{\sum_{\text{j}=1}^{58}\left(\frac{Q_{\text{dm,j}} \times d_{\text{j}}}{COP_{\text{cor,j}}}\right)} \quad \text{(A.5)}$$

$$q = q_{\text{LT}} = q_{\text{MT}} = 1 \text{ for } \quad {}_{\text{amb}} \geq 32\ °\text{C} \quad \text{(A.6)}$$

$$q_{\text{LT}} = 0{,}8 \text{ for } \quad {}_{\text{amb}} \leq 5\ °\text{C} \quad \text{(A.7)}$$

$$q_{\text{MT}} = 0{,}6 \text{ for } \quad {}_{\text{amb}} \leq 5\ °\text{C} \quad \text{(A.8)}$$

$$q_{\mathrm{LT}} = \frac{\left(t_{\mathrm{amb,j}} - 5\right)}{27} \times 0{,}2 + 0{,}8$$ for 5 °C < $_{\mathrm{amb}}$ < 32 °C (A.9)

$$Q_{\mathrm{dm,LT,j}} = q_{\mathrm{LT,j}} \times Q_{\mathrm{R,LT,A}}$$ (A.10)

$$q_{\mathrm{MT}} = \frac{\left(t_{\mathrm{amb,j}} - 5\right)}{27} \times 0{,}4 + 0{,}6$$ for 5 °C < $_{\mathrm{amb}}$ < 32 °C (A.11)

$$Q_{\mathrm{dm,MT,j}} = q_{\mathrm{MT,j}} \times Q_{\mathrm{R,MT,A}}$$ (A.12)

$$COP_{\mathrm{cor,j}} = COP_{\mathrm{B,cor}} - \left(COP_{\mathrm{B,cor}} - COP_{\mathrm{A}}\right) \times \frac{\left(t_{\mathrm{amb,j}} - 25\right)}{7}$$ between A and B (A.13)

$$COP_{\mathrm{cor,j}} = COP_{\mathrm{C,cor}} - \left(COP_{\mathrm{C,cor}} - COP_{\mathrm{B,cor}}\right) \times \frac{\left(t_{\mathrm{amb,j}} - 15\right)}{10}$$ between B and C (A.14)

$$COP_{\mathrm{cor,j}} = COP_{\mathrm{D,cor}} - \left(COP_{\mathrm{D,cor}} - COP_{\mathrm{C,cor}}\right) \times \frac{\left(t_{\mathrm{amb,j}} - 5\right)}{10}$$ between C and D (A.15)

$$E = \sum_{\mathrm{j=1}}^{58} \left(\frac{Q_{\mathrm{dm,j}} \times d_{\mathrm{j}}}{COP_{\mathrm{cor,j}}}\right)$$ (A.16)

Table A.2 - Ambient temperatures and duration for determination of *SEPR*

j	$\boldsymbol{t}_{\mathrm{amb,j}}$ **°C**	$\boldsymbol{d}_{\mathrm{j}}$ **h**
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

j	$t_{amb,j}$ **°C**	d_j **h**
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	223,9
41	21	196,31
42	22	163,04

j	***t***$_{amb,j}$ **°C**	***d***$_{j}$ **h**
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	0,4

{A1►}

Annex B (normative)

Determination of evaporating temperature with refrigerant mixtures

For refrigerants with glide, the evaporating temperature is the arithmetic mean of the temperature at the evaporator inlet and the dew-point temperature at the condensing unit inlet pressure, assuming the following: isenthalpic expansion from the condensing unit outlet temperature to the condensing unit inlet pressure, isobaric evaporation, no pressure drop in the suction line, and refrigerant temperature changes are linear with enthalpy during evaporation, ignoring the effects of oil circulation.

The inlet temperature in the two-phase region is determined by linear interpolation between the dew-point and bubble-point temperatures at the evaporating pressure, using the enthalpy at the expansion-device inlet.

$$t_{\mathrm{om}} = \frac{t_{\mathrm{o1}} + t_{\mathrm{oD}}}{2} \qquad \text{(B.1)}$$

$$t_{\mathrm{o1}} = t_{\mathrm{oB}} + \left(t_{\mathrm{oD}} - t_{\mathrm{oB}}\right) \cdot \frac{h_{\mathrm{EX}} - h_{\mathrm{oB}}}{h_{\mathrm{oD}} - h_{\mathrm{oB}}} \qquad \text{(B.2)}$$

where

t_{om} is the arithmetic mean evaporating temperature, expressed in degrees Celsius (°C);

t_{o1} is the temperature at the evaporator inlet at the unit inlet pressure, expressed in degrees Celsius (°C);

t_{oD} is the dew-point temperature at the unit inlet pressure, expressed in degrees Celsius (°C);

t_{oB} is the bubble-point temperature at the unit inlet pressure, expressed in degrees Celsius (°C);

h_{EX} is the enthalpy at the expansion-device inlet, expressed in joules per kilogram (J/kg);

h_{oB} is the enthalpy at the bubble point at the condensing unit inlet pressure, expressed in joules per kilogram (J/kg);

h_{oD} is the enthalpy at the dew point at the condensing unit inlet pressure, expressed in joules per kilogram (J/kg).

For many refrigerant mixtures, linear interpolation is a good approximation. For refrigerants with a temperature glide greater than 7 K from the bubble point to the dew-point temperature, linear interpolation may result in significant deviations from the thermodynamic mean evaporating temperature $_{\mathrm{o,t}}$, expressed in °C.

$$t_{\mathrm{o,th}} = \frac{\Delta h}{\Delta s} - 273{,}15\,\mathrm{K} = \frac{h_{\mathrm{oD}} - h_{\mathrm{EX}}}{s_{\mathrm{oD}} - s_{\mathrm{o1}}} - 273{,}15\,\mathrm{K} \tag{B.3}$$

where

s_{o1} is the specific entropy at the evaporator inlet, determined using the condensing unit outlet enthalpy at the inlet pressure (without using linear interpolation between the bubble-point entropy and the dew-point entropy), expressed in joules per kilogram per degree Kelvin (J/kg K);

s_{oD} is the specific entropy at the dew point at the unit inlet pressure, expressed in joules per kilogram kelvin (J/kg K).

The thermodynamic mean temperature shall be used to define the evaporating temperature when it exceeds the arithmetic mean temperature by more than 0.5 K. { ◄A1}

Annex ZA (informative)

Relationship between this European Standard and the ecodesign requirements of Commission Regulation (EU) No 2015/1095

This European Standard has been prepared in response to the Commission's standardisation request M/495 (Ecodesign) to provide one voluntary means of conforming to the ecodesign requirements of Commission Regulation (EU) No 2015/1095 of 5 May 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers.

Once this standard is cited in the Official Journal of the European Union under that Regulation, compliance with the normative clauses of this standard given in Table ZA.1 confers, within the limits of the scope of this standard, a presumption of conformity with the corresponding ecodesign requirements of that Regulation and associated EFTA regulations.

Table ZA.1 - Correspondence between this European Standard and Commission Regulation (EU) No 2015/1095 of 5 May 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers and the Commission's standardisation request M/495 (Ecodesign)

Ecodesign requirements of Regulation (EU) Nº 2015/1095	Clauses/ subclauses of this EN	Remarks / Notes
{A1►} Annex V 2 (a) (v)	6	Types and names of refrigerants
Annex V 2 (a) (ii), (iii) and (iv)	8.1	- Power - Power absorbed (the Regulation refers to power input) – COP
Annex V 2 (a) (i)	8.2	Evaporating temperature
Annex V 2 (a) (iii)	8.3.2	– SEPR - Annual electrical energy demand (the Regulation refers to annual electricity consumption)
Annex VI	Annex A	- Calculation of SEPR - Temperature bins { ◄A1}

NOTICE 1 - The presumption of conformity is valid only as long as the reference to this European Standard is maintained in the list published in the Official Journal of the European Union. Users of this standard should consult the latest list published in the Official Journal of the European Union.

NOTICE 2 - Other Union legislation may be applicable to products falling within the scope of this standard.

Bibliography

[1] EN 12693, *Refrigerating systems and heat pumps. Safety and environmental requirements - Positive displacement refrigerant compressors*.

[2] EN 12900, *Refrigerant compressors. Rating conditions, tolerances and presentation of manufacturer's performance data.*

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