

Commission Delegated Regulation (EU) 2019/2018 of 11 March 2019 supplementing Regulation (EU) 2017/1369 of the European Parliament and of the Council with regard to energy labelling of refrigerating appliances with a direct sales function (Text with EEA relevance)

Changes to legislation: There are currently no known outstanding effects for the Commission
Delegated Regulation (EU) 2019/2018, ANNEX IV. (See end of Document for details)

ANNEX IV

Measurement methods and calculations

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

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

TABLE 2

Ambient conditions

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

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

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

$$AE = 365 \times E_{daily};$$
 with:
 - E_{daily} is the energy consumption of the refrigerating appliance with a direct sales function over 24 hours, expressed in kWh/24h and rounded to three decimal places.

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

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

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

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

;

where:

- (1) *c* is the index number for a compartment type ranging from 1 to *n*, with *n* being the total number of compartment types.
- (2) The values of *M* and *N* are given in Table 3.

TABLE 3

M and N values

Category	Value for M	Value for N
Beverage coolers	2,1	0,006
Ice-cream freezers	2,0	0,009
Refrigerated vending machines	4,1	0,004
Gelato-scooping cabinets	25,0	30,4
Vertical and combined supermarket refrigerator cabinets	9,1	9,1
Horizontal supermarket refrigerator cabinets	3,7	3,5
Vertical and combined supermarket freezer cabinets	7,5	19,3
Horizontal supermarket freezer cabinets	4,0	10,3
Roll-in cabinets (from 1 March 2021)	9,2	11,6
Roll-in cabinets (from 1 September 2023)	9,1	9,1

- (3) The values of *C*, the temperature coefficient are given in Table 4.

Changes to legislation: There are currently no known outstanding effects for the Commission Delegated Regulation (EU) 2019/2018, ANNEX IV. (See end of Document for details)

TABLE 4

Temperature conditions and corresponding temperature coefficient values, C

(a) Supermarket cabinets

Category	Temperature class	Highest temperature of warmest M-package (°C)	Lowest temperature of coldest M-package (°C)	Highest minimum temperature of all M-package (°C)	Value for C
Vertical, combined supermarket refrigerator cabinets	M2	≤ +7	≥ -1	n.a.	1,0
	H1 and H2	≤ +10	≥ -1	n.a.	0,82
	M1	≤ +5	≥ -1	n.a.	1,15
Horizontal supermarket refrigerator cabinets	M2	≤ +7	≥ -1	n.a.	1,0
	H1 and H2	≤ +10	≥ -1	n.a.	0,92
	M1	≤ +5	≥ -1	n.a.	1,08
Vertical and combined supermarket freezer cabinets	L1	≤ -15	n.a.	≤ -18	1,0
	L2	≤ -12	n.a.	≤ -18	0,9
	L3	≤ -12	n.a.	≤ -15	0,9
Horizontal supermarket freezer cabinets	L1	≤ -15	n.a.	≤ -18	1,0
	L2	≤ -12	n.a.	≤ -18	0,92
	L3	≤ -12	n.a.	≤ -15	0,92

(b) Gelato-scooping cabinets

Temperature class	Highest temperature of warmest M-package (°C)	Lowest temperature of coldest M-package (°C)	Highest minimum temperature of all M-package (°C)	Value for C
G1	-10	-14	n.a.	1,0
G2	-10	-16	n.a.	1,0
G3	-10	-18	n.a.	1,0
L1	-15	n.a.	-18	1,0
L2	-12	n.a.	-18	1,0
L3	-12	n.a.	-15	1,0

Changes to legislation: There are currently no known outstanding effects for the Commission Delegated Regulation (EU) 2019/2018, ANNEX IV. (See end of Document for details)

S	Special classification	1,0
---	------------------------	-----

(c) Refrigerated vending machines

Temperature class ⁰	Maximum measured product temperature (T_v) (°C)	Value for C
Category 1	7	1+(12- T_v)/25
Category 2	12	
Category 3	3	
Category 4	$(T_{v1}+T_{v2})/2^0$	
Category 6	$(T_{v1}+T_{v2})/2^0$	

(d) other refrigerating appliances with a direct sales function

Category	Value for C
Other appliances	1,0
<p>a For multi-temperature vending machines, T_v shall be the average of T_{v1} (the maximum measured product temperature in the warmest compartment) and T_{v2} (the maximum measured product temperature in the coldest compartment).</p> <p>b category 1 = refrigerated closed fronted can and bottle machines where the products are held in stacks, category 2 = refrigerated glass fronted can and bottle, confectionery & snack machines, category 3 = refrigerated glass fronted machines entirely for perishable foodstuffs, category 4 = refrigerated multi-temperature glass fronted machines, category 6 = combination machines consisting of different categories of machine in the same housing and powered by one chiller.</p>	

Notes:

n.a = not applicable

(4) Coefficient Y is calculated as follows:

(a) for beverage coolers:

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

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

where T_c is the average compartment classification temperature of the compartment and CC is the climate class factor. The values for T_c are set out in Table 5. The values for CC are set out in Table 6.

TABLE 5

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

Temperature class	T_c (°C)
K1	+3,5
K2	+2,5

Changes to legislation: There are currently no known outstanding effects for the Commission Delegated Regulation (EU) 2019/2018, ANNEX IV. (See end of Document for details)

K3	-1,0
K4	+5,0

TABLE 6

Operating conditions and CC values for beverage coolers

Warmest ambient temperature (°C)	Ambient relative humidity (%)	CC
+25	60	1,0
+32	65	1,05
+40	75	1,1

(b) for ice-cream freezers:

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

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

where T_c is the average compartment classification temperature of the compartment and CC is the climate class factor. The values for T_c are set out in Table 7. The values for CC are set out in Table 8.

TABLE 7

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

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

TABLE 8

Operating conditions and corresponding CC values for ice-cream freezers

	Minimum		Maximum		CC
	Ambient temperature (°C)	Ambient relative humidity (%)	Ambient temperature (°C)	Ambient relative humidity (%)	

Changes to legislation: There are currently no known outstanding effects for the Commission Delegated Regulation (EU) 2019/2018, ANNEX IV. (See end of Document for details)

Ice-cream freezer with transparent lid	16	80	30	55	1,0
			35	75	1,1
			40	40	1,2
Ice-cream freezer with non-transparent lid	16	80	30	55	1,0
			35	75	1,04
			40	40	1,1

(c) for refrigerated vending machines:

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

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

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

(5) The values for P are set out in Table 9.

TABLE 9

P values

<i>Cabinet type</i>	<i>P</i>
Integral supermarket cabinets	1,1
Other refrigerating appliances with a direct sales function	1,0

Changes to legislation:

There are currently no known outstanding effects for the Commission Delegated Regulation (EU) 2019/2018, ANNEX IV.