

Published in the Official Gazette of the Republic of Macedonia No. 13 of 5 February 2007

Based upon Article 20, paragraph 4 of the Law on customer safety (Official Gazette of the Republic of Macedonia No. 33/2006), the Minister of Economy has adopted this

RULEBOOK ON ENERGY EFFICIENCY REQUIREMENTS FOR HOUSEHOLD ELECTRIC REFRIGERATORS, FREEZERS AND COMBINATION THEREOF

I. GENERAL PROVISIONS

Article 1

This Rulebook shall prescribe energy efficiency requirements for household electric refrigerators, freezers and combination thereof; and conformity assessment procedures when such appliances are placed on the market.

Article 2

The provisions of this Rulebook shall apply to new electric household refrigerators, frozen food storage cabinets, food freezers and combinations thereof defined in the Method for calculating the maximum allowable electricity consumption of a refrigeration appliance and procedure for checking conformity (Annex 1) enclosed to this Rulebook (hereinafter: refrigeration appliances).

The provisions of this Rulebook shall not apply to appliances which can also use other energy sources, particularly accumulators and household refrigeration appliances working on the absorption principle manufactured on a one-off basis.

II. ENERGY EFFICIENCY REQUIREMENTS FOR REFRIGERATION APPLIENCES

Article 3

All necessary measures shall be taken to ensure that refrigeration appliances covered by the provisions of this Rulebook can be placed on the market only if the electricity consumption of the appliance in question is less or equal to the maximum allowable electricity consumption value for its category as calculated according to the procedure defined in Annex 1.

The manufacturer of a refrigeration appliance, his authorized representative established in the Republic of Macedonia or any natural or legal person responsible for placing the appliance on the market shall ensure that each appliance placed on the market conforms with the requirement referred to in paragraph 1 of this Article.

III. CONFORMITY ASSESSMENT

Article 4

Refrigeration appliances with an affixed 'CE'- marking accompanied by declaration of conformity, compiled in accordance with the provisions from Chapter IV of this Rulebook, shall be considered to comply with the provisions of this Rulebook.

Where refrigeration appliances are subject to other regulations covering other aspects which also provide for affixing of the 'CE'-marking, the latter shall indicate that the refrigeration appliances conform with the provisions of those regulations, unless evidence of the contrary exists.

IV. CONFORMITY ASSESSMENT PROCEDURE (MODULE A)

Article 5

For the purposes of this Rulebook, Module A is a procedure whereby the manufacturer or his authorized representative established in the Republic of Macedonia, who carries out the obligations laid down in Article 6 of this Rulebook, shall ensure and declare that the refrigeration appliance satisfies the relevant requirements set out in the provisions of this Rulebook.

The manufacturer shall affix the 'CE'-marking to each refrigeration appliance which he manufactures and draw up a written declaration of conformity.

The declaration of conformity mentioned in paragraph 2 of this Article shall be in a printed form, certified and written in Macedonian language and in its Cyrillic alphabet.

Article 6

The manufacturer shall establish the technical documentation described in Article 7 of this Rulebook and he or his authorized representative established in the Republic of Macedonia shall keep it at disposal for the relevant national authorities for inspection purposes for a period of not less than three years from the date on which the last appliance has been manufactured.

Where neither the manufacturer nor his authorized representative is established in the Republic of Macedonia, the obligation to keep the technical documentation available shall be the responsibility of the natural or legal person who places the refrigeration appliance on the market.

Article 7

Technical documentation shall enable conformity of the refrigeration appliance with the requirements of the provisions of this Rulebook to be assessed.

Provided it is necessary to assess the conformity, the technical documentation referred to in this article, paragraph 1, it shall cover the design, manufacturing and operation of the refrigeration appliance and shall comprise of:

- name, surname and address or name and the headquarters of the manufacturer;
- a general description of the model sufficient for unambiguous identification;
- information, including relevant drawings, of the main design features of the model and in particular of the items which appreciably affect its electricity consumption, such as dimensions, volume(s), compressor characteristics, special features, etc.;
- the operating instructions, if any;
- the results of electricity consumption measurements carried out as required by Article 8 of this Rulebook;
- details of the conformity of these measures as compared to the energy consumption requirements set out in Annex 1.

Article 8

Manufacturers of refrigeration appliances shall establish the electricity consumption of each refrigeration appliance covered by this Rulebook according to the procedures specified in the national standard MKS EN 153, as well as the appliance's conformity with the requirements of Article 3 of this Rulebook.

Article 9

The manufacturer or its authorized representative established in the Republic of Macedonia, shall keep a copy of the declaration of conformity with the technical documentation.

Article 10

The manufacturer shall undertake all necessary measures to ensure that the manufacturing process guarantees that the manufactured refrigeration appliances are in compliance with the technical documentation referred to in Article 6 of this Rulebook and with the relevant requirements laid down in the provisions of this Rulebook that refer to those appliances.

V. 'CE' CONFORMITY MARKING

Article 11

When refrigeration appliances are placed on the market, they shall bear the 'CE'-marking which shall consist of the initials 'CE'.

The 'CE' conformity marking shall consist of the initials CE taking the form given in Annex 2 enclosed to this Rulebook.

If the 'CE'-marking is reduced or enlarged the proportions given in the Annex 2 should be complied with.

Various components of the 'CE'-marking should have basically the same vertical dimensions, which may not be less than 5 mm.

The 'CE'-marking shall be affixed visibly, legibly and indelibly to the refrigeration appliance and, where appropriate, to the packaging.

Article 12

Refrigeration appliances shall not bear markings which may mislead the natural and legal persons with regards to the meaning and the form of the 'CE'-marking.

Any other marking may be affixed to the appliances, their packaging, the instruction sheet or other documents, provided that the 'CE'-marking remains visible and legible.

VI. FINAL AND TRANSITIONAL PROVISIONS

Article 13

The provisions from this Rulebook, which refer to the 'CE'-marking, shall apply after the integration of the Republic of Macedonia in the European Union or after the entry into force of an appropriate Protocol with the European Community on conformity assessment.

Article 14

Before the period of Republic of Macedonia's accession to the European Union, the manufacturer of a refrigeration appliance, his authorized representative established in the Republic of Macedonia or any natural or legal person responsible for placing the appliance on the market may place on the market refrigeration appliances without 'CE'-marking, provided they have been manufactured in Republic of Macedonia and provided they meet the energy efficiency requirement for such appliances as specified by the provisions of this Rulebook .

In case of paragraph 1 of this Article, the manufacturer of a refrigeration appliance, his authorized representative established in the Republic of Macedonia or any natural or legal person responsible for placing the appliance on the market shall provide for declaration of conformity for each refrigeration appliance in accordance with the conformity assessment procedure set by the provisions of this Rulebook and the national standards.

The documentation from the manufacturer of the refrigeration appliance, his authorized representative established in the Republic of Macedonia or any natural or legal person responsible for placing the appliance on the market for all new refrigeration appliance shall be accompanied by a copy of the declaration of conformity referred to in paragraph 2 of this Article.

Article 15

After the accession of the Republic of Macedonia to the European Union or after the entry into force of an appropriate Protocol with the European Community on conformity assessment, for the purposes of this Rulebook, the following terms shall apply:

- "authorized representative established in the European Union or in the Republic of Macedonia" instead of "authorized representative established in the Republic of Macedonia",
- "CE-declaration of conformity" instead of "Declaration of conformity",
- "CE-marking" instead of "Conformity marking"

Article 16

This Rulebook shall enter into force on the 8th day following its publication in the "Official Gazette of the Republic of Macedonia".

MINISTER

Vera Rafajlovska, signed

METHOD FOR CALCULATING THE MAXIMUM ALLOWABLE ELECTRICITY CONSUMPTION OF A REFRIGERATION APPLIANCE AND PROCEDURE FOR CHECKING CONFORMITY

The electricity consumption of refrigeration appliance (which may be expressed in kWh per 24 hours) is a function of the category of appliance to which it belongs (e.g. 1-star refrigerator, chest freezer, etc.), its volume and energy efficiency of its construction (thickness of insulation, compressor efficiency, etc.) and the difference between the ambient temperature and the temperature inside the appliance. In setting the efficiency standards therefore, allowance must be made for the main endogenous factors which influence energy consumption (i.e. the category of the appliance and its volume). For this reason the maximum allowable electricity consumption of a refrigeration appliance is defined by a linear equation which is a function of the volume of the appliance, with different equations laid down for each category of the appliance.

To calculate the maximum allowable electricity consumption of a given appliance, it must therefore first be allocated to the appropriate category from the following list:

Category	Description
1	Refrigerator, without low temperature compartment(')
2	Refrigerator/chiller with compartment at 5 °C and/or 12 °C
3	Refrigerator, with no-star low temperature compartment
4	Refrigerator, with low temperature compartment (*)
5	Refrigerator, with low temperature compartment (**)
6	Refrigerator, with low temperature compartment (***)
7	Refrigerator/freezer, with freezer compartment (****)
8	Food freezer, upright
9	Food freezer, chest
10	Refrigerator/freezer, with more than two doors, other appliances not covered above.

(') Any compartment with a temperature at or below - 6 °C.

Because refrigeration appliances contain different compartments maintained at different temperatures, (which will significantly influence electricity consumption), maximum allowable electricity consumption defined in practice as a function of the adjusted volume, which is the weighted sum of the volumes of the different compartments.

Thus, for the purposes of this Rulebook, the adjusted volume (V_{adj}) of a refrigeration appliance is defined as:

$$V_{adj} = \sum V_c \times W_c \times F_c \times C_c$$

$$W_c = (25 - T_c) / 20$$

where T_c is the designed temperature in each compartment (in °C),

where V_c is the net volume of a give type of compartment in the appliance and F_c is a factor which equals 1,2 for no frost compartments and 1 for other compartments,

$C_c = 1$ for refrigeration appliances belonging to the normal (N) and subnormal (SN) climate classes

$C_c = X_c$ for refrigeration appliances belonging to the sub- tropical (SN) climate class

$C_c = Y_c$ for refrigeration appliances belonging to the tropical (T) climate class.

The coefficients for X_c и Y_c for different types of compartment are:

Table of coefficients X_c and Y_c , according to the temperature of the compartment		
	X_c	Y_c
Cellar compartment	1,25	1,35
Fresh food cellar compartment	1,20	1,30
0°C cellar compartment	1,15	1,25
No-star cellar compartment	1,15	1,25
1-star (*) cellar compartment	1,12	1,20
2-star (**) cellar compartment	1,08	1,15
3-star (***) cellar compartment	1,05	1,10

Both the adjusted volume and the net volume are expressed in litres.

The maximum allowable electricity consumption (E_{max} expressed in kWh per 24 hours calculated to two decimal places), for an appliance type with adjusted volume V_{adj} is defined by the following equations for each appliance category:

Category	Description	E_{max} (kWh/24 h)
1	Refrigerator, without low temperature compartment(')	$(0,207 \times V_{adj} + 218) / 365$
2	Refrigerator, chiller with compartment at 5 °C and/or 12 °C	$(0,207 \times V_{adj} + 218) / 365$
3	Refrigerator, with no-star low temperature compartment	$(0,207 \times V_{adj} + 218) / 365$
4	Refrigerator, with low temperature compartment (*)	$(0,557 \times V_{adj} + 166) / 365$
5	Refrigerator, with low temperature compartment (**)	$(0,402 \times V_{adj} + 219) / 365$
6	Refrigerator, with low temperature compartment (***)	$(0,573 \times V_{adj} + 206) / 365$
7	Refrigerator/freezer, with freezer compartment (****)	$(0,697 \times V_{adj} + 272) / 365$
8	Food freezer, upright	$(0,434 \times V_{adj} + 262) / 365$
9	Food freezer, chest	$(0,480 \times V_{adj} + 195) / 365$

For refrigerators/freezers with more than two doors, or other appliances not covered above, the maximum allowable electricity consumption (E_{max}) is determined by the temperature and the star rating of the compartment with the lowest temperature, as follows:

Temperature of the coldest compartment	Category	E_{max} (kWh/24 h)
$> -6^\circ\text{C}$	1/2/3	$(0,207 \times V_{adj} + 218) / 365$
$\leq -6^\circ\text{C}$ (*)	4	$(0,557 \times V_{adj} + 166) / 365$
$\leq -12^\circ\text{C}$ (**)	5	$(0,402 \times V_{adj} + 219) / 365$
$\leq -18^\circ\text{C}$ (***)	6	$(0,573 \times V_{adj} + 206) / 365$

$\leq -18^{\circ}\text{C}(\text{****})$	7	$(0,697 \times V_{\text{adj}} + 272) / 365$
Test procedures for checking whether an appliances complies with the electricity consumption requirements of this Rulebook		

Test procedures for checking whether an appliances complies with the electricity consumption requirements of this Rulebook.

If the electricity consumption of a refrigeration appliances submitted for verification is less than or equal to E_{max} (the maximum allowable electricity consumption value for its category, as defined above) plus 15%, the appliance is certified as conforming to the electricity consumption requirements of this Rulebook. If the electricity consumption of the appliance is greater than E_{max} plus 15%, the electricity consumption of a further three appliances must be measured. If the arithmetic mean of the electricity consumption of these three appliances is less then or equal to E_{max} plus 10% the appliance is certified as conforming to the electricity consumption requirements of this Rulebook. If the arithmetic mean exceeds E_{max} plus 10%, the appliances must be judged not to conform to the electricity consumption requirements of this Rulebook.

The terms used in this Annex correspond to the definitions in the National Standard MKS EN 153.

‘CE’ CONFORMITY MARKING

The conformity marking shall consist of the initials ‘CE’ taking the following form:

