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Minimum allowable values of energy efficiency and energy efficiency grades for electric pressure cookers

电压力锅能效限定值及能效等级

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1 Scope

This Standard specifies energy efficiency grades, minimum allowable values of energy efficiency and test methods for electric pressure cookers.

This Standard is applicable to electric pressure cookers that are heated by electric heating elements or electromagnetic induction, of which the rated power is not more than 2000W, the rated volume is not more than 10L, and the rated cooking pressure is 40kPa~140kPa (gauge pressure).

2 Normative references

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

GB 4706.1, *Safety of household and similar electrical appliances Part 1: General requirements*

GB 4706.19, *Household and similar electrical appliances - Safety - Particular requirements for heating liquids*

3 Terms and definitions

For the purposes of this document, the terms and definitions defined in GB 4706.1 and GB 4706.19 as well as the followings apply.

3.1 energy efficiency for electric pressure cookers

the ratio of effective output energy of electric pressure cooker to input electricity

3.2 warm-keeping energy consumption

the power consumption per unit time when the product enters the heat preservation state

3.3 standby power

$$H_i = 9.601\ 2\bar{t} - 539.64\ (100\ ℃ \leqslant t < 140\ ℃) \quad \cdots\cdots (2)$$

$$\bar{t} = \sum_{t=1}^{1\,800} t / 1\,800 \quad \cdots\cdots (3)$$

$$H_{t_1} = 4.187\ 5t_1 + 0.143\ 9\ (20\ ℃ \leqslant t < 100\ ℃) \quad \cdots\cdots (4)$$

Where,

η - Energy efficiency of electric pressure cooker, %;

λ - Heating method correction factor. For products of which the heating method is electromagnetic induction heating, take 1.15 as λ value; for products of which the heating method is electric heating element heating, take 1.0 as λ value;

G - Mass of water before test, in kilograms (kg);

H_i - When the temperature is higher than 100°C, the enthalpy value corresponding to the arithmetic mean value of the cooking temperature in the cooker for 30min continuous work, in kilojoules per kilogram (kJ/kg), calculated according to formula (2);

$\bar{t}$ - When the temperature is higher than 100°C, the arithmetic mean value of the cooking temperature in the cooker for 30min continuous work, in Celsius (°C), calculated according to formula (3);

H_{t1} - Enthalpy value corresponding to the initial water temperature before the test, in kilojoules per kilogram (kJ/kg), calculated according to formula (4);

t_1 - Water temperature before test, in Celsius (°C);

E - Power consumption, total input power of the whole process of determination, in watt hour (W · h);

t - When the temperature is higher than 100°C, the cooking temperature value in the pot for 30min continuous work, recorded once every second, in Celsius (°C).

5 Technical requirements

The minimum allowable value of energy efficiency for electric pressure cooker is grade 3 index value of the energy efficiency grades in Table 1.

Annex A

(normative)

Test methods for energy efficiency for electric pressure cookers

A.1 Test conditions

A.1.1 Test environment

The test environment shall meet the following conditions:

a) Atmospheric pressure: 98kPa~106kPa;

b) Ambient temperature: 23°C±2°C, and there is no air flow in the test room;

c) Relative humidity: 45%~75%.

A.1.2 Power supply

The test of energy efficiency for electric pressure cookers shall be carried out under the conditions at the rated voltage of 220V±2.2V and rated frequency of 50Hz±1Hz.

A.1.3 Measuring instruments

The measuring instruments shall meet the following requirements:

a) The accuracy of the power meter shall not be less than ±0.5%;

b) The electric energy meter can measure energy consumption at a minimum level of 20mW·h;

c) The resolution of the instrument used for temperature measurement is not less than 0.1°C. The accuracy is not less than ±0.85°C in the temperature range of 0°C~100°C. The accuracy is not less than ±1.0°C when it is greater than 100°C;

d) When the weighing instrument is at full scale, the relative error does not exceed ±0.1%, and the minimum display (scale) value is 1g;

e) The accuracy of the timer is not less than ±2s/h.

A.1.4 Water

Use tap water for the test.

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